MULTICULTURAL SCALE DEVELOPMENT
IN SOCIAL WORK

by

ADRIAN DUPELESSIS VANBREDA

DOCTORAL DISSERTATION
Submitted in fulfilment of the requirements for the degree of D LITT ET PHIL in SOCIAL WORK in the FACULTY OF ARTS at the RAND AFRIKAANS UNIVERSITY

SUPERVISOR: DR W. ROESTENBURG

JULY 2004
ACKNOWLEDGEMENTS

I wish to express my appreciation to the following people without whom I could not have completed this dissertation:

- Dr Annatjie Faul, previously a lecturer at RAU and my original doctoral supervisor, who inspired my to undertake this study and who guided me in the formulation of the multicultural scale development process described in chapters 2 & 3.

- Dr Wim Roestenburg, who took over as my doctoral supervisor and who has served to champion ecometrics in South Africa.

- Brigadier General Ntsiki Motumi, Director Social Work in the South African National Defence Force, whose commitment to the Military Social Health Index opened the many doors necessary to collect sufficient data for this study and ensures the use of the Index by social workers throughout the country.

- Mrs Lynette Kleynhans, social work researcher at the Military Health Research Centre, who partnered me through the empirical phase of this study and without whose support I would have been overwhelmed with the administration of the study.

- Major Seravani Govender, Captain Maria Buthelezi, Major Patricia Mokgagane, Major Rut Domingo, Mrs Lynette Kleynhans and Captain Lillian Magagula, social workers in the South African Military Health Service, who pioneered the implementation of multicultural scale development in the SANDF, through serving as the research team for the analysis, design and development phases of the study.

- All the social workers in the SANDF who collected Military Social Health Index data during 2003.

- The 4171 members of the SANDF who were willing to complete the lengthy (200 item!) validation version of the Military Social Health Index in 2003.

- Trina, my wife, and Erin, my son, who endured the six years and many hours of my labour on this dissertation.
ABSTRACT

This study serves to expand the work of A.C. Faul on scale development in social work to incorporate the demand for multiculturalism. Ecometrics – the measurement of ecosystems – is a steadily growing field in South Africa. To date, however, scale development has assumed that the ecometrics will be practiced in a monocultural context. This is obviously not the case in South Africa. Consequently, the research goal is to design a process model for the development of social work scales for multicultural use in South Africa. As a secondary objective, the study aims to test this model in practice, through the development of a multicultural scale that accurately measures the social health of military employees/families.

A number of issues underlying the technical aspects of multicultural scale development are first explored, including issues of the characteristics of ecometrics; the meaning of the term culture; the emic-etic debate; cultural equivalence; and bias, fairness and standards in ecometrics. Thereafter, a process model for the development of multicultural ecometric scales is introduced and five main phases are described: analysis, design, development, evaluation, and diffusion & adoption. Each of these phases is further decomposed into main moments and steps, each of which is described at both theoretical and technical levels.

In order to test this process model in the real world, a new multicultural, multilingual, multidimensional, systems-oriented, salutogenic scale was created, called the Military Social Health Index. In the analysis phase, the need for the scale was analysed and the innovation requirements determined and contracted with the client. A theoretical framework – family resilience theory – was identified and explored, resulting in the development of an assessment model that underlies the scale. The cross-cultural comparability of the constructs was assessed and each construct was operationally defined, using facet maps.

In the design phase, a multicultural, multilingual team of social workers generated close to 200 items, as well as instructions, using a multifocus approach, in which items were generated in four languages simultaneously (English, Zulu, Setswana and Afrikaans). Only items that could be expressed equivalently across languages were accepted. This resulted in an initial instrument, comprising 175 items (plus 16 demographic items), covering seven constructs, in four languages, at an average reading level of Grades 6-7.

During the development (or field testing) phase, the instrument was reviewed by a group of social workers for content relevance, translation equivalence, item formulation, etc. Thereafter it was reviewed by focus groups of soldiers in the SANDF. Finally, the instrument was subjected to an analysis of linguistic equivalence. In response to each review, changes were made to the instrument.

In the evaluation phase, the Military Social Health Index was completed by 4171 uniformed soldiers, of whom 951 were casework clients of military social workers. Convenience sampling was
used, but because the data were collected by approximately 100 social workers across the country, the participants represent a highly diverse group of soldiers. Data were subjected a series of analyses at concept-level, item-level and scale-level, culminating in the establishment of clinical cutting scores. The validation of four of the seven scales is reported. Overall the results of this phase show that the Military Social Health Index is reliable and valid both within and across the four target cultures (African Xhosa, African Setswana, Coloured Afrikaans and White Afrikaans). Only the known groups validity, and consequently the clinical cutting scores, performed poorly.

The study is concluded with a review and evaluation of the newly developed process model for multicultural scale development in social work. A number of adjustments to the model are proposed. The candidate concludes by arguing that the integration of multiculturalism into ecometrics is essential for the sustainability of ecometrics in this country.

The candidate can be reached by email at adrian@vanbreda.org
TABLE OF CONTENTS

Acknowledgements........................................................................................................... i

Abstract .......................................................................................................................... iii

Table of Contents ............................................................................................................. v

List of Figures ................................................................................................................. xix

List of Tables ................................................................................................................. xxiii

CHAPTER ONE: BROAD OVERVIEW OF SUBJECT MATTER.........................1

1.1 Introduction to Chapter One................................................................. 1

1.2 Multicultural Scale Development ................................................. 1

1.2.1 The Push for Accountability ......................................................... 1

1.2.2 The Push for Cultural Competence ................................................ 3

1.2.3 The Changing Demographics of our Client Systems ....................... 6

1.2.4 Conclusion ................................................................................. 7

1.3 Military Deployments & Social Health .......................................... 8

1.3.1 Changes in the Military Community ............................................. 8

1.3.2 Enhancing the Deployment Resilience of Military Families ............... 11

1.3.3 Concurrent Health Assessments ................................................. 13

1.4 Statement of Research Goals ......................................................... 14

1.4.1 Research Problem ...................................................................... 14
1.4.2 Research Question .......................................................................................... 14
1.4.3 Research Goal ................................................................................................. 14
1.4.4 Research Objectives ......................................................................................... 15

1.5 Broad Methodology ........................................................................................... 15

1.6 Definitions of Key Terms .................................................................................... 19

1.7 Limitations of the Study ..................................................................................... 21

1.8 Chapter Outline .................................................................................................. 22

CHAPTER TWO: ANALYSIS OF MULTICULTURAL SCALE DEVELOPMENT 23

2.1 Introduction to Chapter Two .............................................................................. 23

2.2 Ecometrics and Psychometrics .......................................................................... 24
  2.2.1 Measurement of Personality versus Measurement of Ecology ...................... 25
  2.2.2 Latent versus Manifest Traits .......................................................................... 27
  2.2.3 Diagnosis versus Assessment .......................................................................... 28
  2.2.4 Norm-referenced Scaling versus Criterion-referenced Scaling ....................... 29

2.3 Culture and Scale Development ....................................................................... 30
  2.3.1 Material Resources ....................................................................................... 32
  2.3.2 Language ....................................................................................................... 33
  2.3.3 Meanings ...................................................................................................... 35
  2.3.4 Customs ....................................................................................................... 36
  2.3.5 Assimilation and Acculturation ....................................................................... 36
  2.3.6 Multiculturalism in Scale Development .......................................................... 38
2.4 The Emic-etic Debate ................................................................................................. 40
  2.4.1 Emic-Etic ........................................................................................................ 40
  2.4.2 Constructivism-Positivism .............................................................................. 41

2.5 Equivalency ............................................................................................................. 44
  2.5.1 Functional Equivalence .................................................................................. 45
  2.5.2 Conceptual Equivalence ................................................................................ 46
  2.5.3 Metric Equivalence ....................................................................................... 47
  2.5.4 Scalar Equivalence ....................................................................................... 48
  2.5.5 Seeking Equivalence .................................................................................... 49

2.6 Bias & Fairness ........................................................................................................ 49
  2.6.1 Bias & Fairness ............................................................................................. 49
  2.6.2 Standards of Ecometric Scale Development and Use .................................... 51

2.7 Summary of Chapter ............................................................................................. 53

2.8 In the Following Chapter ...................................................................................... 55

CHAPTER THREE: MULTICULTURAL ECOMETRIC SCALE DEVELOPMENT 57

3.1 Introduction to Chapter Three ............................................................................... 57

3.2 Models of Scale Development ............................................................................... 57
  3.2.1 Process Model of Scale Development ............................................................ 57
  3.2.2 Affordability versus Scientific Standards ...................................................... 58
  3.2.3 Models of Scale Development ...................................................................... 59
  3.2.4 Shortcomings of Existing Models of Scale Development ............................. 61
3.2.5 Proposed Model of Multicultural Scale Development .............................................. 63

3.3 The Analysis Phase ........................................................................................................65

3.3.1 Main Moment A: Identify Problem ............................................................................ 65

3.3.1.1 Step 1: Analyse the Problem ............................................................................. 65

3.3.1.2 Step 2: Determine the Study End Results ......................................................... 67

3.3.2 Main Moment B: Formulate Theory ......................................................................... 69

3.3.2.1 Step 3: Identify Theoretical Framework .......................................................... 69

3.3.2.2 Step 4: Identify Operational Assessment Area(s) ............................................. 70

3.3.2.3 Step 5: Explore Cross-Cultural Comparability of Assessment Area(s) ............. 70

3.3.2.4 Step 6: Define Construct(s) to be Measured ..................................................... 71

3.4 The Design Phase .........................................................................................................73

3.4.1 An Overview of Scale Design .................................................................................. 73

3.4.1.1 Scaling Items ..................................................................................................... 73

3.4.1.2 Formulating Items ............................................................................................ 78

3.4.1.3 Translating Items ............................................................................................ 86

3.4.2 Main Moment C: Design Scale ................................................................................ 88

3.4.2.1 Step 7: Scale the Items .................................................................................... 88

3.4.2.2 Step 8: Design the Items ................................................................................ 88

3.4.2.3 Step 9: Determine Reading Level ..................................................................... 89

3.4.2.4 Step 10: Develop a Scoring Formula ............................................................... 91

3.4.2.5 Step 11: Write Instructions for Respondents .................................................... 92

3.5 The Development Phase .............................................................................................93

3.5.1 Main Moment D: Review Items .............................................................................. 93
3.5.1.1 Step 12: Obtain Expert Reviews of Items .......................................................... 95

3.5.1.2 Step 13: Field-Test the Items ........................................................................ 98

3.5.2 Main Moment E: Investigate Linguistic Equivalence ........................................... 99

3.5.2.1 Step 14: Investigate Linguistic Equivalence of Items .................................... 101

3.6 The Evaluation Phase .......................................................................................... 103

3.6.1 Main Moment F: Design Validation Study ....................................................... 103

3.6.1.1 Step 15: Formulate Research Questions ...................................................... 103

3.6.1.2 Step 16: Select a Sample ............................................................................ 104

3.6.1.3 Step 17: Prepare the Research Package ...................................................... 105

3.6.2 Main Moment G: Collect Data ......................................................................... 106

3.6.2.1 Step 18: Administer Research Package to Sample ....................................... 106

3.6.3 Overview of Reliability & Validity .................................................................... 107

3.6.3.1 An Introduction to Reliability ...................................................................... 107

3.6.3.2 An Introduction to Validity ......................................................................... 118

3.6.3.3 Steps Involved in Investigating Reliability & Validity .................................. 133

3.6.4 Main Moment H: Concept-Level Analysis ....................................................... 134

3.6.4.1 Step 19: Consolidate Evidence Supporting Content Validity ....................... 134

3.6.5 Main Moment I: Item-Level Analysis .............................................................. 135

3.6.5.1 Step 20: Conduct Item Analysis .................................................................. 135

3.6.5.2 Step 21: Investigate Item Cultural Bias ....................................................... 136

3.6.5.3 Step 22: Compute Coefficient Alpha .......................................................... 138

3.6.5.4 Step 23: Compare Reliabilities Across Cultures ......................................... 139

3.6.5.5 Step 24: Compute Standard Error of Measurement ...................................... 141

3.6.5.6 Step 25: Conduct Multiple Group Confirmatory Analysis at Item Level ....... 142
3.6.5.7 Step 26: Conclude Multicultural Item-Level Analysis ..............................................144
3.6.6 Main Moment J: Scale-Level Analysis ........................................................................145
3.6.6.1 Step 27: Conduct Convergent and Discriminant Validity Analysis at Scale Level .145
3.6.6.2 Step 28: Conduct Known Groups Validity Analysis ..............................................146
3.6.6.3 Step 29: Conclude Multicultural Scale-Level Analysis ........................................148
3.6.7 Main Moment K: Establish Clinical Cutting Scores ................................................148
3.6.7.1 Step 30: Establish Clinical Cutting Scores ..............................................................150

3.7 The Diffusion & Adoption Phase...............................................................................153
3.7.1 Main Moment L: Disseminate Information................................................................154
3.7.1.1 Step 31: Write a Manual and Present Training.......................................................154
3.7.1.2 Step 32: Write a Journal Article ............................................................................154

3.8 Summary of Chapter ..............................................................................................155
3.9 In the Following Chapter .......................................................................................155

CHAPTER FOUR: ANALYSIS PHASE ..............................................................................157

4.1 Introduction to Analysis Phase ................................................................................157
4.1.1 Introduction to the Creation of the Military Social Health Index............................157
4.1.2 Chapter Overview ....................................................................................................158
4.1.3 What’s New in this Phase? .....................................................................................158

4.2 Main Moment A: Identify Problem .........................................................................159
4.2.1 Step 1: Analyse the Problem ..................................................................................159
4.2.1.1 Purpose of Study and State-of-the-Art Review .....................................................159
4.2.1.2 Feasibility Study

4.2.2 Step 2: Determine the Study End Results

4.2.2.1 Innovation Objective

4.2.2.2 Innovation Requirements

4.3 Main Moment B: Formulate Theory

4.3.1 Step 3: Identify Theoretical Framework

4.3.1.1 Introduction to Theoretical Framework: Resilience Theory

4.3.1.2 The Resilience Model of Social Health

4.3.1.3 The Stressor

4.3.1.4 Vulnerability

4.3.1.5 Social Problems

4.3.1.6 Pileup

4.3.1.7 Family Life Cycle

4.3.1.8 Work-to-Family Interference

4.3.1.9 Resilience

4.3.1.10 Support Systems

4.3.1.11 Stressor Appraisal

4.3.1.12 Problem Solving

4.3.1.13 Generalised Resistance Resources

4.3.1.14 Conclusion to Step 3

4.3.2 Step 4: Identify Operational Assessment Areas

4.3.3 Step 5: Explore Cross-cultural Comparability of Assessment Areas

4.3.4 Step 6: Define Constructs to be Measured

4.3.4.1 Family
5.2.5 Step 11: Write Instructions for Respondents ......................................................248

5.3 Summary of Chapter ...........................................................................................249

5.4 In the Following Chapter ....................................................................................249

CHAPTER SIX: DEVELOPMENT PHASE ...............................................................251

6.1 Introduction to Development Phase .....................................................................251

6.1.1 Chapter Overview ..........................................................................................251

6.1.1 What’s New in this Phase? ............................................................................252

6.2 Main Moment D: Review Items .........................................................................252

6.2.1 Step 12: Obtain Expert Review of Items .......................................................253

6.2.2 Step 13: Field Test Items ............................................................................255

6.3 Main Moment E: Investigate Linguistic Equivalence .......................................256

6.3.1 Step 14: Investigate Linguistic Equivalence .................................................257

6.3.1.1 Procedures ............................................................................................257

6.3.1.2 Sample Characteristics .........................................................................258

6.3.1.3 Item Equivalence ..................................................................................261

6.3.1.4 Split-half Equivalence .........................................................................263

6.3.1.5 Response to Split-half Equivalence ......................................................265

6.3.1.6 Scale-level Equivalence ......................................................................269

6.3.1.7 Summary of Linguistic Equivalence Study Results ................................269

6.4 Summary of Chapter ..........................................................................................271

6.5 In the Following Chapter ....................................................................................271
CHAPTER SEVEN: EVALUATION PHASE ................................................................. 273

7.1 Introduction to Evaluation Phase ..................................................................... 273

7.1.1 Chapter Overview ......................................................................................... 273

7.1.2 What’s New in this Chapter? ......................................................................... 274

7.2 Main Moment F: Design Validation Study ....................................................... 274

7.2.1 Step 15: Formulate Research Questions ...................................................... 275

7.2.2 Step 16: Select a Sample ............................................................................... 275

7.2.3 Step 17: Prepare the Research Package ....................................................... 276

7.3 Main Moment G: Collect Data ......................................................................... 277

7.3.1 Step 18: Administer Research Package to Sample ....................................... 277

7.3.1.1 Age ......................................................................................................... 280

7.3.1.2 Rank ....................................................................................................... 281

7.3.1.3 Gender .................................................................................................... 282

7.3.1.4 Marital Status .......................................................................................... 283

7.3.1.5 Duration of Relationship ......................................................................... 284

7.3.1.6 Arm of Service ......................................................................................... 285

7.3.1.7 Educational Qualification ....................................................................... 286

7.3.1.8 Number of Times Married ...................................................................... 287

7.3.1.9 Number of Children ............................................................................... 288

7.3.1.10 Access to Social Work Services .............................................................. 289

7.3.1.11 Monthly Net Income ............................................................................. 290

7.3.1.12 Language Used in Completing MSHI ...................................................... 291

7.3.1.13 Difficulties Understanding the Questionnaire ........................................ 292
7.3.1.14 Region ................................................................................................... 292

7.4 Main Moment H: Concept-Level Analysis....................................................... 294
7.4.1 Step 19: Consolidate Evidence Supporting Content Validity ......................... 294

7.5 Main Moment I: Item-Level Analysis............................................................... 296
7.5.1 Step 20: Conduct Item Analysis .................................................................... 296
7.5.2 Step 21: Investigate Item Culture Bias ......................................................... 298
7.5.3 Step 22: Compute Coefficient Alpha ............................................................ 299
7.5.4 Step 23: Compare Reliabilities Across Cultures ............................................. 300
7.5.5 Step 24: Compute Standard Error of Measurement ........................................ 302
7.5.6 Step 25: Conduct Multiple Group Confirmatory Analysis at Item Level ......... 303
7.5.7 Step 26: Conclude Multicultural Item-Level Analysis .................................... 306

7.6 Main Moment J: Scale-Level Analysis............................................................. 308
7.6.1 Step 27: Conduct Convergent and Discriminant Validity Analysis at Scale Level ..... 308
7.6.2 Step 28: Conduct Known Groups Scale-Level Analysis ................................. 313
7.6.3 Step 29: Conclude Multicultural Scale-Level Analysis .................................... 317

7.7 Main Moment K: Establish Clinical Cutting scores ......................................... 318
7.7.1 Establish Clinical Cutting scores .................................................................... 318

7.8 Summary of Chapter ...................................................................................... 321
7.8.1 Is the Military Social Health Index reliable for each culture group? .................. 322
7.8.2 Is the Military Social Health Index valid for each culture group? ....................... 322
7.8.3 Is the Military Social Health Index reliable and valid across target culture groups? ... 324

7.9 In the Following Chapter .............................................................................. 325
CHAPTER EIGHT: DIFFUSION & ADOPTION PHASE ...........................................327

8.1 Introduction to the Diffusion & Adoption Phase...........................................327

8.1.1 Chapter Overview ......................................................................................327

8.1.2 What’s New in this Chapter ........................................................................327

8.2 Main Moment L: Disseminate Information ....................................................328

8.2.1 Step 31: Write a Manual & Present Training .............................................328

8.2.2 Step 32: Write a Journal Article .................................................................329

8.3 Future Plans for the Military Social Health Index .......................................329

8.4 In the Following Chapter .............................................................................331

CHAPTER NINE: CONCLUSIONS & RECOMMENDATIONS .......................333

9.1 Introduction to the Chapter ..........................................................................333

9.2 Evaluation of Multicultural Scale Development Process ...........................334

9.2.1 Review of Process Model Phases ...............................................................334

9.2.1.1 Review of Analysis Phase ....................................................................334

9.2.1.2 Review of Design Phase .......................................................................335

9.2.1.3 Review of Development Phase .............................................................336

9.2.1.4 Review of Evaluation Phase ..................................................................336

9.2.1.5 Review of Diffusion & Adoption Phase ................................................338

9.2.2 Review of the Process Model as a Human Service Intervention .............338

9.2.2.1 Objective Capability ............................................................................338

9.2.2.2 Adequacy of Scale Development Procedure .......................................339
9.2.2.3 Ethical Suitability ........................................................... 340
9.2.2.4 Usability ............................................................... 341

9.2.3 Recommended Adjustments to Process Model ........................................ 343

9.3 Achievement of the Research Goal & Objectives ........................................... 343

9.4 Recommendations for Multicultural Ecometrics ........................................... 344

9.5 Diffusion of the Multicultural Scale Development Model ............................... 346

9.6 Conclusion ......................................................................................... 347

REFERENCES ..................................................................................... 349

APPENDIXES .................................................................................... 403

Appendix A: Evidence Of Content Validity ....................................................... 405

Appendix B: Item Level Analysis Form ............................................................. 407

Appendix C: Validation Version of the Military Social Health Index .................. 409

Appendix D: Research Protocol for Validation Study ........................................ 441

Appendix E: Data Analysis Log .................................................................. 461

Appendix F: Factor Matrixes ........................................................................ 463

Appendix G: Integration of Item Analysis ......................................................... 483
<table>
<thead>
<tr>
<th>Figure</th>
<th>Description</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Figure 1</td>
<td>Developmental Research &amp; Utilization (DR&amp;U)</td>
<td>16</td>
</tr>
<tr>
<td>Figure 2</td>
<td>Research Methodology</td>
<td>17</td>
</tr>
<tr>
<td>Figure 3</td>
<td>Research Methodology Illustration</td>
<td>19</td>
</tr>
<tr>
<td>Figure 4</td>
<td>Brief Acculturation Scale</td>
<td>37</td>
</tr>
<tr>
<td>Figure 5</td>
<td>Comparison Of Emic and Etic Approaches</td>
<td>40</td>
</tr>
<tr>
<td>Figure 6</td>
<td>Faul’s Research Process of Scale Development in Ecometrics</td>
<td>60</td>
</tr>
<tr>
<td>Figure 7</td>
<td>De Vellis’ Guidelines on Scale Development</td>
<td>61</td>
</tr>
<tr>
<td>Figure 8</td>
<td>Integration Of Scale Development Models</td>
<td>63</td>
</tr>
<tr>
<td>Figure 9</td>
<td>Process of Multicultural Ecometric Scale Development</td>
<td>64</td>
</tr>
<tr>
<td>Figure 10</td>
<td>The Analysis Phase: Main Moments &amp; Research Steps</td>
<td>65</td>
</tr>
<tr>
<td>Figure 11</td>
<td>The Design Phase: Main Moments &amp; Research Steps</td>
<td>73</td>
</tr>
<tr>
<td>Figure 12</td>
<td>Partition Labels</td>
<td>77</td>
</tr>
<tr>
<td>Figure 13</td>
<td>Fry’s Graph for Estimating Reading Level</td>
<td>90</td>
</tr>
<tr>
<td>Figure 14</td>
<td>The Development Phase: Main Moments &amp; Steps</td>
<td>93</td>
</tr>
<tr>
<td>Figure 15</td>
<td>The Evaluation Phase: Main Moments &amp; Steps</td>
<td>103</td>
</tr>
<tr>
<td>Figure 16</td>
<td>A Scale with Reliability of .90</td>
<td>109</td>
</tr>
<tr>
<td>Figure 17</td>
<td>A Scale with Reliability of .60</td>
<td>109</td>
</tr>
<tr>
<td>Figure 18</td>
<td>Methods of Estimating Reliability</td>
<td>110</td>
</tr>
<tr>
<td>Figure 19</td>
<td>Methods of Estimating Validity</td>
<td>121</td>
</tr>
<tr>
<td>Figure 20</td>
<td>Clinical Cutoff Scores – Perfect Case</td>
<td>149</td>
</tr>
<tr>
<td>Figure 21</td>
<td>Clinical Cutoff Scores – Ideal Case</td>
<td>150</td>
</tr>
</tbody>
</table>
Figure 46: Number of Children per Culture Group ............................................................288
Figure 47: Access to Social Work Services per Culture Group ...........................................289
Figure 48: Monthly Income per Culture Group ..................................................................290
Figure 49: Language Used per Culture Group ..................................................................291
Figure 50: Difficulties Understanding Questionnaire per Culture Group .................................292
Figure 51: Region per Culture Group .............................................................................293
Figure 52: Process of Multicultural Ecometric Scale Development .......................................327
**LIST OF TABLES**

<table>
<thead>
<tr>
<th>Table</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Table 1: Expert Rating Of Content Validity</td>
<td>254</td>
</tr>
<tr>
<td>Table 2: Item Equivalence Across Language Versions</td>
<td>262</td>
</tr>
<tr>
<td>Table 3: Split-Half Linguistic Equivalence For English-Afrikaans</td>
<td>264</td>
</tr>
<tr>
<td>Table 4: Split-Half Linguistic Equivalence For English-Zulu</td>
<td>264</td>
</tr>
<tr>
<td>Table 5: Split-Half Linguistic Equivalence For English-Setswana</td>
<td>264</td>
</tr>
<tr>
<td>Table 6: Comparisons Yielding Significant Differences Between Correlation Coefficients</td>
<td>265</td>
</tr>
<tr>
<td>Table 7: Reliability Coefficients For English-Afrikaans</td>
<td>266</td>
</tr>
<tr>
<td>Table 8: Reliability Coefficients For English-Zulu</td>
<td>266</td>
</tr>
<tr>
<td>Table 9: Reliability Coefficients For English-Setswana</td>
<td>267</td>
</tr>
<tr>
<td>Table 10: Reliability Coefficients for Combined Linguistic Equivalence Study Data</td>
<td>268</td>
</tr>
<tr>
<td>Table 11: Scale-Level Linguistic Equivalence</td>
<td>269</td>
</tr>
<tr>
<td>Table 12: Basic Profile of Usable Data Received</td>
<td>279</td>
</tr>
<tr>
<td>Table 13: Basic Study Sample Profile</td>
<td>279</td>
</tr>
<tr>
<td>Table 14: Summary of Item Analysis Across Cultures</td>
<td>297</td>
</tr>
<tr>
<td>Table 15: Summary of Item Cultural Bias</td>
<td>298</td>
</tr>
<tr>
<td>Table 16: Coefficient Alpha</td>
<td>299</td>
</tr>
<tr>
<td>Table 17: Statistics for Initial Comparisons of Reliability Coefficients Across Culture Groups</td>
<td>301</td>
</tr>
<tr>
<td>Table 18: Statistics for Final Comparisons of Reliability Coefficients Across Culture Groups</td>
<td>301</td>
</tr>
<tr>
<td>Table 19: Standard Error of Measurement</td>
<td>302</td>
</tr>
<tr>
<td>Table 20: Construct Validity Assessment at Item Level</td>
<td>304</td>
</tr>
<tr>
<td>Table 21: Initial Construct Validity at the Item Level of Analysis</td>
<td>305</td>
</tr>
</tbody>
</table>
Table 22: Final Construct Validity at the Item Level of Analysis........................................305
Table 23: Initial Item-Level Construct Validity Coefficients.............................................306
Table 24: Final Item-Level Construct Validity Coefficients .............................................306
Table 25: Initial Construct Validity Class I Predictors.....................................................310
Table 26: Final Construct Validity Class I Predictors .......................................................310
Table 27: Initial Construct Validity Class II & III Predictors .............................................311
Table 28: Final Construct Validity Class II & III Predictors .............................................311
Table 29: Summary of Construct Validity at Scale Level .................................................312
Table 30: Description of Criterion Groups .......................................................................315
Table 31: Summary of Criterion Related Validity...........................................................316
Table 32: Summary of Clinical Cutting scores .................................................................319
Table 33: Percentage Clinical Respondents in Cutting Ranges........................................321
Table 34: Original Factor Matrix: White Afrikaans Culture .............................................463
Table 35: Original Factor Matrix: Coloured Afrikaans Culture .......................................466
Table 36: Original Factor Matrix: African Setswana Culture ..........................................469
Table 37: Original Factor Matrix: African Xhosa Culture ...............................................472
Table 38: Final Factor Matrix: White Afrikaans Culture .................................................475
Table 39: Final Factor Matrix: Coloured Afrikaans Culture ..........................................477
Table 40: Final Factor Matrix: African Setswana Culture .............................................479
Table 41: Final Factor Matrix: African Xhosa Culture ...................................................481
Table 42: Integrated Item Analysis for Resilience Scales ................................................483
CHAPTER ONE: BROAD OVERVIEW OF SUBJECT MATTER

1.1 INTRODUCTION TO CHAPTER ONE

There is increasingly a demand on social workers to demonstrate the effectiveness of their work. This demand arises from within the profession itself, from those who sponsor social work services (including the state) and from the clients who receive social work services. Social work is an exceptionally far-reaching and holistic discipline, and so measuring the effects of social work interventions is a daunting challenge. This challenge is not made easier by the typically multicultural nature of social work clientele.

When endeavouring to measure the effectiveness and impact of their work, social workers often turn to the various standardised scales that are available. The collection of scales called the Clinical Measurement Package (Hudson, 1982), the Heimler Scale of Social Functioning (Heimler, 1990) and the Psychosocial Functioning Inventory (Faul, 1995) are examples of such scales. Many, if not most of these scales have not, however, been developed for multicultural use. Particularly in South Africa, with its extreme cultural diversity, scales that have been developed in the West (especially in the USA) are often not suitable for use with the bulk of social work clientele.

This study, therefore, proposes a model for the development of social work scales for multicultural use. This model will be empirically tested through the development of a scale that measures the social health of military employees (of diverse cultural backgrounds), and in particular, the ability of military employees to resist the stress of military deployments or separations.

This introductory chapter aims to:

- Provide a broad overview of the subject matter,
- Clearly formulate the research problem, question and objectives to be addressed,
- Sketch the broad methodology for the study,
- Define key terms used throughout the document,
- Identify key limitations of the study, and
- Provide a brief synopsis of the dissertation.

1.2 MULTICULTURAL SCALE DEVELOPMENT

1.2.1 THE PUSH FOR ACCOUNTABILITY

There is tremendous and increasing pressure on all professionals to evaluate the efficacy of their work. This is equally true for social workers and for military social workers in particular:
Today there is an increasing sense of urgency about being accountable as the government, our clients and consumers, and colleagues all point to the need to evaluate our practice and to provide evidence of the effectiveness of our work. (Bloom, Fischer, & Orme, 1995, p. xiii)

The last decade or so has seen increasing pressure brought to bear on practitioners to be accountable for what they do in practice. Although the term accountability has several meanings, we believe the most basic meaning of accountability is this: we have to be responsible for what we do with our clients. The most crucial aspect of that responsibility is a commitment to delivering effective services. There are very few in the human services who would deny the importance of providing effective services to clients as a major priority. Where the differences come about is in deciding how to go about implementing or operationalising this commitment to providing effective services. Conscientious monitoring and evaluating of one’s practice and the client’s functioning is a primary way to fulfil this commitment. (Fischer & Corcoran, 1994a, p. 4)

We live and work in an age of increased accountability, and it appears that such an emphasis will continue or perhaps grow more intense as service needs continue to increase and professional resources become scarcer. Funding agents, policymakers, and upper- and middle-level managers and administrators must increasingly seek and present information to show that a huge variety of human service programs are doing the job for which they were designed. (Hudson, 1982, p. 61)

The press for developing a validated knowledge base has been so forceful over the past 30 years that reliance on intuition and practice wisdom ... has long since been rejected as an adequate basis for conducting professional practice. (Hudson & Faul, 1997, p. 9)

The social work profession has called on social workers to become researcher-practitioners, that is, to integrate the art of practice with the science of research (eg. Dangel, 1994; Rosen, 1996; see Geddes & Harrison, 1997 for a similar trend in psychiatry). Social workers have to be able to substantiate the scientific basis of their work, to defend why a particular intervention was chosen, how a particular decision was made, and whether a particular intervention was effective and efficient. These questions can no longer be answered solely on the basis of experience, wisdom, intuition or unsubstantiated evidence. Social workers have to be able to produce concrete evidence to back up their practice methods.

One main way of doing this, if not the only way currently, is through the use of established social work measurement tools. There are a variety of measurement tools available, ranging from extremely tailor-made or individualised through highly standardised and objective (Bloom et al., 1995). The use of standardised social work or ecometric scales has and continues to enjoy popularity.

Within the South African National Defence Force (SANDF), there has been a similar trend over the past several years, and particularly at present. There is, for instance, a movement away from input-driven to output-driven performance assessment (Patti, 1987). Input-driven assessments ask professionals how much time they have spent working, how many clients they have seen, how many projects they have run, and so on (Hudson, 1995). The more hours a professional has worked, the better they are considered to have performed. Now we realise that merely working hard does not guarantee that the objective or outcome of the work has been achieved, nor does it guarantee that the outcome has been achieved as expediently or efficiently as possible.
There is thus a movement away from input towards output (Hudson, 1987). Output-driven assessments ask what professionals have achieved through their work – how many clients completed the service/intervention, how many successfully achieved the objectives, how many were satisfied with the services rendered, how many had to come back because the change was not sustained, how long did clients have to wait to receive the service, etc (eg. Traglia, Pecora, Paddock, & Wilson, 1997). Here the focus is not on what the professional did, but on how well s/he did it and how satisfied the client/user was with the service.

Input-driven assessments are relatively easy to measure – the professional simply keeps a time sheet and records all the hours worked – a practice familiar to all social workers in the public sector. Output-driven assessments are infinitely harder to measure and require some form of measurement tool, such as a scale (Hudson, 1997). Because these assessments can impact on one’s promotion, salary, etc, it is important that standardised measurement tools be used, so as to ensure that the performance assessments are fair across individuals, across evaluators and over time. Hence, the need for standardised scales.

There are many scales available to social workers for use in practice evaluation (Fischer & Corcoran, 1994a; Fischer & Corcoran, 1994b; McMurty, Rose, & Cisler, 2003). Most of these scales have, however, been developed for a monocultural context. Typically, scales are developed and standardised for White, Western populations – mostly in the USA. Such scales frequently do not work well in South Africa, which is characterised by a highly multicultural population (see also Samuda, 1983). Whites in South Africa make up only a small percentage of the total population, making the use of Western-oriented scales indefensible. Psychological test development in South Africa has tended to proceed along ethnic and racial lines (Moerdyk, 1989, p. 1), something that is no longer viable in our multiculturally integrated society (Shuttleworth-Jordan, 1996). Added to this is the increasing political, legal and professional pressure to provide evidence of the cross-cultural validity of scales before they can be used cross-culturally (Suzuki, Meller, & Ponterotto, 1996).

Similarly, the technology for scale development in social work is based on a monocultural assumption. Faul’s (1995) work on ecometric development is probably the most recognised in South Africa, and is derived from Walter Hudson’s work in the USA. Her scale development model can thus be regarded as probably the most representative model of scale development in the profession. However, this model lacks any consideration of multiculturalism, and thus falls short within the strongly multicultural context of South Africa. The push for cultural competence is thus not supported by Faul’s work.

1.2.2 THE PUSH FOR CULTURAL COMPETENCE

In addition to the push over the past few years to demonstrate the efficacy of social work interventions, there is a contemporary push for social workers to be culturally competent (McGoldrick, 1998; Pinderhughes, 1995; Ponterotto, Gretchen, Utsey, Rieger, & Austin, 2002). There are even some who believe professionals who lack cultural competence are “unethical and
potentially harmful" (Ponterotto & Alexander, 1996; see also Corey, Corey, & Callanan, 1998). Cultural competence involves the capacity of social workers (and other professionals) to bracket or set aside their own cultural preconceptions, values, judgements, norms, etc and to respond appropriately to the culture of another person.

Pinderhughes (1995, pp. 132-133) explains that for social workers to be culturally competent, they must be able to avoid using such automatic responses to difference as stereotyping, projection or distancing. Moreover, they must become aware of internalised responses resulting from their developmental experiences and be able to manage them effectively. She continues by listing six cultural competencies required of all social workers (Pinderhughes, 1995):

1. The ability to respect and appreciate the values, beliefs, and practices of all clients, including those who are culturally different, and to perceive such individuals through their own cultural lens rather than that of the practitioner.
2. Knowledge of the specific values, beliefs and cultural practices of clients.
3. The ability to be comfortable with difference in others and to avoid becoming trapped in anxious or defensive behavior in response to differences.
4. The ability to change false beliefs, assumptions, and stereotypes.
5. The ability to think flexibly and to recognize that one’s own way of thinking and behaving is not the only way to think and behave.
6. The ability to behave flexibly, as demonstrated by the readiness to take the steps required to sort through general knowledge about a culture group and to perceive the specific ways in which such knowledge applies or does not apply to a given client. (p. 133)

Weaver (1998) suggests that cultural competence comprises three dimensions:

1. The human services provider must be knowledgeable about the group in question;
2. The human services provider must be able to be self-reflective and to recognize biases within himself or herself and within the profession; and,
3. The human services provider must be able to integrate this knowledge and reflection with practice skills. (p. 201)

There is a slight tension here, because cultural competence involves, among other things, the practitioner being educated about and sensitive to the unique cultural practices and patterns of various culture groups, while at the same time not forcing individuals into these practices and patterns, which would amount to stereotyping (Conoley & Bryant, 1996) – this will be addressed further under the emic-etic debate in Chapter 2. Ultimately, what is probably required is a sensitivity to, acceptance of and respect for ‘differentness’, while acknowledging the many areas of sameness (ibid.; see also Van Breda, 1999c). In this regard, McGoldrick (1998) suggests that we need to develop our sense of:

1. Our uniqueness as individuals.
2. Our various group identities that give us a sense of ‘home’ – that define who we are in relation to others.
3. Our common partnership with every other human being, without which we will surely perish. (p. 7)
The place where most cultures experience the most profound sense of group identity and common partnership is in the family. The family, probably the principal client system of the social work profession, can both vary and remain consistent across cultures. Conoley and Bryant (1996) provide a topography of aspects of family life which can vary across cultures and which can serve as a guide to practitioners who wish to develop their cultural competence:

- **Who is in the family.** Different cultures have different perspectives on family membership, including various notions of nuclear and extended families (see also McGoldrick, 1998).

- **Roles in the family.** Different cultures hold different beliefs about age and gender roles.

- **Service Provision.** Different cultures have different expectations of service providers and their behaviour patterns.

- **Therapeutic Issues.** Different cultures may behave in different ways in the presence of a social worker:
  - **Behaviour.** Different cultures have different patterns of behaviour, including what they are prepared to talk about, who they are prepared to talk to, etc.
  - **Understanding of Difficulties.** Different cultures may have different understandings of illness, problems, mental illness, etc.

Cultural competence affects all aspects of the helping process, including assessment and evaluation. It is thus essential that culturally sensitive methods of assessment and of evaluating client progress or change be developed. A major attack on the psychometric scales used in clinical work has been based on the lack of cultural sensitivity of many of the scales available for use. Such scales have the potential to be destructive when used with culture groups for whom they have not been developed, particularly when the practitioner lacks interpersonal cultural competence (Geisinger & Carlson, 1998). Clients may feel that their own sense of the world is disregarded, even denigrated, by the scale. Clients may be diagnosed or labelled with certain conditions or personality types on the basis of a scale that is not sensitive to the unique ways in which different cultures express illness and health.

It is not the purpose of this dissertation to explore what cultural competence means or how to enhance the cultural competence of practitioners. It is, however, a purpose of this dissertation to establish a method for developing assessment scales which are culturally sensitive and which will form one facet of the cultural competence of our profession.

In other words, it is the candidate’s belief that social work as a profession lacks cultural competence partly because of the lack of culturally appropriate measurement tools. This lack is due partly to the fact that there is no documented and available process model for developing scales that are appropriate for use in a multicultural context by social workers. One necessary
ingredient for the evolution of the cultural competence of the social work profession is, therefore, a model for multicultural scale development in social work.

### 1.2.3 THE CHANGING DEMOGRAPHICS OF OUR CLIENT SYSTEMS

Prior to 1994, South Africa was legally divided along racial lines. Although White social workers could work with all race groups, only White social workers were permitted to work with White clients. There were thus relatively few instances of a practitioner of one race or culture working with clients of another race or culture. As such, there was no need for practitioners to become culturally competent.

Over the past decade, however, there have been substantial advances in the welfare field in this country, which have resulted, among others, in the breakdown of these racial barriers. This has led to an increase in the cultural diversity of the social work client system. Social workers in South Africa are now being called upon to work not only with clients of their own culture or race, but also with clients of other race and culture groups. The need for cultural competence is now greater than ever.

These changes can be clearly seen in the SANDF. Prior to the integration of the various statutory forces (SADF and the former TBVC or homeland defence forces) and nonstatutory forces (Umkhonto we Sizwe (MK) and the Azanian People’s Liberation Army (APLA)) in 1994, the race profile of the South African Defence Force was (Department of Defence, 1998, p. 71, on 26 April 1994):

- 38.36% African employees.
- 1.02% Asian employees.
- 15.96% Coloured employees.
- 44.66% White employees.

Data from the mainframe computer of the SANDF, analysed in May 2000, indicates that the SANDF now comprises (Van Breda, 2000b):

- 60.19% African employees.
- 1.34% Asian employees.
- 10.58% Coloured employees.
- 28.35% White employees.

It is interesting to note that the five most common African home languages in the SANDF, accounting for 75.89% of all African home languages (after removal of 11.7% missing cases) are IsiXhosa (19.91%), IsiZulu (18.44%), Setswana (14.87%), Sepedi (11.53%) and Sesotho.
(11.14%). It is also interesting to note that the four most common home languages overall are Afrikaans (34.18%), English (12.63%), IsiXhosa (10.45%) and IsiZulu (10.11%) (Van Breda, 2000b).

These data are mirrored in the race profile of the actual clients seen by social workers of the SANDF. A total of 450 individual clients (ie casework) were seen by a group of 21 social workers during a four-month period at the end of 1999. The racial breakdown of these clients is as follows (excluding the 6.0% missing cases):

- 67.85% African clients.
- 2.36% Asian clients.
- 15.84% Coloured clients.
- 13.95% White clients.

### 1.2.4 Conclusion

It is thus clear that South Africa and the SANDF (as a microcosm of South Africa) are multicultural communities and that social workers (who themselves are multicultural) are called upon to work with clients of diverse cultural and racial backgrounds (Pinderhughes, 1995). It is thus essential that, if they are being pressured to evaluate their practice with a multicultural clientele, social workers be provided with scales that have been developed and validated for multicultural use (Van De Vijver, 2002).

Currently, very few scales have been demonstrated to be valid for multicultural use. To complicate matters, there are no existing models for the development of multicultural scales in social work. Although a great deal has been written on the cross-cultural validation of scales (eg. Butcher & Han, 1996; Poortinga, 1995b; Retief, 1988; Triandis, 1980), little can be found on the complete process of developing a scale for multicultural use. Consequently, it is not easily possible for social work researchers to develop scales for multicultural use.

There is thus a critical need for a process model of multicultural scale development in social work. Such a model would assist social workers in developing standardised social work scales that are suitable for use in the South African context. Since most countries in the Global Village are now multicultural, there is an international need for such a model.

Faul (1995) has laid a solid foundation for scale development in social work. There is thus no justification for the development of an entirely new model of multicultural scale development, but rather to extend her model to incorporate the multicultural demands of society.
1.3 MILITARY DEPLOYMENTS & SOCIAL HEALTH

1.3.1 CHANGES IN THE MILITARY COMMUNITY

Extensive research has been conducted internationally into the effects of deployments on families (eg. Hunter, 1982). These studies have conclusively demonstrated the deleterious effect of deployments on many military employees, their spouses and families. The need to attend to the psychosocial needs of military families has, therefore, begun to be recognised as important by defence forces internationally. The South African National Defence Force (SANDF) has also realised the need to ensure the well-being of military families.

Historically, military organisations have been staffed largely by young, unmarried men (Kohen, 1984):

Until the 20th century recruitment of full-time military personnel, outside of war emergencies, was restricted to single males... Military policy required first time enlists to be single; career service members were discouraged from marrying. Officers married once their careers were established, but they had few special benefits. The effects of this policy can be seen as late as 1953, when only 38% of all active duty military personnel were married... (p. 403)

These trends allowed the military to concentrate exclusively on military operations, with little regard for the personal needs of the workforce, let alone their families. Over the past few decades, however, the number of military families proportionate to the number of military employees has increased dramatically. Statistics from the US Army indicate that:

- The percentages of married active duty soldiers increased from 38% in 1953 (Kohen, 1984, p. 403) to 60.9% in 1987 (Burnam, Meredith, Sherbourne, Valdez, & Vernez, 1992, p. 15).
- In 1987, 33% of Army personnel had children living with them, and a further 7.9% had children living elsewhere (Burnam et al., 1992, p. 15).
- The percentage of female soldiers remained below 2% until 1972, and had increased to just over 12% by 1993 (Schumm, Bell, Palmer-Johnson, & Tran, 1994, p. 500).
- "The percentage of soldiers who are in a dual military marriage has increased from approximately 4% in 1974 to as much as 7 to 9% [in 1993], with well over 10% of Army marriages involving dual military spouses" (Schumm, Bell, Rice, & Sanders, 1996a, p. 1292).
- In 1993, 41.9% of all female soldiers were married to or seriously involved with a male active duty service member (Schumm et al., 1996a, p. 1292).
- A 1989 survey found that 2.3% of Army personnel were custodial single parents, and 4.4% were financially responsible for a child who was living with someone else (Segal & Harris, 1993, p. 10).
The number of spouses of military employees who are employed “...has increased from about 27% in 1972 to between 60% and 70% in 1992” (Segal & Harris, 1993, p. 11).

“By 1960, for the first time in military history, family members outnumbered military personnel” (Albano, 1994, p. 289).

These demographic trends are also reflected in the SANDF. Current SANDF trends obtained from various sources indicate that:

- 48.3% of the workforce is married (Van Breda, 2000b). In addition, 41.2% of men and 34.0% of women are in steady non-marital relationships (Van Breda, 2000e). A total of 92.3% of men and 81.4% of women report being in some kind of stable relationship (ibid.). Another national survey found that 89.5% of employees (male and female) were in a relationship, just under half of whom (48.03%) were married (Van Breda, 2000a).

- Of those who report being in a relationship, 60.3% of men and 65.0% of women report that they live with their partners (Van Breda, 2000e). In another survey, 50% of those who reported being in a relationship, also reported living with their partners (Van Breda, 2000a).

- 35.9% of the workforce have children who are eligible for health services from the defence force (Van Breda, 2000b). Of those who have children, 42.6% have one child, 35.4% have two children, 14.8% have three children and 7.2% have four or more children (ibid.).

- Many employees have children who are not eligible for military health services. In a national survey, 71.4% of men and 69.4% of women indicated that they had children (Van Breda, 2000e). In another national study, 67.2% of military employees (both male and female) reported having children (Van Breda, 2000a).

- 20.4% of SANDF employees are women (Van Breda, 2000b).

- 48.1% of women who are in a relationship (married or not) are in a relationship with a military man, while 7.5% of men who are in a relationship (married or not) are in a relationship with a military woman (Van Breda, 2000e).

- 44% of male employees and 20.7% of female employees were away from home for more than one month during a twelve-month period (September 1998 to August 1999) (Van Breda, 2000e). Another survey of soldiers earmarked for international peacekeeping operations found that 77.4% had been away from home for more than one month during the previous twelve (Van Breda, 2000a).

- 64.5% of men and 44.8% of women are in the age bracket 25 to 34 years, the age when most people have young, established families (Van Breda, 2000e).

- 52.8% of men and 54.4% of women report that they are in a relationship, live with their partner and have children (Van Breda, 2000e).
The number of recognised family members (95,253), that is spouses and children who are eligible for SANDF health services, is 16% greater than the number of employees (81,923) (Van Breda, 2000b).

These shifts in the makeup of the military community bring numerous changes in the psychosocial orientation of the workforce:

- Employees demand more time to attend to family matters.
- Employees are less willing to sacrifice themselves, due to loyalty and responsibility towards their families.
- Employees are less ‘single-minded’ in their work, being conscious of their families at home.
- Employees are more demanding of financial rewards for their work.

These changes in the demographics of military families and the resultant changes in the orientation of families to the military system, in turn lead to changes in the way military systems respond to the needs or demands of the workforce. Albano (1994, pp. 294-298) identifies six trends in the American military family policy arena, specifically in the way ‘caring’ has become institutionalised, which largely parallel recent trends in the SANDF:

- **From Neglect to a Partnership Philosophy.** Research on military families and operational readiness in the 1970’s resulted in the 1983 army ‘White Paper’, which articulated a partnership philosophy based on the perceived relationship between operational readiness and family support.

  - A study in the SANDF arrived at similar conclusions (Van Breda, Potgieter, Siwisa, & Banda, 1999). A study recommendation that “caring for and supporting families” be seen as a “core organisational responsibility” of the SANDF as a whole was accepted by the Chief of the SANDF (Military Command Council, 2000).

- **From Informal to Formal Support Systems.** Previous approaches to support systems to families which were informal and implied, gave way to a formalised recognition of the army’s responsibility for family support in the 1983 ‘White Paper’. Since then, there has been a plethora of military directives, regulations, structures, systems and personnel placed for formal family support.

  - Similar recommendations made in South Africa (Van Breda et al., 1999) have recently been accepted by the Chief of the SANDF (Military Command Council, 2000).

- **From Categorical to Universal Support.** The previous provision of support to only certain segments of the military community has gradually given way to a universal provision of support to all personnel and all families. There has also been recognition that additional
support is required when military requirements (e.g., deployment) disrupt normative family transitions (e.g., parenting).

- Similar trends have been expressed by the Directorate Social Work as part of a move from a residual approach to welfare towards a developmental approach (De Klerk & Kruger, 2002; Directorate Social Work, 2000; Van Breda, 2000d).

- **From Local, Private Funding to Federal Funding and Guidance.** Initially, the responsibility for the care of military families belonged to private sources. Over time, however, and with the recognition of the organization’s responsibility to protect employees and families from organizational stress, this responsibility was taken over by the Department of Defence and other state bodies.

  - In the SANDF, all health services (including medicine, nursing, dentistry, psychology, social work, dietetics, etc.) are provided internally. In the Social Work Directorate, only in-patient alcohol rehabilitation and statutory services (e.g., children’s court enquiries) are outsourced, and even these are currently under review.

- **From In-kind Benefits to Monetary Allowances to a Mixed Benefit System.** Piecemeal in-kind benefits and monetary allowances have given way to a comprehensive system of benefits that compensate for the military’s demands on families. These benefits include “...government housing or housing allowances, commissary and exchange privileges, cost of living adjustments, use of recreation facilities, medical and dental care, survivor’s benefits, counseling, and a wide range of free services and programs to support families through each stage of the family and life and career cycle” (Albano, 1994, p. 297). In addition, benefit systems for male and female employees have become increasingly uniform.

  - Such benefits have been in place in the SANDF and the former SADF for several decades. The majority of employees probably do not perceive these as ‘benefits’, however.

- **From an Ad Hoc, Reactive, Piecemeal Approach to a Proactive, Planned Approach to Program Development and a Comprehensive System of Services.** Support services provided to military families are currently comprehensive, standardized, and sustained, in contrast with previous services that tended to be piecemeal, fragmented and reactive.

  - The Concurrent Health Assessment (Directorate Social Work, 2001), which has recently been instituted in the SANDF, reflects this trend.

### 1.3.2 Enhancing the Deployment Resilience of Military Families

These trends reflect two aspects of military families that have been recognized by the military system:
Firstly, the responsibility of the military to protect families from the negative consequences of the employee’s military duties, especially deployments.

Secondly, the centrality of families in the operational readiness of military members.

Operational readiness refers to the ability of soldiers to deploy at a moment's notice, to be ready for combat or operation at all times, to work single-mindedly in their military work, etc. Soldiers in contemporary military organisations can only be operationally ready when their families are operationally ready. Indeed, it has been argued that one of the facets of operational readiness is the capacity of families to withstand deployment stress (Van Breda, 1999b). Military leaders, therefore, cannot afford to plan military operations without taking into consideration the family dynamics of the workforce. Additionally, part of the role of the military social worker is to provide operational support that will (1) enable the military to achieve its operational mission and (2) enable families to resist the resultant stress (Directorate Social Work, 1997).

The candidate has termed the capacity of military families to resist the stress of deployments deployment resilience (Van Breda, 1997a). Research suggests that deployments are stressful for most families most of the time. Although there is some evidence that deployments become more manageable with time (i.e., with practice), routine separations seldom become ‘easy’ for the family (Van Breda, 1997b). However, previous research by the candidate has also indicated that certain families cope better than others with deployments (Van Breda, 1998b). Efforts to draw a profile of families who cope better with deployments resulted in eight dimensions of deployment resilience (Van Breda, 1999a). Families that possess these eight dimensions cope better with deployments than families that do not.

Social work practice efforts in the SANDF have thus been directed towards enhancing these resilience dimensions in military families. The Deployment Resilience Seminar is one such intervention (Van Breda, 1997a; 1998b; 1999a). This one-day, psychoeducational seminar for military couples aims to promote the resilience dimensions in families, through education, discussion, illustration, and practice. Initial evaluations of the trial implementations of the seminar indicate that couples "...who incorporated the principles of [deployment] resilience in their families showed relative improvements in 80% of the [dimensions] assessed" (Van Breda, 1999a, p. 602). These couples also indicated that the seminar had helped them to cope better with deployments. Informal follow-up conversations with the Captain of the vessel involved in this study indicate that the value of the seminar to the functioning of the ship had been sustained over many months.

The Deployment Resilience Seminar has demonstrated two important findings:

Firstly, it is possible to improve the resilience dimensions in family functioning. This provides a good translation from theory into practice.

Secondly, deployment resilience seems to enhance coping with deployments. This provides tentative evidence for an underlying assumption of this dissertation, namely that deployment resilience contributes to operational readiness.
1.3.3 Concurrent Health Assessments

The paragraphs in Section 1.3.2 were written early in 1999. Towards the end of 1999 the South African Minister of Defence made a decision that the health status of all soldiers needed to be promoted and that the health status of soldiers who are earmarked for rapid deployment should be determined. The concept of ‘health’ was broadly defined, and includes not only medical health, but also oral health, psychological health and social health.

The Directorate Social Work of the SANDF was thus tasked to develop a mass screening process to assess the social health status of military employees. Since this screening entails thousands of individuals, the need for a standardised social work assessment tool (a pencil & paper test) was indicated. The Directorate’s ideas about deployment resilience thus expanded and moved into the field of ‘social health’.

This mass assessment was termed Concurrent Health Assessment. The term ‘concurrent’ was used as the focus of these assessments was on soldiers who must be ready to deploy across South African borders at short notice. These soldiers were thus required to have a known current health status – hence ‘concurrent health’.

The Directorate Social Work (2001) designed a Concurrent Health Assessment process that entails the completion of a social work scale by groups of soldiers, followed by a screening the scales to determine those at risk of social unhealth, concluded by a clinical social work interview to assess the soldiers’ social functioning, deployment resilience and social health (Van Breda, 2002c).

The focus of the social work assessment is on the notion of ‘social health’. Social health entails a determination of the risk of a military employee and his/her family of ‘breaking down’ socially during a military operation. The social work assessment is thus an assessment of risk, rather than of actual current psychosocial functioning.

A team of social workers identified that the stress of a deployment could be detrimental to even a socially functional family. Conversely, families that experience some form of social problem, challenge or vulnerability will not necessarily experience a deployment as detrimental – this will depend on the kinds of resources that the soldier or family can draw on during the deployment. This led to the realisation that the relationship between deployments and breakdown is mediated by the degree of social vulnerability and strength in a family system.

A revision of deployment resilience theory brought to light the models of family resilience proposed by McCubbin and colleagues (eg McCubbin & McCubbin, 1988; McCubbin & Patterson, 1983a; McCubbin & McCubbin, 1993; McCubbin & McCubbin, 1996) and served to clarify this understanding. This in turn led to the formulation of a definition and model of social health, viz (Directorate Social Work, 2001):

Social health is the relatively low vulnerability and high resilience of people that enables them to deal effectively with life stress, notably the stress of a military operation. (p. 5)
To date, the Directorate Social Work has had to make use of a generic social work assessment scale in the Concurrent Health Assessment process, because no scale is available to measure social health as defined above. This has led to a less than optimal situation in which soldiers are assessed on paper in one model and then in an interview with another model.

Furthermore, the scale being used is not adequately congruent with the interview model, resulting in a high rate of false positives (people being identified for social work interviews who are socially healthy) – indeed, about one quarter of the soldiers are screened for interviews, of whom only about one quarter are found to be socially unhealthy (Directorate Social Work, 2001, p. 9). A lower cutting score on the instrument cannot, however, be used because soldiers throughout the range of scale scores are found to be socially unhealthy in the interviews.

There is, therefore, a great need for a multicultural social work scale that measures social health that can be freely used within the Directorate Social Work for the assessment of soldiers earmarked for deployments. As an occupational social work service, the Directorate’s support of military missions is its core business and enjoys top priority.

1.4 STATEMENT OF RESEARCH GOALS

1.4.1 RESEARCH PROBLEM

The core research problem is that:

| There is no established and tested model of multicultural scale development in social work. |

1.4.2 RESEARCH QUESTION

This study, thus aims to address the question:

| How can we develop a scale that can be used with confidence by social workers in multicultural practice? |

1.4.3 RESEARCH GOAL

The goal of this study is thus:

| To design a process model for the development of social work scales for multicultural use in South Africa. |
1.4.4 **Research Objectives**

This study has two principle research objectives:

<table>
<thead>
<tr>
<th>To design a process model for the development of social work scales for multicultural use in South Africa.</th>
</tr>
</thead>
<tbody>
<tr>
<td>To test this model in practice, through the development of a multicultural scale that accurately measures the social health of military employees/families.</td>
</tr>
</tbody>
</table>

1.5 **Broad Methodology**

Although this study will have two end products, viz a process model of multicultural scale development and a scale that measures the social health of military employees/families, the process of obtaining the latter end result is subordinate to the process of obtaining the former. That is, the principle purpose of this study is to formulate and test a process model of multicultural scale development in social work. The development of the social health measure is simply the means of empirically testing the process. The process model formulated as the larger research endeavour will determine the methodology of developing this scale.

The method of developing the process model of multicultural scale development will be broadly based on Thomas’ (1984) Developmental Research & Utilization (DR&U), of which Thomas (1985b) says:

> In contrast to conventional research methods in the behavioral and social sciences in which the focus of inquiry is on contributing to knowledge about human behavior, the new approaches emphasize one or another means by which innovations in the human services may be developed. (p. 50)

This earlier model of developmental research (Thomas, 1984), is preferred over later models (Rothman & Thomas, 1994), because it is focused on the development of any social innovation, while the later model is focused on the development of social work interventions. An 'intervention’ is a more specific class of ‘innovation’, and excludes innovations such as computer software, administrative systems, assessment tools, etc.

These innovations are termed social technologies and are defined as the “primary means by which social work and social welfare accomplish their objectives” (Thomas, 1992, p. 72). Social technologies can include new interventions, assessment methods, policies, etc. In this case, the principle social technology that will arise out of this research is a process model for multicultural scale development in social work. The secondary technology will be a new ecometric instrument.
### FIGURE 1: DEVELOPMENTAL RESEARCH & UTILIZATION (DR&U)

<table>
<thead>
<tr>
<th>PHASE</th>
<th>MATERIAL CONDITION</th>
<th>ACTIVITIES &amp; STEPS</th>
</tr>
</thead>
<tbody>
<tr>
<td>I. Analysis</td>
<td>A. Problematic Human Condition</td>
<td>1. Problem Identification &amp; Analysis</td>
</tr>
<tr>
<td></td>
<td>B. State of Existing Interventions</td>
<td>2. State-of-the-Art Review</td>
</tr>
<tr>
<td></td>
<td>C. Relevant Information &amp; Resources</td>
<td>3. Feasibility Study</td>
</tr>
<tr>
<td></td>
<td>D. Statement of Feasibility</td>
<td></td>
</tr>
<tr>
<td>II. Design</td>
<td>E. Statement of Objectives &amp; Design Problems</td>
<td>4. Determination of Innovation Objective</td>
</tr>
<tr>
<td></td>
<td>F. Relevant Data</td>
<td>5. Identification of Innovation Requirements</td>
</tr>
<tr>
<td></td>
<td>H. Interventional Innovation</td>
<td>7. Selection of Information Sources</td>
</tr>
<tr>
<td></td>
<td>I. Innovation Procedures</td>
<td>8. Gathering &amp; Processing Information</td>
</tr>
<tr>
<td></td>
<td></td>
<td>9. Generation &amp; Selection of Solution Alternatives</td>
</tr>
<tr>
<td></td>
<td></td>
<td>10. Assembly</td>
</tr>
<tr>
<td></td>
<td></td>
<td>11. Real-World Representation</td>
</tr>
<tr>
<td></td>
<td></td>
<td>12. Proceduralisation</td>
</tr>
<tr>
<td>III. Development</td>
<td>J. Development Plan</td>
<td>13. Formulation of the Development Plan</td>
</tr>
<tr>
<td></td>
<td>K. Trial Implementation</td>
<td>14. Operational Preparation</td>
</tr>
<tr>
<td></td>
<td>L. Trial Use Data</td>
<td>15. Trial Use &amp; Developmental Testing</td>
</tr>
<tr>
<td></td>
<td>M. Tested Interventional Innovations</td>
<td></td>
</tr>
<tr>
<td></td>
<td>O. Evaluation Data</td>
<td>17. Carrying Out Evaluation</td>
</tr>
<tr>
<td>V. Diffusion</td>
<td>P. Diffusion Media</td>
<td>18. Preparation of Dissemination &amp; Diffusion Media</td>
</tr>
<tr>
<td></td>
<td></td>
<td>19. Diffusion of Innovation to Potential Users</td>
</tr>
<tr>
<td>VI. Adoption</td>
<td>Q. Broad Use</td>
<td>20. Implementation by Users</td>
</tr>
</tbody>
</table>

(Thomas, 1984, p. 140)
Thomas’ model comprises several phases (see Figure 1), namely:

- **Analysis.** The phase of analysis involves developing a clear understanding of the problem at hand (which includes traditional methods of research, such as case studies, surveys, etc).

- **Design.** Design means the conceptualisation of a social technology (e.g., a new or revised intervention, form of assessment, policy, etc).

- **Development.** Development involves the pilot testing or field-testing of the technology on relevant samples and the process of refining the technology.

- **Evaluation.** Evaluation involves testing the technology for effectiveness, efficiency, etc., making use of programme evaluation, for example.

- **Diffusion.** Diffusion refers to the dissemination of the technology to the professional sector.

- **Adoption.** Adoption means that the technology is implemented by the appropriate professional sector.

In terms of Thomas’ model, therefore, the methodology of this study can be illustrated in Figure 2:

**FIGURE 2: RESEARCH METHODOLOGY**

<table>
<thead>
<tr>
<th>DESIGN OF PROCESS MODEL FOR MULTICULTURAL SCALE DEVELOPMENT</th>
<th>DESIGN OF THE MILITARY SOCIAL HEALTH INDEX</th>
</tr>
</thead>
<tbody>
<tr>
<td>Analysis of the field of multicultural scale development (Chapter 2)</td>
<td>Analysis of resilience and social health (Chapter 4)</td>
</tr>
<tr>
<td>Design of a process model for multicultural scale development (Chapter 3)</td>
<td>Design of the Military Social Health Index (Chapter 5)</td>
</tr>
<tr>
<td>Development (testing) of the process model for multicultural scale development (Chapters 4-8)</td>
<td>Development (testing) of the Military Social Health Index (Chapter 6)</td>
</tr>
<tr>
<td>Evaluation of the Military Social Health Index (Chapter 7)</td>
<td>Diffusion of the Military Social Health Index (Chapter 8)</td>
</tr>
<tr>
<td>Diffusion of the process model for multicultural scale development (Chapter 9)</td>
<td>Diffusion of the process model for multicultural scale development (Chapter 9)</td>
</tr>
</tbody>
</table>
From Figure 2, it can be seen that there are two DR&U processes running together, although staggered. The methodology is more fully discussed below (with definitions of key terms being provided thereafter):

- **Analysis of the Field of Multicultural Scale Development.** To begin, information concerning scale development in social work and in psychometrics, as well as theory of the cross-cultural validation of scales will be analysed. Key issues in the ecometric field will be highlighted, including the differences between ecometrics and psychometrics, the emic-etic debate, equivalency and legal issues in testing. Such an analysis serves to ensure a thorough understanding of the conceptual and philosophical issues that form the foundation of the more technical aspects of scale development.

- **Design of a Process Model for Multicultural Scale Development.** Within the frame of this analysis, a process model of multicultural scale development will be formulated. This model will be technical in orientation, rather than theoretical or conceptual. The model entails a multicultural extension of the scale development model designed by Faul (1995). Key issues, such as translation, reliability and validity, will be discussed, but the focus will be on the technical steps that should be followed in order to develop a scale that is appropriate for multicultural use in social work. Design is located in the imagination – no testing of the model takes place in this phase of the DR&U process.

- **Development of this Process Model.** In order to test this process model, a scale that measures social health, for use with a multicultural population, will be developed. This will entail executing the process model and will result in a multiculturally valid scale. Since the process model will be developed within the framework of Thomas' DR&U model, the same broad process used to develop the process model will be used to develop the Military Social Health Index. Specifically, therefore, the development phase of the process model for multicultural scale development entails:
  
  - Analysis of the field of resilience so as to lay a clear theoretical foundation concerning the construct 'social health'.
  - Design of a scale that measures social health and that is appropriate for multicultural use.
  - Development of the scale – that is, testing to see whether it works in practice.
  - Evaluation of the scale, to determine whether it is reliable, valid and cross-culturally comparable.
  - Diffusion of the scale, to ensure that it is wide adopted by the target users.

- **Evaluation of the Process Model for Multicultural Scale Development.** The effectiveness of the process model will be evaluated, drawing on empirical data from the Military Social Health Index. The evaluation of the process model of multicultural scale
development is dependent upon but not equivalent to the evaluation of the scale. The evaluation of the scale entails determining its reliability and validity, both within and between cultures. The evaluation of the process model aims to determine whether the process model, which was designed and tested, does indeed result in a scale that is appropriate for multicultural use in social work. Furthermore, it entails an evaluation of the ‘quality’ of the process model, in terms of objective capability, adequacy, ethical suitability and usability (Thomas, 1984).

Diffusion of the Process Model. A plan for the dissemination of the newly tested model will be formulated.

The research methodology is illustrated graphically in Figure 3 below. This illustration will be used throughout the dissertation to assist the reader in navigating through a rather complex and potentially confusing research methodology.

**FIGURE 3: RESEARCH METHODOLOGY ILLUSTRATION**

![Research Methodology Illustration](image)

### 1.6 Definitions of Key Terms

The following key terms will be used regularly in this dissertation, are briefly defined here and will be more fully explicated in subsequent chapters:

**Developmental Research.** Developmental research is a scientific research process that produces social technology or innovation, rather than increased knowledge. Thomas’ 1984 Developmental Research & Utilisation (DR&U) is the model of developmental research used in this study.
**Measurement.** "Measurement consists of rules for assigning symbols to objects so as to (1) represent quantities of attributes numerically (scaling) or (2) define whether the objects fall in the same or different categories with respect to a given attribute (classification)” (Nunnally & Bernstein, 1994, p. 3).

**Ecometrics.** "Ecometrics refers to the measurement (or quantification) of people-in-environment. Ecometrics is concerned with the measurement of the degree of fit (or adaptation) between people and their biopsychosocial environments” (SACSSP, 2003, p. 5).

**Scale.** "The term scale refers to an instrument that is summated. This term is considered synonymous with the term index. An instrument that is summated is simply an instrument comprising two or more items that are added together to get a score. The individual items are not interpreted separately, but rather as a cluster” (SACSSP, 2003, p. 6).

**Culture.** Culture is defined as an intersection of race and language, such as White Afrikaans-speaking or Coloured Afrikaans-speaking.

**Multiculturalism.** Multiculturalism, in the context of ecometric scale development, refers to the utilisation of scales with clients from diverse cultures.

**Cross-Cultural.** In the context of scale development, cross-cultural refers to comparisons of constructs between cultures for the purposes of better understanding both cultures, and the similarities and differences between them. In the broader context of social work, the term cross-cultural refers to cultural differences between social worker and client.

**Reliability.** Reliability is “freedom from random error” (Nunnally & Bernstein, 1994, p. 213), or “the accuracy or precision of a measuring instrument” (Kerlinger, 1986, p. 405). Kerlinger (1986, p. 404) provides the following synonyms for reliability: “dependability, stability, consistency, predictability, accuracy”.

**Validity.** Validity refers to the degree to which an instrument measures what it is supposed to measure, rather than something else.

**Equivalence.** Equivalence refers to the degree of similarity between two measures, such as two language versions of an item, that allows comparisons across groups to take place meaningfully (Berry, 1980).

**Family.** Family is the network of significant and meaningful relationships between a group of individuals who experience a sense of emotional affiliation and mutual obligation.

**Deployment.** Deployments refer to the separation of an individual from his/her family for military purposes, such as war or peacekeeping.
Resilience. Resilience refers to “the presence of factors in the family’s current and recent past that increase the likelihood of positive social functioning in the presence of a life stressor” (Van Breda, 2002c, p. 7).

Vulnerability. Vulnerability refers to “the presence of factors in the family’s current and recent past that increase the likelihood of social malfunctioning in the presence of a life stressor” (Van Breda, 2002c, p. 5).

Social Health. “Social health is the relatively low vulnerability and high resilience of people that enables them to deal effectively with life stress, notably the stress of a military operation” (Directorate Social Work, 2001, p. 5).

1.7 Limitations of the Study

The scope of this study is very broad. It covers the fields of scale development, scale validation, cross-cultural scale development and validation, ecometrics, translation, family resilience theory, salutogenesis and deployment resilience. As such, the review of literature is, by necessity, somewhat broad rather than intensive. Although every attempt has been made to address all fields rigorously, it is not possible to devote in-depth attention to each.

The model of scale development utilised in this study is classic test theory. There are newer, more cutting-edge theories of and technologies for scale development, such as Item Response Theory (IRT) and Differential Item Functioning (DIF). These theories and technologies are, however, not widely available in off-the-shelf statistical packages (such as SPSS and Statistica). Furthermore, there is still ongoing debate in the literature about these theories, which are relatively young. It was therefore decided to adopt the ‘older’ more established theories of scale development for this study.

Although it is hoped that the results of this study will be relevant to and of value for all countries, this study is somewhat unique to South Africa and thus perhaps not entirely generalisable to all countries. The model of scale development proposed here is based on the assumption that the society in which the model will be applied is multicultural and multilingual. This is not universally true and the results may thus be of restricted value elsewhere.

The study works from the assumption that an entirely new instrument will be developed. This study does not address the question of how to adapt an existing instrument for use in another culture. Although the procedures described here could probably be adjusted for such purpose, this is not the focus of this study.
1.8 \textbf{CHAPTER OUTLINE}

A broad outline of the chapter structure of the dissertation is provided below:

- **Broad Overview of Subject Matter.** Chapter One has provided background concerning the main dimension of the study, viz multicultural scale development. The empirical component of the study, viz the measurement of the social health as it relates to military deployments, was also motivated. The chapter has articulated the study's purpose, outlined its broad methodological framework and defined key concepts.

- **Analysis of Multicultural Scale Development.** Chapter Two will provide an analysis of conceptual issues underpinning multicultural scale development, such as the construct of 'culture', the fields of ecometrics and psychometrics, the emic-etic debate, equivalency, legal issues in testing and a brief summary of existing models of scale development. This chapter concludes with a set of 17 principles of multicultural ecometric scale development.

- **Multicultural Scale Development in Social Work.** Chapter Three will present a detailed, technical (rather than theoretical) process model for the development of multicultural scales in social work, based in the theory presented in the previous chapter.

- **Analysis Phase.** Chapter Four will provide a detailed overview of military social health, drawing on individual resilience theory, family resilience theory, work-family interface literature and deployment resilience theory.

- **Design Phase.** Chapter Five will describe the process of designing or creating the \textit{Military Social Health Index}.

- **Development Phase.** Chapter Six will present details regarding the review and linguistic equivalence of the \textit{Military Social Health Index}.

- **Evaluation Phase.** Chapter Seven will present the detailed evaluation of the \textit{Military Social Health Index} in terms of reliability, validity and multicultural comparability.

- **Diffusion & Adoption Phase.** Chapter Eight will provide an indication of how the \textit{Military Social Health Index} will be disseminated to users, via a manual, training and publications.

- **Conclusions & Recommendations.** Chapter Nine will review the multicultural ecometric scale development process that was designed in chapters 2 and 3 and that was implemented in chapters 4 to 8, outline the processes for diffusing the scale development process, summarise the findings of the study, and draw some conclusions based on the research.
CHAPTER TWO
ANALYSIS OF MULTICULTURAL SCALE DEVELOPMENT

2.1 INTRODUCTION TO CHAPTER TWO

This chapter will analyse some of the important conceptual foundations of multicultural scale development. Although the focus of this dissertation is on the design and testing of a process model of multicultural scale development, it is important to first analyse the broader field of multicultural scale development. Scale development, and in particular multicultural scale development, is not a purely technical endeavour. Several ethical dilemmas and conceptual conundrums must first be traversed. Only in the light of such conceptual clarity is it possible to begin the process of actually developing a scale. The purpose of this chapter is to provide some insight into these issues in order to prevent scale development from becoming a purely technical activity, but rather a socially conscious process.

Five principal subjects, which emerged as salient during the candidate’s literature review on the topic of multicultural and crosscultural scale development and validation, will be covered in this chapter, viz:

- **Ecometrics and Psychometrics.** The similarities and differences between ecometrics and psychometrics, which in turn influence the decisions regarding which theories and development techniques may be used in social work scale development.

- **Culture and Scale Development.** The notions of culture, socio-economic status, language and literacy, and how these factors influence testing and scale development.

- **The Emic-etic Debate.** The emic-etic debate, including the philosophical questions concerning positivism, constructivism and relativism.

- **Equivalency.** The notion of equivalency that underpins every aspect of multicultural scale development.

- **Bias and Fairness.** The legal and ethical constraints regarding bias in testing.
These five themes each provide an important component of the foundation of multicultural scale development in social work. In the light of the discussion on these five points, a set of 15 principles will be generated which should guide and underpin the development of social work scales for use in a multicultural context.

Prior to discussing issues of multicultural scale development directly, it is necessary first to highlight the similarities and differences between psychometrics (which is the paradigm within which the vast bulk of scale development has taken place) and ecometrics (which is a relative newcomer on the scale development scene). Such a discussion is important because the ecometric paradigm places certain restrictions on scale development and validation processes.

### 2.2 ECOMETRICS AND PSYCHOMETRICS

Psychometric theory and techniques dominate the field of scale development. Psychometry is based on a specific set of theories that are in some ways not consonant with social work values. The emerging field of ecometrics has been developed to describe the theories and techniques of testing human behaviour within the social work and ecological frameworks (Van Zyl, 1995).

"Psychometrics is the scientific study of the measurement of human behavior" (Corcoran, 1995, p. 1942). The Oxford Dictionary (Allen, 1990, p. 965) defines psychometrics as “the science of measuring mental capacities and processes”. Corcoran (1995, p. 1943) argues, “The profession of social work has numerous needs for psychometrically sound measurement tools”. At face value, psychometrics and ecometrics may be seen as synonymous. However, there are several crucial differences between the two fields (Van Zyl, 1995). Four main areas of difference will be highlighted here (derived in large part from Faul, 1995):

- Measurement of personality versus measurement of ecology.
- Latent versus manifest traits.
- Diagnosis versus assessment.
- Norm-referenced scaling versus criterion-referenced scaling.

The distinction between ecometrics and psychometrics, while perhaps less significant in the rest of the world, is highly salient in South Africa, where social workers are not permitted not utilise instruments registered as psychometric instruments by the Psychometrics Committee of the Professional Board for Psychology (South African Government, 1974, Section 37). Since March 2001, the candidate has been working with the South African Council for Social Service Personnel (SACSSP) to establish an Ecometrics Committee that will regulate ecometric instruments within the social work profession (SACSSP, 2003). On 25 April 2003, the Ecometrics Committee held its first official meeting.
According to the SACSSP’s policy document on ecometrics (2003, p. 5), ecometrics can be defined as:

the measurement (or quantification) of people-in-environment. Ecometrics is concerned with the measurement of the degree of fit (or adaptation) between people and their biopsychosocial environments. (Faul, 1995; Van Zyl, 1995). There are four main categories of ecometric constructs, viz:

Constructs related to individuals, families groups and communities who make up the client system.

Constructs regarding the environments or systems of which people are a part.

Constructs addressing the goodness of fit between people and their environments.

Constructs promoting social change and problem solving in human relationships and the empowerment and liberation of people to enhance well-being.

### 2.2.1 Measurement of Personality versus Measurement of Ecology

Psychometrics is principally concerned with the measurement of personality and intelligence. The study of personality and intelligence is probably the most central dimension of the field of psychology (Tack, 1998).

“Personality can be defined as the totality of emotional and behavioral traits that characterize the person in day-to-day living under ordinary conditions; it is relatively stable and predictable” (Kaplan & Sadock, 1991, p. 525). Elsewhere (Weiten, 1995), personality is described as follows:

The concept of personality is used to explain (1) the stability in a person’s behavior over time and across situations (consistency) and (2) behavioral differences amongst people reacting to the same situation (distinctiveness)... Personality refers to an individual’s unique constellation of consistent behavioral traits. (p. 472)

Intelligence, which is also conceived of as a stable construct, can be defined as follows (Kaplan & Sadock, 1991):

...a person’s ability to assimilate factual information, to recall either recent or remote events, to reason logically, to manipulate concepts (either numbers or words), to translate the abstract to the literal to the abstract, to analyze and synthesize forms, and to deal meaningfully and accurately with problems and priorities deemed important in a particular setting. (p. 155)

Personality and intelligence have two principle features in common:

- They measure traits that are relatively stable over time and context.
- These traits are located inside the individual person and are considered relatively independent of context; that is, the context is relatively unimportant.
In contrast with psychometrics (with its emphasis on the person in isolation), ecometrics is concerned with the person-in-environment (SACSSP, 2003; Van Zyl, 1995). Social work is concerned with people in the context of their environments. Historically, social work has been committed to promoting the goodness of fit between people and the environments within which they exist. More recently, the notion of person-in-environment, originally postulated by Mary Richmond, has been fleshed out and formalised by ecological and systems theory (Germain & Gitterman, 1995). Rather than focusing on either individual or context, social work endeavours to focus on the interface and interactions between people and their environments.

The target of person-in-environment differs markedly from the targets of personality and intelligence:

- The interfaces between people and their environments are relatively unstable over time. Furthermore, context is, by definition, unstable.
- The target is located between people and their environments, rather than within people or within the environments.

Because the targets of ecometrics are unstable and ‘extrapersonal’, the challenges for scale development are great. Faul (1995) describes this as follows:

> Compared to their surroundings, persons are thought to be more stable (persons have traits; environments are ephemeral), to be more clearly bound (persons “end” at their skins; environments have no clear boundaries), and to have greater integrity (the parts that make up a person are well recognized and clearly ordered; the components of environments are diverse and disordered). (p. 29)

These challenges are greatly accentuated by the recognition of culture as an additional factor. The already complex interface between people and their environments is enhanced by cultural differences, many of which were outlined in the Section 2.2. People from different cultures have had different experiences of political power, of health and education, of access to jobs and money, of mobility and of social status and credibility. These experiences may influence people throughout their lives, and thereby introduce new and varying dynamics into the person-environment interface.

In order to overcome the complexity of measuring the intangible interface between people and their environments, ecometrics “tries to take a person-centred approach when environments of individuals are assessed. Ecometrics relies on the capacities of respondents to remember, anticipate, interpret, and report their transactions in and feelings about certain designated environments” (Faul, 1995, p. 30).

Ecometrics is concerned with the interface between people and their environments, rather than with the people or the environments in isolation. This interface is considered relatively unstable over time. Ecometric scales cannot be expected to have high levels of test-retest reliability or predictive validity.
### 2.2.2 Latent versus Manifest Traits

Psychometric theory is fundamentally concerned with the measurement or quantification of ‘latent’ variables. "Many – arguably, most – of the variables of interest to social and behavioral scientists are not directly observable, of which beliefs, motivational states, expectancies, needs, emotions, and social role perceptions are but a few examples” (De Vellis, 1991, p. 7). In this regard, De Vellis (1991, p. 8) defines scales as “collections of items intended to reveal levels of theoretical variables, not readily observable by direct means”, and continues by saying:

> The latent variable is regarded as a cause of the item score – that is, the strength or quantity of the latent variable (ie the value of its true score) is presumed to cause an item (or set of items) to take on a certain value. (p. 13)

Since the latent variable is intangible and cannot be directly observed, the items that are used to measure it are approximations of the ‘true score’, that is, the actual magnitude of the variable. The better the scale, the closer the scale score approximates the true score.

Although in truth, probably all scales of social constructs measure latent traits, psychometrics is in practice concerned with traits that are ‘more latent’ than the phenomena social work is interested in. The items in most psychometric tests do not bear a face value relationship to the underlying trait being measured. The relationship between item and trait has been determined by statistical means. It is, therefore, quite possible for a psychometric scale measuring financial security to have an item having nothing to do with finances. Alternatively, a scale that is purported to measure financial security may be found to have a latent problem-solving variable.

By contrast, ecometric scales are more likely to have face value: a scale measuring financial security will probably contain only items with a financial content. It is unlikely that one will find items that address other issues that relate to the so-called underlying or latent variable of financial security. Furthermore, a scale designed to measure financial security is assumed to measure just that, rather than to be ‘actually measuring’ some other variables or traits (see Hudson, 1987).

In rather crude terms, latent variables can be thought of in three levels or layers:

- Firstly, there is the top level (or skin) of items. These items are the only manifest variables, and are not of direct interest to the psychometrist or ecometrist.

- Secondly, there is the variable that the items are assumed or designed to measure. This can be called the first layer latent variable.

- Thirdly, there is the underlying variable which causes the responses in the second layer, which can be called the second layer latent variable.

In psychometrics, a scale may be developed to measure a certain variable. Because scales measure social constructs, phenomena that are not directly observable, this variable must be latent – the first layer latent variable. Psychometrics tends to go a level down, however, and
assume that this variable is caused by some other variable – the second layer latent variable. This lower level is extracted (usually through factor analysis) and is often then reported as the variable that the scale ‘in fact’ measures. In some cases, a third layer latent variable is even extracted, as in the case of the 16PF’s first-order and second-order factors (Tack, 1998) and the G factor in intelligence (Gardner, 1983).

In ecometrics, a scale may be developed to measure a certain variable. Items are generated or designed to measure that variable, which, because it is a social construct, is a first layer latent variable. Ecometrics does not attempt to extract other latent variables that underlie this first layer latent variable, since the first layer variable is the variable of interest to the researcher. Principle components factor analysis, which assumes that the second layer latent variables underlying the first layer variables are more important (or more real or true) than the first layer latent variables, has limited utility in ecometrics. This will be discussed in more detail in the following chapter.

Both psychometrics and ecometrics are concerned with latent variables. However, ecometrics focuses on latent variables that are closer to the surface than psychometrics, making principle components factor analysis of limited utility.

2.2.3 Diagnosis versus Assessment

Psychometrics is usually applied for diagnostic purposes, where ecometrics is usually applied as part of a broader assessment phase that has as its main purpose the gaining of a fuller understanding of the client in his (sic.) environment. (Faul, 1995, p. 30)

Diagnosis is concerned with classifying the features of a person’s behaviour into a category of personality type/trait or mental disorder (American Psychiatric Association, 1994). In this context, the Diagnostic and Statistical Manual of Mental Disorders, DSM-IV (American Psychiatric Association, 1994, p. xxii) “is a categorical classification that divides mental disorders into types based on criteria sets with defining features.” Classification systems such as the DSM-IV, as well as personality classification systems, all assume stable features or traits underlying the observed behaviour. However, the diagnosis is acknowledged to have only limited value in treatment planning, which requires a much more thorough assessment (American Psychiatric Association, 1994, p. xxv).

Assessment, by contrast, refers to a much broader process of evaluating not only the observable behaviour of a person, but also exploring the causes of the behaviour, the factors which promote and inhibit the behaviour, the strengths and protective features in the person’s functioning and the desired outcome of some form of intervention. Furthermore, assessment, particularly in social work, requires a focus not only on the person, but also on the person’s culture, while diagnosis can often stand free of that person’s culture. The individual’s symptoms, behaviours and feelings can only be understood within an environmental and cultural context, which itself becomes an important, yet complicating target of assessment.
In short, assessment is an integral phase of an intervention process (SACSSP, 2003). Diagnosis, by contrast, can stand apart from assessment and intervention. In assessment, there is little value in classifying behaviours in a taxonomy, since such categories offer virtually no guidance for intervention.

Ecometrics is not so concerned with classifying people’s behaviour into categories (ie diagnosis), as with understanding the experiences of people in order to inform intervention or other helping processes (ie assessment).

2.2.4 Norm-referenced Scaling versus Criterion-referenced Scaling

There are two main ways of scaling psychometric scales, that is, of determining the meaning of a scale score: norm-referenced scaling and criterion-referenced scaling (Bond, 1996).

- **Norm-Referenced Scaling.** Psychometric tests typically make use of norms tables for interpretation (Petersen, Kolen, & Hoover, 1989). Large and representative samples of the target population are selected and statistical norms (ie means and standard deviations) are determined from the sample. People who fall outside of one or two standard deviations are considered ‘abnormal’. Such a practice assumes an absolute standard by which to determine normality and health.

- **Criterion-Referenced Scaling.** Criterion-referenced scaling does not interpret scale scores in terms of a normative population distribution of scores. Instead, some criterion is used to determine whether a person ‘passes’ or ‘fails’ a test (Moerdyk, 1989). Common examples of external criterion-referenced scaling include pre-employment testing where the employer sets a minimum level of performance required for employment (eg on an IQ test) and university exams where a minimum mark of 50% is required to pass (in some courses, eg first aid courses, the pass mark is set at 80% or even higher).

Norm-referenced scaling within a multicultural setting is based on an assumption that people within certain ‘culture groups’ are homogenous – all Xhosa men are the same as each other and different from all Zulu men. While this is perhaps true of isolated societies that have had little or no contact with other cultures, this is certainly not true of twenty-first century South African society, nor of most modern societies. Norm-referenced scaling, particularly the tendency to develop separate norms for separate groups, is incompatible with ecometric theory. The later sections on assimilation & acculturation and the emic-etic debate will illustrate this.

In social work, normality is not defined by a bell curve, but by people’s own experience of social health and good functioning. Ecometrics is less concerned with what is ‘normal’ than with what people experience as distressing. Therefore, a person is said to have a problem when her/his score falls within a score range that most other people in the population would experience as distressing or problematic or that a professional social worker would define as problematic. This is
termed ‘clinical significance’ by Hudson (1982), who developed clinical cut-off scores to divide people into two groups: those who have a clinical problem in the variable being measured and those without the problem.

Since ecometric scales are most often used in conjunction with social work intervention, often as part of a single-system design to track the progress of a client system, two forms of criterion-referenced scaling are most commonly used:

- Clinical cut-off scores are an example of criterion-referenced scaling. These scores can be determined either by the opinions of members of the population or by the professional opinions of social workers, or a combination of the two. The Clinical Measurement Package, for instance, developed by Walter Hudson (1982), uses a cut-off score of 30, in which any score over 30 indicates a clinically significant problem. The intervention aims to bring clients below the score of 30. While this provides a rough guide of clinical significance in comparison with the general population, it does not provide detailed information about individual clients.

- A second form of criterion-referenced scaling is also often used, in which the client, based on the baseline (pre-intervention) scores on the scale, determines together with the social worker the target score (Bloom et al., 1995). The intervention is then monitored by the client’s progress from the baseline score towards the target score. This score is defined independently of what is considered ‘clinically significant’ for the population as a whole.

With a basic foundation of ecometrics in place, it is now appropriate to discuss the notion of culture, as well as the term multiculturalism, which are, naturally, central concepts in this dissertation. The following section will detail various aspects of ‘culture’, viz material resources and socio-economic status, language, meanings and customs. This will be followed by a discussion on cultural assimilation and acculturation, which is an important concept when coming to the later discussion on the emic-etic debate. Finally, the term multiculturalism will be defined in contrast to cross-culturalism.

### 2.3 Culture and Scale Development

Culture is one of the two or three most complicated words in the English language. This is so partly because of its intricate historical development, in several European languages, but mainly because it has now come to be used for important concepts in several distinct intellectual disciplines and in several distinct and incompatible systems of thought. (Williams, 1983, p. 87)

Attaining a universal definition or even conceptualisation of the term ‘culture’ is likely to prove fruitless. There are probably as many definitions of culture as there are people who write about culture (Frisby, 1998a), as the following authors point out (O’Sullivan, Hartley, Saunders, Montgomery, & Fiske, 1994):
The term *culture* is multi-discursive; it can be mobilized in a number of different discourses. This means you cannot import a fixed definition into any and every context and expect it to make sense. What you have to do is identify the discursive context itself. (p. 68)

In South Africa, the constructs culture and race have been confounded (Klineberg, 1980). Race in this country has been reified. We have come to believe that there are marked, fundamental and genetic differences between Whites and Africans. The fact that racial classification was not determined through biological testing, but according to appearance, general acceptance and repute (South African Government, 1950), belies the truth that race is socially constructed and not objectively real. The cultural realists, who believe that culture exists "as a concrete reality of its own" and who have dominated the cultural discourse in South Africa, are being replaced by cultural nominalists who believe that "culture exists as an inference or an abstraction in the mind of the investigator" and probably also in the minds of most members of a society (Retief, 1988, pp. 136-137).

It is thus extremely important, universally, but particularly in South Africa, to ensure that a social construction of 'culture' be adopted. Within the discipline of social work, with its emphasis on the person-in-environment, a social construction of the term is quite apt. Culture is thus not considered inherent in an individual (such as a chromosome), but rather as a function of society, history, belief, etc. This leaves 'culture' as a very diffuse and insubstantial term. Furthermore, an individual’s culture can change over time and place. When one thus makes a statement about an individual's or one's own culture, one is not making a direct statement about the internal makeup of that individual, but rather about the relationship between that individual and the broad environment (including history, society, beliefs, religion, time, etc).

In this regard Kroeber and Kluckhohn (in Triandis, 1980) define culture as follows:

> Culture consists of patterns, explicit and implicit, of and for behavior acquired and transmitted by symbols, constituting the distinctive achievements of human groups, including their embodiments in artefacts; the essential core of culture consists of traditional (i.e., historically derived and selected) ideas and especially their attached values; cultural systems may on the one hand be considered as products of action, on the other as conditioning elements of further action. (p. 1)

For the purposes of this dissertation, culture will be constructed as a composite of four dimensions, viz:

- Material resources (including socioeconomic status, social class and sociopolitical power).
- Language (including literacy and education).
- Meanings (including schemas, norms, values, rules and roles).
- Customs (including traditions and behaviours).
Each of these dimensions will be discussed, and their implications for multicultural scale development highlighted, followed by a discussion on:

- Assimilation and acculturation
- Multiculturalism in scale development

### 2.3.1 Material Resources

Although constructions of culture are often dominated by the notion of a shared system of meanings, the material resources to which a culture group has access is an essential part of their culture (Jahodo in Retief, 1988). The culture of a group of people who have access only to clay may look very different from the culture of a group of people who have access only to stone. Furthermore, the culture of a group of people who have access to electricity and running water on tap may look very different to a group of people who do not have access to such technology. The cultures of these groups of people is contingent not on inherent or genetic factors, but on environmental factors.

In many societies, including South African society, access to material resources links very closely with socioeconomic status and social class, which in turn link closely with race (as socially defined in the Population Registration Act, South African Government, 1950). It is unquestionably true that, historically and generally speaking, Whites in this country have had far greater access to material resources than Africans. It is thus also indubitably true that Africans have enjoyed a much lower socioeconomic status and social class than Whites (see also Moreland, 1996). As examples of these differences, the following statistics are cited by Ormand (1985, pp. 67-81):

- In 1972, the ratio of pensions paid to Africans versus Whites was 1:6.3.
- In 1983, the life expectancy of White people was 70.3 years, while for Africans it was 58.9 years.
- In 1985 the infant mortality rate (per 1000 live births) was 14 for Whites and 80 for Africans.
- During 1982/3 the per capita spending on education (excluding the former homelands) was R1385 for White children and R115 for African children.
- In 1983, the pupil teacher ratios were 18.2 to 1 for White children and 42.7 to 1 for African children.

Factors which may comprise what we refer to as low socio-economic status (Frisby, 1998b; Owen, 1989) include: economic poverty; inadequate access to adequate health facilities; inadequate social infrastructure (eg sewage systems, running water, electricity); malnutrition; inadequate educational facilities; lack of books, pictures, furniture, toys, television, etc; violence; illiterate parents; the absence of a stable relationship with a supportive adult; etc.
There is much evidence that socioeconomic status (as measured by the level of education and occupational status of the respondent’s parents, family income, etc) influences (or is influenced by) test performance on intelligence, aptitude, personality and psychopathology tests (Frisby, 1998b; Van De Vijver, 1997). Because race and socioeconomic status are associated, there is often the perception that certain race groups perform very differently from other race groups. When socioeconomic status is controlled, however, many of these differences disappear (Moreland, 1996), implying that socioeconomic status is a mediating variable between race and test performance (Paniagua, 1994). Furthermore, there is some evidence that the IQ scores of malnourished children can be increased by nutritional therapy (Frisby, 1998b), suggesting that socioeconomic factors are amenable to change, which in turn can alter test performance.

It is not a simple task, however, to measure and control socioeconomic status. In particular, one must address the question of whether the researcher should be interested in current socioeconomic status or the status of the family of origin. For example, an individual may have grown up in a low status family, but currently enjoy high status. The residual impact of the original status cannot be ignored, while the influence of the current status also has an impact. Separating out these various strands from the rest of ‘culture’ is a complex task and a field of study on its own.

Moreland (1996, p. 57) advises, “Researchers need to be careful to control for socioeconomic status, while practitioners need to be sceptical of the many published studies in which the implications of socioeconomic status have not been examined.” Cross-cultural research, therefore, needs to incorporate socioeconomic status into its design, in order to differentiate the effects of socioeconomic status from the other dimensions of culture. Measures of both current and family-of-origin socioeconomic status should be used, and controlled for. It is likely that a significant portion of between-groups variance can be accounted for and controlled by these measures.

| The multicultural scale developer should incorporate measures of socioeconomic status (both current and family-of-origin) into the research design, as mediating variables between culture and scale performance. |

### 2.3.2 LANGUAGE

A second significant component of culture is language. Within the White South African community, for example, there are several cultural or ethnic groups. These groups are similar in terms of access to material resources, but differ on the basis of language – particularly exemplified by Afrikaans and English speaking White South Africans. African ethnic groups are also, in part, differentiated by language (Xhosa, Setswana, Zulu, etc). In a country such as South Africa, which has eleven official (and many more unofficial languages), language has been recognised as an essential dimension of culture.

Different languages have different syntaxes (Baker, 1992). Words in one language do not necessarily match with words from another language. Sentence structure in one language does
not necessarily match with the structure of another language. With or without actual translation of scales into various languages, using scales across people who have different home languages presents significant problems. A scale constructed in the language of one culture is likely to perform better in that culture than in other cultures. This is not so much a function of the individuals or cultures, as of language. An obvious solution to this problem is to ensure that all scale materials are available in the home languages of the respondents. Valdés and Figueroa (in Padilla & Medina, 1996) state the following:

When a bilingual individual confronts a monolingual test, developed by monolingual individuals, and standardised and normed on a monolingual population, both the test taker and the test are asked to do something that they cannot. The bilingual test taker cannot perform like a monolingual. The monolingual test can’t ‘measure’ in the other language. (p. 14)

Unfortunately, simply translating tests from one language to another does not solve the problem (Riordan & Vandenberg, 1994). The differences in syntax between various languages often make it impossible to adequately translate items between languages. Words are not entities in themselves – rather, they are symbols or metaphors located within a cultural particular context or framework (Baker, 1992). A word that means one thing in one culture may mean something else in another culture, even if both speak the same language. Translation often fails not only because of the difficulties in finding semantic equivalents between words, but also because “the different languages often exhibit great differences in the ways they each ‘map’ words or phrases onto experiences of everyday visual scenes” (Faul, 1997, p. 218).

Faul (1997) suggests that the difficulties in cross-cultural assessment lie less in differences in culture per se, and more in differences in language:

It seems very possible to assume that language can be a bigger issue than culture. The semantics of different languages are unique to the language and the skill lies in finding universals of grammatical (semantic) form together with culturally universal and culturally contingent experiences in linguistic expression. In other words, translations of the different instruments from Western languages to Non-Western languages therefore need to be done that will allow for the people of different and diverse cultures to ‘map’ the words or phrases onto similar experiences of life. (p. 220)

Western languages, such as English, have large vocabularies. Words are thus able to differentiate phenomena very finely – for example, the words irritate, vex, peeve, irk and annoy all mean generally the same thing, but each offers a slightly different slant on the same feeling. Western languages tend to have many more words to describe emotional and relational phenomena than African languages. Faul (1997) states in this regard:

In the Non-Western languages, like many of the African languages, specific words are not always used to describe feelings and emotions. As part of a cultural way of describing feelings, it is many times done with the use of stories and metaphors, mainly due to a lack of so many words that could describe emotions. (p. 220)
The use of short, formalised questions, as advocated by many scale developers, may not be adequate for our purposes. Rather, an fair deal of contextualising may be required for adequate translations and understanding across languages (Baker, 1992).

The plurality of languages is confounded by marked variations in levels of literacy and general education. The previous section on material resources highlighted the reality that certain culture groups in South Africa (and probably in most other countries) have had less access to adequate education and thus are less literate. If the literacy level of one culture is significantly higher than the level of literacy of a second culture, one can anticipate better scale performance from members of the first culture. This performance is not necessarily a factor of social functioning or intelligence, but rather of access to education and subsequently of the ability to read and answer questions.

In response to these difficulties, Faul (1997) advocates retaining scales in a common language – often English. Provided the items are phrased in simple English and provided the respondents have a thorough grasp of the language, she has demonstrated that the reliability of the scales will be acceptable (see also Shuttleworth-Jordan, 1996). However, when English is not thoroughly grasped, she advocates retaining the original version, but augmenting it with paraphrases in the respondents’ home language, using metaphors and stories. Using this technique, she achieved acceptable levels of reliability in cross-cultural studies.

Existing rules for formulating items may not apply in multicultural scale development. Other means of formulating items, eg through translation, paraphrasing and combining translations or versions, need to be explored. The simplest possible level of language needs to be used to ensure that semi-literate respondents can complete the scales.

2.3.3 Meanings

Culture can be conceived as a system of ideas or meanings. Rohner (in Retief, 1988, p. 137) defines culture as "the totality of equivalent and complementary learned meanings maintained by a human population, or by identifiable segments of a population, and transmitted from one generation to the next". In this way, culture can be seen as a shared paradigm – people of a particular culture experience, interpret, make sense of and respond to the world in reasonably consistent ways; and this in turn influences and constrains their behavioural repertoire (Poortinga, 1992). Beliefs, values, religion, norms, rules and social roles are all part of this paradigm or schema.

Since a paradigm is a way of filtering and interpreting external phenomena, different cultures may respond to the same phenomena in different ways. It is thus important for cross-cultural researchers to ensure that the phenomena they study are interpreted equivalently by the cultural paradigms of the groups they are interested in. If, for example, a researcher wants to study self-esteem, but neglects to investigate whether both cultures attribute the same meaning to an item such as "I don’t base my feelings about myself on the feedback I receive from others", the
research will be biased. This notion will be explored in more depth in the later section on equivalence.

The multicultural scale developer needs to ensure the functional and conceptual equivalence of the constructs under investigation.

### 2.3.4 Customs

Customs refer to the actual behaviour of people, including their traditions and their customary behaviours. This dimension of culture is not of direct bearing on this study, except as it relates to the meanings and paradigms of the cultures, as discussed in the previous section.

### 2.3.5 Assimilation and Acculturation

Assimilation occurs when individuals from a (usually) subordinate culture are drawn into or taken up into the (usually) dominant culture. Acculturation occurs when individuals from one culture adopt one or more aspects of the culture in which they find themselves. As an anecdotal illustration of acculturation, some Whites have learned to receive money from Africans using both hands (a gesture of respect and gratitude in many African cultures). However, this is frequently met with amusement from the African giver who uses only one hand (something quite acceptable in many White cultures, but not in African cultures). Both people have accommodated to each other’s cultures – they have been acculturated.

Acculturation is a continuum, ranging from complete assimilation into another (usually dominant) culture to complete adherence to one’s own culture. Typically, people from the dominant culture retain their own cultural identity and acculturate very little from other cultures, while people from subordinate cultures often assimilate large amounts of the dominant culture, even learning to despise their own cultural heritage. The notion of the ‘African Renaissance’, which is prevalent in South Africa, seeks to reaffirm the value and worth of African cultures that have been oppressed and denigrated over the past decades.

It is probably true that many, if not most, “multicultural clients [ie African Americans and other minorities] will be neither fully identified with their culture of origin nor fully assimilated into mainstream society” (Moreland, 1996, p. 56). In South Africa, we have the interesting occurrence that there has been a change in dominant cultures – up until ten years ago the White (Afrikaans) culture was dominant. Now African cultures dominate, although the American culture is probably a ‘supraculture’ in this country. It is thus likely that many or most South Africans, of all cultures, will not be fully identified with any single culture.

This makes cross-cultural assessment very difficult. We can no longer assume that all Xhosa clients adhere to a certain set of cultural patterns that were researched over the past century. We can also not assume that all Afrikaners behave in a particular way. Such assumptions are, in fact, stereotypes (as discussed in the previous chapter regarding cultural competence). The greater the
degree of acculturation in a society, the more our group/culture level assumptions become stereotypes (Shuttleworth-Jordan, 1996).

Some writers suggest assessing the degree of acculturation of a client and, on this basis, determining whether to use a Western-oriented assessment method (Keitel, Kopala, & Adamson, 1996). Paniagua (1994, p. 10), for example, suggests the use of the following Brief Acculturation Scale (Figure 4):

**FIGURE 4: BRIEF ACCULTURATION SCALE**

<table>
<thead>
<tr>
<th>Instructions: Please check only one item from the group of generation items, language preferred items, and social activity items.</th>
</tr>
</thead>
<tbody>
<tr>
<td>My generation is:</td>
</tr>
<tr>
<td>First (1)</td>
</tr>
<tr>
<td>---</td>
</tr>
<tr>
<td>The language I prefer to use is:</td>
</tr>
<tr>
<td>Mine only (1)</td>
</tr>
<tr>
<td>---</td>
</tr>
<tr>
<td>I prefer to engage in social activities with:</td>
</tr>
<tr>
<td>Only within racial group (1)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Total Score:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of Items Checked:</td>
</tr>
<tr>
<td>Acculturation Score (Total Score ÷ Number of Items Checked):</td>
</tr>
<tr>
<td>The level of acculturation is:</td>
</tr>
<tr>
<td>Low (1 – 1.75)</td>
</tr>
</tbody>
</table>

(Paniagua, 1994, p. 11)

Historically, psychometric testing in this country used separate tests for different culture groups (Owen, 1989). Political changes over the past few decades have required that the same tests be used across groups, although different norms continue to be used for different culture groups in many instances. In fact, some authors argue that the use of different norms is the only way to avoid cultural bias (Huysamen, 1996). In light of the fact of wide spread acculturation, however, such practices become increasingly questionable. An African person can, in terms of acculturation, range from someone who has never met a White person and is fully grounded in African culture, to someone who attended a White school, grew up in a White community, had little or no contact with other Africans and has little understanding of or appreciation for African culture (Shuttleworth-Jordan, 1996). At what point does one decide to assess this individual using a Westernised scale? Does one use African or White norms to interpret this individual’s scores?
Acculturation demands that multicultural scale developers develop scales that can be used universally, across various cultures, without different norms or methods of administration.

**Efforts must be made to develop scales that do not require different norms or methods of administration for different culture groups.**

### 2.3.6 Multiculturalism in Scale Development

The reader will have noticed that two terms are being used apparently interchangeably: cross-cultural and multicultural. In fact, these terms have very different meanings. This dissertation is multicultural, but most of the literature upon which it is based is cross-cultural.

Cross-cultural studies are primarily concerned with the *comparison* of phenomena between at least two cultures (Stuart-Hamilton, 1996). The cultures of interest are usually large – nations rather than provinces or ethnic groups (Berry, 1980; Brislin, Lonner, & Thorndike, 1973). Cross-cultural studies are quasi-experiments, in which the phenomena are compared between the two or more cultures to determine whether there are any differences or similarities, using a t-test or ANOVA (Van De Vijver & Leung, 1997). In this context, cross-cultural scale development is concerned with how to develop scales that are equivalent across cultures for the purpose of making comparisons of the phenomena across the cultures.

In the clinical literature, the term cross-cultural is typically used to describe what happens when a practitioner of one culture (usually White) works with a client of another culture (usually Black). The purpose of this literature is to assist the practitioner in entering the world of the ‘culturally-other’ client.

This dissertation is more concerned with *multicultural* scale development. It is not its purpose to make comparisons across cultures or to assist practitioners in working with clients from other cultures. Rather, this study purposes to develop scales that can be used by a practitioner (of any culture) with clients from diverse cultures (Lopez, 2002).

The term multiculturalism was "coined in the late 1980’s to refer to a new kind of cultural pluralism, which stresses the inclusion of multicultural perspectives and empowerment of members of minority groups in all aspects of public life” (Auerbach, 1994, p. 1179). Recognising that a society comprises multiple, distinct and interrelated cultures has two primary consequences (O’Sullivan et al., 1994):

- **Multiculturalism demands “a rethinking of dominant assumptions about the unity of a culture”** (O’Sullivan et al., 1994, p. 190). There is, for example, not just one African culture or worldview, but a plurality of African cultures and worldviews. Multiculturalism is expressed in South Africa as the ‘rainbow nation’, which intends to illustrate that there are various different groups (colours), which together make up what we know as South Africa (the rainbow). The colours are not mixed together, but remain distinct; nevertheless, they form a unity that has
an existence separate from but dependent upon each of the individual colours. The image of 
the rainbow stands in contrast to the American notion of the ‘melting pot’, in which all cultures 
are melted down (and thus lost) into one All-American culture – which is actually a White, 
Anglo-Saxon, Male culture (Samuda, 1983).

- Multiculturalism demands “a rethinking of dominant assumptions about the plurality or 
diversity of a culture” (O’Sullivan et al., 1994, p. 190). The plurality of cultures is not simply a 
happy mix of ‘differentness’. There are different power relations between the cultures, with 
some cultures enjoying greater power and status than others. The danger of a metaphor such 
as the ‘rainbow nation’ is that it implies equality between the colours/cultures, when in fact 
there is not equality. “Multi-cultural analysis tries to account for different cultural practices in 
terms of the relations between more or less powerful cultures, rather than as instances of 
more or less exotic traditions” (O’Sullivan et al., 1994, p. 190). Auerbach (1994) continues:

Multiculturalism in this sense is aimed at levelling hierarchies, at assigning equal value to 
the lives and traditions of all Americans, regardless of color, ethnicity, gender, sexual 
orientation, or any other condition that differentiates. The source of social differences and 
the nature of intergroup relations among groups are explained historically by the political 
domination of one group (often referred to as “hegemony”). (p. 1181)

In this context, then, multicultural scale development implies the following:

- **Society comprises people of diverse cultures.** Multicultural ecometric scales must ensure that 
  all cultures are included in the process of scale development, without prejudice.

- **Cultures have different levels of sociopolitical power and different histories.** Multicultural 
  ecometric scales must thus be developed in such a way that these power differentials are not 
  reinforced. The process of scale development must not perpetuate a legacy of cultural 
  oppression.

- **Culture is a multidimensional construct.** Multicultural ecometric scale development must not 
  fall into the trap of equating culture and race, or even culture and ethnicity. The other 
  important dimensions of culture, especially socioeconomic status (both past and present) and 
  language, must be incorporated into the research.

- **Culture is socially constructed.** Multicultural ecometric scale development must not fear 
  revealing differences between cultures, provided such differences are located within culture as 
  socially constructed and not within the genetic makeup of the individuals comprising that 
  culture. The construct ‘culture’ must not be reified.

With this understanding of culture, and especially of the relativity of culture, in place, we are ready 
to move to the emic-etic debate. This is a fairly philosophical issue dealing with the degree to 
which scales measure universal or culturally specific phenomena, as well as the direction of
development – from universal to specific or from specific to universal. Such an issue inevitably raises a host of philosophical debates that will be detailed in the following section.

2.4 **THE EMIC-ETIC DEBATE**

The emic-etic debate is one that appears repeatedly in the cross-cultural psychology literature, as well as in social work literature, although seldom under these terms. The debate is a particularly interesting and important one, as it raises broader issues of constructivism and relativism (within the broader matrix of postmodernism). These -ism’s may appear insubstantial and theoretical, but profoundly influence the direction taken by the multicultural scale developer. For this reason, it is important to make these notions explicit and to attempt to find some form of resolution or at least a position from which to work. This section thus begins with a discussion of the emic-etic debate and then broadens the discussion to the matter of constructivism and relativism.

2.4.1 **EMIC-ETIC**

Berry (1980) explains the origin of the terms ‘emic’ and ‘etic’ very neatly:

> These two terms, initially proposed by Pike (1954/1966), are derived from the two special approaches in linguistics of phonemics and phonetics. Phonemics focuses on sounds which are employed within a single linguistic system; phonetics emphasizes more general or even universal aspects of language. By dropping the root (phon), the two suffixes (emics, etics) become terms which are applicable to this local versus universal distinction in any discipline. (p. 11)

In brief, emics are specific and culture bound, while etics are universal. Figure 5 (Berry, 1980, pp. 11-12) should clarify the distinctions between these terms:

<table>
<thead>
<tr>
<th>EMIC APPROACH</th>
<th>ETIC APPROACH</th>
</tr>
</thead>
<tbody>
<tr>
<td>Studies behaviour from within the system</td>
<td>Studies behaviour from a position outside the system</td>
</tr>
<tr>
<td>Examines only one culture</td>
<td>Examines many cultures, comparing them</td>
</tr>
<tr>
<td>Structure discovered by analyst</td>
<td>Structure created by analyst</td>
</tr>
<tr>
<td>Criteria are relative to internal characteristics</td>
<td>Criteria are considered absolute or universal.</td>
</tr>
</tbody>
</table>

The etic approach can be further subdivided into imposed (or pseudo) etic and derived etic (Berry, 1980). *Imposed* etic takes place when universals are assumed to exist or when they are imposed upon a culture. This imposition is usually from a westernised or Eurocentric perspective. The *derived* etic, by contrast, is derived from data which emerges from within two or more cultures and which, upon reflection, can be seen to be universal or common to those two cultures.

A core challenge facing any researcher who wishes to investigate similar phenomena in two or more cultures is finding how to describe those phenomena in a way that is meaningful and valid for each of the cultures (ie the emic approach), while at the same time doing so in a way that allows for comparison of the phenomenon across the two cultures (ie the etic approach) (Berry,
The tendency in much cross-cultural research is to begin with an imposed etic, and from this platform to seek out the true emic, gradually getting rid of the imposed etic until such time as a derived etic begins to emerge. This tendency is especially reinforced because most cross-cultural research has been conducted by Europeans seeking to understand ‘other’ cultures (Collinge, Rüdell, & Bhui, 2002).

In practical terms, the emic-etic distinction requires cross-cultural researchers to discard all material that is unique to only one or other culture, and to retain only that which is common to both. This can be depicted as a number of overlapping circles or sets. The emic refers to those portions of the sets that are not held in common, while the etic refers to those portions that are held in common. It can be argued multicultural (though not necessarily cross-cultural) research must concentrate on those elements in the sets that are held in common, that is, on the derived etic.

Alternatively, an attempt must be made to evaluate both derived etic phenomena (in order to allow comparisons across cultures) and emic phenomena (in order to allow for culture-specific assessment). The Chinese Personality Assessment Inventory (Cheung et al., 1996) is an example of such an attempt. The inventory incorporates both etic personality constructs (from the MMPI) and Chinese-specific emic personality constructs (derived from a detailed study of Chinese culture). Such a scale seeks to integrate emic and etic components more harmoniously.

In South Africa, with its many culture groups, integrated emic-etic scales would be very unwieldy. Etic-oriented scales are most relevant, since the aim is not to make comparisons across culture groups (as in cross-cultural studies) but to assess various culture groups in common ways (ie multicultural studies).

2.4.2 CONSTRUCTIVISM-POSITIVISM

The emic-etic debate takes us into the realm of the -ism: terms such as postmodernism, constructivism, relativism, absolutism, perspectivism, universalism, positivism, modernism, etc. These terms relate closely – some overlapping and others diverging widely. Ultimately, however, they are all concerned with the question of universals, that is, ‘Are there true universals out there, things which are true for all people for all times?’

Historically, philosophy and science have been dominated by the belief that there are absolute truths in space-time. Jung, for instance, believed that the collective unconscious was universal across space and consistent over time; everyone, he believed, has the same unconscious substructure comprising archetypes, called the collective unconscious (Jung, 1968; see also Van Breda, 1999c). This approach can broadly be called positivistic research (although Jung would probably not qualify as a positivistic researcher).
Rodwell (1998) explains positivistic social work research in more detail:

Social work research and practice within the positivistic framework assumes that any social phenomenon has real existence, external to the individual; that knowledge is hard and factual; and that humans are shaped by their environment... From this frame, universal laws and the relationships between social phenomena are studied by the application of natural science research techniques... The positivistic focus is on the objective nature of social reality and attending to what is. (p. 14)

Contemporary, postmodern approaches to philosophy and science, in contrast, have rejected the belief in or search for absolutes. Rather, postmodernism is concerned with specifics, with the internal experiences, beliefs and subjective truths of individuals and small groups (Waldegrave, 1998). Postmodernism sees the search for absolutes as a form of cultural domination or imperialism. Rodwell (1998), using the term ‘interpretive approach’ to refer to this approach to social work research, explains as follows:

Operating from this frame of reference, as a constructivist researcher does, means that there is an assumption that the world, as it is, can be understood and that understanding of the fundamental nature of the social world happens at the level of subjective experience. Hence, in the interpretive approach, individual consciousness and subjectivity are basic to understanding ... and people are active creators of reality... From this perspective, universal laws are rejected in favor of the highly individual, unique, and emergent. Multiple constructed realities cannot be understood through the concept of law, universal or otherwise. Instead, these realities can only be studied holistically. As a result, research will naturally produce more questions than it answers, so prediction and control are unlikely and uninteresting. (p. 16)

Cross-cultural research typically entails the search for universals (Church & Lonner, 1998; Díaz-Loving, 1998; Kagitcibasi, 1992). Cross-cultural research is thus part of the positivistic approach, which argues that if one applies the ‘scientific method’ one can discover objective truth or knowledge (Fay, 1996). Such an approach believes it can be free of perspective, that is, free of cultural bias or colouring. The notion of universals implies absolutes. Absolutism stands in contrast to social constructivism, which sees reality as socially and personally created, rather than objectively true. From a social constructivist perspective, therefore, one can anticipate fewer universals (Church & Lonner, 1998).

The postmodernist replacement for positivism is ‘perspectivism’ (Fay, 1996):

Perspectivism is the view that all knowledge is essentially perspectival in character; that is, that knowledge claims and their assessment always take place within a framework that provides the conceptual resources in and through which the world is described and explained. According to perspectivism knowers never view reality directly as it is in itself; rather they approach it from their own slant, with their own assumptions and preconceptions. (p. 72)

Perspectivism, taken a step or two further, leads us to relativism, which “is the doctrine that either experience (in the case of epistemological relativism) or reality (in the case of ontological relativism) is a function of a particular conceptual scheme” (Fay, 1996, p. 77). Epistemological relativism argues that the ‘truth’ of a phenomenon can only be verified from within the conceptual
schema of the phenomenon itself. Ontological relativism goes a step further by arguing that these schemas create reality.

The emic approach, taken to its logical (though admittedly extreme) conclusion, leads to relativism. Within an emic-relativistic framework, the unit of study is at most the individual. The notion of ‘culture’ must disintegrate, since each individual is capable of perceiving the world only from within his/her own reality, and is even capable of creating his/her own reality. Comparisons across individuals become impossible, since reality is so fluid and self-defined as to be meaningless to anyone other than the individual. “Motivated by a deep appreciation of the ways people are different from one another, [relativism] ends up making it impossible for us to recognize and appreciate this difference” (Fay, 1996, p. 82). This approach has important implications for research methodology. Rodwell (1998), in her text on social work constructivist research, states:

> The human instrument is the primary data gathering instrument in constructivist research. No nonhuman instrument can be devised beforehand to have sufficient adaptability to adjust to the various realities encountered in the natural setting. No questionnaire, standardised test, or other structured data collection tool would be capable of recognizing, sorting, or testing the multiple perspectives or the subtleties of meaning that shape attitudes and behavior in context. (p. 57)

Relativism may seem to be a radical and seldom-taken step by cross-cultural researchers. However, a review of current writings on cross-cultural social work practice will demonstrate that the social constructivist approach – often operationalised by the narrative approach of Michael White and others (De Shazer & Berg, 1988; White, 1989a; 1989b; 1989c; 1992) – is the most commonly advocated approach when working with clients of a different culture. The candidate’s experience as a social work practitioner holds this approach in high esteem as a philosophical and clinical approach to crossing cultural (and other) differences between practitioner and client. It is a system that enables the practitioner to relinquish his/her own cultural frame (or perspective) and to recognise and validate the reality of the client, even though this reality may be meaningless from within the perspective of the practitioner’s reality. The previous sentence, with which no culturally sensitised practitioner would disagree, is grounded in relativism.

The social constructivist approach has tremendous merit in clinical work with individual clients, families and even groups and communities. However, it is a great danger to the researcher. While practitioners work with individuals, or small groups of individuals who may well share a common reality, researchers typically work with large groups of individuals, who frequently do not share common realities – even more so when the research is multicultural. Since social constructivism tends to result in perspectivism, which tends to degenerate to relativism, such an approach, if adopted carelessly, can lead to complete meaninglessness and the inability to communicate.

There is, however, a current trend in cross-cultural psychology towards relativism and the rejection of the invariance of constructs across cultures (Poortinga, 1995a). The obvious result of this, as has been stated, is that one can no longer use scales across cultures. Perhaps when one is speaking of transporting scales across nations this trend is practicable. However, within a country
such as South Africa (indeed many or most countries in the world), this is simply not feasible. This country comprises multiple diverse cultures; it is neither possible nor desirous to develop separate scales for each. What is required is some kind of working absolutism that allows researchers to strive to develop scales that are reasonably valid across all cultures within a multicultural society.

Fay (1996) sums up his discussion on relativism as follows:

A mature synthesis is required here. If we insist too heavily on dramatic dissimilarity then we lose the capacity to understand others (and therefore the capacity to appreciate their difference). If we insist on their dramatic similarity, then we lose the capacity to appreciate and understand difference and therefore to see others as something not ourselves; in this case, we would only see ourselves everywhere we turn. In relating to others the choice is not difference or similarity; it is difference and similarity. So to return to the question of this chapter: people recognizably living in different cultures cannot be living in a different world; but they may well be living differently in the same world. (p. 90)

The emic-etic distinction, then, should perhaps be thought of less as a distinction, than as two perspectives on the same thing, as is in fact advocated by Pike (in Berry, 1980). The emic-etic debate should not result in an undue focus on ‘differentness’, to the complete exclusion of sameness. Nor should it result in an undue focus on universals, to the complete exclusion of specifics.

Rather, and what is perhaps more practical, the multicultural researcher must embrace the notion that there are more similarities than differences between people, and from the perspective of this fundamental humanness of all humans, begin to tease out the differences. This is, in essence, a broad paradigm or value system that the multicultural scale developer must develop and maintain – indeed, this paradigm/value base should be adopted by all social workers. The emic-etic distinction should keep the researcher cautious about making assumptions, so as to avoid cultural domination or an imposed etic.

Multicultural scale development requires sensitivity to the differences between groups of people (the emic approach) within the context of the basic humanness of all humans (the etic approach).

Part of the resolution of the emic-etic debate lies in the demand for equivalency in multicultural scale development, which is the topic of the next section. Equivalency is perhaps the most central issue in multicultural scale development. It requires scales to mean and measure the same thing across cultures. The various forms of equivalency will be detailed in the following section.

### 2.5 Equivalency

A central issue, if not the central issue in the multicultural or cross-cultural psychology and social work literature, is the notion of equivalency (Butcher, 1996b; Iyengar, 1993; Poortinga, 1983; Tran & Williams, 1994). The issues around equivalency are, perhaps, the most critical dimensions in multicultural scale development and must occupy centre stage throughout the development
process. The concept of equivalency is based on the idea that one cannot make comparisons between groups of people if there is not a fundamental similarity or sameness between the groups. That is, equivalence is a prerequisite for comparability. Paradoxically, therefore, comparisons between groups are only meaningful if there are similarities between groups. As Berry (1980, p. 8) states, “To compare two phenomena, they must share some feature in common and to compare them to some advantage, they should usually differ on some feature.” In this sense, equivalence is the operationalisation of the emic-etic debate discussed in the previous section.

Four principle forms of equivalence will be discussed here:

- Functional equivalence
- Conceptual equivalence
- Metric equivalence
- Scalar equivalence

There are, in fact, many other forms of equivalence described in the literature (e.g., psychological, linguistic, structural, semantic, psychometric, technical, stimulus, item, etc.) (Poortinga, 1983). Delineating the boundaries between each type of equivalence is very difficult. It is probably most pragmatic to ensure that the demand for equivalence be addressed throughout the development process, starting initially with conceptual and functional equivalence, then working with the translation and linguistic equivalence of the scale items, and later moving onto the more specific and statistical methods for establishing metric and scalar equivalence (Butcher & Han, 1996).

### 2.5.1 Functional Equivalence

“Functional equivalence exists when two or more behaviours (in two or more cultural systems) are related to functionally similar problems” (Berry, 1980, p. 9). A few examples should serve to elucidate functional equivalence:

- In Western cultures the behaviour of burping after a meal is indicative of poor manners. The latent variable underlying the burp, so to speak, is lack of manners. In some other cultures, however, the behaviour of burping after a meal is indicative of a compliment on a good meal. The latent variable underlying the burp in these cultures is politeness. The same behaviour, therefore, serves different functions. It is not possible to make meaningful comparisons of politeness between these two cultures using burping as an indicator of politeness (Moreland, 1996).

- Smiling is not functionally equivalent between America and Asia. In America smiling is a function of happiness and friendliness. In Asia smiling is frequently a function of embarrassment (Butcher & Han, 1996). One cannot make meaningful comparisons of friendliness between America and Asia by counting the acts of smiling.
The WHO reports a third example. The item “Do your hands tremble?” intended as a function of anxiety, was found to be a function of virility in Mali, West Africa (Kuyken, Orley, Hudelson, & Sartorius, 1994).

The candidate was recently assisting in the development of a multicultural instrument to measure spirituality. One member of the research team suggested ‘revering my ancestors’ as a function of spirituality in African cultures. Other team members, however, argued that this could be interpreted as antispiritual in White cultures. After lengthy debate, the item was dropped from the instrument prior to field testing.

Since the social sciences (including both psychology and social work) use specific observable behaviours to make inferences about underlying or latent variables, it is essential to first ensure that the behaviours do indeed refer to the same variables. Hence, functional equivalence is a prerequisite for comparability (Pareek & Rao, 1980).

Functional equivalence can be demonstrated through various forms of exploratory research (Kuyken et al., 1994):

Careful review of the relevant literature in the two settings or relevant cross-cultural work will yield some information about [functional and] conceptual equivalence. Qualitative research methods such as interviews and focus groups in the target setting can be used to explore similarities and differences in the understanding [and function] of the concepts underlying the instrument. Quantitative methods are available that can be used to examine the [functional] equivalence of two or more forms of a measure, eg Multidimensional Similarity Structure Analysis. (p. 20)

2.5.2 CONCEPTUAL EQUIVALENCE

Conceptual equivalence entails ensuring that the meaning ascribed by people in various cultures to the behaviours or constructs under consideration is the same. “The researcher must search for and discover the local meaning of concepts within the cognitive systems of the people and groups being compared” (Berry, 1980, p. 9). “Conceptual equivalence is perhaps the vaguest of the types of equivalence because it is the most general” (Butcher & Han, 1996, p. 44).

In this regard, Gough (in Brislin et al., 1973, p. 26) suggests that the ‘intent’ of a scale item must take precedence over the content of the item, since the content may have different meanings in different cultures. For example, the item “Every family owes it to the city to keep its lawn mowed in summer and sidewalks shoveled in winter” is meaningful only to people living in self-owned, single-family houses, with snowy winters, etc. The same intent for this item used in France could be, “The good citizen does not throw his garbage down the stairwell”. Although the content of the items is different, the conceptual meaning is equivalent between the two cultures.

Perhaps the most common way to operationalise conceptual equivalence is through translation (Retief, 1988), as Butcher (1996a) states:

The translated version of the test items must accurately convey the meaning of the items employed in original developmental research for the test. It is necessary for the translator...
to ensure that the items convey the same meaning in both the target and the source language, to ensure content validity. (p. 29)

There is a tendency in much of the literature to equate conceptual equivalence with translation equivalence (eg. Saito, Nomura, Noguchi, & Tezuka, 1996), and while translation (or linguistic) equivalence is certainly a component of conceptual equivalence, they are not synonymous (Iyengar, 1993).

Whether or not translation is required, the meaning of scale items must be demonstrated to be equivalent between cultures, even when both cultures speak the same language (Reddy, Knowles, & Reddy, 1995). An item may mean one thing to one culture and quite another thing to another culture speaking the same language (this is well illustrated in Tanzer, 1995). Or the item may be completely meaningless to another culture. These issues are particularly salient when one or more cultures are completing the scale in a second or third language. Irrespective of what language the item is written in, the meaning of the words must be demonstrated to be the same. It is, therefore, important to separate out the issue of language (as in English versus Xhosa) from the meaning of the words (as in what the word ‘pavement’ means to someone from South Africa versus someone from the USA).

When developing scales, it may therefore be necessary to use differently worded questions with the same ‘intent’ or psychological meaning for each of the cultures (Butcher, 1996a). If, however, one scale is wanted for all cultures (as in the case in multicultural scale development in social work), the researcher will need to adjust the wording of items until they have the same meaning in all target cultures.

2.5.3 **Metric Equivalence**

Metric equivalence requires that the statistical relationships between variables remain relatively stable between culture groups. This is, the correlation matrixes, factor structures and reliability coefficients within each culture group must be shown to be similar before comparisons between culture groups are permissible (Berry, 1980). Metric equivalence demonstrates that the items of the scale and the factors or variables within the scale perform in similar ways for all culture groups involved in the study. Only when the scale can be shown to perform in similar ways for all relevant culture groups can comparisons between these groups be made using this scale.

There is, however, little agreement among researchers about which measures must be similar before metric equivalence can be accepted (Butcher & Han, 1996). Some authors use relatively basic statistical tests, such as “similarity of item difficulty or preference value by rank order or absolute value; item-scale correlations; correlation among rankings of item difficulty or preference (termed the ‘response pattern method’); and correlations between or factor analysis of items or scales” (Butcher & Han, 1996, p. 45; see also Okazaki & Sue, 1998; Van De Vijver, 1997).

Other researchers argue that classical test theory is inadequate to establish metric equivalence, and require the utilisation of modern test theories such as Item Response Theory (IRT) and
Differential Item Functioning (DIF). Using these theories, for example, one study found that 40% of the items in a scale functioned differently across two English-speaking cultures (Huang, Church, & Katigbak, 1997, p. 209). Furthermore, when these DIF items were removed from the scale, most of the scales demonstrated similar mean scores between the two cultures, suggesting that the mean differences in scale scores were a function of poorly performing items (ibid.). However, while it is possible to identify differentially functioning items, there is still no way to determine the source of the DIF – whether it is a result of translation/language or of true differences in “cultural experience or knowledge” (Ellis, 1995, p. 191).

Whereas functional and conceptual equivalence must be established before the collection of data, indeed, even before the generation of the scale items, metric equivalence can only be demonstrated after data have been collected and analysed (Berry, 1980).

### 2.5.4 Scalar Equivalence

Scalar equivalence, the most demanding form of equivalence, demands that the scale score has the same meaning in all cultures under consideration. A score of 75% on a scale measuring marital satisfaction must, therefore, indicate the same degree or intensity of marital satisfaction in all cultures (Butcher & Han, 1996). If, however, a score of 75% indicates a fairly unhappy marriage in one culture, but a high degree of marital tension and dissatisfaction in another culture, the scale does not have scalar equivalence and comparisons cannot therefore be made between the two cultures, even though the scale has functional, conceptual and metric equivalence.

It is important to note that scalar equivalence does not require the mean scores on the scale to be identical across cultures (Moreland, 1996). It is possible that one culture will have a higher mean score than another culture. What scalar equivalence does require, however, is that the scale scores match the experience of the people in the same way across cultures. For example, the scale should order people along a continuum of functioning in the same way as members of the culture would order the same people (Kuyken et al., 1994).

Inasmuch as scalar equivalence does not require identical means across cultures, if the mean scores of a scale do prove identical across two cultures, one cannot conclude that scalar equivalence has been demonstrated. It could well be that the mean score in one culture indicates a higher degree of the variable under examination than in the other culture.

“Scalar equivalence can be demonstrated simply ... by administering the inventory to well-defined groups and confirming that the scales are operating properly in the new culture” (Butcher & Han, 1996, p. 48). This is a form of construct validity (known-groups), but is applied to the cross-cultural question of scalar equivalence (Kuyken et al., 1994). The principle problem with this approach, however, is finding a reliable external criterion (ie the ‘well-defined groups’) against which to evaluate the scale, since there is probably a pervasive differential treatment of culture groups in this country.
Butcher and Han (1996, p. 49) note, however, that "the property of scalar equivalence has been notoriously difficult to establish, and more direct techniques ... have not been widely accepted."

2.5.5 SEEKING EQUIVALENCE

Equivalence is not a discrete step in the development of a scale for multicultural use. Rather it is a thread that runs through the entire process, from beginning to end. It requires, for example, that the construct selected to be measured is meaningful and equivalent between cultures; that the theories and research used to guide the generation of items be comparative; that the items that are generated be constantly evaluated for functional and conceptual equivalence; that the linguistic equivalence of items (especially if translated) be investigated and ensured; that the conclusions drawn from scale scores be equivalent across cultures; that high and low scores mean the same thing in different cultures; and so on. Indeed, every step of the multicultural scale development process must be executed in a way that promotes cultural equivalence.

The establishment of the equivalence of scales (functional, conceptual, metric and scalar) between different cultures is central to multicultural scale development. The methods to promote and ensure equivalence are located throughout the assessment process. Multicultural scale developers must continuously evaluate the multicultural validity of the development process from beginning to end.

The emic-etic debate and the demand for equivalence are driven in large part by the demand for scales that are fair and unbiased. This demand is, essentially, an ethical one. The social work profession requires social workers to provide care to clients that is free from discrimination and bias. Within the field of scale use, this means scales must not discriminate or bias against any culture groups. In order to achieve this objective, there need to be professional standards regulating the development and use of scales. This topic will be further discussed in the following section.

2.6 BIAS & FAIRNESS

2.6.1 BIAS & FAIRNESS

Bias is present when a test score has meanings or implications for a relevant, definable subgroup of test takers that are different from the meanings or implications for the remainder of the test takers. Thus, bias is differential validity of a given interpretation of a test score for any definable, relevant subgroup of test takers. (Cole & Moss, 1989, p. 205)

Elsewhere, bias is defined as follows: "An item [of a scale] is biased if persons of equal ability do not have an equal opportunity for answering the item correctly" (Retief, 1988, p. 45) – here the link with scalar equivalence can be seen. When a test performs differently for people from different cultures, it can be said to be biased. Obviously, cross-cultural and multicultural researchers are concerned to develop scales that are not biased.
Retief (1988) distinguishes fairness from bias:

Fairness concerns the quality of the decision rule used for selecting one person rather than another on the basis of test scores. Fairness can here be distinguished from bias as it concerns the use of test scores after they have been obtained, whereas bias refers to influences on scores during testing. (p. 51)

Bias and fairness are located within the demands for equivalence discussed previously and are also part of ensuring validity (that is, ensuring that the scale really does measure the construct it is supposed to measure). The notions of bias and fairness are, therefore, integrated into this and the following chapter. Poortinga (1995b) highlights five cultural factors that can constitute bias in the use of scales in a multicultural context:

The tester, including personal characteristics such as ethnic identity, stereotypes about intergroup relations, and linguistic expression: These can affect test scores through the stereotyped expectations of the examinee, but also through those of tester, especially in individual test administration.

The examinees, notably the noncorrespondence of sample characteristics: An example is the quality of school-based education. This is a nuisance variable when comparing groups equated for number of years of education or when using norms based on a formally educated population in the assessment of members of minority groups (who usually attend lower quality schools).

Tester-examinee interaction, especially the need for unambiguous communication of the meaning of tasks: Even if examinees have insight in their own lack of understanding and can define the problem, they may not ask for clarification; they almost certainly never ask twice about the same point.

Familiarity with response procedures, including implicit knowledge about the speed versus accuracy tradeoff in time-limited tests and about the effects of incorrect answers on one's scores.

The stimuli, including adequate knowledge of the testing language, unequal familiarity with stimulus materials, and the way in which a particular problem is presented: This is the most important and most widely studied category. (pp. 188-189)

It is important to highlight the concept of 'high-stakes' versus 'low-stakes' testing (Heubert & Hauser, 1999), of which Padilla and Medina (1996) say:

The major concern that arises when culturally sensitive testing procedures are not followed has to do with how the test outcomes are used. In today's test-conscious environment, where tests have acquired such prominence for diagnosis, selection, certification, and accountability, it is vitally important to contextualize this discussion in the language of "low-stakes" and "high-stakes" decision making. (p. 7)

Examples of low-stakes testing include assessment of an individual client or a quiz before a workshop. Examples of high-stakes testing include pre-employment testing or selection, performance evaluation, evaluation of performance at a tertiary academic institution or promotional testing. Scales are no longer simply used for research, self-discovery or interest. Standardised tests (including some ecometric scales) are increasingly being used to make
important decisions about people’s futures, careers and well-being, and thus have legal implications (Plake, 2002; Simpson, 2003).

In this high-stakes, multicultural testing milieu, it becomes essential that scales are unbiased and fair. The high stakes and the complexity of multicultural scale development, however, place great pressure on scale developers, who are under extreme scrutiny by political and professional bodies.

Social work has not, historically, been greatly involved in high stakes testing; most of our scale use has been at an individual, clinical level or as part of programme evaluation. Some social workers are, however, being called upon to participate in higher-stakes assessments. The social workers of the South African National Defence Force, for example, are participating in comprehensive health assessments of all members of the SANDF. These assessments determine the health status of individual soldiers, which in turn influences the utilisation (and possibly the career prospects) of these soldiers, a clear example of high-stakes testing.

2.6.2 Standards of Ecometric Scale Development and Use

Perhaps because social work has had very little experience in the field of testing, especially high-stakes testing, and because ecometrics is a relatively undeveloped field in social work, there have, until very recently, been no professional guidelines for social workers regarding the use of ecometric and other scales (eg. see the NASW’s Code of Ethics in Corey et al., 1998). In psychology, by contrast, there are extremely sophisticated standards for the development and validation of scales (American Psychological Association, 1974) and for the use of scales by practitioners (eg. see the APA’s Ethical Principles of Psychologists and Code of Conduct in Corey et al., 1998).

As social work has become more ‘testwise’, as we have begun to conduct high-stakes testing (as many social workers in occupational and forensic settings seem to be doing) and as our ecometric scale development technology has become more sophisticated, our need for standards and ethical guidelines has become imperative. Without such standards, there is little way for social work as a profession to ensure that scales are developed and used in a way that is unbiased and fair, in a way that promotes social work values and ethics, in a way that respects cultural diversity and in a way that is of benefit to our clients.

In view of this imperative, the candidate formulated a set of standards as a departure point for ecometrics for an earlier draft of this dissertation (June 2000). These standards were almost entirely based on other standards, notably those of the APA’s 1995 Ethical Principles of Psychologists and Code of Conduct (Corey et al., 1998), The American Counseling Association’s 1995 Codes of Ethics and Standards of Practice (Corey et al., 1998), the NASW’s 1996 Code of Ethics (Corey et al., 1998), and most strongly on the APA’s 1974 Standards for Educational and Psychological Tests (American Psychological Association, 1974).
On 25 February 2001, however, the South African Council for Social Service Professions (SACSSP) sent out a letter to social workers, in which they said the following:

As from the end of 2000, the SACSSP obtained representation on the Psychometrics Committee of the Professional Board for Psychology. This Committee is inter alia responsible for the registration of all psychometric tests and assessment instruments in order to comply with section 37 of the Health Professions Act, 1974. ... As social workers utilise assessment instruments, the SACSSP entered into an agreement with the Professional Board for Psychology that all social work assessment instruments would be submitted to the Psychometrics Committee for accreditation. ... With a view to the above, all social workers utilising such instruments are urgently requested to provide particulars of such instruments to the SACSSP ... in order to register and legalise the application thereof.

This action by the SACSSP led to an outcry among social workers in South Africa. The candidate was apparently the first social worker to respond, by contacting universities throughout the country, as well as established developers of ecometric instruments (such as Faul, who was the candidate’s doctoral supervisor at the time). This outcry was initially met with defensiveness by the SACSSP. The Perspective Training College – the main developer and supplier of ecometric instrument in South Africa – initiated a petition in response.

On 23 July 2001, the SACSSP invited interested parties, of whom the candidate was one, to attend the first meeting of concerned social workers to address the issues of ecometrics. After much deliberation, and some heated debate, the SACSSP was finally persuaded to establish an Ecometrics Committee to oversee, within the social work profession, the utilisation of ecometric instruments. The first official meeting of the Committee was held on 25 April 2003. The candidate is a member of this committee.

The establishment of the Ecometrics Committee was, in part, facilitated by the drafting of a position paper on ecometrics (SACSSP, 2003), which addressed:

- A definition of ecometrics and the distinction between ecometrics and psychometrics.
- The ethical standards regarding the use of ecometric instruments.
- Standards for ecometric scale development.
- The training and competencies required by social workers to use ecometric instruments, and thus be recognised as ecometrics.
- Procedures to accredit ecometric instruments.

Large sections of the position paper (including the first three bullets above) were extracted, almost verbatim, from the June 2000 draft of the candidate’s thesis (extracts which have subsequently been deleted from the dissertation due to redundancy). As a result of these efforts by the candidate and other significant role players in the social work profession, the candidate is now in a position to state that the profession of social work in South Africa has established the mechanisms
to begin regulating ecometric instruments and their utilisation by social workers, so as to ensure fairness, ethics and professionalism.

Since the issues of multiculturalism in ecometrics are largely unexamined, the Ecometrics Committee has still to fully incorporate multiculturalism into its processes. This dissertation will hopefully contribute to the Committee’s role in this regard.

In June 2000, the conclusion to this section was:

Although social work is not yet bound by significant legal constraints regarding the development and use of ecometric scales, ecometric scale developers and users should voluntarily subject themselves to the same principles and requirements that psychometric scale developers and users are subjected.

In January 2004, the conclusion to this section is:

The South African Council for Social Service Personnel’s Ecometrics Committee now regulates Ecometrics in South Africa. Ecometric scale developers must thus align their development to meet the criteria and standards laid down by this Committee in order to ensure fair and professional scale development and utilisation.

2.7 SUMMARY OF CHAPTER

This chapter has attempted to provide a conceptual basis to the technical process of scale development that will be addressed in the following chapter. Such a conceptual basis is important as it guides and informs the choice of techniques. Five main issues were covered in this chapter:

- The similarities and differences between ecometrics and psychometrics, which in turn influence the decisions regarding which theories and development techniques may be used in social work scale development.
- The notions of culture, socio-economic status, language and literacy, assimilation-acculturation and multiculturalism, and how these factors influence testing and scale development.
- The emic-etic debate, including the philosophical questions concerning constructivism, positivism and relativism.
- The notion of equivalency, which underpins every aspect of multicultural scale development.
- The legal and ethical constraints regarding bias in testing.

In light of the discussion on these five points, the following 17 principles were generated which should guide and underpin the development of social work scales for use in a multicultural context:
Ecometrics is concerned with the interface between people and their environments, rather than with the people or the environments in isolation. This interface is considered relatively unstable over time. Ecometric scales cannot be expected to have high levels of test-retest reliability or predictive validity.

Both psychometrics and ecometrics are concerned with latent variables. However, ecometrics focuses on latent variables that are closer to the surface than psychometrics, making principles components factor analysis of questionable utility.

Ecometrics is not so concerned with classifying people’s behaviour into categories (ie diagnosis), as with understanding the experiences of people in order to inform intervention or other helping processes (ie assessment).

In ecometric assessment criterion-referenced scaling is used, usually the internally referenced criterion.

The multicultural scale developer should incorporate measures of socioeconomic status (both current and family-of-origin) into the research design, as mediating variables between culture and scale performance.

Existing rules for formulating items may not apply in multicultural scale development. Other means of formulating items, eg through translation, paraphrasing, combining translations/versions, need to be explored. The simplest possible level of language needs to be used to ensure that semi-literate respondents can complete the scales.

The multicultural scale developer needs to ensure the functional and conceptual equivalence of the constructs under investigation.

Efforts must be made to develop scales that do not have different norms or methods of administration for different culture groups.

Multicultural ecometric scales must ensure that all cultures are included in the process of scale development, without prejudice.

Multicultural ecometric scales must thus be developed in such a way that the intercultural power differentials are not reinforced. The process of scale development must not perpetuate a legacy of cultural oppression.

Multicultural ecometric scale development must not fall into the trap of equating culture and race, or even culture and ethnicity. The other important dimensions of culture, especially socioeconomic status (both past and present) and language, must be incorporated into the research.

Multicultural ecometric scale development must not fear revealing differences between cultures, provided such differences are located within culture as socially constructed and not
within the genetic makeup of the individuals comprising that culture. The construct ‘culture’
must not be reified.

- Multicultural scale development requires sensitivity to the differences between groups of
  people (the emic approach) within the context of the basic humanness of all humans (the etic
  approach).

- The establishment of the equivalence of scales (functional, conceptual, metric and scalar)
  between different cultures is central to multicultural scale development. The methods to
  promote and ensure equivalence are located throughout the assessment process. Multicultural
  scale developers must continuously evaluate the multicultural validity of the development
  process from beginning to end.

- The South African Council for Social Service Profession’s Ecometrics Committee now regulates
  Ecometrics in South Africa. Ecometric scale developers must thus align their development to
  meet the criteria and standards laid down by this Committee in order to ensure fair and
  professional scale development and utilisation.

- A model of scale development must be multicultural in orientation, even if the scale is not
  intended for multicultural use.

- Ecometric scale development is a subset of developmental research.

### 2.8 IN THE FOLLOWING CHAPTER

With the broad guiding principles as a foundation, it is now possible to mode to a more technical
analysis of scale development. The following chapter will propose a new model of scale
development, based on previous models – notably that of Faul (1995) – that incorporates the
demands for multiculturalism, within the social work paradigm. The chapter will provide a
detailed, step-by-step, technical, process model of multicultural scale development.
CHAPTER THREE: 
MULTICULTURAL ECOMETRIC SCALE DEVELOPMENT

3.1 INTRODUCTION TO CHAPTER THREE

This chapter purposes not so much to describe the theoretical issues underpinning and guiding multicultural scale development, as to detail the application of such theory. The steps involved in developing a social work scale for multicultural use will be described in detail. It is anticipated that if these steps are followed carefully and entirely, the scale developer will achieve a scale that is valid for multicultural use. This process model is thus not for testing the cross-cultural validity of an existing scale, but for developing a multicultural valid scale from conception through completion.

This third chapter starts with a review of issues related to models of scale development, with specific reference to the model of ecometric scale development provided by Faul (1995), upon which the candidate is developing. This is followed by a formal presentation of the candidate’s model of multicultural ecometric scale development, with detailed discussions of the various steps that comprise the model.

3.2 MODELS OF SCALE DEVELOPMENT

3.2.1 PROCESS MODEL OF SCALE DEVELOPMENT

A great deal has been written on the methods of scale development and scale validation. This is particularly true in the field of psychometrics and, more recently (though to a limited degree), in ecometrics. There is, however, a general tendency for these writings to focus on one or other specific aspect of scale development, such as the formulation of items, validity studies, avoidance of bias, reliability, etc. There are few documents that pull these components together into a coherent process model for scale development. Perhaps one reason why this is seldom done is the enormity of scale development and the many extremely complex aspects it comprises – amply illustrated in the previous chapter. Condensing all of this into a single document would require volumes.

Nevertheless, a process model of scale development is essential to create the broad framework and steps required in scale development. Without such a model, the novice scale developer may feel overwhelmed by the apparently fragmented approach to scale development.
Social workers, in particular, who generally lack the sophisticated research skills of research psychologists, may feel that the task of developing a scale (as opposed to simply constructing a questionnaire) is too complex and unformulated. In order to promote scale development in social work, a process model that is clear, straightforward, directive and concise is essential.

Effectively, such a process model needs to adopt a step-by-step ‘cookbook’ approach that will serve as the ‘default’ approach to scale development. One thing that is clear from the literature is that scale development requires a great number of decisions from the developer, such as what theory of measurement to use, what kind of response scale to use, whether or not to translate, what kinds of validity tests to use, what standards of reliability to set, etc. Each of these decisions requires from the developer a thorough knowledge of the many options available and the criteria to be used to determine the best option in each situation. Many, even most, social workers do not have such a detailed knowledge of the field.

A process map approach to scale development provides the novice developer with a standard (or ‘default’ to use computer language) method of scale development that, under most conditions, should be adequate. As the developer gains experience (much as a cook who gains experience), s/he will be able to deviate from the ‘recipe’ and tailor the scale development process to fit the particular requirements of the moment.

A process map of scale development is thus not intended to be exhaustive. Rather, it is designed to provide the user with a technically simple and clear set of directions. The more advanced developer will be able to consult more sophisticated literature to explore specific aspects of the development process in greater depth.

### 3.2.2 Affordability versus Scientific Standards

Faul (1995) raises an important point concerning affordability:

> Another aspect that has an influence on the procedures followed in ecometrics is affordability. The demands of affordability..., which are paramount in times of economic stagnation and shortage of trained manpower (sic.), require a new look at expensive research techniques in the development of measurement tools for ecometrics. (p. 33)

Social work does not have access to large amounts of money for scale development. Our profession is a primary health care service, rendered typically to impoverished communities and sponsored by businesses, philanthropists or the state. Within this context, expensive scale development does not enjoy a high priority. This is in contrast to psychometric scale development, which is often in the interests of industry, which uses psychometric scales for important business decisions – there is a great deal more cash available to subsidise such scale development.

Apart from the costs in terms of personnel, time, specialist expertise, sampling, etc, social work also has limited access to and expertise in sophisticated information technology. Some of the computer software and hardware required to perform sophisticated data analysis (such as
confirmatory factor analysis and IRT) are not accessible to most social workers. If scale development in social work is to be more widely used, the data analytic demands need to be restricted to those that can be performed with relative ease on a standard PC, with a basic statistical package, calculator and spreadsheet.

Conversely, however, it is important that social work as a profession does not undermine its professional standing in the multidisciplinary community, a point frequently and fervently made by Faul (1995) and the SACCSSP (2003). This means that social work should not sacrifice the scientific standard of its work in order to produce cheap scales. This would simply be professional suicide.

Rather, a careful, conscious and conscientious balance needs to be struck between the demand for scientifically validated scales and the demands for affordable and workable scales. Some validation requirements are extremely expensive and, if made prerequisites for scale development in social work, will result in no scales being developed or accepted as valid. It is likely that some will critique social work scale development as cutting corners and being sloppy, while others will critique it for being excessively complex and technical and thus beyond the reach of the majority of social workers.

One way around this difficulty is to provide social work scale developers with a clearly thought out and scientifically grounded model of scale development that highlights those areas of scale development that have been omitted. In addition, such a model should be sufficiently detailed and concrete that any social worker who has a moderate research competence and access to the requisite information technology will be able to follow the instructions. Such models are, however, in short supply in social work.

### 3.2.3 MODELS OF SCALE DEVELOPMENT

There are two primary models of scale development that are relevant to social workers: those developed by Faul (1995) and De Vellis (1991).

**Faul’s Model.** Faul’s model (1995) was developed for her Doctoral dissertation under the supervision of Walter Hudson and Riaan Van Zyl (Figure 6). She says of her model (Faul, 1995):

> Before the schematic representation [of the model] is presented, it is important to state clearly that nothing new was developed by the researcher. All that was done, was to integrate procedures that had already been developed, into a scheme of phases, main moments and research steps. Most of these procedures and techniques had been developed by psychologists in the development of measurement methodology. However, specific emphasis will be placed on the procedures followed by Hudson and his associates with the scales they developed for the social work procession over the years and the adaptations they made to original procedures developed by psychologists. Hudson gave permission for this (sic.) newly adapted procedures to be integrated into a formal schematic representation of a research process. (p. 33)

Faul has broken the process down into four phases, nine main moments and 25 steps. The four phases are:
- **Pre-development**, which principally involves the formulation of the theory underpinning the content of the scale and the definition of the constructs to be measured.

- **Development**, which involves the design of the scale itself – writing the items, scaling them, writing the instructions, etc.

- **Validation**, which involves investigating its reliability and validity.

- **Utilization**, which involves publishing the scale and making it available to other users.

**FIGURE 6: FAUL’S RESEARCH PROCESS OF SCALE DEVELOPMENT IN ECOMETRICS**

<table>
<thead>
<tr>
<th>PHASES</th>
<th>MAIN MOMENTS</th>
<th>STEPS</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>PRE-DEVELOPMENT</strong></td>
<td><strong>PROBLEM IDENTIFICATION</strong></td>
<td>1</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2</td>
</tr>
<tr>
<td><strong>B</strong></td>
<td><strong>THEORY FORMULATION</strong></td>
<td>3</td>
</tr>
<tr>
<td></td>
<td></td>
<td>4</td>
</tr>
<tr>
<td></td>
<td></td>
<td>5</td>
</tr>
<tr>
<td><strong>DEVELOPMENT</strong></td>
<td><strong>DESIGN SCALE</strong></td>
<td>6</td>
</tr>
<tr>
<td></td>
<td></td>
<td>7</td>
</tr>
<tr>
<td></td>
<td></td>
<td>8</td>
</tr>
<tr>
<td></td>
<td></td>
<td>9</td>
</tr>
<tr>
<td></td>
<td></td>
<td>10</td>
</tr>
<tr>
<td><strong>VALIDATION</strong></td>
<td><strong>DESIGN VALIDATION STUDY</strong></td>
<td>11</td>
</tr>
<tr>
<td></td>
<td></td>
<td>12</td>
</tr>
<tr>
<td></td>
<td></td>
<td>13</td>
</tr>
<tr>
<td></td>
<td></td>
<td>14</td>
</tr>
<tr>
<td><strong>E</strong></td>
<td><strong>COLLECT DATA</strong></td>
<td>15</td>
</tr>
<tr>
<td><strong>F</strong></td>
<td><strong>INVESTIGATE RELIABILITY</strong></td>
<td>16</td>
</tr>
<tr>
<td></td>
<td></td>
<td>17</td>
</tr>
<tr>
<td><strong>G</strong></td>
<td><strong>INVESTIGATE VALIDITY</strong></td>
<td>18</td>
</tr>
<tr>
<td></td>
<td></td>
<td>19</td>
</tr>
<tr>
<td></td>
<td></td>
<td>20</td>
</tr>
<tr>
<td></td>
<td></td>
<td>21</td>
</tr>
<tr>
<td></td>
<td></td>
<td>22</td>
</tr>
<tr>
<td><strong>H</strong></td>
<td><strong>ESTABLISH CLINICAL CUTTING SCORES</strong></td>
<td>23</td>
</tr>
<tr>
<td><strong>UTILIZATION</strong></td>
<td><strong>DISSEMINATION OF INFORMATION</strong></td>
<td>24</td>
</tr>
<tr>
<td></td>
<td></td>
<td>25</td>
</tr>
</tbody>
</table>

(Faul, 1995, p. 34)
De Vellis’ Model. In addition to Faul’s model, which was specifically developed within an econometric framework, is the process of scale development provided by De Vellis (1991). De Vellis’ short book on the theory and applications of scale development provides a concise overview of the field of psychometric scale development. After a discussion on latent variables, reliability, validity and factor analysis, he provides guidelines for an eight-step process of scale development. These eight steps have been formatted into a diagram, which is presented in Figure 7.

**FIGURE 7: DE VELLIS’ GUIDELINES ON SCALE DEVELOPMENT**

<table>
<thead>
<tr>
<th>STEPS</th>
<th>POINTS FOR CONSIDERATION</th>
</tr>
</thead>
</table>
| 1     | Determine clearly what it is you want to measure | Theory as an aid to clarity  
Specificity as an aid to clarity  
Being clear about what to include in a measure |
| 2     | Generate an item pool | Choose items that reflect the scale’s purpose  
Redundancy  
Characteristics of good and bad items  
Positively and negatively worded items |
| 3     | Determine the format for measurement | Thurstone scaling  
Guttman scaling  
Scales with equally weighted items  
How many response categories?  
Specific types of response formats  
Item time frames |
| 4     | Have initial pool reviewed by experts |  |
| 5     | Consider inclusion of validation items |  |
| 6     | Administer items to a development sample |  |
| 7     | Evaluate the items | Initial examination of items’ performance  
Reverse scoring  
Item-scale correlations  
Item variances  
Item means  
Coefficient alpha |
| 8     | Optimize scale length | Effect of scale length on reliability  
Effects of dropping ‘bad’ items  
Tinkering with scale length  
Split samples |

(Based on De Vellis, 1991, chap. 5)

3.2.4 **SHORTCOMINGS OF EXISTING MODELS OF SCALE DEVELOPMENT**

The models of both Faul and De Vellis (as described above) provide excellent guidelines for social work scale developers. There are however two shortcomings of both models.

Firstly, and of greatest concern, these models do not at any point mention the question of cross-cultural or multicultural scale development. Both implicitly assume that the scales they develop
will be used in a monocultural context. As a result, the social worker who wishes to develop a scale that can be used in a multicultural context will find little assistance in this endeavour from these models. This is a concern apparent in much psychometric literature – for instance, in Nunnally and Bernstein’s (1994, p. 95) landmark text, there is only a single reference to the question of culture in scale development and validation.

Secondly, neither model is located within the context of a broader model of research and development. While not a prerequisite for scale development, ensuring the link between various theoretical models of developmental research is important for the evolution of social work theory. There are a number of well-developed and respected theories and models of development available, particularly in social work (Van Rooyen, 1994), such as Social R&D (Rothman, 1980a; 1980b), Developmental Research (Thomas, 1978; 1980; 1984; 1985a; 1985b; 1987; 1989; 1992) and Intervention Research (Rothman, 1995; Rothman & Thomas, 1994).

Developmental research entails the development of social technologies, which are the “primary means by which social work and social welfare accomplish their objectives” (Thomas, 1992, p. 72). Regarding developmental research, Thomas (1992) states:

> Developmental research may be the single most appropriate model of research for social work and human service because it consists of methods directed explicitly toward the analysis, design, development, and evaluation of the very technical means by which social work and human service objectives are achieved. (pp. 72-73)

The ecometric scale is a prime example of social technology. The model of development of such scales should, therefore, fit within the generic model of developmental research. Apart from locating scale development within the field of social work research, this also contributes to the evolvement of developmental research theory and practice.

Thomas’ (1984) model of developmental research, which was detailed in chapter 1, comprises six phases:

- **Analysis.** The phase of analysis involves developing a clear understanding of the problem at hand (which includes traditional methods of research, such as case studies, surveys, etc).

- **Design.** Design means the conceptualisation of a social technology (eg a new or revised intervention, form of assessment, policy, etc).

- **Development.** Development involves the pilot testing or field-testing of the technology on relevant samples and the process of refining the technology.

- **Evaluation.** Evaluation involves testing the technology for effectiveness, efficiency, etc, making use of programme evaluation, for example.

- **Diffusion.** Diffusion refers to the dissemination of the technology to the professional sector.
3.2.5 PROPOSED MODEL OF MULTICULTURAL SCALE DEVELOPMENT

The candidate therefore attempted to integrate the requirements of multiculturalism into Faul’s model of ecometric scale development. The model thus proposed in this dissertation is thus not an entirely new innovation, but rather an advancement (with her permission) upon the work of Faul (1995). There are three principle changes to her model, however.

Firstly, the model has been augmented to incorporate multicultural scale development.

Secondly, the format of the model has been adjusted to fit with Thomas’ Developmental Research model (Thomas, 1985a).

Thirdly, the candidate’s own perspective on the content and flow of the process is incorporated, which has resulted in some shuffling of the steps and flow of thought.

Figure 8 presents the fit between Faul’s model and the candidate’s model (based on Thomas’ model). It is important to note that no aspect of Faul’s model has been omitted, but that the order, labelling and delineation of certain steps have been adjusted.

The proposed model of multicultural scale development is depicted diagrammatically in Figure 9. The process is divided into five main phases, briefly summarised:

Analysis. In this first phase of analysis, the researcher identifies the need for an ecometric scale measuring a particular phenomenon (or set of phenomena), determines the theoretical framework which should undergird the scale and identifies the constructs and research which elucidate the phenomenon. Of great importance in this phase is the exploration of the cross-cultural comparability of the phenomenon. This comparability must be established before the researcher begins to formulate items to be included in the scale.
### FIGURE 9: PROCESS OF MULTICULTURAL ECOMETRIC SCALE DEVELOPMENT

<table>
<thead>
<tr>
<th>PHASES</th>
<th>MAIN MOMENTS</th>
<th>STEPS</th>
</tr>
</thead>
<tbody>
<tr>
<td>ANALYSIS</td>
<td>A IDENTIFY PROBLEM</td>
<td>1 Analyse the problem</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2 Determine the study end results</td>
</tr>
<tr>
<td></td>
<td>B FORMULATE THEORY</td>
<td>3 Identify and describe the theoretical framework within which the scale is to be developed</td>
</tr>
<tr>
<td></td>
<td></td>
<td>4 Identify the operational assessment area(s) that will be measured by the scale</td>
</tr>
<tr>
<td></td>
<td></td>
<td>5 Explore the cross-cultural comparability of the assessment area(s)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>6 Define the construct(s) to be measured</td>
</tr>
<tr>
<td>DESIGN</td>
<td>C DESIGN SCALE</td>
<td>7 Scale the items</td>
</tr>
<tr>
<td></td>
<td></td>
<td>8 Design the items</td>
</tr>
<tr>
<td></td>
<td></td>
<td>9 Determine reading level</td>
</tr>
<tr>
<td></td>
<td></td>
<td>10 Develop a scoring formula</td>
</tr>
<tr>
<td></td>
<td></td>
<td>11 Write instructions for respondents</td>
</tr>
<tr>
<td>DEVELOPMENT</td>
<td>D REVIEW ITEMS</td>
<td>12 Obtain expert reviews of items</td>
</tr>
<tr>
<td></td>
<td></td>
<td>13 Field test the items</td>
</tr>
<tr>
<td></td>
<td>E INVESTIGATE LINGUISTIC</td>
<td>14 Investigate linguistic equivalence of items</td>
</tr>
<tr>
<td></td>
<td>EQUIVALENCE</td>
<td></td>
</tr>
<tr>
<td>EVALUATION</td>
<td>F DESIGN VALIDATION STUDY</td>
<td>15 Formulate research questions</td>
</tr>
<tr>
<td></td>
<td></td>
<td>16 Select a sample</td>
</tr>
<tr>
<td></td>
<td></td>
<td>17 Prepare the research package</td>
</tr>
<tr>
<td></td>
<td>G COLLECT DATA</td>
<td>18 Administer research package to sample</td>
</tr>
<tr>
<td></td>
<td>H CONCEPT-LEVEL ANALYSIS</td>
<td>19 Consolidate evidence supporting content validity</td>
</tr>
<tr>
<td></td>
<td>I ITEM-LEVEL ANALYSIS</td>
<td>20 Conduct item analysis</td>
</tr>
<tr>
<td></td>
<td></td>
<td>21 Investigate item cultural bias</td>
</tr>
<tr>
<td></td>
<td></td>
<td>22 Compute coefficient alpha</td>
</tr>
<tr>
<td></td>
<td></td>
<td>23 Compare reliabilities across cultures</td>
</tr>
<tr>
<td></td>
<td></td>
<td>24 Compute standard error of measurement</td>
</tr>
<tr>
<td></td>
<td></td>
<td>25 Conduct multiple group confirmatory analysis at item level</td>
</tr>
<tr>
<td></td>
<td></td>
<td>26 Conclude multicultural item-level analysis</td>
</tr>
<tr>
<td></td>
<td>J SCALE-LEVEL ANALYSIS</td>
<td>27 Conduct convergent and discriminant validity analysis at scale level</td>
</tr>
<tr>
<td></td>
<td></td>
<td>28 Conduct known groups validity analysis</td>
</tr>
<tr>
<td></td>
<td></td>
<td>29 Conclude multicultural scale-level analysis</td>
</tr>
<tr>
<td></td>
<td>K ESTABLISH CLINICAL</td>
<td>30 Establish clinical cutting scores</td>
</tr>
<tr>
<td></td>
<td>CUTTING SCORES</td>
<td></td>
</tr>
<tr>
<td>DIFFUSION &amp; ADOPTION</td>
<td>L DISSEMINATE INFORMATION</td>
<td>31 Write a manual &amp; present training</td>
</tr>
<tr>
<td></td>
<td></td>
<td>32 Write a journal article</td>
</tr>
</tbody>
</table>

- **Design.** The second phase, design, involves designing the actual scale, including formulating the items, translating them (if applicable), scaling the items and designing the scale format. Of great importance, the individual items should be designed by a multicultural team of researchers to ensure their acceptability in a multicultural context.

- **Development.** The third phase, development, involves testing the scale in the field so as to ensure that the scale measures what it is supposed to measure, to ensure that the items are well formulated and to ensure that the translations of the scale are equivalent.
Evaluation. The fourth phase of evaluation entails assessing the validity and reliability of the scale for each identified culture group, and then reaching a conclusion about the multicultural validity of the scale.

Diffusion and Adoption. Lastly, the fifth phase of diffusion and adoption, involves making the scale available to users in the field, and writing the manuals and other academic papers required to ensure that the scale has acceptable scientific status.

The remainder of this chapter will provide detailed information and guidelines concerning each step in the process. In several instances (eg the sections on reliability and validity), a broad theoretical introduction will be given prior to the technical description of the steps. The model will be described phase by phase, with specific reference to the main moments and research steps illustrated in Figure 9.

3.3 THE ANALYSIS PHASE

This first phase is about establishing the conceptual and theoretical foundation of the scale. All ecometric scales have a strong and explicit theoretical grounding. As with all research, of which scale development within the broader framework of developmental research is one example, scale development must start with the identification and formal statement of a problem followed by a conceptual, theoretical and research-based exploration of the problem.

This phase comprises two main moments and six steps, as depicted in Figure 10 (extracted from Figure 9).

FIGURE 10: THE ANALYSIS PHASE: MAIN MOMENTS & RESEARCH STEPS

<table>
<thead>
<tr>
<th>PHASES</th>
<th>MAIN MOMENTS</th>
<th>STEPS</th>
</tr>
</thead>
<tbody>
<tr>
<td>ANALYSIS</td>
<td>A  IDENTIFY PROBLEM</td>
<td>1 Analyse the problem</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2 Determine the study end results</td>
</tr>
<tr>
<td></td>
<td>B  FORMULATE THEORY</td>
<td>3 Identify and describe the theoretical framework within which the scale is to be developed</td>
</tr>
<tr>
<td></td>
<td></td>
<td>4 Identify the operational assessment area(s) that will be measured by the scale</td>
</tr>
<tr>
<td></td>
<td></td>
<td>5 Explore the cross-cultural comparability of the assessment area(s)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>6 Define the construct(s) to be measured</td>
</tr>
</tbody>
</table>

3.3.1 MAIN MOMENT A: IDENTIFY PROBLEM

3.3.1.1 Step 1: Analyse the Problem

All research starts with the formulation of a problem. Research is a costly process, particularly in social work where limited resources require that social workers first target their efforts towards social work interventions and only secondly to research. Research endeavours must, therefore, be well justified so as to demonstrate that the expense of the research process is warranted. There are three principle reasons for developing a new scale:
There may be no scales available which measure the construct/s in the way you want the construct/s to be measured. When a social worker deals with a unique problem for which there is no available and accessible standardised scale, it is probably best to use behavioural observation or a self-anchored rating scale. But when the problem is dealt with on a frequent or even regular basis (such as a unique problem in which a particular agency specialises), it is appropriate to develop a standardised measurement instrument.

The development of a new scale may be warranted when existing scales do not comply with the requirements of ecometric scales as identified by Hudson (1982 in Faul, 1995, p. 40), viz that they be “valid, reliable, short, easy to administer and score, easy to understand and interpret, and must not suffer from response decay when used repeatedly over many occasions” (see also Hudson, 1987).

The development of a new scale may be warranted when an existing scale has not been developed for multicultural use. Although it may be possible to simply translate and revalidate the scale in the new culture, it is preferable (and theoretically more sound) to go through the complete scale development procedure, with the existing scale as a reference point.

Thomas (1984) stresses the importance of reviewing the state-of-the-art, that is, the state of existing scales:

Successful identification and analysis of the problem serves mainly to establish the importance and dimensions of the problem area, but it does not rule out the possibility that relevant [ecometric scales] are already available. The purpose of the state-of-the-art review is to determine whether relevant interventions already exist and, if so, whether further development is merited. A successful state-of-the-art review does not guarantee that someone else has not already come up with a satisfactory solution to the problem, but it does increase the likelihood of protecting the practitioner-researcher from making needless effort. (p. 145)

In addition to conducting a state-of-the-art review, Thomas (1984, p. 146) also advocates conducting a feasibility study, an analysis of “the practicality of the proposed development”, which minimises the potential waste of effort and resources. He outlines several dimensions that can be assessed, including the following:

- **Technical Feasibility.** Do we have the necessary technological capabilities (notably information technology, but also printing facilities, etc) to conduct the scale development?

- **Organisational Feasibility.** Do we have:
  - The necessary skill, knowledge and training to conduct the scale development?
  - The active, informed support of top management?
  - The support of administrative and support personnel?
Economic Feasibility. Do we have sufficient funds to develop the scale, and is the anticipated end product worth spending these funds?

Use Feasibility. Is it likely that the newly developed scale will be of use to anyone?

Having identified a valid need, having conducted a state-of-the-art review that indicates that there is no available social technology to meet this need, and having conducted a feasibility study that indicates that the necessary resources to develop the technology are available, the researcher is ready to move on to the next step.

The following information should be documented:

- The purpose of the study.
- The results of the state-of-the-art review.
- The results of the feasibility study.

3.3.1.2 Step 2: Determine the Study End Results

In all research, the researcher should have a clear idea in mind of what is being sought through the research process. This idea is referred to as the end result, that is, when the whole research process is over, what will result in the end. The formulation of end results will keep the research on track and will establish the criteria by which to evaluate whether or not the research has been effective.

Since it is likely that all scales are developed for use by some or other client, it is important that this first main moment be conducted in collaboration with the client. The client may be a business wanting to evaluate some aspect of their workforce’s social functioning, the client may be a welfare organisation wanting to do programme evaluation, etc. The client needs to be closely involved in defining the problem and the end results, since these serve as the user requirements, which can also be thought of as the mandate that the scale developer receives to develop the scale.

The end result consists of two components (Thomas, 1984):

- Innovation Objective. Firstly, a single sentence statement of what is required must be formulated, stated as an end result. An end result is stated as a noun, not as a verb, hence ‘to develop a scale’ is not an end result (it is an activity). An end result is stated as if it currently existing, that is, in the present tense, hence ‘a scale that will measure family well-being’ is not an end result (it is a prediction).
  - For example, ‘A scale to assess families in which child abuse is suspected.’
Innovation Requirements. Secondly, flowing out of the objective are a number of innovation requirements, which can also be stated as end results. Rosove (in Thomas, 1984) says:

A "requirement" ... may be defined as a characteristic which a system or one of its elements should possess if the system is to accomplish a given objective. Requirements ... tell us what the system is supposed to do in both qualitative and quantitative terms rather than how it is to do it. (p. 156)

For example, 'The scale can be completed by all members of the family above the age of ten years.'

Answering the following questions (adapted from Faul, 1995) will assist the researcher in formulating the innovation requirements for a new scale:

- **What is going to be measured?** There are, according to Hudson (1985, pp. 192-193), several things that can be measured, including "physical characteristics, biological characteristics, social characteristics, knowledge, ability, achievement, attitudes, beliefs, values, feelings, perceptions, behaviors, problems in personal functioning and problems in social functioning". It is important that the researcher clearly determine what is to be measured before attempting to measure it.

- **Will the scale be unidimensional or multidimensional?** Scales can measure only one construct (e.g. family problem solving) or can measure several constructs that are combined into a single scale (e.g. various dimensions of family functioning). In Hudson’s approach to scale development, however, a multidimensional scale is typically a cluster of unidimensional scales (Hudson & Faul, 1996).

- **What ecometric standards will be required of the scale?** In the same way that researchers establish significance levels before conducting statistical analysis of data, scale developers need to establish the levels of reliability and validity required of a scale before conducting the scale development.

- **What kinds of reliability and validity tests will be performed on the new scale?** Following on from the previous question, this question helps focus the researcher on the set of procedures which will be performed to determine the scale’s validity, its reliability and validity tests.

- **Which culture groups will be involved in the study?** Since the process of multicultural scale development very early requires the researcher to explore cross-cultural comparability, it is necessary to determine which culture groups will be involved in the study early in the research process. This also requires the operationalisation of each culture, that is, how will you define each culture group?

- **How will the researcher determine the multicultural validity of the scale?** Finally, the methods of determining multicultural validity must be spelled out before the researcher begins. There are innumerable ways of determining cross-cultural validity. The process described here
supports some of these methods, but not others. The researcher must be able to clearly explain which methods have been selected and why.

Based on the answers to these six questions, the researcher should be able to formulate the end results of the study. This formulation should be concise and specific, should be restricted to one page and should serve as the standard by which to measure the product that results from the study at the end.

The following information should be documented:

- The project end results (including innovation objective and innovation requirements).

### 3.3.2 Main Moment B: Formulate Theory

#### 3.3.2.1 Step 3: Identify Theoretical Framework

According to Faul (1995, p. 41) ecometric scales must be grounded in “a specific theoretical framework. ... [This framework] forces researchers to think about their data ahead of time and allows them to incorporate the reasons why they select certain items for their scales”.

Unfortunately, not all scale development is strongly guided by theory. Referring to what they call “shotgun empiricism”, Nunnally and Bernstein (1994) state:

> Some investigators believe (though they may be loathe to admit it) that factor analyses and related methods automatically grind out the ‘true nature of things’ in the absence of any theory. One can almost hear such individuals saying, ‘Give me a large enough collection of items to factor-analyze and a huge computer and I can completely determine the nature of human attributes’. From a technical standpoint, modern computers allow such analyses to be conducted more easily, unfortunately. ... Progress in science must be guided by theories rather than by random efforts to relate things to one another. Good theories greatly reduce the amount of trial-and-error effort, and people who explore theories stand at the vanguard of each field of science. (p. 317)

De Vellis (1991) says the following regarding the importance of theory:

> Although there are many technical aspects involved in developing and validating a scale, one should not overlook the importance of being well grounded in the substantive theories related to the phenomenon to be measured. ... The boundaries of the phenomenon must be recognized so that the content of the scale does not inadvertently drift into unintended domains. ... Theory is a great aid to clarity. Relevant social science theories should always be considered before developing a scale of the type discussed in this volume. ... Even if there is no available theory to guide the investigators, they must lay out their own conceptual formulations prior to trying to operationalize them. In essence, they must specify at least a tentative theoretical model that will serve as a guide to scale development. This may be as simple as a well-formulated definition of the phenomenon they seek to measure. Better still would be to include a description of how the new construct relates to existing phenomena and their operationalization. (pp. 51-52)

In multicultural scale development, a theoretical grounding for the scale is particularly important, since one is looking for items that relate to a theoretical construct, rather than to some or other external criterion (Brislin et al., 1973). When items vary across cultures, one is in a better
position to interpret the variation if the items are theoretically grounded than when they are merely mathematically constructed. This will be explored in more detail when comparing exploratory and confirmatory factor analysis.

It is, therefore, essential that all newly developed scales be strongly grounded in theory, requiring a thorough analysis of the literature surrounding the construct of interest (Clark & Watson, 1998). Such theory serves to guide the researcher through the rest of the development process, will serve to enhance the reliability and validity of the scale later on and will assist the researcher in explaining unanticipated results.

**3.3.2.2 Step 4: Identify Operational Assessment Area(s)**

Faul (1995) says the following:

This step mainly involves the identification of the specific assessment areas that are going to be measured. For example, when a scale is developed that measures social functioning, it must be clearly specified what assessment areas will be used to measure social functioning. The formulation of the theoretical framework in step 3 will lead the researcher in the identification of these areas. (p. 42)

Although this step is not as yet a formal operationalisation of the assessment area(s), it should result in a preliminary identification and description of the area or areas that must be included in the scale.

**3.3.2.3 Step 5: Explore Cross-Cultural Comparability of Assessment Area(s)**

Before the constructs to be measured can be formally defined and operationalised (which takes place in Step 6), the constructs must be compared across the cultures which have been identified to participate in the scale development. In simple terms, the researcher must determine whether the constructs ‘work’ or ‘make sense’ in each of the target cultures before attempting to design items to measure the construct (Berry, 1980; Pareek & Rao, 1980; Reddy et al., 1995). This requirement was described in the previous chapter as equivalence, specifically functional and conceptual equivalence.

There are two main ways of addressing this requirement: direct and indirect. Direct methods involve speaking to people directly during the scale development process about the constructs under investigation, while indirect methods involve drawing research conducted for other purposes into the scale development process.

Direct methods of ensuring comparability entail directly discussing the concepts with people of the various cultures. These people could be either experts (eg social workers from a specific culture, social anthropologists or ethnologists with expertise concerning a specific culture, etc) or everyday people (eg a purposive sample of people who represent the specific culture). "Qualitative research methods such as interviews and focus groups in the target setting can be used to explore
similarities and differences in the understanding of the concepts underlying the instrument” (Kuyken et al., 1994, p. 20).

Indirect methods entail a survey of research conducted in all target cultures. Even though different methodologies may have been used, such study reports may contain clues that point to the comparability of the constructs in all the target cultures. Such research may be conducted by other independent researchers, or even by the researcher him/herself. “Careful review of the relevant literature in the two setting or relevant cross-cultural work will yield some information about conceptual equivalence” (Kuyken et al., 1994, p. 20).

By the end of this step, the researcher should have evidence that supports the manifestation and comparability or equivalence of the constructs or assessment area(s) in all target cultures.

### 3.3.2.4 Step 6: Define Construct(s) to be Measured

Most scales measure constructs, although, as was noted in the section on ecometrics in the previous chapter, social work scales tend to measure lower order latent variables than psychology. "A construct is a concept. It has the added meaning, however, of having been deliberately and consciously invested or adopted for a special scientific purpose” (Kerlinger, 1986, p. 27). A construct must, therefore, be carefully defined and operationalised, in order to ensure that everyone knows exactly what it is. There are two main ways in which constructs should be defined:

- **Constitutive Definition.** “A constitutive definition defines a construct with other constructs” (Kerlinger, 1986, p. 28). Constitutive definitions of constructs describe the construct conceptually in terms of theory. By ensuring that the construct is clearly embedded within a theoretical framework (or set of theories), the meaning of the construct becomes clearer and more definite. There are two additional important aspects of constitutive definitions:

  - **Facets/Attributes.** An important way of achieving a helpful constitutive definition is to break the construct down into its constitutive facets or dimensions (Haynes, Richard, & Kubany, 1995). All constructs, especially the broad constructs social workers are interested in, comprise multiple facets that, together, make up the construct as an entity. Faul (1995) illustrates the use of facets (which she terms attributes) by using a kind of mind-map to map out the various constituent facets of the constructs she explored in her research.

  - **Divergent Definitions.** It is important to define the construct not only in terms of how it is related to other constructs, but also in terms of how it is not related to other constructs (Dawis, 1998; Haynes et al., 1995). One can gain as much insight into a construct by understanding how it overlaps with other constructs, as with understanding the boundaries between constructs. Later on, these distinctions can be used to determine the convergent and discriminant validity (construct validity) of the scale (Clark & Watson, 1998).
**Operational Definition.** "An operational definition assigns meaning to a construct or a variable by specifying the activities or ‘operations’ necessary to measure it" (Kerlinger, 1986, p. 28). Although there is the danger of defining a construct as 'X construct is what X test measures', operationally defining constructs is extremely important since, in the end, the construct must be measured. It is possible that a construct measured in one way may, in fact, not be the same as that same construct measured in another way – the measurement of the construct is an important part of the construct itself.

Kerlinger (1986) states:

> The importance of operational definitions cannot be overemphasized. They are indispensable ingredients of scientific research because they enable researchers to measure variables and because they are bridges between the theory-hypothesis-construct level and the level of observation. There can be no scientific research without observations, and observations are impossible without clear and specific instructions on what and how to observe. Operational definitions are such instructions. (p. 29)

Of course, operational definitions are poor reflections of reality and constitutive definitions at best simply add more concepts to the original concept. However, together, the theory based constitutive definition and the technical operational definition combine to give a clear definition of the construct to the reader. And this, the ability of the definition to convey the same, unequivocal meaning to different readers, is one of the most important reasons why the definition is important (Faul, 1995):

> The design and execution of social research requires a clearing away of the confusion over concepts and reality. In the midst of disagreement and confusion over what a term really means, the scientist specifies a working definition for the purpose of the inquiry. Others might disagree with our conceptualization and operationalization, but the definition would have one essential scientific virtue: It would be absolutely specific and unambiguous. Even if someone disagreed with our definition, that person would have a good idea of how to interpret our research results, because what we mean by the specific term – reflected in our analysis and conclusions – will be clear. (p. 43)

The establishment of content validity, which will be discussed in some depth in a later step of the process, begins in the earliest stages of the scale development process. The first step in content validation is to "carefully define the domain and facets of the construct and subject them to content validation before developing other elements of the assessment instrument" (Haynes et al., 1995, p. 244). Unless this step of the scale development process is properly conducted, with great attention to detail and in light of the theoretical framework developed in step 3, the content validity (and thus the entire validity) of the scale will be severely compromised. Haynes et al. (1995) continue:

> This ... step is essential to the development of a content-valid assessment instrument, and is the most difficult phase of content validation... A construct that is poorly defined, undifferentiated, and imprecisely partitioned will limit the content validity of the assessment instrument. (p. 244)
The final step of the analysis phase, then, is to provide the constitutive, divergent and operational definitions, as well as the map of facets/attributes/dimensions, of each of the constructs that the researcher wishes to include in the scale.

3.4 **The Design Phase**

All developmental research is about designing some kind of new social work technology. Ecometric scales are a prime example of such technology. The design phase of developmental research is about creating the technology, about generating it and placing it into the real world of things. Within this second phase, then, the scale developer writes and refines the questions or items that will comprise the ecometric scale.

This phase comprises one main moment and five steps, as depicted in Figure 11 (extracted from Figure 9).

**3.4.1 An Overview of Scale Design**

Designing a scale requires many judgement decisions from the researcher. In order to keep the steps focused, the various issues that need to be considered when designing a scale will be discussed first, after which the steps will be presented.

**3.4.1.1 Scaling Items**

"Measurement consists of rules for assigning symbols to objects so as to (1) represent quantities of attributes numerically (scaling) or (2) define whether the objects fall in the same or different categories with respect to a given attribute (classification)" (Nunnally & Bernstein, 1994, p. 3).

There are many methods and techniques for converting attributes, experiences and other social phenomena into numbers – these methods are referred to as 'scaling'.

Faul (1995) places the scaling of items after the design of the items in her process model of scale development. De Vellis (1991) also places the scaling of items after the design of items, but explains that in fact the two processes occur simultaneously. In the process model proposed here, however, scaling should precede item design. In practice, the choice of scale determines the required format of items. It is therefore necessary to first determine the method of scaling and then to design the items within that framework. It does not make sense to design a number of items in question form when the method of scaling to be used requires statements or even just descriptive words.
The subject of scaling can be divided into four sections:

- Scaling formats
- Scale partitions
- Number of partitions
- Labelling the partitions

### 3.4.1.1.1 Scaling Formats

There are several formats for scaling, which will be briefly summarized here (refer to De Vellis, 1991 for a fuller discussion of most of these formats):

- **Thurstone Scaling.** In Thurstone Scaling, each item comprises several statements that have been ranked in order of intensity (or difficulty, etc) (Dawis, 1998). “The respondent then selects the responses that best describe how he or she feels” (Fischer & Corcoran, 1994a, p. 41).

- **Guttman Scaling.** Guttman Scaling, like Thurstone Scaling, involves a series of statements that have been ranked in order of intensity. While Thurstone Scaling involves selecting only one of the statements, Guttman Scaling involves selecting all the items with which one agrees until one’s level of intensity on the construct is reached (for more detail see Dawis, 1998; De Vellis, 1991; Nunnally & Bernstein, 1994).

- **Semantic Differential.** Semantic Differential scales comprise pairs of words that either represent the opposites of an attribute (eg friendly and hostile) or the presence and absence of an attribute (eg friendly and not friendly), separated by a set of several response categories. The respondent marks the category along the continuum that best represents her/his position on the attribute.

- **Binary Options.** In Binary Options a respondent is presented with an item (a word, statement or question), and asked to mark a dichotomous response, such as ‘yes’ or ‘no’, or ‘agree’ or ‘disagree’.

- **Forced Choice.** In Forced Choice scaling, often used in personality assessment, respondents are presented with a pair of words or statements, and asked to select the one that they support most strongly.

- **Likert Scaling.** Likert Scales, formulated by Rensis Likert in 1932, are probably the most commonly used scales in ecometrics, and will thus be discussed here as the scaling format of choice for novice scale developers (Dawis, 1998).
Likert scales typically involve an item in the form of a statement, "followed by response options that indicate varying degrees of agreement with or endorsement of the statement" (De Vellis, 1991, p. 68). The Likert scale is sometimes referred to as a category partition scale (Faul, 1995):

This kind of scaling consists of breaking up a continuum into a collection of equal intervals or categories. With this kind of scaling a common problem in the social sciences, namely to assign values for a single item in such a way that the resulting item scale is a truly continuous variable, is overcome by partitioning the score continuum into a small number of categories. (p. 51)

In fact, individual items on a Likert scale are, at best, ordinal, while combined or summated Likert items are ordinal or quasiordinal (Floyd & Widaman, 1995; Nunnally & Bernstein, 1994). In practice, however, such summated scales are treated as continuous.

In this regard, Hudson (1985, p. 199) also recommends using "magnitude estimation scaling", in which a higher number (eg 7) represents a greater magnitude of the attribute being measured than a smaller number (eg 1). It is thus appropriate to place words like 'disagree' or 'never' linked to a low number on the left, and words like 'agree' or 'always' linked to a high number on the right (Frary, 1996). This makes intuitive sense to the respondent.

### 3.4.1.1.2 Scale Partitions

Category partition scales are, by definition, a continuum, divided into a number of partitions. The scale developer needs to determine on what basis to partition this scale. Although the response categories on Likert scales historically measure degree of agreement (eg 1=strongly disagree, 2=disagree, 3=neutral/undecided, 4=agree, 5=strongly agree), other categories can be used. In fact, some reports indicate that certain cultures are more or less inclined to use certain responses – for example, Chinese respondents tend to avoid the agree categories, while Australian students tend to prefer the neutral/undecided category (Tanzer, 1995).

Hudson uses the "relative frequency estimation scaling procedure" for all or most of his scales, described as follows (Nurius & Hudson, 1993):

[Relative frequency estimation scaling] consists of estimation counts, conceiving frequency of occurrence as a continuum, and then using the category partition method to segment those occurrences into meaningful sets of levels. For example, 1=Never, 2=Very rarely, 3=A little of the time, 4=Some of the time, 5=A good part of the time, 6=Very frequently, and 7=All of the time. (p. 305)

There are five main types of Likert response scales (Skevington & Tucker, 1999, p. 54):

- **Intensity.** “Questions are concerned with the degree or extent to which a person experiences a state or situation.”

- **Capacity.** “Question refers to a feeling, state or behaviour.”

- **Frequency.** “Questions are about the number, frequency or commonness of an occurrence.”
Evaluation. “Three subtypes of response scale were derived that assess a state, capacity or behaviours and may involve cognitive or affective appraisal,” viz satisfaction, happiness and goodness.

Importance. “Questions refer to the importance of each aspect (or facet) of quality of life to the respondent.”

Hudson (1987, p. 64) proposes two additional partitions:

Binary Status. Questions ask whether the aspect is present or absent.

Duration. Questions ask how long the aspect has been present.

3.4.1.1.3 Number of Scale Partitions

Once the type of scale partition has been selected, the researcher needs to determine how many partitions or response categories are necessary. According to Hudson (1994 in Faul, 1995) the “magic number” of partitions is 7±2 (see also Comrey, 1988). While the original versions of the scales developed by Hudson and colleagues had five partitions (Hudson, 1982), the current versions of these scales have been extended to seven partitions (Fischer & Corcoran, 1994a). Hudson added two additional partitions to increase the reliability of the scales (A. C. Faul, personal communication, July, 2000), since, given an equal number of items, a seven-point response scale will generate a higher level of internal reliability than a five-point scale (Dawis, 1998; De Vellis, 1991).

Hence, the fewer the partitions the more items are needed to achieve acceptable levels of reliability. The scale developer must, therefore, achieve an optimal balance between the number of items in the scale and the number of partitions. Faul (1997) reports that acceptable levels of reliability have been obtained with five-point scales. The candidate has found scales with acceptable levels of reliability (.88) and standard error of measurement (2.5%) using three-point scales, but with larger numbers of items (50) (Van Breda, 2000c).

In multicultural scale development it seems that five-point response categories are more appropriate than three-point or seven-point categories (Faul, 1997). With the greater variation in education, literacy, proficiency in English and other target languages, etc greater numbers of response categories are more likely to create unreliability in responses rather than reliability. The World Health Organization, for example, uses five-point response categories in its multicultural Quality of Life surveys (Skevington & Tucker, 1999; Szabo, Orley, & Saxena, 1997). Three-point scales, in contrast, tend to require too many items to generate sufficient variance in the scale and tend to result in scales with poor measurement properties (Comrey, 1988). Five partitions allow for higher levels of variance, and thus acceptable reliability and validity, without requiring excessively many items (Frary, 1996).
3.4.1.1.4  Labelling the Partitions

One of the difficulties with developing scales for multicultural use is finding labels for the response categories that have the same meaning across cultures and languages (Pareek & Rao, 1980). The word “sometimes,” for example, is placed third on a five-point frequency scale in some cultures but placed second in other cultures (Szabo et al., 1997, p. 275).

Figure 12 illustrates the five-point partitions that were developed to measure frequency, intensity and capacity in a study in the United Kingdom (Skevington & Tucker, 1999, p. 59). These three formats for frequency partitions can be compared with those of Hudson (1982) and Faul (1997, p. 221) (also in Figure 12).

**FIGURE 12: PARTITION LABELS**

<table>
<thead>
<tr>
<th>SKEVINGTON &amp; TUCKER, 1999: FREQUENCY</th>
</tr>
</thead>
<tbody>
<tr>
<td>Never</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>SKEVINGTON &amp; TUCKER, 1999: INTENSITY</th>
</tr>
</thead>
<tbody>
<tr>
<td>Not at all</td>
</tr>
<tr>
<td>Not at all</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>SKEVINGTON &amp; TUCKER, 1999: CAPACITY</th>
</tr>
</thead>
<tbody>
<tr>
<td>Not at all</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>HUDSON, 1982</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rarely or none of the time</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>FAUL, 1997</th>
</tr>
</thead>
<tbody>
<tr>
<td>Never</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>SZABO ET AL, 1997</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
</tr>
<tr>
<td>Never</td>
</tr>
<tr>
<td>Seldom</td>
</tr>
<tr>
<td>Very little of the time</td>
</tr>
<tr>
<td>Occasionally</td>
</tr>
<tr>
<td>Sometimes</td>
</tr>
<tr>
<td>Not often</td>
</tr>
<tr>
<td>Infrequently</td>
</tr>
<tr>
<td>Rather rarely</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>FAUL, 1997</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
</tr>
<tr>
<td>Never</td>
</tr>
</tbody>
</table>

In another cross-cultural study (Szabo et al., 1997, p. 274) the different labels for the middle three frequency partitions (between never and always) were selected by various culture groups.
(including Thailand, Israel, India, Zimbabwe, Hong Kong, Argentina, Germany, Australia, Brazil, Russian Federation, and Croatia), as illustrated in Figure 12.

It is thus clear that different languages and culture groups have different ways of partitioning response scales. In order to meet the Likert scale requirement for equidistance between the partitions it is important that this research be considered and that scale developers develop partition labels with great care. It is probably a good idea to replicate the small studies (samples of approximately 20 people per culture) conducted by the WHOQOL Group in the various target cultures (Skevington & Tucker, 1999; Szabo et al., 1997).

Faul’s practice (1997) of combining words, numbers and images in response categories should probably be adopted in all multicultural work. She does this in order to make it possible for even illiterate people to complete the scale. The candidate has used this procedure in research on violence towards women and has found it to be effective (Van Breda, 2000e). Using this method, an example of a relative frequency response scale for an item is included in Figure 12 (Faul, 1997, p. 221, used with permission).

When developing scales for multicultural use, the researcher needs to provide the greatest opportunity for understanding among each individual and common understanding across culture groups. Careful selection of response categories, and combining words, numbers and images are important ways of promoting such understanding.

### 3.4.1.2 Formulating Items

This discussion on formulating or writing items comprises several sections, viz:

- Multi-focus approach
- Number of items
- Generation of items
- Rule for writing items
- Context and redundancy

#### 3.4.1.2.1 Multi-focus Approach

Designing a scale for multicultural use is a difficult task. It is complicated by traditional, Eurocentric methods that begin with a Western scale that is then adapted for multicultural use – it is seldom that a scale is designed simultaneously for two cultures (Van De Vijver & Leung, 1997). A novel and probably a most effective and efficient approach to scale design is to use a variation of the committee and dual-focus approaches that is here called the ‘multi-focus approach’. The dual-focus approach is designed for use in multilingual scales, but the principles apply equally well to a monolingual scale for use in a multicultural context.
Erkut and colleagues advocate a "dual-focus approach to creating bilingual measures", in which a team of researchers work together to formulate a research question and a data collection device for use in bicultural research (Erkut, Alarcón, Coll, Tropp, & García, 1999):

The dual-focus approach has two main features. First, it involves a horizontal collaboration ... with researchers from indigenous cultures as full and equal members of the research team. Second, it is a concept-driven rather than a translation-driven approach to attaining conceptual and linguistic equivalence. The collaboration among equals on a research team – most of whose members are bilingual/bicultural and include researchers indigenous to the cultures being studied – is a safeguard against the ethical concern about cultural hegemony when Western/Anglo theories drive the research questions posed in the study of other cultures. (p. 207)

In this approach, the formulation of items, the ensuring that such items are conceptually equivalent and the equivalent translation of the items into other languages are integrated into one, collaborative process. Rather than beginning with an acceptable (typically English) version of a scale and then testing its cross-cultural applicability, the multi-focus approach is a multicultural collaboration from beginning to end (Brislin et al., 1973; Niero et al., 2002; Suzuki et al., 1996).

The broad process of designing the items for the scale, using the multi-focus approach, is described as follows (Erkut et al., 1999):

Once members of the research team reach consensus on concept equivalence, they enter the third step and jointly generate items to measure the concepts. The twin questions "How would we say it in Spanish?" and "How would we say it in English?" initiate the discussion. Wording for each scale item is determined simultaneously in both languages. No newly constructed items are included in the protocol that cannot be directly and easily expressed and understood with parallel wording in the other language. The wording of each item is examined to see if it has the same level of difficulty, affect, and clarity of meaning in both languages. Therefore, constraints of one language are just as likely to influence the final wording as constraints of the other language. In effect, both Spanish and English become target languages, whereas the conceptual base serves as the source. (p. 212)

The candidate has used this process in the development of two instruments outside the scope of this dissertation – an instrument to measure impression management (or social desirability) and an instrument to evaluate an HIV prevention programme based on pan-religious values (with constructs such as spirituality, value consciousness, ethical decision making and self-regulation). The process of generating multilingual items from the beginning has proven highly effective. The forward and backward translation processes that take place have resulted in English items that are superior to those generated in only English.

3.4.1.2.2 Number of Items

Classical test theory (on which this entire process is based) posits that there is a true score for each construct – for example, if we are measuring the self-esteem of an individual, there is a real, objectively true self-esteem score for this person. Any scale is an imprecise measure of this true score. The goal of scale development is to measure this true score as closely or as truly as possible. Multi-item or summated scales (such as we are discussing here) attempt to measure these true scores.
A commonly used “model of a process which gives rise to true scores is called ‘domain sampling’” (Nunnally & Bernstein, 1994, p. 211). Domain sampling, which underlies the methods described here, assumes that for any given construct there is an infinitely large pool of items that together will generate a true score. Because the pool is infinitely large (and thus hypothetical) we cannot, in reality, know or include all the items in a real scale. The trick is to find a way to ‘sample’ this infinite ‘domain’ (sometimes called a population) of items, i.e., domain sampling. Scales “are constructed by selecting a specified number of measures [or items] at random from a homogeneous, infinitely large pool” (ibid.).

“The domain-sampling model does not require that any specific number of items be sampled in order to define a particular measure. Each sample (test) can consist of a single item or many items” (Nunnally & Bernstein, 1994, p. 217). However, it is true that the larger the number of items sampled, the more reliable the scale will be in estimating the true score (Nunnally & Bernstein, 1994, p. 230).

In practice, most researchers first select the ‘best’ items from the domain. This sampling is no longer random. As a result, adding more items, which are not as ‘good’ as the first items, does not make a significant difference to the correlation of the scale score with the true score (Nunnally & Bernstein, 1994, p. 232). This is referred to as the “law of diminishing returns” (Faul, 1995, p. 50), in which “the gain in reliability is greater when one moves from 1 to 10 questions than when one moves from 11 to 20 questions, and even smaller when one moves from 21 to 30 questions.”

Scale development typically involves sampling a number of items, testing them in the field and keeping those that perform best (in terms of reliability and validity, factor analysis, etc). The question that arises is how many items should be selected for the initial sample item pool. There are, according to Hudson (Hudson, 1987; Nurius & Hudson, 1993), two main methods for creating this item pool, viz the large item pool (LIP) and the small item pool (SIP).

The Large Item Pool or LIP method of sampling items (see for example De Vellis, 1991) involves sampling large numbers of items and then, through item analysis, whittling them down to the best few (Faul, 1995):

[This method begins by asking] one or more experts to each develop a number of scale items that presume to play a part in measuring the construct. All these items are then put together to create a large item pool. Once a large pool of items has been organized into a questionnaire, an item analysis is performed to eliminate poor items and to identify those items that must be retained. Factor analysis is often used at this stage to lift out the one dominant factor that is assumed to measure the construct. The final step is to create a revised, final version of the scale where only the best items remain in the scale. (p. 45)

Hudson (1987) identifies two major problems with the LIP model of scale development:

- Firstly, the large number of items, whittled down with the mathematical process of factor analysis, can seriously compromise the content validity of the final scale.
Secondly, it is difficult to justify “the cost and labor involved in working with a very large pool of items and then discarding many of them. It is a common experience to start with 200 or more items and finish with as few as 30 or less” (Hudson, 1987, p. 65).

Hudson (1987) and Faul (1995) both advocate the Small Item Pool or SIP method of scale development (Nurius & Hudson, 1993):

An effective alternative to the LIP approach to developing a summated scale is one that is based on a small item pool. The SIP model is constructed using a clear conception or definition of the construct to be measured. In the SIP model the aim is to develop a unidimensional scale, and the initial item pool should contain, at most, about 20 percent more items than the number desired in the final version of the scale. The use of the SIP model forces the scale developer to exercise great care in the creation of the initial item pool, and each item should be carefully tested for content validity against the definition of the construct that is to be measured. If an item does not conform to the definition of the construct, it is omitted before any data are collected. (p. 307)

If the researcher thus foresees a final scale with 30 items, s/he needs to sample up to 36 items for the initial test pool. The SIP model requires very clear constitutive and operational definitions of the construct (as discussed in the sixth step), from which to sample the items. It is, unfortunately, quite possible that the items will perform badly, but according to Nurius and Hudson (1993):

It may still be more efficient to discard 30 terrible items and begin anew than it is to discard 170, retain 30, and risk being misled by statistical artefacts arising from the misuse of factor analysis, other forms of item analysis, or just plain old sampling error. (p. 307)

Ecometric scale developers therefore make use of the Small Item Pool method of scale development, in which the researcher samples 20% more items from the domain than are intended for use in the final version of the scale.

Multicultural scale development produces many more possibilities for items to perform badly than the monocultural scale development described by Hudson and Faul. Fewer items, less complex items, shorter response scales, a variety of educational levels and language difficulties, and comparisons between two or more sample/culture groups may all impact negatively on the performance of scale items. It is thus recommended that, as a rule of thumb, 40% more items be designed than needed when a scale is being developed for multicultural use. In general, the more cultures included in the design, the more additional items are needed during the validation phase.

Because ecometric scales are often used in clinical settings as part of single system designs, they should be short and quick to administer. It is thus recommended that such scales be kept as short as possible, without sacrificing their reliability and validity (Faul, 1995). Most of the Hudson unidimensional scales are 25-30 items long, and this can serve as a rule of thumb for ecometric scale developers (see also Comrey, 1988; Kline, 1986).
3.4.1.2.3 Generation of Items

Hudson (in Faul, 1995) recommends two main methods to generate items, viz the two-step method and the list method.

The Two-Step Method comprises the following steps (Faul, 1995):

- Define the construct to be measured in clear, unambiguous terms.
- Ask one question that will measure the defined construct.
- Write the number of items the scale developer wants to include that ask the same question in a different way. (p. 47)

The List Method comprises the following steps (Faul, 1995):

- Write down one attribute of the defined construct: an affect, behaviour or judgement.
- Write an item based on that attribute.
- Repeat these two steps until the required number of items have been generated. (p. 47)

Ecometric developers use the List Method most commonly (B. Hanekom, personal communication, June, 2002).

3.4.1.2.4 Rules for Writing Items

Most research texts contain a section addressing the construction of questionnaires and most of these provide guidelines for writing items in a questionnaire. Most of these texts, however, assume that the scales are being developed for a monocultural population, rather than a multicultural population. It is important to write items in translatable English (Brislin et al., 1973), even if the scale developer does not intend to translate the scale. Furthermore, the literacy level required to understand the items must be kept to an absolute minimum.

The following points, then, provide augmented guidelines for the formulation of English items for multicultural populations (Brislin et al., 1973; Butcher, 1996a; De Vellis, 1991; Faul, 1995; Nunnally & Bernstein, 1994; Padilla & Medina, 1996; Retief, 1988):

- Use short simple sentences of no more than about 14 words and no more than about 17 syllables. This will yield text for a grade 5 (standard 3) reader, using Fry’s Readability Graph (to be discussed later).

No: It is fair to say that one of the things I seem to have a problem with much of the time is getting my point across to other people. (Note that this is a grade 8 sentence – using Fry’s Readability Graph.)
No: I often have difficulty making a point.  *(Although this sentence is much shorter, it contains too many syllables, and is thus a grade 11 sentence.)*

Yes: I often struggle to make a point.  *(This is a grade 2 sentence.)*

Avoid using pronouns (eg him, his, they) in the scale instructions and scale items.  Rather repeat the nouns.

No: Murderers and rapists should not seek pardons from politicians because they are the scum of the earth.

Yes: Murderers and rapists should not seek pardons from politicians because murderers and rapists are the scum of the earth.

Do not use metaphors, colloquialisms, idioms, etc.

No: I sometimes feel like a jack of all trades, but master of none.

Yes: I sometimes feel that although I can do a lot of different things, I can’t do any of them really well.

Do not use the passive voice in scale directions or items – rather use the active voice.

No: The following items should be carefully completed by respondents.

Yes: Complete the following items carefully.

Avoid hypothetical phrasing and the subjunctive mood (eg words such as could or would) in scale directions and items.

No: If a man were to lack self-confidence he would be likely to hit his wife.

Yes: Men who lack self-confidence hit their wives.

Avoid adverbs and prepositions telling “where” or “when” (eg frequent, beyond, upper).

No: I have recently been having headaches.

Yes: I have been having headaches over the past week.

Avoid possessive forms (eg his, hers, theirs, mine).

No: A mother should talk with her daughter about her feelings.

Yes: A mother should talk with her daughter about the daughter’s feelings.
- Use specific rather than general terms (e.g., the specific animal, such as cows, pigs, chickens, rather than the general term "livestock").

  No: Medical professionals are available to help abused women.

  Yes: Nurses, doctors, and social workers are available to help abused women.

- Avoid words that indicate vagueness regarding some event or thing (e.g., probably or frequently).

  No: Women who are abused frequently abuse their children.

  Yes: Women who are abused abuse their children more often than women who are not abused.

- Use familiar words, even if this makes the sentence more awkward.

  No: Men who have affairs should be punished.

  Yes: Married men who have sexual relations with other women should be punished.

- Avoid double (and multiple) negatives.

  No: I am not in favour of corporations stopping funding for anti-nuclear groups.

  Yes: I favour continued private support of groups advocating a nuclear ban.

- Avoid double-barrelled questions.

  No: I support civil rights because discrimination is a crime against God.

  Yes: Discrimination is a crime against God.

  Yes: I support civil rights.

- Avoid excessive use of negatively worded items. Underline the word not whenever it is used.

  No: Smoking dagga is not a serious criminal offence.

  Yes: Smoking dagga is not a serious criminal offence.

- Consider the cultural contexts (including socioeconomic factors) of target cultures when phrasing all questions.

  No: I communicate with my family by phone when I am away on business.

  Yes: I find ways to communicate with my family when I am away on business.
Use context and redundancy (to be discussed below).

No: Life has given me enough scope for self-expression.

Yes: Life has given me enough scope for self-expression. I have had enough chances to reach my dreams and goals in life.

Following these rules will produce a set of items which can more easily be translated into another language (should this be necessary) and which will be more readily understood by people of various cultures even in the original language.

3.4.1.2.5 Context and Redundancy

Brislin and colleagues advocate the use of redundancy and context when developing scales for cross-cultural use. Regarding redundancy they say (Brislin et al., 1973):

Campbell (1968) has written that every concept under investigation should be represented by at least two questions, differently worded if at all possible. If the two or more questions show similar results, a researcher may have more faith in his (sic.) measuring instrument, and can also add more credence to his claim that the obtained results are not due to translation errors. ... The redundancy also gives the eventual respondent a greater chance of understanding the purpose of the question. (p. 34)

Generally speaking, when using the LIP method of scale development it is advisable to ensure a high degree of redundancy between items (De Vellis, 1991). For example, the items, "I will do almost anything to ensure my child’s success" and "No sacrifice is too great if it helps my child achieve success" are "usefully redundant because they express a similar idea in somewhat different ways" (De Vellis, 1991, p. 56). De Vellis (ibid.) states, "By using multiple and seemingly redundant items, the content that is common to the items will summate across items while their irrelevant idiosyncrasies will cancel out.” In this regard, Miller (1953 in Brislin et al., 1973) points out:

It is reasonable to ask why we are so redundant. The answer lies in the fact that redundancy is an insurance against mistakes. The only way to catch an error is to repeat. Redundant information is an automatic mistake catcher built into all natural languages. (p. 34)

However, De Vellis (De Vellis, 1991, p. 56) also points out that "You can tolerate considerably more redundancy in your item pool than in the final scale, even though some redundancy is desirable even in the latter.” When using the SIP method of scale development, there is little scope for using redundancy, since there are few items to play with. Alternative forms of redundancy are thus required. The following discussion on context should provide such an alternative.

"A word is translated [or understood] least adequately when it is translated as a single item. Translation improves when a word is a part of a sentence, and is even better when the sentence is part of a paragraph” (Brislin et al., 1973, p. 34; see also Butcher, 1996a). Faul (1997) advocates
a similar approach – she found that the brief English original question, combined with a paraphrase (which provides context) in another language, gave the best results in terms of internal reliability.

It would seem, then, that a useful approach to formulating items might be to lengthen the questions by creating a cluster of brief, translatable sentences that provide redundancy and context (Baker, 1992). Questions of this nature will enable those who do not read English as a first language to understand the question better since they are given more cues as to the meaning of the question. By keeping the sentence structure simple (by following the rules for writing translatable English), the researcher ensures that the language remains accessible, even to those with lower levels of literacy in English. Should there be a need to translate the question, this will be easier, since the source language is explicit and descriptive, yet simple. This approach is similar to that advocated by Faul (1997), except that the paraphrase in an African language would be provided in English. “Although this procedure makes the items longer, and possibly more complex, this appears to be the most effective strategy available” (Butcher, 1996a, p. 32).

### 3.4.1.3 Translating Items

The many advantages and disadvantages to translating scale items were discussed in the previous chapter, specifically in the section on equivalence. Here it is important to note that the translation of items has been fraught with difficulties. Languages often have highly dissimilar syntax, grammar, word order and thematic structures (Baker, 1992), which undermine the potential success of translation:

> The literature abounds with theoretical arguments which suggest that translation is an impossible task, that it is doomed to failure because (a) languages are never sufficiently similar to express the same realities, and (b) even worse, ‘reality’ cannot be assumed to exist independently of language. (p. 8)

These difficulties have resulted in various methods to ensure the equivalence of translated versions of scales. *Most of these difficulties result from a Eurocentric approach to multicultural scale development and fall away if the multi-focus approach is used.* Nevertheless, a brief review of a few significant aspects of translation is important:

- **Committee Approach.** The committee approach to translation (Butcher, 1996a) involves getting a number of bilingual and, if possible, bicultural individuals to independently translate the scale from the source language to the target language. After this is done, the translators meet as a committee, review each other’s work and derive the best translation of the source scale that they can. They effectively function as a committee, seeking to integrate their various perspectives into a single, consensual decision.

- **Back-Translation.** Back-translation involves getting someone other than the original translator to translate the target language version of the scale back into the source language (Baker, 1992; Brislin et al., 1973). A third person, who is not necessarily a bilingual, compares the two source language versions of the scale. Items that are identical are
accepted, while nonidentical items must be retranslated. According to Butcher (1996a) about 10-15% of back-translated items must be retranslated. Back-translation can, however, lead to a false sense of security, because changes in meaning can occur in both forward and back translation stages (Flay, Bull, & Tamahori, 1993).

- **Decentring**. An important aspect of effective translation is decentring. Frequently, translations of standardised scales require that the source language not be changed. However, most literature on translation of scales indicates that translation is most effective when the source version can be changed, i.e., decentring. Brislin (1973) explains:

  Decentering refers to a translation process in which the source and the target language are equally important and open to modification during the translation procedure. One language does not contain content that must be translated without change into the other. That is, the researcher does not center on one of the languages. ... [The procedure of moving backwards and forwards between the two languages, through back-translation] continues until there is equivalence between an English version (now different from the original version) and the back-translation. (pp. 37-38)

- Decentring allows changes to both the source language version and the target language version. In many instances, however, the source language version must remain unchanged – you cannot, for instance, repeatedly change the English version of the MMPI each time it is translated. Decentring is thus only usually possible when the source language version is still in development.

- **Multi-focus Approach**. Obviously, the multi-focus approach to translation breaks away from the committee and back-translation approaches to translation and obviates the need for decentring. Instead, items are formulated from the beginning in multiple languages until a set of equivalent questions, in all target languages, is created.

The decision on whether or not to develop a multilingual version of a scale is a complex one. The process of producing a multilingual scale is very demanding and threatens the validity of the scale. However, if the population for which it is being designed is not fluent in a common language, a multilingual scale will be necessary. Considering the tremendous discrepancies in literacy and competence in a common language in South Africa, it is likely that multilingual scales will be necessary.

Given that social workers, even multilingual social workers, are not trained in linguistics and translation, it is strongly advisable that:

- Social workers engaging in the development of multilingual instruments should study the literature on translation. Baker’s 1992 book on translation is a fine place to start. In particular, the first three chapters – which address equivalence at word level, equivalence above word level and grammatical equivalence – provide easily accessible information on the potential dangers and recommended solutions in translation, the details of which are beyond the scope of this dissertation.
The various language versions should be formulated by the development team, and not translated by independent experts after the formulation of a source language version.

Developers should request linguists to review translations of their instruments.

### 3.4.2 Main Moment C: Design Scale

#### 3.4.2.1 Step 7: Scale the Items

The first step in this phase is to scale the items, using the information provided in the preceding pages. The following procedure can be followed:

- Determine what scaling format will be used. Unless otherwise indicated, ecometric scales typically make use of Likert Scaling, with magnitude estimation scaling.
- Determine what kind of scale partitions will be used. Many ecometric scale developers (notably Hudson and Faul) make use of relative frequency estimation partitioning. Others prefer the classic Likert partitions (degrees of agreement).
- Determine the number of scale partitions. It appears that five-point scales may be most appropriate in a multicultural context.
- Determine appropriate labels for the partitions. The differences between culture and language groups in understanding partition labels must be carefully considered. Faul’s use of images, words and numbers in combination is encouraged.

The following information should be documented:

- The results of the four decisions required.

#### 3.4.2.2 Step 8: Design the Items

The following steps (based on the multi-focus approach) should be followed in designing the scale items:

- Convene a workgroup of social work researcher/practitioners who represent the various cultures under consideration – ideally two or three researchers per target culture. These researchers (1) should be familiar with their own culture and the language of their culture, (2) should have at least one language in common, and (3) should be practising social workers.
- Provide a briefing of the theoretical framework covered in Step 3 and the definitions of the constructs as provided in Step 6, as well as the cross-cultural comparability of the constructs as in Step 5. Ensure that there is understanding of and consensus on all of these constructs.
Explain the procedure that you have decided to use to design the items, including information on formulating the items in translatable English, translating the items (if applicable), formulating items as paragraphs (contextualising) and reviewing the items.

Starting with one of the constructs, write up one of the facets of the construct on a sheet of paper and begin the process of generating an item paragraph that taps into the facet (ie the list method).

As soon as there is at least some agreement that a proposed item addresses the facet in question, ask, “How would we say this in another language?” Endeavour to cover all the languages simultaneously, using a process of forward and back-translation, and allowing continual changes to the originally proposed item (decentring) until everyone is in agreement on the equivalence of all translations. Once all the languages are covered, write the item down in all target languages.

Evaluate the item in terms of the rules for writing items.

Once everyone agrees that the item is adequate, proceed to the next facet and repeat this process.

Continue until sufficient items have been generated (up to 140% of the number of items desired in the final version of the scale).

The following information should be documented:

- The procedures followed to generate the items.
- The credentials (education, background, experience, culture, etc) of the research team.
- The items generated.

### 3.4.2.3 Step 9: Determine Reading Level

Fry (1977, p. 249) has developed a method that can be used to determine the reading level of an English passage of text; there do not appear to be similar methods for African languages. The lower portion of the graph is presented in Figure 13. The steps for determining the reading level of the text are (Fry, 1977, p. 249):
"Randomly select three (3) sample passages and count out exactly 100 words each, beginning with the beginning of a sentence. Do count proper nouns, initializations, and numerals."

"Count the number of sentences in the hundred words, estimating length of the fraction of the last sentence to the nearest one-tenth."

"Count the total number of syllables in the 100-word passage."

"Enter graph with average sentence length and average number of syllables; plot dot where the two lines intersect. Area where dot is plotted will give you the approximate grade level."

"If a great deal of variability is found in syllable count or sentence count, putting more samples into the average is desirable."

"A word is defined as a group of symbols with a space on either side; thus, Joe, IRA, 1945, and & are each one word."

"A syllable is defined as a phonetic syllable. Generally, there are as many syllables as vowel sounds. For example, stopped is one syllable and wanted is two syllables. When counting syllables for numerals and initializations, count one syllable for each symbol. For example, 1945 is four syllables, IRA is three syllables, and & is one syllable." (Fry, 1977, p. 249)

From the graph in Figure 13 we can see that to achieve a reading level of Grade 5 (Standard 3), we need to have sentences comprising an average of 14 words and about 17 syllables. (It is interesting to note that the instructions quoted from Fry are grade 10 on his readability graph, having an average of 7.5 sentences and 160 syllables per 100 words.)

The following information should be documented:

- The procedure used for determining reading level.
- The reading level of the scale.

### 3.4.2.4 Step 10: Develop a Scoring Formula

Hudson (1982) advocates the use of a standard scoring formula for all scales, irrespective of the number of items and the number of response categories. He calls this formula Hudson’s Universal Scoring Formula (Hudson, 1995, p. 10). This formula will always generate a score from 0 to 100. Such a score simplifies the process of interpreting the score – the higher the score the more of the construct is present. Furthermore, such a formula simplifies the scoring process itself – although easier to compute these scores by computer, doing so by hand is reasonably straightforward.

This formula accommodates items that are omitted or incorrectly completed, by replacing them with the mean score of all the correctly completed items. This is of great value since most respondents do omit one or more items when completing a scale. Provided at least 80% of the
scale has been correctly completed, this scoring formula can be used (Hudson, 1982). When more
than 20% of the scale is omitted, the scale should not be scored since it will result in an unreliable
score.

The scoring formula contains the following symbols:

\[
\begin{align*}
  x & = \text{Original score recorded by participant} \\
  Y & = \text{Reverse-scored item} \\
  K & = \text{Largest item response permitted} \\
  N & = \text{Number of correctly completed items} \\
  X & = \text{Item responses after reverse scoring} \\
  S & = \text{Final score}
\end{align*}
\]

The scoring comprises two steps:

**Step One.** If some items have been negatively worded, they need to be reverse scored. This is
done using the following formula:

\[
Y = K - x + 1
\]

**Step Two.** Now the final score can be calculated using the following formula:

\[
S = \frac{(\sum X - N)(100)}{N(K - 1)}
\]

The following information should be documented:

- The procedure selected for scoring the scale.

**3.4.2.5 Step 11: Write Instructions for Respondents**

The scale design is not complete until instructions are written to guide respondents through the
process of completing the scale. Too often researchers assume that respondents will be able to
complete the scale without instructions, resulting in serious errors. The following guidelines can
be followed when writing these instructions (adapted from Faul, 1995, p. 51):

- Keep it simple
- Explain what is being measured
When scales are designed for multicultural use, these instructions are particularly important. Instructions must be included in the same languages as the scale items and the equivalence of the instructions should be evaluated. Instructions need to be particularly clear, explicit and concrete in order to ensure maximum understanding. It is thus advisable that the multi-focus research team develops the instructions.

The following information should be documented:

- The scale instructions.

### 3.5 The Development Phase

The development phase of developmental research involves initial testing of the social technology in the field, to determine what works and what doesn’t, and to allow a chance to refine the technology before subjecting it to full-scale evaluation. In ecometric scale development, therefore, this entails initial testing and reviewing of the scale, as well as the establishment of the linguistic equivalence of the scale if it has been translated into multiple languages.

This phase comprises two main moments and three steps, as depicted Figure 14 (extracted from Figure 9).

**FIGURE 14: THE DEVELOPMENT PHASE: MAIN MOMENTS & STEPS**

<table>
<thead>
<tr>
<th>PHASES</th>
<th>MAIN MOMENTS</th>
<th>STEPS</th>
</tr>
</thead>
<tbody>
<tr>
<td>DEVELOPMENT</td>
<td>D REVIEW ITEMS</td>
<td>12 Obtain expert reviews of items</td>
</tr>
<tr>
<td></td>
<td>E INVESTIGATE LINGUISTIC</td>
<td>13 Field test the items</td>
</tr>
<tr>
<td></td>
<td>EQUIVALENCE</td>
<td>14 Investigate linguistic equivalence of items</td>
</tr>
</tbody>
</table>

### 3.5.1 Main Moment D: Review Items

Before an item can be accepted or evaluated, it must be reviewed to ensure that it measures what it is supposed to measure. This brings us, somewhat prematurely perhaps, to the issue of validity, which will be discussed in far greater depth in the Evaluation Phase. One important aspect of validity is content validity and it is this form of validity that must be assessed here, and not only after data has been collected. Some may question why scale validation is being evaluated here and not later. There are two main reasons: firstly, it is not ethical to collect data from people if the items themselves have not been judged to validly reflect the content, and secondly, content
validation conceptually fits into the analysis, design and development phases, before the data collection of the evaluation phase.

A few quotations on content validity may clarify these points:

Content validity is established by showing that the test items are a sample of a universe in which the investigator is interested. Content validity is ordinarily to be established deductively, by defining a universe of items and sampling systematically within this universe to establish the tests. (Cronbach & Meehl, 1955/1996, p. 180)

Content validity is based on professional judgments about the relevance of the test content to the content of a particular behavioral domain of interest and about the representativeness with which items or task content covers that domain. Content validity as such is not concerned with response processes, internal and external test structures, performance differences and responsiveness to treatment, or with social consequences. Thus, content validity provides judgmental evidence in support of the domain relevance and representativeness of the content of the test instrument, rather than evidence in support of inferences to be made from test scores. Test responses and test scores are not even addressed in typical accounts of content validity. (Messick, 1989, p. 17)

One should ensure content validity (adequacy of sampling the material on which people are tested) in terms of a well-formulated plan and procedure of test construction before the actual test is developed rather than evaluate this after construction. (Nunnally & Bernstein, 1994, p. 102)

Content validation, then, is basically judgmental. The items of a test must be studied, each item being weighed for its presumed representativeness of the universe. This means that each item must be judged for its presumed relevance to the property being measured, which is no easy task. Usually other ‘competent’ judges should judge the content of the items. The universe of content must, if possible, be clearly defined; that is, the judges must be furnished with specific directions for making judgments, as well as with specification of what they are judging. Then, some method for pooling independent judgements can be used. (Kerlinger, 1986, p. 418)

Content validity, then, involves determining whether the sample of items generated is representative of the infinite domain (or population or universe) of items related to the construct being measured. All writers agree that this determination is essentially a judgement by a person or persons. There are various methods for converting these judgements into a numerical value (these methods will be described below), but basically the content validation remains judgement based.

If content validation is directly based on the quality of item sampling, then it can be evaluated immediately after the items are designed. Content validation is not based on the responses of people to the scale items, but rather to the quality of the items themselves. It is unlikely that a researcher would validate a set of items if s/he did not believe that the items did, in fact, measure the intended construct(s). By sending out a trial scale for validation, the researcher is tacitly agreeing that the scale has content validity, even if this has not been formally and deliberately evaluated.

This process should, therefore, be made explicit, and content validity should be actively established prior to subjecting the items to further testing or validation. This position is, in fact,
supported by De Vellis (1991, p. 75), who places the step of having the initial item pool reviewed by experts prior to administering the scale to a development sample – "The next step in the process is having a group of people who are knowledgeable in the content area review the item pool. This review serves multiple purposes related to maximizing the content validity ... of the scale." According to De Vellis, the reviewers should evaluate the extent to which each item measures the construct under consideration. If the scale comprises multiple subscales, the reviewers should be able to correctly assign each item to the appropriate subscale.

There are a number of methods that can be used for evaluating and quantifying the content validity of a new scale. The first decision has to do with how many people to use for the review. The scale developer can conduct the review alone (assuming the scale is being developed by one individual), however, "it is better to include other people in the judgement of content validity" (Faul, 1995, p. 79). Furthermore, "confidence in the robustness of the ratings (the standard error of measurement) will increase as the number of judges increases. In addition, increasing the number of raters (eg more than five) facilitates the detection and exclusion of rater outliers" (Haynes et al., 1995, p. 244).

It may be helpful to convert the qualitative judgements of the reviewers into a quantitative index (Messick, 1989; see also Haynes et al., 1995):

Content specialists’ judgments of whether or not each item reflects the content defined by each dimension or facet of the domain specification could be numerically summarized in a statistical index of item-domain congruence... Or, content experts could rate each item (say, on a 5-point scale) for the extent to which it reflects the domain facet that the item was intended to measure. Or as a third instance, content specialists could match each item to the domain facet they think the item best represents, if any. (p. 39)

Hudson (1982) suggests the following procedure for quantifying content validity:

If an item is judged as definitely measuring the problem defined for that scale, place a plus sign (+) beside the item. If an item is judged as definitely measuring some other construct than the problem defined for the scale, place a minus sign (-) beside the item. The number of plus signs divided by [the number of scale items] will give a crude index of content validity. (pp. 95-96)

Although there is no standard method for quantifying content validity, nor for determining what an acceptable content validity statistic is (eg 0.6 or 0.9), such a procedure will assist the researcher in identifying scale items which do not have strong content validity, that is, which do not strongly represent the content domain.

### 3.5.1.1 Step 12: Obtain Expert Reviews of Items

Before sending the scale into the field, it is important to obtain an expert review of the scale items. The research team has already evaluated each item in terms of it format (conciseness, clarity, translatable language, etc). The review here is focused on investigating the content validity of the scale. Before beginning with the expert review, however, it is worth getting a multilingual instrument reviewed by linguistic experts, to ensure that the translations are adequate.
Once the language is secured, the content validity review involves the following steps:

- In the interests of cost-effectiveness, utilise the multi-focus research team as the expert reviewers.

- **Content Relevance.** Request each member of the research team to privately rate the content relevance of each of the items, by rating each item according to the following question:
  
  - How relevant is each item to the construct? To what extent does each item measure the construct as defined and not some other construct?

- Rate this question on the following five-point scale:
  
  - 4 - Extremely
  - 3 - Very much
  - 2 - More or less
  - 1 - Not much
  - 0 - Not at all

- Collect and summate these ratings.

- Select those items that received the lowest ratings and review them for content relevance, revising them as needed.

- Repeat the individual ratings of each item.

- Use the following formula to get a coefficient of content relevance:
  
  \[
  \frac{\text{Summated score for all reviewers and all items}}{\text{number of items times number of reviewers times four}}
  \]

- **Content Representivity.** Once this is done, return to the original definitions of the construct, and request each member of the research team to evaluate the degree to which they believe the construct is represented by the sampled items, by addressing the following three questions:
  
  - How well covered is the construct by the items?
  
  - To what degree do the items address all aspects of the construct, without leaving any facets out?
➢ If you had not been given the construct definition, how well would you have been able to describe the construct based only on the items?

➢ Rate these questions on the five-point scale used previously for content relevance.

➢ If any member of the team is concerned that the sample of items is not representative of the domain/construct, generate additional items to ensure better content representivity.

➢ Repeat the review and then calculate a rough coefficient of content relevance using the following formula:

   (Summated score for all questions for all reviewers) divided by (number of reviewers times 12).

➢ **Content Comparability.** Lastly, ask each member of the research team to evaluate whether the multiple versions of each item (if translated) are equivalent in meaning and whether they will be understood similarly in each target culture, using the following three questions:

   ➢ **Meaning:** Does the item mean the same thing in the different cultures/languages?

   ➢ **Difficulty:** Is the language equally simple in the different cultures/languages?

   ➢ **Cultural Relevance:** Is the item equally relevant to the different cultures/languages?

➢ Rate these questions on the following five-point scale:

   ➢ 4 - Completely

   ➢ 3 - A great deal

   ➢ 2 - Moderately

   ➢ 1 - Not much

   ➢ 0 - Not at all

➢ One of the advantages of the multi-focus approach, however, is that the content comparability should be largely assured by now.

➢ If any member of the team is concerned that some of the items are not comparable across cultures, these items should again be reviewed.

➢ Calculate a rough coefficient of content comparability as for content representivity.

➢ **Finalise Expert Reviews.** Once the necessary changes have been made to the items on the basis of these three reviews, the reviews should be repeated to obtain a final review.
The following information should be documented:

- The procedures followed.
- The credentials (qualifications, experience, cultures, etc) of the expert reviewers.
- The degree of agreement among the reviewers regarding the validity of the items (i.e., the average and range of ratings), together with the three content validity coefficients.
- Any changes made to the items on the basis of the reviews.

### 3.5.1.2 Step 13: Field-Test the Items

Once the experts are satisfied that the scale comprises items which adequately measure the target construct, which are appropriately formulated, which are equivalent in meaning and which are comparable across cultures, it is necessary to check this with samples of members of the target cultures. Because this is a field test, only small samples are needed and these samples can be drawn conveniently. The following steps should be taken:

- Request the members of the research team to convene a small group (5-10 people) from the culture that they represent. It is preferable to have the group discussion run by a researcher from the same culture as the group members, since this will reduce or eliminate language/translation problems as well as cultural misunderstandings or inhibitions.
- The scale items should be presented to the group one at a time and discussed. The researcher should ask “What do you understand by this item?” rather than “Do you understand this item?” to ensure an exploratory review of the items.
- The responses of the group to the items (both their correct and incorrect understanding of the items) should be documented.
- If an item is misunderstood, the researcher should explore with the group how the item could be improved (Butcher, 1996a).
- The research team should reconvene and present feedback on any problematic items.
- Problematic items may need to be reformulated or omitted.

The following information should be documented:

- The procedures followed in the field-testing.
- Any specific responses from participants that resulted in alterations to the items.
3.5.2  **Main Moment E: Investigate Linguistic Equivalence**

It is always difficult to decide at what point of the scale development process one should start to collect live data from respondents. An important feature of translating scales into different languages is conducting trials to ensure that the various language versions are equivalent in terms of their linguistic meanings – that is, an item in one language should elicit the same response as an item in another language (Iyengar, 1993). The question is, when should this linguistic equivalence be assessed?

The main impetus for the answer comes from answering a preliminary question, viz whether establishing linguistic equivalence is part of the development or evaluation phase of developmental research, that is, whether it is part of testing the scale or part of validating or evaluating it. The candidate's position is that ensuring the linguistic equivalence of scale items is part of the development phase. A prerequisite for validating a scale is ensuring that the items in the various versions do, in fact, mean the same thing. This is not validation itself, although it does add value to the notion of cross-cultural equivalence, which is a key dimension of multicultural scale development. The bottom line is that before distributing the scale to a thousand or more respondents, the scale developer wants to be confident that the various versions of the scale amount to more or less the same thing. This is part of the development (or pretesting) phase of scale development.

There are a few different methods of determining translation equivalence:

- **Source Language Monolinguals Method.** The original/source version of the scale and the back-translation of the scale are both administered to a group of source language monolinguals (Hambleton & Kanjee, 1995).

- **Source and Target Language Monolinguals Method.** The source language version is given to source language monolinguals, while the target language version is given to target language monolinguals. The major problem with this approach is that differences between the two groups may, in fact, be attributed to actual differences between the two groups and not to linguistic differences (Hambleton & Kanjee, 1995).

- **Basic Bilingual Examinees Method.** Here a group of bilingual participants complete both the source and target language versions of the scale, half completing the source language version first and half completing the target language version first (Hambleton & Kanjee, 1995) – participants are randomly assigned to the two groups. Most researchers using this method administer the versions about one month apart (Saito et al., 1996; Sperber, De Vellis, & Boehlecke, 1994), although Nunnally and Bernstein (1994) recommend that alternative forms of a scale be administered at a two-week interval, while Iyengar (1993) recommends 8-9 weeks.
Advanced Bilingual Examinees Method. Brislin and colleagues (1973) explain this method as follows:

An actual original language questionnaire and its target language translation are given to four groups of bilingual subjects equated by randomization. One group sees the original language version of the questions; a second group sees the target language version; a third sees the first-half original, second-half target; the fourth sees the first-half target, second-half original. (p. 53)

Because the respondents are assigned to the four groups at random, one can expect that each of the groups should perform similarly on the scale.

This last method is considered probably ideal (Brislin et al., 1973). Most studies reporting similar methods use relatively small samples: one (Diareme, Tsiantis, & Tsitoura, 1997), eleven (Saito et al., 1996) and 14-18 (Sperber et al., 1994) respondents per sample group. If one allows 15 people per group, one is required to obtain 60 bilinguals per language pair. Of course, if one is developing a scale in four languages simultaneously, it may be necessary to compare all paired combinations of the scale, which would require a total of 360 bilinguals. Alternatively, if one of the four languages is a ‘link’ language – one understood to some degree by all respondents – one could conduct three analyses only (the link language paired with each of the other three languages), necessitating only 180 bilinguals.

Various statistics have been proposed to assess the equivalence of the scale versions:

- The item frequencies should be the same across groups (Brislin et al., 1973; Saito et al., 1996).
- The total scores for the entire scale should be the same across groups (Brislin et al., 1973).
- The correlations between the two language versions for those completing both the source and target language versions should be ‘high’ (Brislin et al., 1973).
- The correlations between the two complete language versions, when completed by the same people, should be high (Butcher, 1996a).
- When respondents complete full versions of both languages, their responses to each pair of items should be the same (Diareme et al., 1997; Sperber et al., 1994).

Of course, the problem with all of these methods is that they rely on bilingual respondents who may not have the same profile as monolingual respondents. Furthermore, bilingual respondents may have assimilated aspects of both cultures making them less typical of each language/culture group (Butcher, 1996a; Hambleton & Kanjee, 1995; Sperber et al., 1994). Nevertheless, it is recommended that the researcher use the Advanced Bilingual Examinees Method to determine the equivalence of the translations, since this is the most viable method for keeping language equivalence central to the investigation.
3.5.2.1 **Step 14: Investigate Linguistic Equivalence of Items**

Make use of the Advanced Bilingual Examinees method described above. This entails the following:

- Determine which pairs of languages need to be compared.
- Obtain approximately 60 respondents for each language pair.
- Randomly assign the 60 respondents into four equal groups (computerized procedures are available on the World Wide Web to randomly assign a given number of people to a specified number of groups, eg. Rankin, n.d.):
  - Group one completes the scale in the first language.
  - Group two completes the scale in the second language.
  - Group three completes the first half of the scale in the first language and the second half of the scale in the second language.
  - Group four completes the first half of the scale in the second language and the second half of the scale in the first language.
- Administer the various scale versions as described.
- Conduct the analysis of data using the three procedures described below for each language pair. If comparing more than one language pair, randomly sample the collected data down to the same sample sizes, to avoid the contaminating effect of different sample sizes on your results.
- If the statistical differences between each language pair are nonsignificant \((p \geq 0.01)\), the language versions can be considered to be equivalent.

The three procedures to be used for each language pair are as follows:

- **Item Equivalence.** The responses to each item should be the same across the pair of language versions. For example, if one is evaluating the equivalence of an English-Afrikaans version of the scale, the item responses of the monolingual English and first half English versions should be combined, and the monolingual Afrikaans and first half Afrikaans versions should be combined, for item one. A Mann-Whitney U test performed on these two independent groups should be nonsignificant at .01. (A nonparametric test is used because item data is ordinal rather than ratio, and due to the small sample sizes – approximately 30 per group.)

- **Split-half Equivalence.** The pair of correlations between the two halves of the scales should be the same. Because the purpose of this exercise is not to establish the reliability of the
scale, but rather to establish the equivalence of the scale, the size of the correlations is less important than their similarity. Nevertheless, the correlations should ideally be .82 or greater, since, when this value is inserted into the Spearman-Brown Prophecy formula it will generate a split-half estimate of reliability of .90 or greater (Nunnally & Bernstein, 1994).

- Compute the two half scores for all of the scales using the same items in each half (based on the division of items for the bilingual versions). Compute the correlations between these two halves for each of the four versions separately using the nonparametric Spearman’s rho due to the small sample sizes. The four correlation coefficients should all be approximately equal; specifically, the correlations for the bilingual versions should not be consistently lower than the correlations for the monolingual versions.

- The following procedure (Van De Vijver & Leung, 1997, p. 60) should be used to investigate the equivalence of the pairs of correlations (the procedure will be described in more detail in step 23). Perform the following calculation: \( F = \frac{1 - r_1}{1 - r_2} \), in which \( r_1 \) and \( r_2 \) represent the two correlations (note: \( r_1 < r_2 \)). If both samples comprise 15 respondents each, the derived \( F \) value needs to be 2.022 or less for the reliabilities to be nonsignificantly different at .01 (df\(_{182} = 14\)).

- In general, the smaller the reliabilities, the greater the difference allowed between them. For example, take two samples each comprising 15 respondents each (df\(_{182} = 14\)). If the larger correlation is .95, the other correlation will need to be .82 or higher to maintain a nonsignificant \( F \) value (\( p \geq .01 \)) – a difference of up to .13 is allowed. However, if the larger correlation is only .82, the other correlation will need to be only .34 or higher to maintain a nonsignificant \( F \) value – a difference of up to .48 is acceptable here. With such small samples, very large differences between the correlations are acceptable, when the larger correlation is not very high. The use of the PQRS Calculator (Knypstra, 1998) will assist in calculating the significance levels of the \( F \) scores, given the degrees of freedom in the numerator and denominator, and the \( F \) score or required level of significance. Alternatively, use can be made of the FDIST function in Microsoft Excel.

- **Scale-level Equivalence.** The summated scores for each of the four versions (two monolingual and two bilingual) should be the same. The nonparametric Kruskal-Wallis analysis of variance, with scale version as the independent variable and scale score as the dependent variable, should be nonsignificant at .01.

If all of these tests are nonsignificant at .01, one can conclude that the various translations of the scale are linguistically equivalent. If certain items perform badly, the researcher will need to go back to the design phase and rework or omit those items.

The following information should be documented:

- The procedures followed to establish linguistic equivalence, with suitable referencing.
The results of the three procedures.

Any changes made to the items on the basis of the investigations.

### 3.6 The Evaluation Phase

The evaluation phase of developmental research involves evaluating the effectiveness and adequacy of a new social technology. In the instance of scale development, then, evaluation concerns the testing of the reliability and validity of the scale – that is, judging whether or not the scale is ‘good’.

This phase comprises six main moments and sixteen steps, as depicted in Figure 15 (extracted from Figure 9).

**FIGURE 15: THE EVALUATION PHASE: MAIN MOMENTS & STEPS**

<table>
<thead>
<tr>
<th>PHASES</th>
<th>MAIN MOMENTS</th>
<th>STEPS</th>
</tr>
</thead>
<tbody>
<tr>
<td>EVALUATION</td>
<td>F DESIGN VALIDATION STUDY</td>
<td>15 Formulate research questions</td>
</tr>
<tr>
<td></td>
<td></td>
<td>16 Select a sample</td>
</tr>
<tr>
<td></td>
<td></td>
<td>17 Prepare the research package</td>
</tr>
<tr>
<td>G COLLECT DATA</td>
<td></td>
<td>18 Administer research package to sample</td>
</tr>
<tr>
<td>H CONCEPT-LEVEL ANALYSIS</td>
<td></td>
<td>19 Consolidate evidence supporting content validity</td>
</tr>
<tr>
<td>I ITEM-LEVEL ANALYSIS</td>
<td></td>
<td>20 Conduct item analysis</td>
</tr>
<tr>
<td></td>
<td></td>
<td>21 Investigate item cultural bias</td>
</tr>
<tr>
<td></td>
<td></td>
<td>22 Compute coefficient alpha</td>
</tr>
<tr>
<td></td>
<td></td>
<td>23 Compare reliabilities across cultures</td>
</tr>
<tr>
<td>J SCALE-LEVEL ANALYSIS</td>
<td></td>
<td>24 Compute standard error of measurement</td>
</tr>
<tr>
<td></td>
<td></td>
<td>25 Conduct multiple group confirmatory analysis at item level</td>
</tr>
<tr>
<td></td>
<td></td>
<td>26 Conclude multicultural item-level analysis</td>
</tr>
<tr>
<td>K ESTABLISH CLINICAL CUTTING SCORES</td>
<td></td>
<td>27 Conduct convergent and discriminant validity analysis at scale level</td>
</tr>
<tr>
<td></td>
<td></td>
<td>28 Conduct known groups validity analysis</td>
</tr>
<tr>
<td></td>
<td></td>
<td>29 Conclude multicultural scale-level analysis</td>
</tr>
<tr>
<td></td>
<td></td>
<td>30 Establish clinical cutting scores</td>
</tr>
</tbody>
</table>

#### 3.6.1 Main Moment F: Design Validation Study

**3.6.1.1 Step 15: Formulate Research Questions**

All research aims to answer a question. The validation study is a subcomponent of the broader developmental research endeavour and, in fact, can stand alone as a study. Indeed, most of the literature on cross-cultural research that has been used in this dissertation deals primarily with cross-cultural scale validation and not multicultural scale development.

The purpose of the validation study is not to describe any culture group, to understand the dynamics of or between various cultures or even to determine how two or more cultures differ on
a particular construct. The only purpose of the validation study is to validate the scale. There are therefore only three research questions (adapted from Faul, 1995):

- Is the newly developed scale reliable for each culture group?
- Is the newly developed scale valid for each culture group?
- Is the newly developed scale reliable and valid across the target culture groups?

The following information should be documented:

- The research questions.

### 3.6.1.2 Step 16: Select a Sample

In psychometry, the validation of a scale typically involves the establishment of norms for the population from which the validation sample is drawn. It is thus necessary to ensure that the sample is representative of the population and a probability sample is thus required.

In ecometric scale development no norms are developed. As was discussed in the previous chapter, criterion referenced norms are used which are not population dependent. It is, therefore, not essential that the sample represent the population in any statistical sense.

There are, however, two important criteria in multicultural scale development:

- The sample must be heterogeneous. Faul (1995) notes that because Cronbach’s alpha is based on inter-item correlations, it is influenced by the homogeneity of responses to scale items. It is thus important that the scale be heterogeneous in terms of occupation, income, education, age, marital status, gender, etc.

- The samples of each culture group must, at some level, reflect the characteristics of the population. If a particular culture group has a very high percentage of poorly educated members, but the sample includes a high proportion of well-educated members, the study cannot be said to be valid, since the sample does not reflect the characteristics of the population.

In short, although a probability sample is not required, the sample must aim to be representative of the broad characteristics of the population. Hence, the researcher must seek out individuals who present a broad or heterogeneous and mirror image of the population. Hudson who has pioneered ecometrics, “prefers a convenience sampling technique where heterogeneity can be insured” (Faul, 1995, p. 62; for example, see Hudson, Nurius, Daley, & Newsome, 1990). Because the sample in multicultural scale development comprises two or more culture groups, the sampling technique of choice (a nonprobability sample) is a quota sample (Kerlinger, 1986, p. 119).
It is important to provide a fair amount of detail about the sample and sampling methods used when conducting multicultural research (Okazaki & Sue, 1998). Given the high degree of fluidity between cultures, as discussed in the previous chapter, and given the degree of acculturation prevalent in South Africa, it is important to describe culture groups in more detail than simply ‘African participants’. The researcher needs to provide details about whether the respondents are urban or rural, what socioeconomic group they come from, their degree of literacy, their degree of acculturation into White Western cultures, etc. Simply describing participants as ‘African’ implies that all Africans are the same, which is obviously not true.

The required sample size, according to Orme and Hudson (1995, p. 126), is between 450 and 550 cases; this sample size will "comfortably satisfy the requirements of the hypothesis tester, power analyst, and parameter fitter". Although larger samples produce better levels of reliability and validity, they tend to average out errors of measurement, which can create problems when a practitioner needs to use the scale for an individual client. It is thus better to have a scale that produces good reliability and validity with a smaller sample than to have a scale that produces equal reliability and validity with a larger sample (Faul, 1995). Large samples produce better results, but the large numbers of respondents can obscure the adequacy of the scale itself. It is, therefore, adequate to have a sample that comprises approximately 500 people. Since multicultural scale development is effectively a set of validations (one per culture group), the researcher needs to draw samples of approximately 500 people per culture group – hence four cultures will generate a sample of about 2000 people in total.

The following information should be documented:

- The planned procedures to draw the samples.
- The target sizes of the samples.

3.6.1.3 Step 17: Prepare the Research Package

The research package is the total document that will be provided to the sample for completion. It comprises the following sections (Faul, 1995):

- **Covering Letter.** A covering letter should introduce the research. Specifically it should address what the research is about, who is conducting it, why it is being conducted and the fact that participation is voluntary and anonymous.

- **Biographical Information Sheet.** The biographical information about the sample is important when reporting on the results of the validation and is needed to demonstrate that the sample is heterogeneous. Background information is particularly important for the construct validation that comes later, since it is usually hypothesised that the scale should correlate poorly with these variables. Biographical information usually comprises “age, gender, education, marital status, income, length of marriage, number of children and number of persons in the household” (Faul, 1995, p. 64).
As discussed in the previous chapter, culture is a composite of various demographic trends, including socio-economic status, level of education, urban-rural distinctions, level of acculturation, etc. It is thus worthwhile including various demographic data that can be used to unpack the variables that may contribute to variance between culture groups. Although this is not strictly part of scale validation, it is important material for further investigations of the scale’s ecometric properties.

**Scales.** Validation studies require multiple scales in order to establish the validity of the scale. If the scale to be validated is unidimensional, the researcher will need to include two to four additional scales (Faul, 1995). These scales should be selected if, on the basis of theory, they are expected to converge or diverge with the new scale (see step 27). If, however, the scale to be validated is multidimensional, it may not be necessary to include additional scales.

The following information should be documented:

- The research package.

### 3.6.2 MAIN MOMENT G: COLLECT DATA

#### 3.6.2.1 Step 18: Administer Research Package to Sample

The administration of a scale to a multicultural sample is a critical factor in the multicultural validity of the scale, and brings the ‘cultural competence’ of the social worker into relief (Ponterotto & Alexander, 1996):

... the present chapter focuses not on the cultural relevance of an assessment device or procedure but on the cultural competence of the clinician providing the assessment. A main thesis of this chapter is that despite the ‘cultural validity’ of an assessment device with a particular ethnic group, what is of paramount importance is the clinician’s multicultural awareness, knowledge, and interpretive skill. Our position is that a culture-bound (or biased) assessment device in the hands of a well-trained multicultural practitioner is preferred over a culture-fair instrument in the hands of a poorly trained multicultural practitioner. (pp. 651-652)

One important aspect of ensuring appropriate administration of scales across cultures is to appreciate that not all respondents are equally “testwise” (Padilla & Medina, 1996, p. 14). Respondents from (previously) disadvantaged culture groups may have had less exposure to scales and standardised tests than respondents from (previously) advantaged groups, and thus may perform less well and/or less reliably. The method of administering the scale must take this into account.

The following information should be documented:

- The procedures actually followed to collect data.
- The demographic profile of the samples.
- An evaluation of the heterogeneity and general representivity of the samples.
3.6.3 Overview of Reliability & Validity

Before it is possible to describe the next three main moments, it is necessary to provide an introductory overview of reliability and validity. For practical reasons that shall become apparent later, reliability and validity are investigated simultaneously, not sequentially. They are, however, separate issues and need first to be explored conceptually and theoretically.

3.6.3.1 An Introduction to Reliability

Reliability is a central and important dimension of validating a scale (De Vellis, 1991), albeit not the only dimension, or even the most important one (Nunnally & Bernstein, 1994). A great many papers on reliability have been published and the interested reader is encouraged to read other more detailed texts that provide greater discussion on the theoretical grounding of reliability (e.g. De Vellis, 1991; Feldt & Brennan, 1989; Nunnally & Bernstein, 1994). This introduction will review some aspects of reliability, specifically the definition and theory of reliability, the various forms of reliability and the required standards of reliability in ecometrics.

3.6.3.1.1 Introduction

Five important terms are central to any discussion of reliability, viz true scores, observed scores, error, standard error of measurement and reliability coefficient (Cronbach, 1990), and will become clearer in the course of this introduction. The true score is the objectively true value of a construct that an individual possesses (De Vellis, 1991). If, for example, we were interested in measuring musical aptitude, the true score would be a person’s actual aptitude if we were able to truly know it. Of course, the true score is merely a theoretical construct, since there is, in fact, no way of actually measuring a true score.

More formally and operationally defined, however, the true score is “the mean score resulting from a large number of repeated measurements on parallel tests for the same individual” (Lemke & Wiersma, 1976, p. 64). Referring back to the earlier discussion on domain sampling, let us assume that there is an infinitely large pool of items that measure musical aptitude. If an individual could respond to all of these items on numerous occasions, we would eventually get to her/his true score. This score is free from all error and measures only the construct itself, viz musical aptitude (Cronbach, 1990).

The observed score, by contrast, is the score we actually obtain on a measuring instrument, such as the fictitious Musical Aptitude Scale. This score hopes and aims to measure musical aptitude as accurately as it can, but it is always limited and thus does not measure the true score perfectly – it contains a degree of error.

Error, then, is the difference between the true score and the observed score, hence the classic equation, $O = T - E$, where the observed score ($O$) equals the true score ($T$) minus error ($E$). Nurius and Hudson (1993) present a neat example to illustrate:
Suppose, for example, that one of your clients has the absolute true score of 38 on the Index of Self-Esteem (ISE) scale. Suppose also that your client completed the ISE on one occasion and obtained a score of 39. If 38 is the true score and 39 is the observed score, the difference between the two scores would represent the amount of measurement error involved in the use of the ISE scale on this one occasion for this particular client. (p. 213)

In short (Lemke & Wiersma, 1976):

The obtained variance of a test can be partitioned into true and error components. The true component is due to systematic sources, such as individual differences in people; the error component is due to unsystematic sources, such as guessing, scoring errors, and recording errors. (p. 69)

Reliability refers to the amount of error present in a measurement (Nugent, White, & Basham, n.d.). Hence, the greater the error, the lower the reliability; while the less the error, the higher the reliability (Hudson, 1982; Nunnally & Bernstein, 1994). Expressed another way, reliability is “the proportion of a scale’s total variance that is attributable to a common source, presumably the true score of a latent variable underlying the items” (De Vellis, 1991, p. 27). Hudson (1982, p. 82) expresses this same notion as follows, “the reliability of a measurement tool is the proportion of the true-score variance that is contained within the observed-score variance.” The formula for this is as follows (ibid.):

\[
r_{tt} = \frac{V_t}{V_o} = \frac{V_t}{(V_t + V_e)}
\]

where,

\[
\begin{align*}
    r_{tt} & = \text{reliability} \\
    V_t & = \text{true-score variance} \\
    V_o & = \text{observed-score variance} \\
    V_e & = \text{error-score variance}
\end{align*}
\]

When this formula is calculated, it results in a proportion that can range from 0.0 to 1.0. Hence the reliability estimate falls within this range, with a higher score (eg .92) indicating a higher level of reliability. In other words, a higher reliability indicates that a larger proportion of the variance in an observed score is variance in the true score (Lemke & Wiersma, 1976).

In fact, the reliability coefficient can be converted to a percentage. If the reliability=.92, we can conclude that 92% of the observed variance in the scale is due to variance in the true score (Lemke & Wiersma, 1976). This can be depicted graphically. The scale depicted in Figure 16 has a reliability of .90, indicating that 90% of the variance in the scale is true variance.
The scale in Figure 17 has a reliability of .60, indicating that 60% of the scale’s variance is true, while 40% is error.

The standard error of measurement, the fifth important term identified by Cronbach (1990), will be discussed in a later section of this introduction to reliability.

### 3.6.3.1.2 Methods for Estimating Reliability

There are several forms of reliability that have evolved over the past century. These are presented graphically in Figure 18. These methods will be briefly discussed and critiqued below.

**Test/Retest Reliability.** Reliability is historically defined as “the consistency of scores obtained by the same person when reexamined with the same test on difference occasions” (Anastasi, 1982, p. 102). This is probably the simplest and most theoretically correct way of measuring reliability (ibid.):

The reliability coefficient ... in this case is simply the correlation between the scores obtained by the same persons on the two administrations of the test. The error variance corresponds to the random fluctuations of performance from one test session to the other. (p. 109)

Although test/retest reliability works in theory, there are a great many practical problems which undermine its usefulness, including:

- “Memory is a contaminating factor” (Rogers, 1995, p. 369), because respondents may remember their responses from the first to the second test, even when these responses are
based on guesses (Feldt & Brennan, 1989), thereby producing an inflated reliability coefficient (Nunnally & Bernstein, 1994).

- “It is entirely possible that respondents’ status on the variable could change between testings” (Rogers, 1995, p. 369). Many of the variables in which social scientists (and social workers in particular) are interested are highly changeable. Such variables are termed “ephemeral variables” by Rogers (1995, p. 369).

- Test/retest is more a measure of “temporal stability” (De Vellis, 1991, p. 37) than a measure of internal consistency (Cronbach, 1951/1996; Spector, 1994). In fact, it is quite possible for a scale that has no internal consistency (to be discussed later) to have very high test/retest reliability (Nunnally & Bernstein, 1994).

**FIGURE 18: METHODS OF ESTIMATING RELIABILITY**

When test/retest reliability is used, a key issue to decide is the duration of the interval between testing. There is a high degree of variation in recommendations, including two to 24 hours (Bostwick & Kyte, 1985, p. 173), two to 14 days (Bloom et al., 1995, p. 41), two weeks (Nunnally & Bernstein, 1994, p. 252), two to four weeks (Bostwick & Kyte, 1985, p. 172), or at least six months (Kline, 1986, p. 130). Nunnally and Bernstein (1994) discuss in some depth various options, such as conducting more than one retest (e.g., later on the same day, two weeks later, and six months after that) and comparing the results.

Many of the constructs measured by psychologists, such as intelligence and personality, are, by definition, stable over time (as was discussed in the previous chapter). As such, test/retest reliability is an important form of reliability. It is, however, worth noting that Anastasi (1982, p...
111) states, "For the large majority of psychological tests, however, retesting with the identical test is not an appropriate technique for finding a reliability coefficient."

For social work, however, it is clear that most or all constructs are ephemeral variables that fluctuate over time. Indeed, social work scales are intended to be sensitive to change, since they are frequently used in single system design to monitor a client’s progress in therapy (Bloom et al., 1995). Because of this, test/retest reliability is often decried by social workers – Hudson (1982, p. 86) for example states, "It is my conviction that estimates of test-retest reliability are, at best, of dubious value and that this kind of reliability has been given entirely too much emphasis."

Scales that are developed to have high test/retest reliability may well be inadequate for use in detecting change in response to psychosocial interventions, because of their excessive temporal stability (Meier, 2000). Meier proposes an alternative method of item analysis during scale development that involves selecting items that show a high degree of change in response to psychosocial interventions among a clinical sample from baseline to follow-up. In this way, the researcher is able to generate instruments that have high internal consistency, high sensitivity to change and (presumably) lower test/retest reliability (ibid.). If the primary purpose of an instrument is, indeed, to measure clinical change in response to interventions, this is an approach to scale development worth exploring.

Despite Hudson’s misgivings and Meier’s suggestions, the main proponents of the single system design in social work (Bloom et al., 1995) explain that test/retest reliability is of particular importance for practitioners:

Test-retest reliability is particularly important for single-system evaluation because you will be administering your measures or making your observations several times over the course of assessment and intervention ('repeated measures'). If your measurement or observation tool is not stable, changes that come about may be a result of changes in the measurement tool itself. With a stable measure you can be more confident that you are recording real changes in the behavior, feelings, attitudes, and so forth, that are being measured. (p. 40)

Perhaps the most valid position on the place of test/retest reliability is hinted at by Nunnally and Bernstein (1994, pp. 251 & 255): a method of reliability based on internal consistency (such as the Alpha coefficient) should be the reliability test of choice, followed by the addition of test/retest reliability if deemed necessary. The duration between tests should be relatively short – one day to two weeks at most (Bloom et al., 1995). Provided that a scale has been demonstrated to be coherent or consistent, the added value of temporal stability is of particular relevance to social work practitioners who seek confirmation that the measure will detect real changes and not merely performance and memory error.

**Parallel-form Reliability.** Test/retest and parallel-form reliability have in common the fact that there are two administrations of a scale with the same people. In the former case the same scale is administered twice, while in the latter two versions of the same scale are administered once each (Fischer & Corcoran, 1994a). All the limitations of the test/retest method apply here
(Rogers, 1995), plus the additional difficulty that two parallel versions of the same scale (with the same number and form of items) are seldom found in practice (Anastasi, 1982; Bostwick & Kyte, 1985).

Parallel-form reliability makes good sense in theory, however, being based on domain sampling theory (Nunnally & Bernstein, 1994). If there is an infinite pool of items (the domain) for a given construct it should be possible to take two random samples of this domain (Bostwick & Kyte, 1985). According to classical test theory, these two sets of items should correlate highly with each other since they are both randomly drawn from the same domain – indeed, when items correlate highly with each other this is interpreted as evidence that they are drawn from the same domain. However, because the two sets of items are drawn at random, it is possible that they will not correlate highly (due to sampling error) (Cronbach, 1951/1996; Nunnally & Bernstein, 1994). This could, perhaps, be overcome by designing pairs of equivalent items (ie two items which have the same content but different forms), a kind of matched pairs sampling (Cronbach, 1951/1996).

In practice, however, parallel-form reliability has little utility, and both Anastasi (1982) and Faul (1995) conclude that it has limited value.

**Split-Half and Odd/Even Reliability.** Split-half reliability (of which odd/even reliability is a specific example) was the mainstay of reliability testing for forty years (Cronbach, 1951/1996). The procedure involves dividing a scale into two halves – the first half of the scale and the latter half of the scale – and correlating the two subtotals. This correlation served as an estimate of the reliability or internal consistency of the scale. Because reliability is, in part, influenced by the number of items in a scale, the Spearman-Brown formula was used to determine the reliability of the entire scale (Anastasi, 1982). (It is worth noting that this is the same procedure used to establish linguistic equivalence in step 14.)

One of the main problems encountered with split-half reliability is that fatigue effects may influence how the second half of the scale items are completed in comparison with the first half. Other methods of splitting the scale were thus explored, most notably the odd/even method, in which all the odd items formed one half and all the even items the other half of the scale (Rogers, 1995). In fact, there are many ways of splitting a scale into equal halves, including the random assignment of items into two equal groups (ibid.).

The various ways of splitting a scale, while offering the researcher more choice, also introduced greater error (Cronbach, 1951/1996):

Instead of giving a single coefficient for the test, the procedure gives different coefficients depending on which items are grouped when the test is split in two parts. If one split may give a higher coefficient than another, one can have little faith in whatever result is obtained from a single split. (pp. 258-259)
Hudson (1982) thus describes the demise of split-half reliability:

Actually, the split-half method of estimating the reliability of a scale turns out to be only an estimate of another internal consistency measure, called coefficient alpha, that is much more powerful than the split-half method. In the early phases of the validation research for the CMP scales, I used the split-half method of estimating the reliability of the scales because I did not know that a better method was available. Once it was learned that alpha was a better device, the split-half method was abandoned entirely, and all subsequent estimates of reliability for the CMP scales were based on alpha. (p. 85)

It became necessary to develop a way of “estimating the average of all possible half-score reliabilities of a test” (Rogers, 1995, p. 370). In 1937, Kuder and Richardson published a number of methods for calculating this average. Their 20th formula became widely used and is now referred to as the Kuder-Richardson Formula 20 (or KR20). The KR20 is a simple formula used with data scored in dichotomous format (ibid.).

In 1951, Cronbach “introduced a variant of the KR20 that was intended to be used when items were answered in formats with more than two alternatives” (Rogers, 1995, p. 371). Cronbach’s statistic, called the alpha coefficient and signed with the Greek letter $\alpha$ (Cronbach, 1951/1996), has become the sine qua non of reliability (Hudson, 1982).

**Coefficient Alpha.** Coefficient alpha has been defined as the “average of all the possible split-half coefficients for a given test” (Cronbach, 1951/1996, p. 260). Coefficient alpha is a measure of the internal consistency of a scale, which is equivalent to the interitem correlations of the scale (De Vellis, 1991; Spector, 1994). One of the advantages of alpha is that it tends to produce figures that are comparable with other reliability estimates conducted on the same scale (Nunnally & Bernstein, 1994, p. 252). Coefficient alpha has become one of the most important statistics in scale development literature (Cortina, 1993, p. 98).

Alpha, however, increases as the number of items increase, without a true change in the interitem correlations. For example (Cortina, 1993),

For a 3-item scale with alpha=.80, the average interitem correlation is .57. For a 10-item scale with alpha =.80, the average interitem correlation is only .28. This is strikingly different from .57 and underscores the fact that, even without taking dimensionality into account, alpha must be interpreted with some caution. (p. 101)

Some authors consequently recommend evaluating both coefficient alpha and the average interitem correlations (Clark & Watson, 1998), and suggest aiming for average correlations of .15 to .50 – higher correlations (.40 to .50) for narrower constructs and lower correlations (.15 to .20) for broader constructs (ibid., p. 231).

“Coefficient alpha involves comparison of the variance of a total scale score (sum of all items) with the variances of the individual items” (Spector, 1994, p. 260). If the items are completely uncorrelated, the variance of the total scale score will be identical to the sum of the variances of the individual items. As the items correlate with each other, the variance of the total scale score
will increase (ibid.). Based on this idea, the following formula is typically used to calculate alpha (slightly adapted from Cronbach, 1951/1996; and Faul, 1995):

\[
\alpha = \frac{k}{k-1} \left(1 - \frac{\sum V_i}{V_t}\right)
\]

where,

- \(\alpha\) = alpha coefficient
- \(k\) = number of items
- \(V_i\) = variance of items
- \(V_t\) = variance of total score

There is, however, another way of calculating alpha that makes it more clear how it is derived from the interitem correlations, since alpha is “a direct function of both the number of items and their magnitude of intercorrelation” (Spector, 1994). This formula presupposes that the items “have equal or near-equal variances, as they will if all items use the same response category format. This formula can also be used if all items are converted to Z scores before summing” (Bohrnstedt & Knoke, 1988, pp. 384-385):

\[
\alpha = \frac{kr}{1 + (k - 1)r}
\]

where,

- \(\alpha\) = alpha coefficient
- \(k\) = number of items
- \(r\) = the average intercorrelation among the \(k\) items comprising the index

**Standard Error of Measurement.** The final form of reliability that will be discussed here is the standard error of measurement (SEM) (Bloom et al., 1995). One of the shortcomings of most measures of reliability (including the alpha coefficient) is that, because it is based on correlations and item variance, it is susceptible to sample influence, that is, it can vary from sample to sample (Hudson, 1982; Pike & Hudson, 1998). What is thus needed is a measure of reliability which is independent of the variability of the group on which was calculated (Anastasi, 1982; Cronbach,
SEM, which “summarizes potential within-person inconsistency in score-scale units” (Feldt & Brennan, 1989, p. 105), is just that statistic.

SEM can be defined as “the standard deviation of a set of measures of the same event or object” (Cronbach, 1990, p. 192) or as “the average of the standard deviations we would obtain if each of N individuals were measured on n different, but parallel, tests” (Lemke & Wiersma, 1976, p. 77). Because each scale is an imperfect measure, there is at least some error in the scale, which means that there is likely to be a discrepancy between the observed score and the true score (ibid.). SEM is an attempt to measure that error (Hudson, 1982; Huysamen, 1996). Obviously, the greater the reliability of a scale, the smaller the SEM.

The SEM is calculated by the following formula:

\[ SEM = S_o \sqrt{1 - \alpha} \]

where,

- \( SEM \) = standard error of measurement
- \( S_o \) = standard deviation of the observed scale score
- \( \alpha \) = alpha coefficient (or other measure of reliability; eg test/retest (Kline, 1986))

The SEM functions much like a standard deviation (Huysamen, 1996), hence one can say that there is a 68% chance (one standard deviation/SEM) that an observed score will fall within the range of the true score ±1SEM, and a 95% chance that an observed score will fall within the range of the true score ±1.96SEM (this latter is a 95% confidence interval). For example, if a person’s true score on a scale is 40, and the scale has an SEM of 3, we can be 95% confident that this person’s observed score on the scale will fall in the range 34 to 46.

Nunnally and Bernstein (1994, pp. 239 & 259) are careful to point out that the SEM clusters around the true score and not the observed score (see also Kline, 1986). It is thus not correct to say that there is a 95% chance that someone with a score (on the scale mentioned in the previous paragraph) of 35 would have a true score that falls between 29 and 41 (cf. Bloom et al., 1995, p. 44). Clearly the range of 34-46 is not equivalent to the range of 29-41.

Nevertheless, this technical correctness aside, the SEM offers a number of advantages to the scale developer and practitioner (Bloom et al., 1995):

- The SEM can be used to convert a clinical cut-off score to a cut-off range, giving a more realistic confidence interval that takes into consideration the limitations of the measure.
The SEM can be used to evaluate how great a difference is required in an individual client’s scale scores to have confidence that the score change reflects real change.

Scale developers thus look for low levels of SEM. According to Faul (1995), however:

The major disadvantage of the SEM is that there are no clear criteria for judging what is a small or large SEM. Hudson ... adopted a rule of thumb stating that the SEM should be approximately five per cent (or less) of the range of possible scores when scored over a range from 0 to 100. (p. 73)

The SEM carries a great deal of weight in determining whether or not a scale is reliable – a scale may have moderate or even low levels of reliability (alpha) but if the SEM is also very low, the scale can be said to be reliable (Pike & Hudson, 1998).

The alpha coefficient is a standardised score and thus comparisons of the score can be made across tests. The SEM, however, is dependent on the possible range of scores of the scale. For this reason, the SEM cannot be used as is to make comparisons across scales. SEM can be standardised, however, by dividing it by the score range and multiplying by 100 to create a percentage (Bloom et al., 1995, p. 44; Fischer & Corcoran, 1994a, p. 15). Obviously, if Hudson’s Universal Scoring Formula is used, the scale range will already be 0 to 100 and this conversion is obviated.

Nevertheless, most authors agree that alpha is most useful for comparing the reliabilities of scales, while the SEM is most useful for interpreting the scores of individuals (Anastasi, 1982).

3.6.3.1.3 Reliability Standards

As mentioned previously, reliability coefficients can range from 0.0 (no reliability, maximum error) to 1.0 (complete reliability, zero error). No scales score exactly 0.0 or 1.0 and it is therefore necessary to determine how high reliability needs to be to be ‘high enough’.

Most authors agree that the standards of reliability required for basic research (which makes use of large samples and group comparisons) are significantly lower than the standards required for high-stakes testing and individual application (Hudson, 1982; Nunnally & Bernstein, 1994; Nurius & Hudson, 1993). In general, group based research can accommodate reliability coefficients around .60 to .80. The use of large samples averages out errors of measurement (Hudson, 1982) making lower levels of reliability of little consequence.

When scales are being used for individuals (such as in clinical work) or in high-stakes situations (such as pre-employment testing, promotions, etc) high levels of reliability are required. In the past .80 was considered adequate, but there is general consensus these days that such levels should be at least .90 and even higher – in the mid .90’s (Cronbach, 1990; De Vellis, 1991; Faul, 1995; Nugent et al., n.d.; Nunnally & Bernstein, 1994).

There are some authors, however, who argue that such high levels of reliability are antithetical to validity, since very high levels of reliability require very narrow definitions of constructs. When
constructs are broad, one cannot expect such high levels of reliability without compromising construct validity. An example should serve to clarify this concern (Kline, 1986):

Typically extraversion ... is held to embrace sociability, talkativeness, cheerfulness, confidence and interest in the outer rather than the inner world, *inter alia*. An extraversion scale which includes all these variables will be homogeneous because they do in fact cluster together. However, inevitably, it will be less homogeneous and therefore of lower reliability than a scale concentrating on the sociability component of the factor. However, the latter would indubitably be less valid as a test of extraversion. (p. 120)

This concern is termed the “attenuation paradox” by some authors (Clark & Watson, 1998, p. 232), who state, “Simply put, the paradox is that increasing the internal consistency of a test beyond a certain point will not enhance its construct validity and, in fact, may occur at the expense of validity”. High internal consistency implies a high degree of intercorrelation among items. To achieve this quality, there is a danger of excessive redundancy among the items, in which each item adds little or no incremental information about the construct. Ultimately, an instrument can be developed that appears to have good measurement properties, but which in fact measures only a fragment of the construct it is supposed to measure.

There are also some criticisms against high reliability coefficients from those researchers who develop criterion-referenced scales (not to be confused with the criterion-referenced scaling discussed in the previous chapter). The items for criterion-referenced scales are developed in relation to a well-defined, external criterion (such as group membership or mastery of one or other skill) (Berk, 1980). Such scales may have very low levels of reliability (Anastasi, 1982), but are considered highly valid in terms of the external criteria. Criterion-referenced scale development is, however, beyond the scope of this thesis and is not standard practice in ecometrics.

Notwithstanding these concerns, reliability (specifically internal consistency) coefficients in ecometrics should be above .80 and preferably above .90. Test-retest reliability, if conducted, should be .70 or above (Kline, 1986, p. 3). The need to aim for high levels of reliability is supported by three additional points:

- **Reliability is sample dependent.** Thus, a reliability coefficient found during validation may not be equaled in subsequent testing. It is thus advantageous to require a slightly higher level of reliability than is necessary, to accommodate for these decreases (De Vellis, 1991).

- **According to Hudson (1982):**

  The upper limit of the validity of any scale is established as the square root of its reliability. Very few scales ever have validity coefficients that approach this upper limit, but the importance of the relationship is clear. The validity of any scale is determined, in part, or limited by its reliability. ... In short, it is important to protect the ... validity of ... scales ... by protecting their reliabilities. (pp. 87-88)

- **High reliabilities suggest high homogeneity of content.** When the reliability is greater than .90, it is suggested that the scale is unidimensional (Hudson, 1982, p. 85), though not necessarily comprising only one factor (Nunnally & Bernstein, 1994, p. 228). Nevertheless, since the
homogenous unidimensional scales are necessary for meaningful interpretation of scale scores, high reliability is essential.

In the end, it is necessary to achieve the best levels of reliability possible, without compromising the validity of the scale (Faul, 1995) – this is the art of scale development.

### 3.6.3.2 An Introduction to Validity

Validity is the most important aspect of scale development (Bloom et al., 1995; Nunnally & Bernstein, 1994; Ward, Stoker, & Murray-Ward, 1996). As Schoenfeldt (1984, p. 61) has noted, validity is where the rubber of scale development meets the road. A scale may be extremely reliable with an alpha coefficient of .99, but if it is not valid, it is worthless (Nurius & Hudson, 1993). It is of concern, however, that many papers publishing new scales, while providing ample evidence of reliability, do not provide evidence of validity. It is thus of great importance that ecometric scales demonstrate good to excellent levels of validity before they may be used in practice.

This introduction will provide background information regarding validity, specifically, what is validity, what are the various kinds of validity and what are acceptable standards for validity.

#### 3.6.3.2.1 Introduction

Whereas reliability had to do with the internal functioning of a scale, validity has to do with the inferences made on the basis of scale results – that is, validity is more about the meaning or use of the scale, than with the scale itself (Messick, 1989; Messick, 1998; Nunnally & Bernstein, 1994). Validity has gone through a number of significant developments during this century, such that its meaning has in fact shifted somewhat (Rogers, 1995). The following general definitions of validity can be presented:

Two of the most important types of problems in measurement are those connected with the determination of what a test measures, and of how consistently it measures. The first should be called the problem of validity, the second, the problem of reliability. ... Members are urged to devise and publish means of determining the relation between the scores made in a test and other measures of the same ability: in other words, to try and solve the problem of determining the validity of a test. (Published by the Standardization Committee of the National Association of Directors of Educational Research in 1921 and cited in Rogers, 1995, p. 246 – Rogers' emphasis removed)

Validity is the degree to which inferences from scores on tests or other assessments are supported or justified on the basis of actual evidence. ... Thus, validation determines the degree of relatedness between inferences made and actual events. (Schoenfeldt, 1984, p. 62)

Validation is inquiry into the soundness of the interpretations proposed for scores from a test. (Cronbach, 1990, p. 145)

A valid measuring instrument has been described as doing what it is intended to do, as measuring what it is supposed to measure, and as yielding scores whose differences reflect
Based on these definitions, one can summarize by stating that validity entails ensuring that a scale, designed to measure a certain construct, does in fact measure that construct (and not some other construct). Although validity, as a whole, is a unitary concept, it is measured in multiple ways—these measures, in combination, are used to demonstrate validity, and one should thus talk about ‘validities’ rather than ‘validity’ (Ward et al., 1996, p. 126). Messick (1989, p. 14) says that “validity is a unified though facetted concept,” to which Cronbach (1990) adds that because it is multifaceted, multiple evidence is needed for its demonstration.

There are several methods for determining validity and, according to Foster and Cone (1995), “several judgements can be made based on test scores”:

- Whether the test looks appropriate for a particular use (face validity);
- Whether the test is made up of stimuli calling for construct-relevant responses (content validity);
- Whether responses to the test stimuli relate to other types of responses, either concurrently available or to be available sometime in the future (criterion-related validity);
- Whether relationships entered into by scores on the test are consistent with theory (construct validity); and
- Whether predictions based on test scores add incremental value in decision making [intervention or treatment validity]. (p. 248)

Validity, because it is defined by the use to which a scale is put, is situation or use specific. “The same test may be used for several different purposes, and its validity may be high for one, moderate for another, and low for a third” (Cureton, 1951/1996, p. 133). For example, a scale measuring couple functioning may be valid to determine whether couples need therapy, but not valid to determine whether couples are at risk of divorce. When scale developers do not produce evidence regarding the utilization of their scale, that is, when they do not provide evidence about the validity of their scale, their scales in fact have no documented valid use (Nunnally & Bernstein, 1994).

Because of these points, validity is considered to be “a matter of degree, rather than an all-or-none property” (Nunnally & Bernstein, 1994, p. 84; also Ward et al., 1996). Validation is thus an ongoing process and not a once-only event. Each time a scale is used for a new purpose or in a new situation (even within the same population) it must be revalidated.

There is, in fact, no way to ‘prove’ validity as such. Unlike reliability, there is no one validity coefficient that states the validity of a scale. Scale developers and evaluators need to continually collect circumstantial evidence about the validity of a scale. If these data are positive, the scale user can gradually gain confidence in the validity of the scale. Over time, with repeated testing
and exploration, a portfolio of evidence is accumulated which indicates that there is a greater likelihood that the scale does, in fact, measure what it is intended to measure (Nunnally & Bernstein, 1994).

Many social workers may find themselves becoming confused between what is reliability and what is validity. In fact, these terms were used somewhat interchangeably in the past and there is a degree of overlap or intersection between the two concepts. An example may assist in clarifying these concepts (Bloom et al., 1995):

The reliability of a measure indicates only whether something is being measured consistently, but that ‘something’ may or may not be the variable we’re trying to measure. The validity of a measure indicates whether and how well it measures what is intended. For example, consider ... the question ‘Has a nurse or social worker or teacher ever said that any child of yours wasn’t being given enough to eat?’ Even if the correct answer for a client is yes, the client might be very consistent (ie reliable) in answering no to this question on different occasions, or no to a series of similar questions designed to measure neglect. What you’re measuring would be measured reliably or consistently (the unwillingness to admit to neglect when it occurs), but you wouldn’t be measuring what you intended (child neglect). (p. 45)

Part of the confusion between reliability and validity may arise because both are primarily based (in statistical terms) on correlations. In the case of reliability, however, the correlations are between the items within a scale, which indicates that the scale is internally consistent, suggesting that each item measures the same thing. Validity, on the other hand, uses correlations between the scale (and/or its items) and other measures of the same construct, which indicates that both measures are tapping into the same construct.

Reliability (or rather the square root of the reliability coefficient) does, however, set the upper limit of validity (Hudson, 1982, p. 93; Lemke & Wiersma, 1976, p. 121). Rogers (1995) explains further:

Reliability, as estimated by the test/retest method, reflects the amount of error-free variance in a test score. Certainly, the error in a score could not enter meaningfully into a validity coefficient. This suggested that a test could never be more valid than it was reliable. That is, reliability sets an upper limit on the validity. If validity coefficients exceed reliability estimates, something is clearly wrong. (p. 254)

3.6.3.2.2 Methods for Estimating Validity

There are three main categories of methods for estimating reliability (the third of which comprises two submethods), viz content validity, construct validity and criterion-related validity (comprising concurrent validity and predictive validity) (Ekstrom, Elmore, & Schefer, 1997; Rogers, 1995). These three are termed the “holy trinity” or “trinitarian” view of validity (Ward et al., 1996, p. 127). Many authors claim that construct validity is the most important form of validity (Irvine & Carroll, 1980; Triandis, 1980) and that the other forms of validity are subcomponents of construct validity (Haynes et al., 1995; Messick, 1989; 1998). Others (eg Nunnally & Bernstein, 1994) suggest that each of the forms of validity is unique and distinct from the other, despite overlap.
Figure 19 (prompted by a figure in Rogers, 1995, p. 747) illustrates the main forms of validity that should be of concern to social workers. Each of these forms of validity will be discussed at a theoretical and conceptual level. Those forms of validity that will be carried out in the scale development process will constitute the research steps described thereafter in technical detail.

**FIGURE 19: METHODS OF ESTIMATING VALIDITY**

<table>
<thead>
<tr>
<th>Validity</th>
<th>Content Validity</th>
<th>Construct Validity</th>
<th>Criterion-Related Validity</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Including Face Validity</td>
<td>Convergent Validity</td>
<td>Predictive Validity</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Divergent Validity</td>
<td>Concurrent Validity</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Factorial Validity</td>
<td>Concurrent Instrument Validity</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>External Criterion Validity</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Known Groups Validity</td>
</tr>
</tbody>
</table>

(Adapted from Rogers, 1995, p. 747)

**Content Validity.** Content validity was discussed in an earlier stage (see Step 12), and will thus not be discussed in any depth here. It is, however, worth recapitulating the main notions of content validity in the present context of validity as a whole.

"Content validity is the degree to which elements of an assessment instrument are relevant to and representative of the targeted construct for a particular assessment purpose" (Haynes et al., 1995, p. 238, emphasis added). Based on domain sampling theory, the content of a scale is said to valid when it has been randomly sampled from the universe or domain of items that could be used to measure a construct. Items demonstrate content validity when they measure the construct in question and not another construct (relevance) and when the items as a group adequately represent all aspects of the construct (representivity).

Content validity tends to be underused and underreported, has been called the “step-child” of validity (Schoenfeldt, 1984, p. 64) and is regarded by some as not even qualifying to be called validity (Messick, 1989). Perhaps a key reason for this is that content validity cannot be established with the use of statistics (Nunnally & Bernstein, 1994). Rather, it is based on methodology, judgement and consensus (Kline, 1986), and is thus sometimes referred to as "logical content validity" (eg Corcoran, 1995). Indeed, if content validity has not already been established by this stage it is too late – content validity is enhanced and must be ensured during
the analysis, design and development phases, well before the evaluation phase (Messick, 1989; Nunnally & Bernstein, 1994).

**Face Validity.** Face validity is considered by many authors to be a component of content validity (Haynes et al., 1995), although Faul (1995) presents it separately from content validity. "A test is face-valid if it looks valid – particularly if it looks valid to laymen" (Cureton, 1951/1996, p. 176). If someone looks at the items in a scale and concludes that the items obviously or clearly measure what the scale is purported to measure, the scale can be said to be face valid. This does not, however, mean that the scale has content validity (Bostwick & Kyte, 1985).

The main value of face validity is the message that it conveys to the general public or to those who will complete the scale. The willingness of people to complete a scale will probably be higher if the questions are perceived to be relevant to the respondent (Bloom et al., 1995; Kline, 1986). In general, then (Cureton, 1951/1996):

> So long as we realize that face validity is not logical relevance [ie content validity], no harm need result from attempts to make tests face-valid to increase their public acceptability, provided this does not result in weakening their logical or empirical relevances [ie their content validity]. (p. 176)

Notwithstanding these words, Bloom and colleagues point out that in some cases the scale developer may want the scale to not have face validity. For example, a scale designed to measure alcohol or drug use may be called a “Health Practices Questionnaire” in order to reduce the chances that the respondents will distort their responses (Bloom et al., 1995, p. 46). The MMPI, for instance, includes a subscale (the MacAndrew Addicition Scale) that measures alcohol abuse, but does not contain a single item referring to substance use (Butcher, 1999) – all items referring to alcohol were omitted to deliberately reduce the scale’s face validity.

However, face validity under most circumstances does little or nothing to enhance the validity of a scale, and Hudson’s perspective on the matter is probably the most appropriate one (1982):

> Face validity is without doubt the weakest form of validity. It ... is so weak that it may be wise to adopt a policy of granting any measurement device an acknowledgement of face validity and thereby dispensing of the entire matter. By doing so, nothing is gained or lost and one can then get on with the task of looking at the forms of validity that matter. (p. 94)

**Construct Validity.** Construct validity emerged in the field of psychometrics quite suddenly in the mid-1950s and heralded a major shift in scale construction. At that time, construct validity was described as follows (published in the APA Technical Recommendations for Psychological Tests and Diagnostic Aids in 1954, and quoted in Rogers, 1995 – Rogers’ italics removed):

> Construct validity is evaluated by investigating what psychological qualities a test measures, ie by demonstrating that certain explanatory constructs account to some degree for performance on the test. To examine construct validity requires both logical and empirical attacks. Essentially, in studies of construct validity we are validating the theory underlying the test. (p. 460)
This description, which seems quite unremarkable in today’s testing culture, was quite remarkable at the time. Scale development in the 1950s was dominated by operationism and the notion of “measurement without definition” (Rogers, 1995). Scale items were developed en masse and subjected to statistical analysis until items emerged which factored together and/or which correlated with external criteria. No theoretical foundation was required for new scales to be developed (Reckase, 1996). Construct validity readmitted theory into the field of scale development, and within a few years had become the sine qua non of validation (Rogers, 1995).

Previously, criterion-related validity had been the primary form of validity (Schoenfeldt, 1984). In this approach to validity, the scale is correlated with an external criteria – for example, an IQ test is correlated with teacher’s ratings of student ability. When there is a high correlation, the test is said to be valid. Construct validity shifts the emphasis from correlating a scale with a criterion, to correlating a scale with theory (Rogers, 1995):

The fundamental tenet of construct validity is that a test is valid in proportion to the extent to which the measure is an effective definition of an explicit theoretical statement about what the test is intended to measure. The term construct refers to a theoretical term. Thus, the construct underlying a test of depression is the theory of depression from which the test was derived and which the test scores are thought to reflect. A test, then, has construct validity to the extent it is an effective measure of the theoretical entity. (p. 462)

Since a construct is a theoretical entity, something that we believe to exist but cannot directly observe or measure, construct validity is inextricably linked with theory. A scale must therefore, be thoroughly grounded in a theoretical framework, even when the scale is designed to measure a very specific and apparently obvious construct (Clark & Watson, 1998). This theoretical framework is sometimes termed a “nomological network” (Butcher & Han, 1996; Cronbach & Meehl, 1955/1996).

Construct validity thus involves the formulation and testing of theoretically grounded hypotheses about how the construct being measured is expected to perform (Kline, 1986). Typically, a series of hypotheses is formulated, rather than a single hypothesis, and validity is assessed by comparing multiple results (ibid.).

Construct validity is essential for the clinical utility of a scale (Clark & Watson, 1998). A scale to measure depression that is developed within a cognitive-behavioural paradigm will have items quite different to a depression scale developed within a psychoanalytic paradigm. Both scales presumably measure the same construct, but each has a different theoretical base. Scales that fit with the “intuitive theoretical networks” of a practitioner will be of much greater value and utility than scales which are theoryless (Rogers, 1995, p. 475).

There are three principle methods for estimating construct validity:

- Convergent validity
- Discriminant validity
Factorial validity

Each of these will now be discussed.

**Convergent Validity.** The principle underlying convergent validity is that if a scale is designed to measure a certain construct, it should correlate highly with other measures of the same construct, that is, the measures should converge. For example, a scale designed to measure the construct of depression by self-reporting should correlate highly with a depression behavioural rating scale to be completed by the client’s spouse, since both are designed to measure the same construct. In other words, if both measures correlate with the same construct, they should also correlate with each other.

Convergent validity can largely be confirmed when one’s new scale correlates with another measure of the same construct. It is preferable that the other measure should use a different method of measurement from the new scale – e.g. behavioural observation (Campbell & Fiske, 1959/1996). If two scales measuring the same construct and using the same method of measurement correlate, the correlation could, in part, be due to the similar method, rather than due to their both measuring the same underlying construct (Bloom et al., 1995).

The most important aspect of this correlation, however, is that it should be theoretically predicted before being tested – that is, there should be theoretical grounds to anticipate a correlation (Bloom et al., 1995). Based on theory, one may also be able to predict that a certain scale will correlate with a scale measuring another construct. Even though the two scales do not measure the same construct, one can theoretically predict that there should be a relationship between the two constructs. For example, one may expect a correlation between two scales measuring suicidal ideation and self-esteem, since these two constructs, while clearly distinct, can be theoretically linked. One should also, on the basis of theory, be able to predict the relative size or strength of the correlation. For example, we could predict that suicidal ideation should correlate with both depression and self-esteem, but more strongly with depression.

**Discriminant Validity.** This brings us to the method of discriminant validity, which is the converse of convergent validity. Convergent validity predicts, on the basis of theory, what constructs should correlate with the scale. Discriminant validity predicts, on the basis of theory, what constructs should not correlate with the scale (Bloom et al., 1995). For example, self-esteem should not correlate with musical ability, since they cannot be theoretically linked. It will be remembered from the earlier discussion on defining the constructs to be measured (step 6) that divergent definitions were an important part of the process of defining the constructs. These definitions come into play here.

When a new scale correlates highly with another scale that it should not be correlated with, the new scale is invalidated (Campbell & Fiske, 1959/1996):

> When a dimension of personality is hypothesized, when a construct is proposed, the proponent invariably has in mind distinctions between the new dimension and other
constructs already in use. One cannot define without implying distinctions, and the verification of these distinctions is an important part of the validation process. (p. 229)

Campbell and Fiske (1959/1996) developed an early method or model of establishing convergent and discriminant validity called the multitrait/multimethod matrix. The introduction to their article makes four important points (Campbell & Fiske, 1959/1996, p. 226), the first three of which are paraphrased by Nunnally and Bernstein (1994, pp. 92-93):

1. Validation is typically **convergent** because it is concerned with demonstrating that two independent methods of inferring an attribute lead to similar ends. This often involves correlating a new measure with an existing measure...

2. In order to justify novel measures of attributes, a measure should have **divergent** validity in the sense of measuring something different from existing methods. Measures of different attributes should therefore not correlate to an extremely high degree.

3. A measure is jointly defined by a **method** and attribute-related **content**. Two measures may differ in method, content, or both.

4. In order to examine discriminant validity, and in order to estimate the relative contributions of trait and method variance, **more than one trait** as well as **more than one method** must be employed in the validation process. In many instances it will be convenient to achieve this through a multitrait-multimethod matrix. Such a matrix presents all of the intercorrelations resulting when each of several traits is measured by each of several methods.

While the multitrait-multimethod matrix may be difficult to implement, it serves as a thorough conceptual grounding for the notions of convergent and discriminant validity.

**Factor Analysis.** The third method of collecting evidence contributing to construct validity is factor analysis, a method which has become the mainstay of construct validation for many scale developers, particularly in the cross-cultural arena (Floyd & Widaman, 1995; Moreland, 1996). In fact, about a third of all papers published on test construction or scale development in psychology make use of factor analysis to validate the scale (Clark & Watson, 1998, p. 226). Factor analysis is also widely used in the development of scales (Chen, 1997; Kline, 1986; Tacq, 1997).

Factor analysis “is a means for finding a set of dimensions which account for the relationship among the variables under study” (Brislin et al., 1973, p. 259). Simply put, factor analysis involves taking a set of items and, using largely mathematical procedures, putting them together in such a way that each cluster of items measures a different construct. Each item will correlate more highly with the other items within its cluster than with the items in other clusters (Faul, 1995; Siegert & Chung, 1995). This is a way of simplifying data, or reducing a large number of items to a smaller number of constructs (Hair, Anderson, Tatham, & Black, 1998; Kim & Mueller, 1994; Kline, 1994).

This construct is called a factor. These factors have no real existence, but are mathematical entities that ‘explain’ the relationships between items. The term factor is regarded as equivalent
to ‘latent variable’ in much of the literature (Field, 2000; Pohlmann, n.d.), and factor analysis can be considered a “technique of latent structure analysis” (Tacq, 1997, p. 266). “Essentially a factor is a dimension or construct which is a condensed statement of the relationships between a set of variables [or items]. ... a factor is a construct operationally defined by its factor loadings” (Kline, 1994, p. 5). In effect, a factor is a construct that has been created mathematically. The factor has no intrinsic meaning, and must be defined after being created, based on the content of the items or on the relationship between the factor and some external criteria (ibid.).

The link between factor analysis and construct validity can be clearly seen in a statement by Brislin et al. (1973):

The interpretation of a factor loading is the same as for a correlation, except that the latter is a measure of a relationship between two observed variables while the former reflects the relationship between an observed variable and a mathematical composite of variables. (p. 263)

Construct validity, it will be remembered, involves correlating items with a theoretical construct, rather than with an external criterion as in criterion-related validity. Factor analysis, similarly, involves correlating items with a mathematical construct called a factor.

The important question is whether a factor qualifies as a theoretical construct. This question is particularly salient given the fact that construct validity (and all validity for that matter) involves ensuring the link between theories and measures. The answer to this question appears to be yes or no, depending on the method of factor analysis used; exploratory factor analysis makes little or no use of theory, while confirmatory factor analysis is driven by theory.

These two methods need some clarification:

- **Exploratory Factor Analysis.** Exploratory factor analysis, like exploratory research in general, starts with no preconceptions about the relationships between a set of items. It is a method that seeks to discover what constructs underlie a set of items through mathematical exploration (Kline, 1994):

  In general in exploratory analysis the rule is to put in as many variables as possible and see what loads on the relevant factor. If our interest is in achievement at school we simply look for all the variables which load on the same factor as the achievement measures. If our interest were more specific, say science performance, then we would look for a factor specific to that and see what variables loaded on it. (p. 9)

- “An exploratory analysis defines factors in the purely mathematical terms of best fit, typically ‘most variance accounted for,’ and eventually leads to factors which the investigator then interprets. It tends to be stepwise (data-driven) rather than direct (theory-driven)” (Nunnally & Bernstein, 1994, p. 450). This last sentence sums up the principle of exploratory factor analysis, answering the above question clearly – A factor is not a theoretical construct, but a mathematical one and theory is used afterwards to ‘explain’ what the factor measures (Johnson & Wichern, 2002). This explanation may be of dubious value and it is possible to...
‘explain’ most anything from such factor analysis (Brislin et al., 1973; Nunnally & Bernstein, 1994). For this reason, exploratory factor analysis has little value in construct validation (Schoenfeldt, 1984). However, exploratory factor analysis is probably the most widely used form of factor analysis in the social sciences (Kim & Mueller, 1994, p. 3).

- **Confirmatory Factor Analysis.** A few quotations should clarify the meaning of confirmatory factor analysis:

  We have thus far let one of several mathematical definitions of ‘best’ dictate the organization of linear combinations and then interpreted the content of the resulting factors. We will now essentially reverse the procedure by beginning with some form of theory that at least partially dictates the content of the factors and see how well that theory fits the data. (Nunnally & Bernstein, 1994, p. 542)

  Originally factor analysis was simply an exploratory statistical method. Recently however it has become possible to test hypotheses using factor analysis, a method developed by Joreskog (1973) and called confirmatory factor analysis. In this method, based upon previous studies or relevant theory, factor loadings for the variables are hypothesized. Confirmatory factor analysis then proceeds to fit these loadings in the target matrix, as it is called, as closely as possible. How good the fit is can also be measured. Since the scientific method, as it is generally conceived, eg by Popper (1959), involves testing hypotheses confirmatory analysis has become acceptable to psychologists who were previously resistant to exploratory methods. (Kline, 1994, p. 10)

  So, to answer the previous question, confirmatory factor analysis, like exploratory factor analysis, also produces mathematical constructs, but because these factors were predicted (or constructed) on the basis of theory, they are also theoretical constructs. Confirmatory factor analysis essentially explores the fit between theoretical and mathematical definitions of the same constructs (Kim & Mueller, 1994).

In short, then, exploratory factor analysis, while commonly used in psychometric scale development, does not meet the requirement of ecometric scale development for scales to be well grounded in theory. Confirmatory factor analysis, however, does meet these requirements and justly deserves to be a method for establishing construct validity (Schoenfeldt, 1984). Unfortunately, confirmatory factor analysis is highly sophisticated and requires specialised software that is not typically incorporated into standard statistics packages (Diseth, 2001; Long, 1994).

Hudson (1982) recommends the use of a form of confirmatory factor analysis for scale development called Multiple Group Confirmatory Analysis (MGCA):

The major task of investigating this kind of factorial validity consists of finding some way to test the hypotheses that items correlate well with the variables (constructs, factors) they are supposed to correlate with and that they correlate poorly with the constructs they are not supposed to correlate with. The multiple group method of factor analysis (Thurstone, 1947; Overall and Klett, 1972; Nunnally, 1978) is almost ideally suited for this task. The multiple group method is a type of an a priori, confirmatory, or hypothesis-testing factor analysis that is designed to show whether some well-specified hypothesis matrix will do a good job of accounting for the pattern of correlations among a specific set of variables that are supposed to represent a specific set of well-defined factors. (p. 108)
Hudson (1982) describes a somewhat different procedure to be used in MGCA than Nunnally and Bernstein (1994) and Tacq (1997). Nunnally and Bernstein’s method makes clear use of factor loadings that will be familiar to researchers experienced in factor analysis. Hudson, however, argues that his own method, which makes use of Pearson’s product-moment correlations, is mathematically identical to Nunnally and Bernstein’s method, but obviates the needs for complex factorial mathematics. The interested reader is referred to Nunnally and Bernstein’s treatment of the MGCA.

Hudson’s description (1982) is reported here:

If \( R \) denotes the matrix of correlations among all the items for two or more scales (with units on the main diagonal), and \( H \) denotes an hypothesis matrix that specifies all the explicit hypotheses concerning which items load on which factors, then the factor loadings that are needed to confirm or deny those hypotheses can be obtained as

\[
S = RHD^{\frac{1}{2}}
\]

where \( D \) is the diagonal of \( H'RH \) and

\[
\phi = D^{\frac{1}{2}}H'RHD^{\frac{1}{2}}
\]

contains the correlations among the factors. The great advantage of this method arises from the fact that the above results can be obtained by computing nothing more than simple Pearson product moment correlations. In order to compute the factor loading matrix, \( S \), all that is needed is to compute a total score for each scale involved in the analysis and to then correlate every scale item with each of those total scores. The matrix, \( \phi \), is obtained by correlating all of the total scores with each other. This procedure is direct; it is powerful as an hypothesis-testing procedure; it requires no rotation; it produces an oblique solution; and it is simple to use. (p. 109)

**Criterion-related Validity.** Although discussed last, criterion-related validity was historically the first form of validity to be used and dominated the field of scale validation for the first half of the twentieth century (Schoenfeldt, 1984). The other forms were all developed subsequently – content validity in the 1930’s and construct validity in 1954 (Rogers, 1995). Perhaps it is because criterion-related validity is the oldest, and hence the least well developed, that it is discussed last. Content validity and construct validity are both very closely linked with theoretical constructs. Criterion-related validity, in contrast, makes relatively little use of theory and is primarily driven by pragmatism, even ‘blind empiricism’ (Schoenfeldt, 1984, p. 81; see also Reckase, 1996). Notwithstanding these initial comments, criterion-related validity was used to form the basis of intelligence testing.

Whereas construct validity concerns the relationship or correlation between a scale item and a theoretical (or mathematical) construct, criterion-related validity concerns the relationship or
correlation between a scale item and some external criterion (Harrick, Schaefer, Pynes, & Daugherty, 1993; Owen, 1989). For example, if we develop a scale that measures couple functioning, we may select the number of positive interactions observed during a specified period as the external criterion. Presumably, if the scale indicates that the couple is functioning well we will observe a large number of positive interactions; that is, there should be a correlation between test score and number of positive interactions.

One of the reasons for developing scales is to substitute for more complex, expensive or time consuming methods of assessment. For example, if an organization wants to screen the psychosocial functioning of all its prospective employees to determine whether applicants should be employed, it could employ a team of social workers to conduct in-depth psychosocial assessment interviews. This is, of course, a very expensive and unwieldy option. If, however, one could design a scale that will produce a score comparable with the social worker’s clinical assessments, this would be considerably cheaper and faster. In this case, the social worker’s assessments are the criterion in relation to which the scale is validated – hence criterion-related validity (Foster & Cone, 1995).

In the light of this, criterion-related validity can be described as follows (Lemke & Wiersma, 1976):

> In criterion validation, the criterion is a quantified index of performance on some task for which a test-performance substitution is desired. This test-performance substitution is increasingly justified as the test-performance correlation coefficient increases. (p. 112)

Historically and currently, there are two main forms of criterion-related validity, viz concurrent (originally termed “diagnostic”) and predictive (originally termed “prognostic”) (Rogers, 1995, p. 241). The difference between these forms is temporal – concurrent validity refers to the person’s present status, while predictive validity refers to a person’s future status (Bostwick & Kyte, 1985). These two forms of criterion-related validity are discussed below.

**Predictive Validity.** Predictive validity refers to the future performance or functioning of a person, as predicted by the scale results (Rogers, 1995):

> A test had predictive validity in proportion to the extent that it was possible to use the test score to forecast criterion status. This subtype of validity is particularly important if tests are being used to select or place employees within an organization because the concern is with how people will perform in the future. (p. 251)

Predictive validity has enjoyed high status in the field of psychometrics (Kline, 1986), particularly as used by industrial and educational psychologists. Scales are needed which can predict future job performance (for pre-employment screening), likelihood of psychological breakdown (for testing soldiers prior to deploying them into combat), academic performance (for selecting applicants for tertiary education), etc (Huysamen, 1996; Rogers, 1995). Due to the many factors that influence behaviour over time, predictive validity is particularly difficult to demonstrate.
Ecometric scale developers have tended to reject the value of predictive validity for social work. Faul (1995), for example, states:

Predictive validity is of no use in ecometrics, because measurement is not used in social work to make decisions about problems people will have in the future, but to assess the magnitude of the problems within their environment and to use these results as indicators of the help that must be provided.  (p. 89)

In the previous chapter, during the discussion on the differences between ecometrics and psychometrics, it was noted that while psychometric scales measure supposedly stable, enduring and internal phenomena, ecometric scales measure transient and external (or intra-system) phenomena.  Ecometric theory thus does not easily allow social work researchers to make the assumptions required to explore the predictive validity of ecometric scales.

Nevertheless, some social workers, such as occupational social workers, are increasingly taking a place alongside psychology in screening potential and current employees for various reasons. In such instances, scales may well be needed to make a professional recommendation. The SANDF is a good case in point. Military social workers are now being required to assess the psychosocial functioning of all soldiers earmarked for long-term, international deployments. The purpose of the assessment is firstly to predict which soldiers are most likely to develop psychosocial problems during deployments which would impede their ability to perform in combat and which might require them to be sent home (at great expense to the individual and organization). The need to identify those needing social work intervention is only the secondary purpose of the assessment. Clearly, in such instances, a scale is needed which has predictive validity.

In summary, then, ecometric scales may well benefit from predictive validity if and when there is a need for an ecometric scale to predict some future criterion. Nevertheless, predictive validity “has only empirical value, but nothing else that can be of use to the social worker” (Hudson in Faul, 1995, p. 89) and is thus not a central part of scale validation in ecometrics. Predictive validity is thus not required in this model of scale development and is considered to be theoretically questionable in the field of ecometrics.

**Concurrent Validity.**  Whereas predictive validity addresses a criterion at some time in the future, concurrent validity addresses a criterion in the present. “The major gain of tests demonstrating concurrent validity is that they provide inexpensive, simpler, and frequently quick means of determining present status when compared with other nontest methods” (Rogers, 1995, p. 252). There are three principle methods of establishing concurrent validity, which can be termed concurrent instrument validity, external criterion validity and known groups validity:

- **Concurrent Instrument Validity.**  A first method to determine concurrent validity is to correlate the new scale with another instrument that is thought to measure the same construct and which has been validated (Bostwick & Kyte, 1985).

- This method sounds very much like convergent validity, a method of establishing construct validity, and indeed, at a technical level they are identical. The difference between convergent
validity and concurrent instrument validity lies in the ‘intent’ of the researcher (De Vellis, 1991). If the intent of the researcher is simply to determine whether a scale is able to measure some criterion in an easier, cheaper or more efficient way, it is concurrent instrument (criterion-related) validity. If, however, the intent of the researcher is to test a hypothesis that the measures are theoretically related, this is convergent (construct) validity.

- In light of the previous discussion about the central importance of theory in ecometrics and in the various forms of validity, it may seem that there is little value for criterion-related validity. In practice, however, it is likely that a criterion will be selected on the basis of theoretically grounded expectations. Indeed, in ecometrics there would be no justification in selecting a criterion other than one that is theoretically related to the scale being developed.

- **External Criterion Validity.** This second method is parallel to the first, except that instead of selecting another scale with which to correlate the new scale, some actual performance criterion is selected. This is particularly relevant when the new scale is designed as a test-substitute for some more complex or labour-intensive method of assessment (Bloom et al., 1995). The example mentioned previously of correlating a scale measuring couple functioning with the number of positive interactions between the partners illustrates this method clearly.

- In the early stages of scale development (particularly early intelligence tests), student responses to large batteries of items were correlated with teacher ratings of student ability. On the basis of these results, items were selected which were able to predict the external criterion of teacher ratings. These items then formed the basis of an IQ test. Today, items will be designed which are believed, on the basis of theory, to predict performance, and so this form of validity is now more theory driven than in the past. By doing so, external criterion validity becomes quite similar to the multimethod/sametrait component of Campbell and Fiske’s multimethod/multitrait matrix, which is designed to evaluate convergent (construct) validity (Campbell & Fiske, 1959/1996).

- **Known Groups Validity.** The third and final form of criterion-related validity that will be discussed here is called known groups validity, although others (eg Hudson, 1982) refer to it as “discriminant validity”. This form of validity “is determined to examine whether a measure distinguishes [or discriminates] between groups known to have different amounts of whatever is supposedly measured” (Bloom et al., 1995). If, for example, a scale designed to measure alcoholism yields significantly different scores for a group of alcoholics compared with a group of nonalcoholics, the scale can be said to have known groups validity.

- This form of validity has particular clinical validity, and is often used to distinguish between clinical and nonclinical samples (Smith & McCarthy, 1995). A scale designed to measure some construct of clinical concern (eg depression, suicidality, anxiety, personality disturbance, family violence, etc) should be able to discriminate well between those individuals who have the problem and those who do not. Known groups validity later becomes the tool to establish clinical cut-off points for a clinical scale.
Known groups validity is also important “because a measure that is sensitive to a known-groups contrast also should be sensitive to intervention effects comparable to the difference between the groups” (Bloom et al., 1995, p. 48).

Known groups validity, as with all forms of criterion-related validity, is, however, dependent on the accuracy of the criterion. It is essential that the judgement used to determine group membership is reliable. Often this is a problem (Kline, 1986).

Correlations between individual items and known group can be used during the scale development process – items with high correlations would be retained, while those with low correlations discarded (Matlock-Hetzel, 1997). In effect, items that do not discriminate well between the criterion are discarded, a process which is comparable to discarding items that do not correlate highly with their corrected scale score (Huysamen, 1996). This will create an instrument with stronger known-groups validity at scale level. Huysamen recommends retaining only items the correlate at .30 or above with the criterion (ibid., p. 51).

3.6.3.2.3 Validity Standards

Validity, it has been seen, comprises partly judgements of circumstantial qualitative evidence, and partly correlations between the new scale and various other constructs, measures and criteria. In the case of the former, there are no established quantitative standards. Rather validity can be claimed to the degree to which the researcher has followed the guidelines provided to enhance validity (eg thorough theoretical frameworks, clear definitions of constructs, etc); a framework for these guidelines is included in Appendix A.

In the case of the correlations, a number of coefficients will be generated which, like all coefficients, can range from 0.0 to 1.0, with higher coefficients indicating higher levels of validity. It has been previously noted that the square root of the reliability coefficient sets the upper limit of the validity coefficient. Since the minimum reliability coefficient acceptable in ecometrics was set at .80, the lowest upper limit of validity is .89. In practice, however, validity coefficients seldom reach these levels (Hudson, 1982).

Validity coefficients tend to range between .40 and .60, and Hudson (1982, p. 93) “indicates that any scale with a validity coefficient greater than .50 is among the best 50 percent of all scales in terms of its ability to measure what it is supposed to measure.” Indeed, one paper that produced validity coefficients of .49 and .55 indicates that these “are much higher than those commonly reported in the literature” (Harrick et al., 1993, p. 5).

Hudson (1982, p. 94), Nurius and Hudson (1993, p. 217) and Faul (1995, p. 77), however, set the minimum standard for validity coefficients at .60. “The reason for recommending such a new standard is that our ability to create measurement scales with such validities and our awareness of the hidden dangers of flawed measures have improved considerably over the years” (Nurius & Hudson, 1993, p. 217).
3.6.3.3 Steps Involved in Investigating Reliability & Validity

Having thus described reliability and validity and their various forms from a theoretical and conceptual perspective, we are now ready to describe the various technical steps in ecometric scale development to investigate and establish reliability and validity.

The reader will notice that not all of the procedures for estimating reliability and validity, as described in the preceding pages, are included in the steps that follow:

- Only one form of criterion-related validity (ie known groups validity) is used. This is because:
  - Concurrent instrument validity is, in effect, convergent validity;
  - External criterion validity for our purposes is equivalent to known groups validity (both involve an external criterion); and
  - Predictive validity (as has been discussed) is not considered a standard component of ecometric scale development.

- Face validity has also not been included for the reasons previously discussed.

- Interrater reliability has been omitted because it is less relevant for standardised summated rating scales, unless the interpretation of the scale scores is complex and/or subjective, which is not envisaged to be the case here.

- Temporal stability (test-retest reliability) is also not used, for the reasons previously discussed.

In practice, reliability and validity cannot be established in a neat orderly progression, as sometimes appears to be the case in textbooks. In practice, because reliability and validity overlap and influence each other (as has been discussed), the steps happen in an iterative process. That is, one conducts a set of analyses, omits an item, repeats all the analyses, omits another item and repeats all the analyses, etc until the items and scale perform adequately.

This process, which is already fairly time consuming when working in a monocultural context, becomes exceedingly demanding (though not technically more complex) in a multicultural context. In order to make this procedure more manageable and structured, the steps are presented in chronological sequence rather than in conceptual clusters. The candidate has also created a form (Appendix B) that should assist in creating a framework to contain the many test results.

The chronological sequence has three main moments:

- **Concept-Level Analysis.** Before any statistics can be compiled, it is necessary to ensure that the scale has conceptual validity. This main moment comprises one step, viz:
  - Consolidate evidence supporting content validity.
Item-Level Analysis. Once content validity has been assured, one can proceed to investigate the performance of the scale at item level. This main moment comprises seven steps:

- Conduct item analysis.
- Investigate item cultural bias.
- Compute coefficient alpha.
- Compare reliabilities across cultures.
- Compute standard error of measurement.
- Conduct multiple group confirmatory analysis at item level (ie construct validity at item level).
- Conclude multicultural item-level analysis.

Scale-Level Analysis. Once poorly performing items have been removed from the scale, the scale can be analysed at scale level. This main moment comprises three steps:

- Conduct convergent and discriminant construct validity analysis at scale level.
- Conduct known groups validity analysis.
- Conclude multicultural scale-level analysis.

3.6.4 Main Moment H: Concept-Level Analysis

3.6.4.1 Step 19: Consolidate Evidence Supporting Content Validity

The steps to achieve content validity were conducted during the previous phases of scale development. As stated earlier, if the scale is not already content valid, it is too late, and the researcher is advised to start again.

What is required at this stage, however, is for the researcher to consolidate the circumstantial evidence in support of content validity. This does not require any calculations or validity coefficients. Rather, it is a matter of judgement and reporting.

The researcher should document the steps that have been taken to ensure content validity, and having done so, reach a tentative conclusion about whether these steps are adequate to justify confidence in the scale’s content validity. To guide and structure this process, a framework has been slightly adapted from a framework compiled by Haynes et al. (1995, p. 247), and is included in Appendix A. By structuring one’s reporting around this framework, the researcher will be sure to report all the various possible procedures that were followed to ensure content validity.
framework is, however, overinclusive, and not all components must have been followed to substantiate content validity.

### 3.6.5 Main Moment I: Item-Level Analysis

#### 3.6.5.1 Step 20: Conduct Item Analysis

An initial item analysis will provide an initial overview of the performance of the items in the scale and will alert the researcher to any items that perform particularly badly or particularly well. Sophisticated methods and theories of item analysis have been developed, notably Item Response Theory and Differential Item Functioning (Ellis, 1995; Embretson, 1997; Hambleton, 1989; Hambleton & Kanjee, 1995; Millsap & Everson, 1993; Roznowski & Reith, 1999; Van Batenburg & Laros, 2002). These methods are, however, extremely complex, require sophisticated computer programmes and have not, as yet, been adequately tested (Rogers, 1995). They are thus not included in this scale development process.

There are four components of the initial item analysis recommended here, which should be conducted separately for each culture group:

- **Item Variance.** The researcher should print out a list of all items from the statistics programme (eg SPSS) with the variance and mean of each item. Those items with the highest variance are the most valuable, since they discriminate most greatly between individuals (Clark & Watson, 1998; De Vellis, 1991; Kline, 1986). Since the final scale should have high variance, which will increase the scale’s reliability and ability to discriminate between high functioning and low functioning individuals, it is important that the individual items have high variance (Huysamen, 1996).

- Unfortunately, De Vellis (1991) does not provide any indication of what constitutes ‘high variance’. It is thus suggested that the researcher highlight those items that have the lowest variance. Since the Small Item Pool method of multicultural scale development suggests designing 40% more items than envisaged will be used in the final scale, it is here suggested that the lowest scoring 14% of the items (ie half of the extra items) be marked. For example, if the initial scale comprises 42 items that will be cut down to 30 in the final version, highlight the six items with the lowest variance.

- **Item Means.** De Vellis (1991) states:

> A mean close to the center of the range of possible scores is also desirable. ... Generally, items with means too near to an extreme of the response range will have low variances, and those that vary over a narrow range will correlate poorly with other items. (p. 83)

- If, for example, a scale has a five-point response scale (range of 1 to 5), an item with a mean score of 3.1 is better than an item with a mean score of 1.3 (see Clark & Watson, 1998).
Once again, De Vellis does not provide specific guidelines in this regard. The candidate therefore proposes that the 14% of items that have means furthest away from the middle of the scale range be highlighted for possible omission.

- **Item Omissions.** Obtain a frequency distribution printout of each item. Those items with the highest frequency of omission (i.e., missing values) perform the worst and should be highlighted. When an item is omitted by more than 5% of the sample it should be earmarked for omission from the final scale.

- **Item-Total Correlations.** Obtain a printout of the corrected item-total correlations. These are the correlations of each item with the total scale score (having removed the item itself since including it would unduly inflate the correlation) (De Vellis, 1991; Rogers, 1995). Items with the highest item-total correlations perform the best. Highlight those items that have an item-total correlation less than .45 (Faul, 1995, p. 300). If the construct being measured is very broad, there may be grounds to reduce this requirement to about .30 (Dolbier & Steinhardt, 2000) or even .20 (Clark & Watson, 1998, p. 231; Huysamen, 1996, p. 50; Kline, 1986, p. 143), however this may seriously jeopardize the reliability and validity of the scale.

The results of these analyses, for each item in each culture group, should be collated on the form in Appendix B. Those items that have been highlighted in the course of this item analysis should be considered for possible exclusion from the scale since they are not performing as well as the remaining items. At this stage, however, it is not advisable to actually remove these items.

The following information should be documented:

- The scale variance before removal of items and after removal of items (i.e., the initial and the final scale variance).

- The initial and final mean scale scores.

- The initial and final average percentage of missing responses.

- The initial and final percentage of item-total correlations that fall below the standard of .45.

- When, later, items are removed from the scale, based in part on the results of this item analysis, this should be clearly indicated.

### 3.6.5.2 Step 21: Investigate Item Cultural Bias

A method for establishing the equivalence of items across culture groups, that is, for determining the presence or absence of item bias, is presented by Van De Vijver and Leung (1997, pp. 62-68). If a scale is designed for use in a multicultural context, the scale as a whole must, of course, not be biased towards any culture group. Because a scale is made up of multiple items, it is important, from the outset, to ensure that none of the items in the scale is biased. If an item is found to contain bias, it should be highlighted on the form in Appendix B for possible omission.
from the scale. In order to accommodate possible mean differences in total scale scores between
culture groups, the following procedure controls for total scale score by analysing the performance
of each item across individuals in the various culture groups who had the same or similar total
scale scores (ibid.).

This method involves a form of analysis of variance, in which “the item score is the dependent
variable, while culture group ... and score levels are the independent variables” (Van De Vijver &
Leung, 1997, p. 62). It is conceptually related to the Mantel-Haenszel procedure (which is used
for dichotomous rather than interval or ratio level data) (ibid.). It is, unfortunately, a rather
laborious and manual iterative process; fortunately, it can be performed on any basic
computerized statistical programme, meeting one of the requirements of this scale development
process. The procedure for this method involves the following steps:

- The first step is to delete the maximum and minimum scale scores – using Hudson’s universal
  scoring formula, this will entail deleting scores of 0 and 100. Van De Vijver and Leung (1997,
p. 63) explain that this is required “because the responses of all persons would necessarily be
  identical across all culture groups. In these groups bias cannot be studied.”

- The next step is to condense the total scale score into a number of ‘levels’. Ideally, one needs
  at least 50 people per level (Van De Vijver & Leung, 1997, p. 63). The suggested formula for
determining level size is to multiply the number of target culture groups by 50 (thus if there
are three cultures being compared, each level should comprise at least 150 people). To
determine the number of levels needed, therefore, divide the total sample size by this desired
level size and down to the next whole number.

- To create the levels, use the categorisation function available in packages such as SPSS.
  Instruct the programme to categorise the scale scores into the desired number of groups. If
this function is not available, the procedures below can be followed:

  - Do a frequency calculation on the combined data (across cultures) and obtain a printout of
    the cutting points for the number of desired levels. This is a variation of the quartile
    (which would create four equal sized levels).

  - Create a dummy variable called ‘level’ by recoding the total score into the desired number
    of levels.

  - Check that the resultant groups are approximately equal in size and that no items are
    accidentally omitted (be falling between two cutting points).

- Perform an analysis of variance (ANOVA) in which the first item score is the dependent
  variable and the culture group and level are independent variables.
The analysis will produce three scores, of which the second two are important:

- The main effect of the variable 'level' is unimportant and can be ignored (see Van De Vijver & Leung, 1997, p. 65 for an explanation).

- Check if the main effect of 'culture' is significant at $p<.01$.

- Check if the main 2-way interactional effects of 'culture' and 'level' are significant at $p<.01$.

"When both the main effect of 'culture' and the interaction of 'level' and 'culture' are nonsignificant [at $p<.01$], the item is taken to be unbiased" (Van De Vijver & Leung, 1997, p. 66). If, however, either or both of these scores are significant at $p<.01$, the item is biased. Any item that is biased should be highlighted on the form in Appendix B.

This procedure should be repeated for each item. If, after the various investigations described in this phase, one or more items are removed from the scale, these procedures should be repeated, including the establishment of new levels, since the total score will have changed.

The following information should be documented:

- The initial findings of item bias, specifically, the percentage of items found to be culturally biased.

- When items are removed partly on the basis of item cultural bias, this should be clearly indicated.

- The final findings of item bias once poorly performing items have been removed.

### 3.6.5.3 Step 22: Compute Coefficient Alpha

Most computer statistics programmes easily compute the alpha coefficient. The following guidelines apply:

- It is necessary to first reverse score any negatively worded questions. If this is not done, it is possible that a negative alpha statistic will result (Spector, 1994).

- Obtain a printout of the alpha coefficients for each subscale for each culture group separately. It is helpful to request the computer to print both the alpha value and the alpha values were each one of the items removed.

- It becomes clear from the printout which items are performing badly – this can be seen by identifying those items which, if removed, will result in an increase in the alpha coefficient. It is likely that this will confirm the preliminary findings of the step 20 (De Vellis, 1991).
It is important to check which items could be removed to increase the scale’s reliability and to highlight these items. Items that perform badly should not be removed from the scale at this stage. They should, however, be indicated on the form in Appendix B.

The following information should be documented (based on the example of Faul, 1995):

- The initial reliability coefficients (based on all the initial items) and the final reliability coefficients (based on the items finally selected for the scale) for the scale and/or subscales, for each culture group.
- If items are removed partly in an effort to improve the alpha coefficient, this should be clearly indicated.

### 3.6.5.4 Step 23: Compare Reliabilities Across Cultures

Early in the process of conducting this main moment the researcher will have a set of preliminary reliability coefficients for each culture group under consideration, as described in the previous step. Towards the end of the research process a second revised set of reliability coefficients (hopefully higher than the first set) will be produced. The demand for multicultural equivalence requires that the reliabilities be comparable across the different groups. There are two principle ways of determining whether this is, in fact, so, the first of which has the final say regarding the validity of each version of the scale:

- **First Line Reliability: External Standards.** Firstly, the reliability coefficients of each culture group should be measured against the external ecometric standard, viz alpha should be at least .80, but preferably above .90. When the constructs under examination are very broad, reliability coefficients between .80 and .90 are acceptable. When the constructs are quite narrow, reliability coefficients above .90 are required.

- Unless each culture group meets these standards, the scale cannot be said to be reliable for all cultures. The scale will only be reliable for those groups that do meet these standards.

- **Second Line Reliability: Equality of Reliability Coefficients.** The limitation of the above standard is that the reliability coefficients are not actually being compared, and it is thus not truly possible to claim that the scales are equivalent in terms of reliability. To state equivalence of reliability some form of direct comparison is required. Van de Vijver and Leung (1997) present a method for “testing the equality of reliability coefficients in two groups”:

  The statistic to test the equality of two independent reliability coefficients is \( (1-\alpha_1)/(1-\alpha_2) \), in which \( \alpha_1 \) and \( \alpha_2 \) represent the reliabilities (usually Cronbach’s \( \alpha \)) of an instrument in two culture groups. For large samples, the statistic follows an \( F \) distribution with \( N_1-1 \) and \( N_2-1 \) degrees of freedom (\( N_1 \) and \( N_2 \) are the sample sizes).

  As an example, suppose that a test of 10 items has been administered to 250 subjects in each of two culture groups and Cronbach’s \( \alpha \)s were .60 and .80, respectively. The above statistic is equal to \( (1-.60)/(1-.80)=2.00 \), which is larger than the critical \( F \) ratio of 1.28.
To avoid spurious differences, i.e., to reduce the risk of Type II error, a significance level of .01 (two-tailed) should be used for these comparisons.

The use of the PQRS calculator (Knypstra, 1998), which is readily available on the World Wide Web, will simplify the process of determining whether the reliabilities are equivalent (alternatively the tables of critical values of the F distribution found in most statistical texts can be used). The degrees of freedom for the numerator and denominator as well as the resultant F ratio are entered into the calculator, which produces the resultant one-tailed level of significance. Alternatively, the researcher can input the degrees of freedom and the required level of significance (.01, two-tailed), which will result in the maximum permissible F ratio. Alternative to the PQRS calculator, the researcher can use the FDIST function of Excel or Quattro Pro.

This procedure must be followed for each pair of culture groups, forming a matrix of F scores. Thus, if there are four culture groups, there are a total of six pairs and therefore there will be six F scores, all of which must be nonsignificant at $p \geq .01$ (two-tailed). A simpler way to start will be to first compare the highest and lowest reliability coefficients. If the resultant F score is nonsignificant at .01, then all the intermediate F scores will also be nonsignificant, unless there are significant differences in sample size. If, however, the F score is significant, the other pairs of reliabilities must also be investigated.

Based on the results of these two procedures for comparing reliability coefficients, the researcher may choose to delete the items that the poorest performing version indicates will improve the reliability, even if this results in a lowering of the reliability of another version. In other words, the researcher needs to strike a balance between (1) ensuring high reliability coefficients within all culture groups and (2) ensuring similar reliability coefficients across all culture groups. Ultimately, however, both ways of determining equivalence are imperative. The scale must perform adequately within each culture group (first line reliability), and must also be comparable across culture groups (second line reliability).

The following information should be documented:

- The initial and final reliability coefficients for each culture group (first line reliability).
- The initial and final comparisons of reliability coefficients across culture group pairs (second line reliability).
- If items are deleted in part as a result of these comparisons, this should be clearly indicated.
3.6.5.5 Step 24: Compute Standard Error of Measurement

The SEM is calculated by the following formula:

\[ SEM = S_o \sqrt{1 - \alpha} \]

where,

- \( SEM \) = standard error of measurement
- \( S_o \) = standard deviation of the observed scores
- \( \alpha \) = alpha coefficient (or other measure of reliability)

The following steps can be followed to calculate the SEM for each culture group separately:

- When a scale is scored in an unusual way, such as the Heimler Scale of Social Functioning (Heimler, 1990), which makes use of various weightings of items responses, it is important that the standard deviation used is the standard deviation of the scale as scored by the required formula and not by the mere summation of items. This is important because the SEM reflects the amount of error in the measurement and part of the measurement is the score range.

- If there is only one scale score (as in the case of a unidimensional scale), the statistic can be calculated most easily with an ordinary calculator. Type in the number 1, subtract the alpha coefficient for the scale, square root the total and multiply it by the standard deviation of the scale. The answer is the SEM.

- If there are a number of subscales, or if the researcher is experimenting with various SEMs according to which items are removed from the scale, computing the SEM in a spreadsheet is probably more convenient. Enter the alpha coefficients in the first column and the standard deviations in the second. In a third column enter the formula above referring to the two previous cells. In this way, the SEM will be automatically updated as you alter the alpha and standard deviation.

- Standardize the SEMs by dividing them by the score range and multiplying by 100 – present these SEMs as a percentage.

  - The score range is calculated by subtracting the lowest possible value from the highest possible value – thus if the total score can range from 10 to 70, the scale range is 70-10 = 60.
If the scale score was derived using Hudson’s Universal Scoring Formula, it is not necessary to convert SEM to a percentage, since the scale range is already 0-100.

The following information should be documented (based on the example of Faul, 1995):

- Provide the standardised SEMs for both the initial pool of items and the final items selected for the scale for each culture group, as was done with the alpha coefficient.

### 3.6.5.6 Step 25: Conduct Multiple Group Confirmatory Analysis at Item Level

Conduct the MGCA procedure, described by Faul (1995, pp. 86-87), for each culture group separately:

- Calculate the mean corrected item-total correlation for all the items in the scale. This figure can be interpreted as a construct validity coefficient at item level.

- Prepare a correlation matrix where each item of the new scale is correlated with a number of total scale scores. If the new scale comprises a number of subscales, these subscales can serve as total scale scores. If, however, the new scale is unidimensional it must be administered with two or more other scales that will serve as the total scale scores.

- Obtain a printout of the corrected item-total correlations of the new scale (or subscales if the scale is multidimensional). SPSS does this as part of the reliability analysis function. A corrected item-total correlation removes the item-self component of the item-total correlation. It is important to remove all item-self correlations because they inflate the estimate of validity (Faul, 1995).

- Plot the scale (or subscale) into a matrix with the items down the left side and the various scales across the top, starting with the scale or subscale of which the items are a part. The corrected item-total correlations calculated in the previous paragraph thus run down the first column, while the item-scale correlations calculated in the first step run down the remaining columns. (This table is equivalent to a factor matrix or pattern matrix that is produced in exploratory factor analysis.)

- “Test each item for factorial/construct validity by comparing the item-total correlation with the other scale total correlations” (Faul, 1995, p. 86). Items may be earmarked for removal on the basis of two criteria:
  - First, if an item correlates more highly with one of the other scales than with its own total, it is likely that the item is not measuring the construct being measured by the scale (Faul, 1995, p. 299). Such items should be considered for discarding and should be marked on the form in Appendix B. They should not be moved to the scale with which they correlate most highly, since such “interpretations after the fact” which are motivated purely by mathematics can severely compromise the construct validity of the scale (ibid.). Although
in some scales items load on more than one construct, this practice is not recommended by many developers (Comrey, 1988; Faul, 1995).

- Second, if an item did not correlate adequately with its corrected total it may not be sufficient to measure the construct or may be part of another related but distinct construct. Corrected item-total correlations under about 0.45 should be considered for discarding if the construct is very specific. If the construct being measured is very broad, there may be grounds to reduce this requirement to about .20 (Clark & Watson, 1998, p. 231). (These findings do not need to be recorded on the form in Appendix B, since this was already done in step 20.)

- Borderline cases (eg when the item-total correlation is .50 and one of the item-scale correlations is .51) should be evaluated in light of theory. The item should be critically evaluated and the reason for the discrepancy assessed. The researcher needs to make a critical and overt decision about whether to retain or discard such items.

- Once poorly performing items have been removed, the MGCA matrix for each culture group should be recalculated and the mean corrected item-total correlation calculated to get a coefficient of construct validity at item level. This coefficient should be .60 or above. The mean item-total correlations (with other scales) should also be calculated and these should all be lower than the coefficient of construct validity.

- Compare the equivalence of the validity coefficients using the procedure described in step 23.

The following information should be documented (based on the example set by Faul, 1995):

- The initial and final MGCA factor matrixes for each culture group.

- A table for each culture group summarising the results of the item-analysis performed in the MGCA, containing the initial and final percentage of items that failed to meet the two criteria set earlier (ie to correlate more highly with their own corrected scale total than with other scales and to have a correlation above 0.45).

- A table summarising the initial and final mean item-total correlations for each culture containing:
  - The mean corrected item-total correlations of items with their own scales (which should all be above .60).
  - The mean item-total correlations of items with the other scales (which should all be below .60 and/or lower than the mean corrected item-total correlations).

- Report the equivalence of the corrected item-total correlations, which are item-level construct validity coefficients.
If items are removed from the scale, in part on the basis of the MGCA, this should be clearly indicated.

3.6.5.7 **Step 26: Conclude Multicultural Item-Level Analysis**

Once all of the previous steps in this main moment have been completed, the researcher is ready to eliminate poorly performing items. This involves the following iterative process:

- Complete the form in Appendix B for each target culture group by summing the total number of failures per item (i.e., per column).

- Those items with the highest failure rate should be analysed to determine the possible reasons why they failed, and a decision should be made regarding whether or not to eliminate the items. It is probably wise at this stage to eliminate up to only about half of the extra items that were included in the scale during the design phase. In deciding which items to eliminate, the researcher should consider two requirements:
  - Firstly, each item should perform well *within* each group, according to external standards.
  - Secondly, each item should perform similarly (irrespective of how well in terms of external standards) *across* each group. Items that differentiate between groups too highly (i.e., are biased) are not desirable.

- Once these items have been deleted, the various steps involved in this main moment must be repeated. With the removal of a number of poorly performing items, the failure rate as recorded on the form in Appendix B should be considerably less.

- A second phase of analysing why certain items performed poorly should be conducted and additional items removed if necessary. This is again followed by the replication of the various steps in this main moment.

- This process must continue until the scale performs adequately at item level, both within and across culture groups. In addition, this process may continue until the scale is sufficiently short to meet the innovation requirements. At this point, the scale can be said to perform adequately at item level in terms of reliability and validity.

The following information should be documented:

- The procedures followed to analyse the scale at item level.
- The initial results of the analyses for each culture group.
- The evidence used in deciding to remove an item.
- The final results of the analyses after removal of poorly performing items for each culture group.
A conclusion about the multicultural equivalence of the scale at item level.

3.6.6 **Main Moment J: Scale-Level Analysis**

3.6.6.1 **Step 27: Conduct Convergent and Discriminant Validity Analysis at Scale Level**

Convergent and discriminant construct validity analysis at scale level is based on a set of three hypotheses, grounded in the theory underlying the scale. These hypotheses are based on the content of steps 3 to 6, which are here tested empirically. If they hold true, there is greater evidence for construct validity, because the theory and the statistics support each other. The steps that should be followed are:

- First, develop the three hypotheses, using the following guidelines provided by Hudson (1982):

  - **Class I Criterion Variables.** According to Hudson (1982):
    
    [The new scale will] correlate the lowest with a set of basic social background variables such as age, sex, ... , family size, and so on. These low levels of predicted correlation [are] made because it is believed that the types of [constructs] that are measured by [ecometrics] actually have little to do with ‘who we are’ as represented by background social characteristics. ... The social status variables will be referred to as class I criterion variables when examining [discriminant] construct validity. (p. 102)

  - **Only variables that are either dichotomous (such as gender) or continuous (such as age) can be used as criterion variables.**

  - **Class II Criterion Variables.** According to Hudson (1982):
    
    [There will be] a number of variables that are expected to have only moderate correlations with the particular scale to be evaluated. This list of variables will vary somewhat from one scale to the next, and it is necessary to specify that list separately for each [scale]. ... Variables that are expected to have only moderate correlations with the [new scale] will be referred to as class II criterion variables and provide beginning evidence of convergent construct validity. (p. 102)

  - **Class III Criterion Variables.** According to Faul (1995):
    
    There will be a group of variables that will have the highest correlations with the scale to be evaluated. Theory will guide the scale developer to decide what variables these will be.... Class III criterion variables will give an indication of convergent construct validity at the scale level of analysis. (p. 88)

- Correlate the scale with all of the variables defined by these hypotheses, for each culture group separately.

- “Summarize the construct validity findings by averaging all the correlations between the newly developed scale and each of the class I, class II and class III criterion variables [separately]” (Faul, 1995, p. 88).
Evaluate the mean correlations against the following criteria:

- The mean correlation between the scale and the class I criterion variables should be “non-significant or trivially small” (Faul, 1995, p. 331). If it is, this provides evidence of discriminant validity.

- The mean correlation between the scale and the class II criterion variables should be moderately low. If it is, this provides beginning evidence of convergent validity.

- The mean correlation between the scale and the class III criterion variables should be moderately high. If it is, this provides evidence of convergent validity.

The following information should be documented (based on the example of Faul, 1995):

- A set of correlation tables for each culture group, covering the three classes of criterion predictors, with the scale or subscales down the left side and the criterion predictors across the top.

- A summary table for each culture, with the scale or subscales down the left side, and the three classes across the top. Each cell should contain the mean correlation between each subscale and the criterion variables of each class. The mean correlation of each column should be calculated. These three correlations are the three validity coefficients and should range from low, to medium, to high as hypothesised.

### 3.6.6.2 Step 28: Conduct Known Groups Validity Analysis

The following procedure, proposed by Hudson (1982, in Faul, 1995, p. 91), should be suitable for most situations:

- "Ask experienced therapists to divide their clients into three groups:
  - Those who definitely have a clinically significant problem in the area being studied;
  - Those who are definitely free of a clinically significant problem in the area being investigated; and
  - Those about whom the therapists are uncertain.

- After dividing clients into the above-mentioned groups, clients in the two known groups are asked to complete the research questionnaire package. The clients who belong to the uncertain group are not used in the research, because they will not contribute to the clarity of the instrument” (Faul, 1995, p. 91).

- Clients in the ‘problem’ group are labelled ‘0’ and clients in the ‘no problem’ group are labelled ‘1’, although in fact any two values could be used in the calculations (Howell, 1992).
Working with each culture group separately, “...conduct a one-way analysis of variance in which the scale being evaluated is treated as the dependent variable and the membership in the criterion groups is treated as the independent variable” (Faul, 1995, p. 91). (Alternatively, conduct a t-test to compare the scale score across the two known groups – the test results will be equivalent.) If these analyses are significant at \( p < .01 \) (one-tailed), one can conclude that the scale effectively discriminates between the different criterion groups (Faul, 1995, p. 337).

For each culture group separately, calculate the point-biserial correlation \( (r_{pb}) \) between group membership (a dichotomous variable) and the scale (a continuous variable) using the standard Pearson’s product-moment correlation (Howell, 1992). This correlation is called the Known Groups Validity Coefficient. If the scale is multidimensional, calculate the mean validity coefficient across subscales. These coefficients should be above 0.60, in which case evidence has been generated for criterion-related validity, specifically known groups validity. (Faul, 1995)

Square the point-biserial correlations to provide an indication of how much variance between the criterion groups is accounted for by the scale.

Investigate the multicultural equivalence of these validity coefficients using the procedure described in step 23.

To investigate multicultural scalar equivalence, select first the ‘problem’ group and thereafter the ‘no problem’ group, and conduct a one-way analysis of variance on each, using the scale being evaluated as the dependent variable and culture as the independent variable. If the analyses are nonsignificant at \( p > .01 \) (two-tailed), one has tentative evidence of scalar equivalence across cultures (Butcher & Han, 1996).

The following information should be documented (based on the example of Faul, 1995):

Provide a table for each culture group with the sample sizes, distinguishing between the ‘problem’ and ‘no problem’ groups. It is likely that the latter group will be small, since data are drawn from a clinical sample, requiring greater discretion in the reporting of test results by the researcher (Faul, 1995).

Include the following information in the tables: the mean scores and standard deviations on the scale or each of the subscales for the two known groups, as well as the difference between the mean scores, the F ratio (or t-test) and the significance level, the point biserial correlation for the scale or each of the subscales, as well as the square of the correlation and the significance level of the correlation.

Provide the results of the tests for the multicultural equivalence of the validity coefficients.

Provide the results of the ANOVA for multicultural scalar equivalence.
3.6.6.3 **Step 29: Conclude Multicultural Scale-Level Analysis**

As in the previous steps, there are two primary methods for determining whether the scale is valid across cultures at scale level, viz:

- To evaluate the scale’s performance for each culture group against the external ecometric standards for reliability and validity, and
- To evaluate the equivalence of the validity coefficients using the procedure described in step 23.

These procedures have been integrated into the previous two steps, but should be summarized here, and a final conclusion made regarding the multicultural validity of the scale.

3.6.7 **Main Moment K: Establish Clinical Cutting Scores**

In the previous chapter it was argued that ecometrics, in comparison with psychometrics, makes use of criterion-referenced scaling rather than norm-referenced scaling. In norm-referenced scaling, an individual’s functioning or performance is compared against the ‘normal’ or ‘typical’ functioning or performance of the population of which the individual is a member (Nurius & Hudson, 1993; Petersen et al., 1989). Faul (1995) describes this as follows:

> ... the psychometric test must be administered with standard direction under standard conditions to a sample of examinees representative of the group for whom the test is intended. The purpose of this procedure is to determine the distribution of raw scores in the standardization group. These raw scores are then converted to some form of derived scores, or norms – age equivalents, percentile ranks, or standard scores. Most test manuals contain tables of norms giving the converted score equivalents of particular raw scores. An examinee's standing on a test may be evaluated by referring his (sic.) raw score to the norm table appropriate for his particular group. In this way norms serve as a frame of reference for interpreting raw scores. They indicate the examinee's standing on the test relative to the distribution of scores obtained by other people of his age, grade, gender, etc. (p. 93)

As was argued in the previous chapter, social work is not so much concerned with what is ‘normal’ or ‘typical’, not so much concerned to know where a person’s score falls relative to the majority of other people in a population, as to know whether the person’s score indicates the need for some kind of intervention. For example, a norm may argue that only the bottom quartile of respondents on a particular scale have a problem, whereas clinical opinion reveals that 60% (or only 5%) of respondents have a problem. Social work is interested to know the latter figures, since these are of clinical interest and value.

Nurius and Hudson (1993) explain:

> All the CASS scales are based on criterion-referenced scaling, which means that fundamental attention is given to the client’s unique score on a scale in relation to the unique problems that are being faced by that client, rather than to comparing the client’s score with a group or population mean or ‘average’ performance. (p. 241)
The logic of criterion-referenced scaling is quite simple. All individuals are seen as occupying a position somewhere along a continuum from a high degree of the construct being measured to a low degree of the construct. Let us say that the construct being measured is child abuse. People who score high on the scale are abusive towards their children, while people who score low on the scale are not abusive towards their children. Abuse of children, however, is not an either-or matter. Some people do not abuse their children, others shout at their children, still others hit their children with a stick, others burn their children with cigarettes and others even kill their children.

The question is trying to determine at what point on the scale one can determine that a parent is abusing their child to the degree that some form of clinical intervention is needed (Hudson, 1982). If it were possible to identify such a point, it would be possible to divide individuals into two groups – those who significantly abuse their children and those who do not. In perfect terms this could be illustrated as in Figure 20.

**FIGURE 20: CLINICAL CUTOFF SCORES – PERFECT CASE**

In Figure 20 it can clearly be seen that the clinical cutting score is 50, since all the nonclinical scores fall above this, and all the clinical scores fall below it. There is no error in this graph. Unfortunately, data are seldom this clear. The ideal case can be illustrated as in Figure 21, where we can see that the cutting point is still 50, but there is some overlap between the clinical and nonclinical scores – scores from 40-60 could fall in either the clinical or nonclinical groups. The aim of establishing a useful clinical cutting score is to minimize this overlap, that is, to minimize the chances of error.

In order to accommodate for this degree of error, Hudson (in Faul, 1995) recommends the use of clinical cutting ranges. A common problem experienced by practitioners is how to interpret a score that is very close to the cutting. As illustrated in Figure 21, a score of 53 could indicate that there is a problem or that there is not a problem. The standard error of measurement (SEM) can be used to create a range of scores within which interpretation is unclear, but outside of which interpretation can be quite confident. If one creates a range of 1.96 SEM on either side of the cutting score, one can be fairly sure (95% sure) that scores outside of that range fall accurately.
within the clinical or nonclinical groups. When a client falls within the cutting range, the practitioner will need to collect additional information to determine whether or not the individual has a clinically significant problem (Hudson in Faul, 1995).

**FIGURE 21: CLINICAL CUTOFF SCORES – IDEAL CASE**

The methods or steps to establish clinical cutting scores and cutting ranges will be detailed in the following step.

### 3.6.7.1 Step 30: Establish Clinical Cutting Scores

The following steps are slightly adapted from those described by Hudson and his various associates (Faul, 1995; Hudson, 1982):

- Request a group of practitioners to assess their clients and determine whether or not they have a clinically significant problem with the area that is being assessed by the scale (xyz). Provide the clinicians with three choices, viz:
  - Client has a significant problem with xyz.
  - Client does not have a problem with xyz.
  - Not sure whether or not client has a problem with xyz.

- The clients who definitely have or have not got clinically significant problems with xyz form the sample for the establishment of the clinical cutting scores. Those about whom the practitioner is unsure are excluded because it is not clear into which criterion group they fall.

- Perform a discriminant analysis (Hair et al., 1998; Tacq, 1997) on the data, for each culture group separately and for the combined sample, using the criterion as the dichotomous grouping variable and using the scale score as the (sole) independent variable. Request the computer to save the predicted group membership, as calculated by the analysis, as an additional variable in the data file.
Compare the minimum and maximum scale scores of the two predicted groups. The range of scores will have been divided into two non-overlapping ranges. The point between the two ranges is the cutting score – take the average of the adjacent maximum and minimum scores. This score is calculated by the discriminant analysis to ensure the optimal percentage of accurate classifications of respondents into the original two groups based on the scale scores.

Perform a 2x2 cross tabulation on the data file for each culture group and for the combined sample, using the predicted group membership and actual group membership as the variables. Calculate the following scores:

- **Percentage Correctly Classified.** Sum the two cells in which the predicted and actual group membership are the same, divide this sum by the total number of cases in the sample and multiply by 100. This provides the percentage of correctly classified respondents.

- **Percentage False Positives.** Next, divide the number of respondents who are known to be problem free but who are erroneously classified by the scale as having a clinically significant problem, by the total number of respondents known to be free of the problem, and multiply by 100. This provides the percentage of false positives, which is the proportion of people who are free of the problem but incorrectly classified by the scale as having a problem.

- **Percentage False Negatives.** Lastly, divide the number of respondents who are known to have the problem but who are classified by the scale as being free of a clinically significant problem, by the total number of respondents known to have the problem, and multiply by 100. This provides the percentage of false negatives, which is the proportion of people who have a problem but incorrectly classified as being problem-free.

The smaller the percentages of false positives and false negatives, the better the scale’s clinical cutting score performs and the greater the clinical utility of the scale. Levels of acceptable error are not recommended in the literature, but Hudson and associates (Hudson, 1982, pp. 127-128; Hudson et al., 1990, p. 64) and Faul (1995, p. 344) report error rates ranging from 1.2% to 25%, with a mean of 10.4% reported by Hudson and a mean of 11.2% reported by Faul. Both claim that these are acceptable levels of error for individual work and that the risks involved are small. It seems reasonable to accept, therefore, that error rates under about 25% are acceptable, although lower levels of error are surely desirable.

Determine the scale’s cutting range by adding and subtracting 1 standard error of measurement from the cutting score (to create a 68% confidence interval). For example, if the cutting score is 50 and the SEM is 4.5, the cutting range is 45.5 to 54.5.

Now compare the cutting scores of the separate culture groups with the cutting score range for the combined sample. Ensure that the cutting scores for each culture group fall within the 68% confidence intervals of the combined sample. Effectively, this implies that the combined
sample is the ‘true score’, and that the cultural cutting scores are sample scores that should cluster reasonably closely around the true score. This methodology was derived from Butcher and Han (1996, p. 48), combined with the concepts on SEM and true scores as described in section 3.6.3.1.2.

- If they do (providing evidence of scalar equivalence), use the cutting score and ranges of the combined sample for all culture groups, reporting the percentages of false positives and negatives.

- If they do not, it will probably be necessary to use separate cutting scores for each culture group, since scalar equivalence will not have been demonstrated. This is, however, not the ideal for all the reasons discussed in the previous chapter, and may be an indication that the scale has not performed adequately. Alternatively, it may be an indication of bias in the social workers’ judgements about who has and who has not got a social problem – it is well documented that certain problems tend to be over-diagnosed in minority or ethnically-different culture groups (Draguns, 1984; Swartz, 1986; Westermeyer, 1985).

Report the following information:

- A description of how the two groups were determined, if this has not been done when documenting the known-groups validity.

- Sample characteristics for these two groups, per culture, if these groups are subgroups of the previous validation analyses.

- The cutting score for the scale (or subscales), together with the percentage of false positives and false negatives, for each culture group.

- The overall accuracy of the cutting score, i.e. the percentage of correctly classified respondents, for each culture group.

- The cutting score range, for each culture group.

- The procedure for consolidating the cutting scores and the results of this consolidation, together with the revised accuracy of the consolidated score for each culture group and the total sample combined.

There are a number of alternative steps that can be taken in addition to or instead of those described here. There is, in fact, no one way to determine such cutting scores; it all depends on the purpose of the scale and the kind of data that can be obtained. Alternatives that can be considered include:

- The two criterion groups can be determined by asking one key question of the respondents themselves. This question should be a summation of the entire scale’s intent. This question is used to divide the sample into the two groups (see Hudson et al., 1990 for example).
A combination of practitioner’s classification (as described in the main section of this step) and respondents’ classification (as described in the previous paragraph) can be used. Respondents are assigned to one of the two known groups only when both the respondent and practitioner agree that the respondent has or has not got a clinically significant problem in the area under consideration (Hudson, 1982).

It is possible that the researcher may use more than two criterion groups. For example, a measure of child abuse may include three groups: complete absence of abuse, presence of ‘mild’ child abuse of therapeutic concern, presence of ‘severe’ child abuse necessitating legal intervention. The procedures apply as above.

Instead of using discriminant analysis to determine the cutting score, the researcher can use Faul’s (1995) method of establishing two cumulative frequency graphs. This method requires a fair amount of manual coding and is thus not advised unless the researcher does not have access to computerized discriminant analysis.

A criterion, other than presence or absence of a clinically significant problem as determined by a clinician, could be used depending on the purpose of the scale. For example, the researcher may be developing a scale measuring degree of child abuse. Rather than asking clinicians to rate their clients on this issue, the researcher could take a sample of parents who are undergoing court mandated treatment for child abuse and compare their scores with a sample of parents who have no known problem in this area. The decision on what groups to select and how to select them may vary from situation to situation, but it is likely that ecometric scale developers will most commonly use the procedure described earlier.

Receiver Operating Characteristic (ROC) curve analysis could be used, if available in the statistical package being used (eg. Metz, 1998), to determine the cutting score and sensitivity (percentage true positives) and specificity (percentage true negatives) of the instrument (CMH, 2002; Marzban, 2003; MedCalc, 2003; Tape, n.d.). ROC curves are widely used in medical research to determine the sensitivity and specificity of tests (eg blood or urine tests) (Edler, Benner, & Ittrich, 2003; Otto et al., 1998). ROC curves have also been used to determine cutting scores in various sciences (Glenn et al., 2002; Krefetz, Steer, Gulab, & Beck, 2002; Martin & Jolly, 2002; Yeung et al., 2002) and recently also in social work (Conley, 2003).

3.7 The Diffusion & Adoption Phase

This final phase of multicultural ecometric scale development involves diffusing the research and the resultant scale, now validated, to those who will use the scale. It said that poetry is not poetry until someone else has heard it. The same is, no doubt, true of developmental research. The research cannot truly be called research until it has been shared with others who can use the technologies generated by the research.
This phase comprises one main moment and two steps, as depicted in Figure 22 (extracted from Figure 9).

**FIGURE 22: THE DIFFUSION & ADOPTION PHASE: MAIN MOMENTS & RESEARCH STEPS**

<table>
<thead>
<tr>
<th>PHASES</th>
<th>MAIN MOMENTS</th>
<th>STEPS</th>
</tr>
</thead>
<tbody>
<tr>
<td>DIFFUSION &amp; ADOPTION</td>
<td>DISSEMINATE INFORMATION</td>
<td>31 Write a manual &amp; present training</td>
</tr>
<tr>
<td></td>
<td></td>
<td>32 Write a journal article</td>
</tr>
</tbody>
</table>

### 3.7.1 Main Moment L: Disseminate Information

#### 3.7.1.1 Step 31: Write a Manual and Present Training

In order for someone else to use the newly scale, a technical manual is required in which the user is given sufficient information about the scale to understand it, evaluate it and use it intelligently (see American Psychological Association, 1974 for a detailed discussion of what should be included in a scale manual; see also the Standards for Ecometric Scale Development in Chapter Two of this dissertation). The South African Council for Social Service Personnel (2003) has drafted guidelines on what should be included in such a manual, as mentioned in Chapter 2 of this dissertation.

Faul (1995, p. 98) recommends that the following be included in this manual:

- The theoretical framework within which the scale was developed.
- A formal definition and explanatory description of the construct that was measured.
- Instructions on the administration of the scale.
- The procedures involved in scoring of the scale.
- Guidelines for interpreting the scale scores.
- Evidence of the reliability of the scale.
- Evidence of the validity of the scale.
- Evidence of the multicultural validity of the scale, and for which cultures it has been validated.

Hudson’s *Clinical Measurement Package: A Field Manual* (1982) is an outstanding example of such a manual.

#### 3.7.1.2 Step 32: Write a Journal Article

Publication of the new scale in a journal is probably the most important means of disseminating the scale and ensuring its utilization (Faul, 1995). Unpublished scales may remain in the office of the researcher who developed them and the professional community has very limited access to
technical manuals. Journals enjoy wide readership and remain accessible to large numbers of people many years after the scale was developed. Books providing guidelines for publishing journal articles are readily available (e.g., American Psychological Association, 1994; Kazdin, 1995). It may also be helpful to study examples of papers publishing the validity studies of newly developed scales for ideas regarding the format of such publications (e.g., Attala, Hudson, & McSweeney, 1994; Faul, 1996; Faul & Hudson, n.d.; Hudson & Decker, n.d.; Hudson, MacNeil, & Dierks, n.d.; Hudson & McMurtry, 1997; Hudson et al., 1990; Klein, Beltran, & Sowers-Hoag, 1990; McMurtry & Hudson, n.d.; Van Breda, 2002b).

3.8  **Summary of Chapter**

This chapter has endeavoured to provide a step-by-step guide to multicultural scale development in social work. This has involved using Faul’s work (1995) on ecometric scale development as a departure point and framework, and integrating into this framework the many guidelines scattered throughout the cross-cultural psychology literature. This has resulted in a coherent procedural guide to multicultural scale development.

3.9  **In the Following Chapter**

Starting from the following chapter, the process model of multicultural scale development that has been defined and described in this chapter will be empirically tested in the field. A new scale will be designed for use within the military community by the Directorate Social Work. The instrument will be multilingual and thus designed for multicultural use. The purpose of this exercise is to examine how the scale development process works in practice, so as to identify potential pitfalls and make final adjustments to the procedures.

In chapter 4, which follows, the implementation of the analysis phase of multicultural ecometric scale development, as described in this chapter, will be presented.
CHAPTER FOUR: ANALYSIS PHASE

4.1 INTRODUCTION TO ANALYSIS PHASE

4.1.1 INTRODUCTION TO THE CREATION OF THE MILITARY SOCIAL HEALTH INDEX

Beginning with this chapter and continuing on to Chapter 8, the process model of multicultural ecometric scale development that was proposed and detailed in Chapter 3, founded on the conceptual issues addressed in Chapter 2, will be empirically tested. As stated in Section 1.4.3, the goal of this dissertation is “to design a process model for the development of social work scales for multicultural use in South Africa.”

The development of a scale, using the process model, is, as stated in Section 1.4.4, a secondary objective of the study. The actual development of a scale is considered an empirical ‘test’ of the process model. The actual resultant scale is subordinate to the opportunity to discover components of the process model that are flawed, particularly challenging, unnecessary, etc.

Each of the following five chapters will address a separate phase of the process model: Chapter 4 will address the execution of the analysis phase; Chapter 5 the design phase; Chapter 6 the development phase; Chapter 7 the evaluation phase; and Chapter 8 the diffusion and adoption phase.

The execution of the process model in these five chapters will be largely nonreflective and nonevaluative. The evaluation of the process model itself will take place in Chapter 9.

The development of the Military Social Health Index is a very large and long-term project. It extends far beyond the scope of this dissertation, and consequently not all aspects of the project will be reported here. An attempt is made to report honestly but with discretion on what was done and not done, in order to illustrate the implementation of the multicultural scale development process, without confusing the reader.
4.1.2 Chapter Overview

In this chapter, the candidate will present the results of the analysis phase of the process of developing an ecometric instrument for the Director Social Work of the South African National Defence Force (SANDF). Drawing on the guidelines from the Chapter Three, the candidate will, in this chapter, describe the two main moments and the six steps that comprise the first phase of multicultural ecometric scale development, as illustrated in Figure 23:

**FIGURE 23: THE ANALYSIS PHASE: MAIN MOMENTS & RESEARCH STEPS**

<table>
<thead>
<tr>
<th>PHASES</th>
<th>MAIN MOMENTS</th>
<th>STEPS</th>
</tr>
</thead>
<tbody>
<tr>
<td>ANALYSIS</td>
<td>A IDENTIFY PROBLEM</td>
<td>1 Analyse the problem</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2 Determine the study end results</td>
</tr>
<tr>
<td></td>
<td>B FORMULATE THEORY</td>
<td>3 Identify and describe the theoretical framework within which the scale is to be developed</td>
</tr>
<tr>
<td></td>
<td></td>
<td>4 Identify the operational assessment area(s) that will be measured by the scale</td>
</tr>
<tr>
<td></td>
<td></td>
<td>5 Explore the cross-cultural comparability of the assessment area(s)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>6 Define the construct(s) to be measured</td>
</tr>
</tbody>
</table>

4.1.3 What’s New in This Phase?

This model of scale development is an extension of Faul’s (1995). Apart from step 5, however, all steps in this first phase are identical to those of Faul’s. The main differences lie in the integration of Thomas’ guidelines for developmental research and the inclusion of a multicultural focus. In the former case, Thomas’ guidelines on analysing a problem and determining the study end results have been incorporated. Specially, new issues such as conducting a feasibility study and determining innovation objectives have been included. It is the candidate’s experience, after conducting many research projects for clients, that these are essential components of the first main moment, particularly when conducting contract research. In the latter case, this first phase also requires a decision as to what cultures the instrument must be designed for and what languages it must be translated into (if any). Furthermore, the theoretical foundation of the instrument must address the issue of cultural equivalence – if the constructs to be measured do not manifest comparably across cultures, a multicultural scale cannot be developed.
4.2 MAIN MOMENT A: IDENTIFY PROBLEM

4.2.1 STEP 1: ANALYSE THE PROBLEM

4.2.1.1 Purpose of Study and State-of-the-Art Review

The Directorate Social Work of the SANDF has been presented with a unique challenge, viz to assess the social functioning of thousands of soldiers, en masse, so as to provide a recommendation to the Chief of Joint Operations regarding whether the soldiers are socially fit for deployment. The first of these assessments was conducted in March 2000. Since then, several thousand soldiers have been assessed twice yearly.

The Directorate Social Work identified and adapted a model of family resilience as the theoretical foundation for their assessments. This model has been widely used in military family research, particularly regarding family resilience to the stress of deployments and other military separations. Research conducted in the SANDF over previous years into family resilience to separations indicated the value of this model as an assessment framework.

Within the context of this theoretical framework, which will be discussed in more depth later in this chapter, ‘social health’ (the target of assessment) was defined as “the relatively low vulnerability and high resilience of people that enables them to deal effectively with life stress, notably the stress of a military operation” (Directorate Social Work, 2001, p. 5). The purpose of the assessment was consequently defined as “to determine and elevate the social health status of all military employees” (ibid.).

In light of the above, the Directorate Social Work (2001) designed an assessment process that has been followed since March 2000. This process involves several steps:

- Soldiers receive a briefing on social health and the purpose of the social health assessment.
- Soldiers complete a questionnaire (Heimler, 1990) that purposes to screen out soldiers who are at risk of social ‘ill-health’ or ‘un-health’.
- Soldiers who fall below a cut-off score on the questionnaire are individually interviewed by a social worker.
- Based on the interview results, the soldier is allocated a social health status colour: ‘green’ (socially healthy and thus fit for deployment), ‘yellow’ (socially unhealthy, not fit for deployment and requiring social work intervention) or ‘red’ (socially unhealthy, not fit for deployment and treatment unresponsive). In practice, a ‘red’ social health status is allocated only after repeated failure of social work interventions.
- Soldiers who are allocated a ‘yellow’ social health status receive social work interventions until they can be reclassified to a ‘green’ status.
The Heimler Scale for Social Functioning (Heimler, 1990) has been used to date as the screening instrument. This instrument was selected because of its brevity, its validation in South Africa (Van Zyl, 1986), its breadth or scope of interest, its familiarity to many military social workers and its simplicity of administration.

Notwithstanding these advantages, however, the Heimler Scale has demonstrated a number of shortcomings for the purposes to which it is being put:

- The Heimler Scale was not designed to measure ‘social health’ as defined above, but rather social functioning. The Directorate Social Work is consequently using the instrument for a purpose for which it was not intended.

- Military social workers have expressed concerns about the cross-cultural validity and language of the Heimler Scale. Some items use difficult English and others are considered too abstract. Although the Directorate has not investigated the cross-cultural validity of the Heimler Scale, these concerns stand.

- The Heimler Scale is based on a model of health very different from the model of health used in the SANDF’s assessment process. This confuses social workers, who receive a paper assessment of soldiers that bears no relationship with the clinical assessment.

- The Heimler Scale has not demonstrated adequate reliability and validity standards, as indicated in a paper published by the candidate (Van Breda, 2002b). Even when the response scale is extended from three to five points, the scale does not perform adequately (Van Breda, in review).

- The Heimler Scale generates a high drop out rate of about 25%, although only about one quarter of these are clinically assessed to be ‘socially unhealthy’. This indicates a high percentage of false positives. In addition, there are some concerns about the incidence of false negatives – people who are socially unhealthy but who score above the cut-off score used on the Heimler Scale.

In light of these shortcomings, most of which have to do with the Directorate Social Work’s utilisation of the instrument and not necessarily with the Heimler Scale itself, the Directorate Social Work identified the need to develop a new instrument that could be used more effectively for their assessment processes, within the multicultural SANDF community.

4.2.1.2 Feasibility Study

Thomas (1984, p. 146) identified four dimensions that should be assessed when deciding to develop a new health technology:

- Technical Feasibility. Do we have the necessary technological capabilities (notably information technology, but also printing facilities, etc) to conduct the scale development?
The answer to this first question appears to be “Yes”. The Directorate Social Work, via its Social Work Research & Development unit at the Military Psychological Institute, has access to printing facilities, high-volume scanners for data capturing, SPSS for statistical analysis, etc.

Organisational Feasibility. Do we have the necessary competence to conduct scale development, the active, informed support of top management and the support of administrative and support personnel?

Again, the answer to this second question appears to be “Yes”:

- The candidate has developed, through the process of his doctoral studies and in collaboration with experienced social workers at the Rand Afrikaans University and elsewhere, the competencies required to conduct multicultural ecometric scale development.
- The Director Social Work, Brigadier General Ntsiki Motumi, has mandated this study and tasked her deputy and assistant directors to work actively for the achievement of the study objectives. She has signed the project proposal, which clearly indicates the responsibilities of the entire Directorate Social Work in the R&D process.
- Few administrative personnel are involved in the study. Social workers are largely responsible for executing the study. Social workers have been asking for a new scale for some time now and are lending their full support to the project.
- A social work researcher has been allocated to the study to ensure all project administrative needs.

Economic Feasibility. Do we have sufficient funds to develop the scale, and is the anticipated end product worth spending these funds?

Lack of funding is a perennial problem in the SANDF, as elsewhere. Compared with the public and private welfare fields, however, the Directorate Social Work has relatively easy access to finances. The technology to conduct the study (computers, scanners and software) has already been purchased and is available. This technology reduces many of the costs of such a project; for instance, data capturing can be done in a day or two with a high-volume scanner compared with several weeks by hand.

The main costs for the study involve printing of questionnaires and answer sheets. These funds can be obtained within the SANDF.

'Operational support', that is, providing social support to the SANDF’s operational mission, is the core business of the Directorate Social Work. There is, therefore, no question in the minds of the Director Social Work and her staff that the development of this scale is part of the Directorate’s core business. The costs of the project are thus seen as entirely justified.
Use Feasibility. Is it likely that the newly developed scale will be of use to anyone?

This final question, perhaps the crux of the matter, can also be answered with a “Yes”. Once the new instrument has been developed and validated, it will replace the Heimler Scale in the Concurrent Health Assessment process. Over a twelve-month period, it is likely that several thousand soldiers will complete the instrument. The utilisation of the instrument for other assessments, as well as for routine clinical work, is anticipated.

4.2.2 STEP 2: DETERMINE THE STUDY END RESULTS

The candidate, together with several consultants, was responsible for the development of the original social health assessment process in late 1999, for first implementation in March 2000. Since then, an ongoing dialogue between the candidate, the Director Social Work and other key role players in the Directorate Social Work, has generated clarity regarding what must be achieved by this study.

4.2.2.1 Innovation Objective

The objective of this study is a Military Social Health Index – Deployment Resilience Version that measures the social health of soldiers earmarked for cross-border military operations.

4.2.2.2 Innovation Requirements

In light of the Innovation Objective, and in the context of two years experience of assessing social health, the following innovation requirements were identified and contracted with the Director Social Work:

- The Index must primarily be of use for determining the social health of soldiers, that is, for determining their social readiness for deployments.

- The Index must also provide indirect information that can be used in the broader, non-individual/clinical work of military occupational social workers.

- The Index must be multicultural, so that it can be used with confidence with all members of the SANDF, who represent the cultural diversity of South Africa.

- The Index must be multilingual, since many members of the SANDF are not able to accurately complete psychosocial instruments in English. Based on an analysis of language trends in the SANDF, four languages have been identified for the Index, viz English, Afrikaans, isiZulu and Setswana. Together these represent the home languages of 65% of SANDF employees and 54% of South African citizens (Stats SA, 2003).

- The Index should be provided to respondents in all four language versions, so that respondents are able to cross-validate the multiple languages.
The Index must be located within the theoretical model underlying the assessment process, viz the Resilience Model.

The Index must be designed on a generic base, so that by altering only a small portion of the instrument, it can be used to conduct other assessments of social health.

The Index should not be so long that it tires respondents, but neither so short that its reliability and validity are compromised.

The Index should assess the entire family system, not only the respondent him or herself.

The Index should be sensitive to a diversity of family structures.

The Index should be called Military Social Health Index – Deployment Readiness Version.

The reading level of the Index should not be above Standard 7 (Grade 9) and preferably around Standard 5 (Grade 7).

The Index should provide a separate question book and answer sheet, to reduce the cost of printing and to facilitate data scanning.

The answer sheet should be formatted to facilitate both scanning and manual data capturing.

4.3 **MAIN MOMENT B: FORMULATE THEORY**

Main Moment B comprises four steps, viz to identify the theoretical framework of the instrument, to identify the constructs to be measured, to explore the cross-cultural comparability of the constructs and to formally define the constructs.

In the case of the Military Social Health Index, the order is somewhat less sequential than these four steps. The instrument has a long conceptual history that pre-dates this dissertation. For the past 12 years, the candidate has been researching the theory of resilience. The candidate’s master’s degree thesis, finalised in 1997, addresses the issue of resilience. By the time the Directorate Social Work requested the candidate to develop the Military Social Health Index, a great deal of review of resilience theory had already been done and the constructs that were to be measured had already been identified.

The information presented in this section may mistakenly give the impression that a review of resilience theory led to the identification of the seven target constructs. However, it is probably truer that a fairly fragmented review of literature, predating the dissertation, led to the identification of the constructs, and that since then a detailed and coherent literature review has been conducted.

Section 4.3.1, which follows, provides a lengthy and detailed review of resilience theory. An attempt has been made to cluster the theory under the constructs that will comprise the Military
4.3.1 **STEP 3: IDENTIFY THEORETICAL FRAMEWORK**

**4.3.1.1 Introduction to Theoretical Framework: Resilience Theory**

The broad theoretical framework for the *Military Social Health Index* is resilience theory. The candidate conducted a detailed literature review, synthesising a wide range of theories on resilience (Van Breda, 2001). This review serves as the basis for the information in this section. The full detail (some 300 pages and several hundred references) is beyond the scope of this dissertation. What follows, then, is a brief summary of the most important components of the review, with regard to the *Military Social Health Index*.

Resilience theory is a multifaceted field of study that has been addressed by social workers, psychologists, sociologists, educators and many others over the past few decades. In short, resilience theory addresses the strengths that people and systems demonstrate that enable them to rise above adversity.

The emergence of resilience theory is associated with a reduction in emphasis on pathology and an increase in emphasis on strengths (Rak & Patterson, 1996). O'Leary (1998) notes:

> Psychologists have recently called for a move away from vulnerability/deficit models to focus instead on triumphs in the face of adversity ... This call for a focus on strengths parallels that of a number of other investigators in child development..., medical sociology..., and education... The potential theoretical, empirical and policy significance of the proposed paradigm shift from illness to health, from vulnerability to thriving, from deficit to protection and beyond ought not be underestimated. The precedent for this paradigm shift is growing in the scientific literature. (p. 426)

Hawley and De Haan (1996) note a similar trend in family therapy:

> In recent years there has been a movement in the family field toward strengths-based and away from deficit-based models. For example, in family therapy the solution-focused and narrative models assume that clients possess resources that will allow them to resolve their difficulties... An emphasis on resilience in clients has often accompanied this focus on strengths. (p. 283)

H.I. McCubbin and M.A. McCubbin (1992, p. 150) have identified five major developments in the field of family social work during the 1970s and 1980s, the fifth of which is most relevant here:

- There has been ongoing evaluation of the efficacy of interventions targeted at the family system.
- The revival of family stress theory has highlighted important dimensions of family functioning for intervention.
Various family typologies have been developed to guide family assessment and intervention.

Theory and research have been advanced to promote family strengths and capabilities, which have enhanced intervention.

Family assessment and measurement tools have been developed for use in family research, clinical assessment and programme evaluation.

Pearlin and Schooler (1982) note that researchers have historically tended to confine their attention to pathology and problems. The advance of our knowledge of how people survive, cope and even thrive has been left largely to clinicians in the field. This has had four main effects:

Firstly, it has created the impression that coping in the face of adversity is an idiosyncratic phenomenon rather than widespread or even normative (see also Antonovsky, 1979).

Secondly, it has tended to locate such coping within unique individuals, thereby overlooking the possibility of "institutionalised solutions to common life tasks" (Pearlin & Schooler, 1982, p. 110; see also Saleebey, 1997a).

Thirdly, it has elevated pathology into the high realm of 'Science', and relegated coping to the homely world of folklore (see also Goldstein, 1997).

Fourthly, it has led clinicians, including social workers, to resist acknowledging the validity and presence of strengths in their clients. Barnard (1994, p. 136) refers to this as the Law of the Hammer, which "suggests that if you give young children a hammer, everything they come in contact with will need pounding. One of the primary 'hammers' of the human services fields has been psychopathology, and related nomenclature."

There is, of course, the danger of turning the notion of resilience into a kind of rugged, rigid, "just-shake-it-off", "don't-look-back", "Teflon-coated" resilience, which renders the individual or system "brittle" and vulnerable to stress (Schwartz, 1997). What is advocated in the resilience literature, however, is a kind of resilience that is compassionate, flexible and in-touch-with-life, and which promotes the ability-to-bounce-back (ibid.).

The theory underlying the Military Social Health Index draws on several areas of resilience theory, including the following (Van Breda, 2001):

- Literature on the development of resilience in children who are exposed to adverse conditions in childhood (Benard & Marshall, 1997; Bogenschneider, 1996; Butler, 1997; Cederblad, Dahlin, Hagnell, & Hansson, 1994; Cederblad, Dahlin, Hagnell, & Hansson, 1995; Cederblad & Hansson, 1996; Dahlin, Cederblad, Antonovsky, & Hagnell, 1990; Hawley & De Haan, 1996; Parker, Cowen, Work, & Wyman, 1990; Rak & Patterson, 1996; Rutter, 1979; Rutter, 1985; Saleebey, 1996; Werner, 1984; Werner, 1990; Werner & Smith, 1992). This research has concentrated on identifying factors in childhood that are predictive of optimal responses to
adverse conditions over time. These studies have tended to be longitudinal, tracking participants often over two or more decades.

- The domain of resilience in individual adults, which has concentrated on understanding how adults respond to life stressors in constructive ways (Barnard, 1994; Goldstein, 1997; Kaplan, Turner, Norman, & Stilson, 1996; Kline & Snow, 1994; Pearlin & Schooler, 1982; Petticrew, Bell, & Hunter, 2002; Polk, 1997; Saleebey, 1996; Sonn & Fisher, 1998; Strümpfer, 2002; Walsh, 1996). Specific theories of individual resilience have been influential in the field, particularly:
  - Antonovsky’s work on salutogenesis (Antonovsky, 1979; Antonovsky, 1984; Antonovsky, 1998a; Antonovsky, 1998b; Antonovsky & Bernstein, 1986; Strümpfer, 1990; Strümpfer, 1995) and Sense of Coherence (Anderson, 1998; Anson, Carmel, Levenson, Bonneh, & Maoz, 1993; Antonovsky, 1987; Association of Ontario Health Centres, 1995; Baker, 1998; Brooks, 1998; Cederblad et al., 1994; Cederblad & Hansson, 1996; Coe, Romeis, & Hall, 1998; Dahlin et al., 1990; Fiorentino & Pomazal, 1998; Flick & Homan, 1998; Gottlieb, 1998; Milanesi et al., 1998; Post-White, 1998; Ryland, Tegarden, & King, 1998; Sagy & Antonovsky, 1998; Shiu, 1998; Wagenfeld, Baro, Gallagher, & Haepers, 1998). The notion of salutogenesis is particularly significant in that it shifts the focus from the origins of disease (patho-genesis) to the origins of health (saluto-genesis) or more broadly towards strength (forti-genesis). This paradigm shift is fundamental to resilience theory.
  - Thriving is a term that has been discussed as a development on resilience, and implies that people may not only ‘bounce back’ to their pre-stress level of functioning, but in fact attain a higher level of functioning (Carver, 1998; Ickovics & Park, 1998a; Ickovics & Park, 1998b).
  - Hardiness, developed by Kobasa, is a concept that has been especially well researched in the organisational field, and refers to a set of personality traits that enables people who are exposed to stress to resist developing health complaints (Ganellen & Blaney, 1984; Howard, Cunningham, & Rechnitzer, 1986; Hull, Van Treuren, & Virnelli, 1987; Kobasa, 1979; Kobasa, Maddi, & Courington, 1981; Kobasa, Maddi, & Kahn, 1982a; Kobasa, Maddi, & Puccetti, 1982b; Kobasa, Maddi, & Zola, 1983; Ouellette Kobasa & Puccetti, 1983; Schmied & Lawler, 1986; Strümpfer, 1990).
  - Learned resourcefulness, developed by Rosenbaum, is a cluster of skills that contrasts with learned helpfulness (Rosenbaum & Ben-Ari, 1985; Strümpfer, 1990).
  - Self-efficacy, developed by Bandura, refers to the belief people have in their own ability to change (Bandura, 1982).
  - Locus of control, developed by Rotter, concerns people’s beliefs about who is in control of their lives (Rotter, 1966).
Potency, developed by Ben-Sira, is a combination of belief in one’s self and in the basic meaningfulness of one’s environment (in Strümpfer, 1990).

Stamina, developed by Thomas and Colerick, refers to a quality of endurance and the ability to resist stress (in Strümpfer, 1990).

Personal causation, developer by De Charms, is the belief that one is the master of one’s life (De Charms, 1968).

The literature on the resilience of families, while perhaps younger than that of the resilience of individuals, has been well developed over the past few decades. Much of the work has been done in the field of military families, in response to war and war-induced separations (Butler, 1997; Caplan, 1982; Frankel, Snowden, & Nelson, 1992; Hawley & De Haan, 1996; H.I. McCubbin & McCubbin, 1988; Silliman, 1994; Walsh, 1996). Given that the focus of the Military Social Health Index is the family system, of which the soldier is a part, this aspect of resilience theory is especially significant. The theory has undergone a number of developments:

- Much of the earlier family resilience research focused on family strengths, with the aim to identify those characteristics that distinguish strong families from less resilient families. Various such factors have been identified, including: family cohesion; communication; problem solving; spirituality and values; family identity and rituals; affective responsiveness; boundaries and hierarchies; flexibility and adaptability; social support; autonomy; and family coherence (Barnhill, 1979; Bigbee, 1992; Bobele, 1989; Boss, 1980; Cederblad et al., 1995; Cobb, 1982; Epstein & Bishop, 1981; Fristad, 1989; Gantman, 1980; Gunn, 1980; Imber-Black, Roberts, & Whiting, 1988; Johnson et al., 1998; Kabacoff, Miller, Bishop, Epstein, & Keitner, 1990; Lee & Brage, 1989; Littlejohn-Blake & Darling, 1993; McAdoo, 1982; H.I. McCubbin & McCubbin, 1988; H.I. McCubbin & McCubbin, 1992; H.I. McCubbin, Thompson, & McCubbin, 1996; Miller, Epstein, Bishop, & Keitner, 1985; Minuchin, 1974; Olson, Lavee, & McCubbin, 1988; Ponzetti & Long, 1989; Roberts, 1988; Sarason, Levine, Basham, & Sarason, 1983; Sawin, 1979; Sawyer, Sarris, Baghurst, Cross, & Kalucy, 1988; Schvaneveldt & Young, 1992; Stinnett, 1979; Stinnett & De Frain, 1989; Tallman, 1988; Trivette, Dunst, Deal, Hamer, & Propst, 1990; Will & Wrate, 1985; Wolin & Bennett, 1984).

- Hill’s ABCX Model, developed during World War II, provides the foundation for all later models of family resilience. The model posits that the response of families to stress is mediated by the family’s crisis-meeting resources and their definition of the stressor (Black, 1993; Burr, 1973/1982; McCubbin & Patterson, 1982; 1983b).

- McCubbin’s Double ABCX Model (McCubbin & Patterson, 1983a; M.A. McCubbin & McCubbin, 1996), FAAR Model (Lavee, McCubbin, & Olson, 1987; McCubbin & Patterson, 1983a; M.A. McCubbin & McCubbin, 1996) and T-Double ABCX Model (McCubbin et al.,
McCubbin’s Resiliency Model of Family Adjustment and Adaptation is the most developed model produced by these authors, and represents the culmination of decades of research into family resilience (M.A. McCubbin et al., 1996; McCubbin, Thompson, Thompson, Elver, & McCubbin, 1998; McCubbin, Thompson, Thompson, & Fromer, 1995a; McCubbin, Thompson, Thompson, & Futrell, 1995b; McCubbin & McCubbin, 1993; 1996; Patterson & Garwick, 1998).


The candidate’s own work on deployment resilience has made a valuable contribution to the domain of resilience theory, particularly in its application to military families and how they cope with military-induced separations (Van Breda, 1997a; 1998a; 1998b; 1998c; 1999a; 1999b). Eight primary dimensions were identified that facilitate resilience to deployment stress, viz emotional continuity; positive perspectives on deployments; support systems; financial preparation; ‘partner-aware’ family structure; resilient children; flexible marriage; and family-oriented management (101st Airborne Division (Air Assault) & 1st Battalion 327 Infantry, n.d.; Adler, 1995; Adler, Bartone, & Vaitkus, 1995; Albano, 1995; Aldridge, Sturdivant, Smith, & Lago, 1997a; Aldridge, Sturdivant, Smith, & Lago, 1997b; Amen, Merves, Jellen, & Lee, 1988; Applewhite & Mays, 1996; Applewhite & Segal, 1990; Baker et al., 1968; Beckman, Marsella, & Finney, 1979; Bell, 1991a; Bell, 1991b; Bell, 1993; Bell, Bartone, Bartone, Schumm, & Gade, 1997; Bell, Scarville, & Quigley, 1991; Bell, Stevens, & Segal, 1996a; Bell, Teitelbaum, & Schumm, 1996b; Bey & Lange, 1974; Black, 1993; Blaisure & Arnold-Mann, 1992; Bloch, Zimmerman, Perez, Embry, & Magers, 1991; Blount, Curry, & Lubin, 1992; Boss, McCubbin, & Lester, 1979; Bowen, 1984; Bowen, 1986; Bowen, 1989a; Bowen, 1989b; Bowen & Orthner, 1989; Bowen, Orthner, & Bell, 1997; Bowen, Orthner, &

- Although resilience theory is an interdisciplinary field, social work has certainly made its mark. McCubbin, probably the most significant pioneer of family resilience, is a social worker. Several of the other writers in the field are also social workers. Furthermore, social workers have adapted resilience theory into the clinical field, under a number of titles, including the strengths approach, the solution-focused approach and narrative therapy (Benard, 1997; Bendor, Davidson, & Skolnik, 1997; Bricker-Jenkins, 1997; Cowger, 1997; De Jong & Miller, 1995; De Shazer & Berg, 1988; Epston & White, 1992; Fast & Chapin, 1997; Holmes, 1997; Jenkins, 1990; Kaplan et al., 1996; Kisthardt, 1997; McQuaide & Ehrenreich, 1997; Nichols & Schwartz, 1991; Rapp, 1997; Saleebey, 1996; Saleebey, 1997a; Saleebey, 1997b; Saleebey, 1997c; Saleebey, 1997d; Tomm, 1989; Weick & Chamberlain, 1997; Weick, Rapp, Sullivan, & Kisthardt, 1989; Weick & Saleebey, 1995; Weiner-Davis, 1992; White, 1989a; White, 1989b; White, 1989c; White, 1992).

4.3.1.2 The Resilience Model of Social Health

As mentioned previously, the Directorate Social Work of the SANDF has, for the past few years, been employing a modified version of the Resilience Model of Family Adjustment and Adaptation (M.A. McCubbin & McCubbin, 1996) in its Concurrent Health Assessments. This modified model emerged through a process of broad consultation with social workers throughout the organisation – both across the hierarchy and across region. The most salient components of McCubbin’s Resiliency Model of Family Adjustment and Adaptation were incorporated into the Resilience Model of Social Health, and influenced by other aspects of resilience theory, as briefly outlined in the previous section.

McCubbin and associates are primarily researchers, who use model development and testing to reach a deeper understanding of how families respond in resilient ways to life stressors. As a consequence, their models have become increasingly rich and complex over time, and thus less and less accessible to practitioners.

The goal of the current study, within the context of health assessment, is not to achieve greater understanding of social health or family resilience as such, but rather to create a clinical tool that can be used with simplicity and efficiency by social work practitioners in the field. It was, therefore, necessary to sacrifice the richness of McCubbin’s models for the clinical gain in assessment.

Components of the model were further influenced by other research and theory in the field of resiliency and also by the strategic agenda of the Directorate Social Work. This resulted, for
instance, in the exploration and inclusion of the dimension Work-to-Family Interference, which is not mentioned in McCubbin’s work. Another example is the use of the term Generalised Resistance Resources – the term, though not the direct meaning, was cannibalised from Antonovsky’s model of salutogenesis and the content is a composite of many individual and family strengths.

The resultant model, with its two main dimensions (Vulnerability and Resilience) and its eight subconstructs, has been in use by the Directorate Social Work since the beginning of 2000. It has been well tested in the field in both assessment and practice, and has held up to such use. The Directorate has demonstrated its confidence in the model by extending its application to organisational interventions and also to the support function of social work supervision. In this way, the Directorate has located the model as a central organising framework for all social work practice.

The Resilience Model of Social Health is thus presented in Figure 24. The pages that follow serve to provide a brief overview of the literature, theory and research that underpin each of the components of the model, drawing on the cross-section of resilience theory outlined previously.
4.3.1.3 The Stressor

“A stressor is a demand placed on the family that produces, or has the potential of producing changes in the family system” (M.A. McCubbin & McCubbin, 1996, p. 17). Stressors can be divided into normative and nonnormative stressors:

- **Normative stressors** “are expectable, scheduled changes involving entrances into and exists from social roles” (Lavee et al., 1987, p. 859). Life events can be considered normative when they are “ubiquitous (they occur in most families), expectable (families could anticipate their occurrence at certain scheduled points in the family life cycle), and short-term (not chronic)” (McCubbin & Patterson, 1983b, p. 8). Normative stressors tend to create less strain for families than nonnormative stressors, and the strain caused by a normative stressor tends to increase with the number of changes families must make in response to the stressor (ibid.).

- **Nonnormative stressors**, by contrast, “are those that occur unexpectedly, such as natural disasters, the loss of a family member, war”, etc (Lavee et al., 1987, p. 859).

Lipman-Blumen (1975, in McCubbin & Patterson, 1983b, pp. 7-8) posed several criteria that can be helpful in determining the stressfulness of a stressor:

- “Is the origin of the stressor from within the family system (eg mother goes back to work) or from outside the family (eg loss of a job)?

- “Does the impact of the stressor extend directly to all family members (eg divorce) or to only some members (eg adolescent has argument with friend)?

- “Is the onset of the stressor very sudden (eg tornado) or does it emerge gradually (eg pregnancy)?

- “Is the degree of severity of the stressor intense (eg a death) or mild (eg the purchase of a new car)?

- “Is the length of adjustment to the stressor short-term (eg child starts school) or long-term (eg parent gets cancer)?

- “Can the stressor be expected (eg child becoming an adolescent) or does it occur unpredictably at random (eg an auto accident)?

- “Does the stressor emerge through natural causes (eg a hurricane) or as a result of artificial, human-made situations (eg loss of a job from increased use of technology)?
“Does the family believe that the stressor is one that can be solved (e.g., adjusting to a new home) or is it beyond their control (e.g., inflation’s effect on family income)?”

According to M.A. McCubbin and McCubbin (1996, p. 17), “The severity of the stressor is determined by the degree to which the stressor threatens the stability of the family unit, disrupts the functioning of the family unit, or places significant demands on and depletion of the family’s resources and capabilities.”

Within the current Social Health context, the stressor is defined as the deployment of a soldier for military purposes. Drawing in part on the Lipman-Blumen’s criteria, the stressfulness of the deployment can be attributed to a combination of the following key variables:

- The duration of the deployment – although long deployments place a chronic stress on the family system, frequent short deployments create significant disruptions in the family system (Huffman et al., 2000; Van Breda, 1997b).

- The frequency of deployments – it appears that the duration of separations is a less significant factor in predicting separation stress than is the frequency of separations (Van Breda, 1997b). When separations are longer and less frequent, families have time to adjust to the phases of togetherness and separation. Short but frequent separations require the family to adjust continually to the coming or going of the employee, which effectively prevents the family from ever achieving a period of stable functioning (Howe, 1983; Peck & Schroeder, 1976). It seems that the crux of the stressor is the adjustments that families must make at the points of separation and reunion, rather than the separation itself.

- The predictability of deployments – Van Breda’s (1997b) research in the SA Navy found that those families with the highest deployment stress work on ships that have erratic, unpredictable separations. Time to plan for a deployment is probably the most essential ingredient in deployment resilience. In a study of US military families whose partners were deployed in 1991 to South-West Asia, 35% “felt that they were not given adequate information, 65% said that there was insufficient time for family needs, and 41% said that leaders were not supportive of families during” the pre-deployment period (Martin et al., 1992, p. 6). Without preparation, which is inevitable when deployments are unpredictable, all of the efforts of families to develop their resilience are undermined (Bloch et al., 1991; see Simon, 1990 for a similar perspective regarding shift work schedules).

- The distance between the family and the place of deployment – the further away the soldier, the more stressful the deployment. When families perceive the soldier to be inaccessible, as is the case when s/he is deployed to another country, small concerns become inflated and the deployment itself is consequently experienced as more stressful.

- The danger involved in the deployment – deployments that expose soldiers to danger or potential harm are more stressful than those that do not (Van Breda et al., 1999).
The quantification of the stressor is complicated by the nonlinear relationship between the above variables and stress. The duration of deployments is a good example – it would appear that short frequent deployments and very long deployments are most stressful, while moderate length deployments are least stressful. Similarly, families who have no experience of deployments or who have a great deal of deployment experience evidence the highest deployment stress, while those with moderate experience of deployments evidence lower stress. These curvilinear and interactive relationships make quantification of the stressfulness of the stressor difficult.

4.3.1.4 Vulnerability

Family vulnerability refers to "the interpersonal and organizational condition of the family system" (M.A. McCubbin & McCubbin, 1996, p. 17) and is determined by (M.A. McCubbin & McCubbin, 1993):

1. The accumulation, or pileup, of demands on or within the family unit, such as financial debts, poor health status of relatives, and changes in a parent’s work role or work environment, and
2. the normative trials and tribulations associated with the family’s particular life-cycle stage with all of its demands and changes. (p. 28)

Vulnerability therefore indicates how vulnerable the family is to a particular stressor. Since the pileup of stress varies across the life cycle, the family’s vulnerability also varies across the life cycle, and one can predict that a particular stressor will be more or less threatening at different times in the life of a family. A couple without children may be less vulnerable to losing a job, for example, than a family with adolescent children, due to the “accumulation of life strains associated with raising an adolescent and the depletion of family interpersonal, social, and economic resources at this stage” (M.A. McCubbin & McCubbin, 1996, p. 17).

Vulnerability is elsewhere described as the increased likelihood of “wellness breakdown” in response to an increase in acute and chronic stressors (Maddi, 1999, p. 68).

Within the context of the Resilience Model for Social Health, vulnerability refers to those factors that auger against family well-being in the face of stressors. Were a family not vulnerable, it is possible that they would be able to deal with the stressor without experiencing crisis. The presence of vulnerability, however, increases the likelihood that the stressor will lead to social unhealth. Four specific dimensions are identified as most significant, viz: social problems, pileup of life stressors, family life cycle and work-to-family interference.

4.3.1.5 Social Problems

The dimension of social problems is based in the theory of vulnerability as described in the previous section. Clinical experience suggests that families who already experience some kind
of social problems (e.g., alcohol abuse, financial difficulties, conflict with children, etc.) are more vulnerable to the deployment stressor than families who are not experiencing social problems. The presence of such problems means that the family is already overwhelmed with challenges when the deployment stressor arrives.

This notion is supported by research among military families. One study found that the mental health conditions of 83% of the people diagnosed during a deployment in Bosnia predated the deployment (Winfield & Lafferty, 1997, p. 104). Problems at home are perceived to increase in frequency and severity during deployments (Bell et al., 1996b; Bloch et al., 1991; Decker, 1978), although these authors indicate that families often simply find it harder to cope with 'normal' problems when a family member is deployed – the family is thus more vulnerable to the stressor.

4.3.1.6 Pileup

Families seldom have to deal with only one stressor at a time. A large part of the reason for the ongoing development of family resilience models has been to explain how families cope with multiple stressors. The confluence of such stressors is termed pileup. Pileup differs from the stressor as such, in that the latter refers to a single stressor while the former refers to a pileup of multiple stressors. Typically, multiple stressors coincide, requiring a complex range of coping patterns. McCubbin's studies indicate that most families “experience a pileup of demands, particularly from a chronic stressor such as caring for a disabled family member or in the aftermath of a major stressor, such as a death, a major role change for one member, or a natural disaster” (McCubbin & Patterson, 1983b, p. 14). The greater the pileup experienced by a family, the more vulnerable the family is to stress and maladaptation.

M.A. McCubbin and McCubbin (1996) identify nine principle sources of pileup:

- **The Stress & Its Hardships.** Firstly, pileup results from the “initial stress and related hardships which develop over time” (M.A. McCubbin & McCubbin, 1996, p. 27). There are various indirect or additional stressors that are inherent in the initial stressor (McCubbin & Patterson, 1983b). For example, the stressor of a father losing his job brings with it the additional stressors of financial difficulties, loss of masculinity and esteem, potential loss of the family home, excess free time, frustrations resulting from searching for a new job, etc.

- **Normative Transitions.** Secondly, pileup results from “normative transitions in individual family members and the family as a whole which happened during the same period of time” as the original stressor (M.A. McCubbin & McCubbin, 1996, p. 27). Stressors and normative, family life-cycle transitions may co-occur independently of each other, but combine in ways that increase the pileup of family stress. The families researched by McCubbin and Patterson (1983b):
Experienced the normal growth and development of child members (eg increasing need for nurturance and supervision; increasing need for independence), of adult members (eg spouse’s desire to continue with her career; mother’s increasing need for a meaningful relationship), of the extended family (eg illness and death of grandparents); and family life cycle changes (eg children entering school, adolescence). (p. 14)

**Prior Strains.** Previous stressors create strains in the family that are often not resolved at that time and continue to exert a subtle influence over the family. “These prior strains are not usually discrete events which can be identified as occurring at a specific point in time; rather, they emerge more insidiously in the family” (McCubbin & Patterson, 1983b, p. 15). The introduction of a new stressor in the family system may exacerbate the prior strains thereby contributing to increased pileup and to the vulnerability of the family to the stressor.

**Situational Demands and Contextual Difficulties.** The society or community within which the family is situated may contribute to the stress of a family or undermine the ability of a family to resolve crises. For instance, the employer of a mother with a disabled child may be unaccommodating regarding the mother working flexitime in order to care for the child’s medical needs. The lack of adequate childcare facilities may be a contextual difficulty or concern for many. Political instability, crime or a history of discrimination are all examples of situational demands and contextual difficulties that contribute to pileup.

**Consequences of Family Efforts to Cope.** Not only the stressor itself contributes to pileup, but also the family’s efforts to deal with the stressor (McCubbin & Patterson, 1983b). “These stressors and strains emerge from specific behaviors or strategies that a family may have used in the adjustment phase, ... or that the family currently uses in their effort to adapt to the crisis situation” (M.A. McCubbin & McCubbin, 1996, p. 29). Some of a family’s coping efforts may be obviously negative and stressful (such as the use of alcohol or drugs to cope with the stressor), but others may be apparently positive and helpful (such as avoiding discussing the problem which reduces the short term stress but leads to aversive medium and long term consequences).

**Intrafamily and Social Ambiguity.** All change results in a degree of uncertainty about the future, and this uncertainty constitutes ambiguity. There may be ambiguity within the family system, such as boundary ambiguity (Boss, 1980) (in which it is unclear who is in or out the family system) or shifts in family roles and responsibilities following a divorce. There may also be ambiguity in the family’s social context, such as when the community is unable to decide how to handle a family. For instance, a catholic wife who believes divorce is the only viable final response to being battered by her husband may face ostracism by the Church and her congregation (M.A. McCubbin & McCubbin, 1996).

**Newly Instituted Patterns of Functioning Create Additional Stress.** The healthy new patterns of functioning instituted during a family’s adaptation to previous stressors may demand changes in the family system that create additional stress. Positive long-term
changes tend to produce increased disharmony and imbalance in the short-term. These additional changes constitute pileup.

- **Newly Instituted Patterns of Functioning Clash with Family Beliefs.** Pileup results from the “newly instituted patterns of functioning which are in conflict with or incongruent with the Family’s Schema (values and beliefs) and/or the Family’s Paradigms (ie rules and expectations)” (M.A. McCubbin & McCubbin, 1996, p. 28). Not all family members may agree with the changes that are implemented during adaptation to stressors, creating additional strain in the family system.

- **Established Patterns of Functioning.** Lastly, pileup may result from “old patterns of functioning which are in conflict or not compatible with newly adopted patterns of functioning” (M.A. McCubbin & McCubbin, 1996). Established patterns of functioning continue while the family is adapting to the stressor and crisis, thereby providing much-needed stability and continuity for the family. However, these patterns may be in conflict with the new patterns that are being established, resulting in conflict and tension.

There are, perhaps, three important aspects of pileup that can be measured (Ruehlman, Lanyon, & Karoly, 1999):

- The number of stressors experienced.
- The stressfulness of these stressors.
- The impact of these stressors on the individual or family.

### 4.3.1.7 Family Life Cycle

The resilience of families changes across the life cycle. Families are more vulnerable to certain stressors at certain stages in the cycle than at others (M.A. McCubbin & McCubbin, 1996). A couple without children may be less vulnerable to losing a job, for example, than a family with adolescent children, due to the “accumulation of life strains associated with raising and adolescent and the depletion of family, interpersonal, social, and economic resources at this stage” (ibid., p. 17).

---

1 Ultimately, Family Life Cycle was not included in the Military Social Health Index, because the construct did not lend itself to standardised measurement and because it was found to be culturally biased.
Furthermore, the structure or typology of families influences their vulnerability to certain stressors. M.A. McCubbin and McCubbin (1989, p. 27) define a family typology as "a set of basic attributes about the family system which characterize and explain how a family system typically [italics added] appraises, operated, and/or behaves." A family typology is the family's typical, predictable or habitual pattern of behaviour, which is established over time. McCubbin's research has endeavoured to identify these typologies and to use them to predict how families will respond to stress.

4.3.1.8 Work-to-Family Interference

The term 'work-life interface,' which is the precursor or superordinate of work-to-family interference, refers to the often-conflictual relationship between the occupational or work role/system and the personal, 'life' or family roles/systems of people. Changes in the modern workforce, particularly since the 1980's, have lead to great increases in work-life conflicts (Googins, 1991). Employers are increasingly having to address how to reduce these conflicts in order to retain qualified personnel, reduce absenteeism, increase productivity and improve client satisfaction. Most organizations at the turn of the 21st century have introduced policies that facilitate this interface – work-life initiatives, alternative working arrangements, family-friendly policies, etc.

None of the literature on the work-life interface is explicitly grounded in resilience theory. Nevertheless, there are a number of characteristics of this field which suggest that it can be meaningfully considered as an example of resilience-based policy:

- The work-life policies promote the interface between two conflicting systems in order to promote the well-being of both systems.
- The outcome of work-life policies can be described as a balance between demands and capabilities between the two systems of work and family. This balance between the demands placed on a system and the system's capability to deal with these demands is equated with family adjustment (McCubbin & Patterson, 1983a) and community adjustment (Melson, 1983) in some resilience literature.
- Work-life policies create a societal system that is much more flexible and cohesive, characterised by greater commitment and a greater ability to cope with stress and change. All of these outcomes are consonant with resilience theory.
- Work-life policies, in general, focus on the entire working community rather than only on those with problems, and in this way have a preventive, strengths-building approach rather than a purely remedial one.
This section will provide a brief overview of theory related to the work-life interface in order to clarify the concept, provide examples of work-life conflicts and highlight the impact of such conflicts on the workplace and on the family/employee.

4.3.1.8.1 Theory of the Work-Life Interface

The theory of work-life interface originates in two sets of changes, viz changes in the workforce and changes in organizational processes. In addition, much work-life theory addresses the degree or nature of the interface between these two systems.

Changes in the Workforce. The workforce has changed dramatically over the past few decades. Society has also changed greatly, along with economic change, cultural change and changes in the workplace itself. These changes have necessitated radical change in how one thinks about work and in how employers approach employees (O'Connell, 1999). More and more companies are realising the importance of attending to the family and other social needs of their employees (Moore, 1997).

The 'Baby-Boomer' generation, which entered the workforce during the 1960s, placed great emphasis on work. Their personal identities were very tied up with their work identity (Gibbon, 1995). Consequently, they had a very strong work commitment or psychological contract. Many of these workers were prepared to put in 60 or more hours of work per week (Keele, 1984) and were willing to sacrifice family time for work time. Workers prior to that, in the wake of the Depression, were willing to take any job that provided security, and found their family or religious identity as important as their work identity (ibid.).

The employee of the last two decades of the 20th Century, Generation X, however, is seeking a better balance between work and family life, and is demanding that the workplace take a less central role in life (Allen & Russell, 1999). One of the reasons for such a shift is the changing demographic of the workforce. Only a small percentage of the workforce conforms to the traditional American family type: breadwinner husband and stay-at-home mother/wife. "In fact, it is estimated that among American two-parent heterosexual families, only 20% fit the description of a traditional household" (ibid., p. 166).

As we move into the 21st Century, one may wonder what is in store for us. A team of panellists believe that one of the major changes in the workplace during the first decade of the 21st Century will be a shift towards "working to live, not living to work" and that companies will free up workers to seek fulfilment at home and in the community (Kemske, 1998). These panellists believe that in the future work will not occupy the centre of people’s emotional lives and identity (ibid.; see also Segal, 1989).

One of the main changes in the demographics of families is the rising number of dual-income families (Portner, 1983). In Canada the percentage of all two-parent families that were dual-income families increased from 20% in 1961, to 40% in 1981, and to 65% in 1991 (Duxbury et
In the USA in 1997, 78% of married full-time employees had a partner who was also employed (Bond et al., 1998, p. 5).

In addition, increasing numbers of families have only one parent – whether divorced parents, never-married parents or widowed parents (Portner, 1983). "In 1991, 12.8% of Canadian families were classified as single-parent families, ... the majority of which are headed by women" (Duxbury et al., 1994, p. 449). In 1997 in the USA, almost 20% of employed parents were single parents (Bond et al., 1998, p. 5).

Other studies have indicated that increasing numbers of employees are responsible for the care of children or elderly relatives (Weiss, 1998). As society ages it is likely that there will be a tremendous increase in the percentage of employees caring for the elderly. Currently, about one in four American households cares for an elderly family member or friend, and about 60% of caregivers find that caring for an elderly person causes them to miss work, arrive late, leave early, take extended lunch breaks, etc (Rachor, 1998, p. 20).

Men are taking an increasingly active role in family life, way beyond the traditional role of 'providing' for the family economically (Cohen, 1993; Segal, 1989; Stanford, 1998). Although employed mothers still spend more time with their children than do fathers (3.2 vs 2.3 hours respectively per workday in 1997), employed fathers in 1997 are spending 30 minutes more per workday with their children than they did in 1977, while employed mothers’ time per day has remained constant (Bond et al., 1998, p. 5). In addition to spending more time with their children, employed fathers are spending more time on home chores – "mothers’ workday time on chores has decreased by 36 minutes per day [from 1977 to 1997], while men’s time has increased by one hour" (ibid., p. 6).

Ellen Galinksy is quoted as saying (in Pleck, 1993):

> When we first started doing this the groups of men and women sounded very different. If the men complained at all about long hours, they complained about their wives' complaints. Now if the timbre of the voice was disguised, I couldn't tell which is which. The men are saying: "I don't want to live this way. I want to be with my kids." I think the corporate culture will have to begin to respond to that. (p. 234)

The establishment of the Fatherhood Project in 1981 (Levine & Pitt, 1999) provides an example of the growing commitment of men to life beyond the workplace. This project aims to help men find a better balance between work and family responsibilities. The Fatherhood Project lists 19 additional websites dedicated to addressing fatherhood issues, particularly work-family issues (ibid.).

**Changes in the Workplace.** In addition to changes in family structures, there have been major changes in the workplace as well (Cooper, 1998). Three of the main changes are "downsizing, diffusing information via computerized telecommunication technologies, and increasing reliance on high-involvement team approaches" (Crouter & Manke, 1994, p. 117):
Downsizing. Many American organisations began a substantial process of downsizing during the 1980s and 1990s. These retrenchments went beyond the natural shrinking of the formal market during a recession, but reflected changes in the way the contemporary market is being structured. In order to gain a corner of the global market, companies have to be smaller and more efficient ('lean & mean'), and are out-contracting specific portions of their work. This has implications for both those who are laid off and those who remain behind. (Crouter & Manke, 1994)

Information Technology. More and more production and service processes are becoming automated. Consequently, fewer workers are required with technical or manual skills, and workers are increasingly required to work with data rather than materials. This places greater conceptual and cognitive demands on workers, fewer workers are needed and the boundaries between workers and managers become blurred. (Crouter & Manke, 1994)

High-involvement Teams. Many companies are making increasing use of high-involvement work teams to solve work problems. Previously, workers became highly specialised in their specific field, often without understanding the broader process. Work teams require everyone to know most everything about the process, providing workers with a much broader range of knowledge and skills. Consequently, work becomes more stressful and demanding and workers become much more emotionally and psychologically involved in the work. (Crouter & Manke, 1994)

These changes in the workplace – downsizing and retrenchments, shortened work weeks, privatisation, increasing self-employment, working by contract rather than life-long employment, the rapid changes in technology, increased mechanisation and depersonalisation of work processes, increasing percentage of women in the workforce, etc – have had and will continue to have a profound impact on society's workforce and families (Cooper, 1998). The changes introduce various challenges for families including: (1) having to cope with marked job insecurity, (2) learning to incorporate work and family into the same building as more and more people work from home, (3) coping with working longer hours, (4) the shifting roles and power relationships between men and women at work and home, (5) changing levels of commitment or loyalty towards work, and (6) changes in the factors that motivate people to work (ibid.).

One of the major changes in the workplace is the large number of women who are now working. Almost half of all employed people (46-49%) are women (Gini, 1998, p. 3). Although they make up only 3% of senior managers, women have an influence on the nature of the workplace, and its responsiveness to the needs of families (ibid.).

The Myth of Separate Worlds. All of these changes in modern society have resulted in a gradual collapse of what has been termed the "myth of separate worlds" (Andrews & Bailyn, 1993; Davis, 1982; Googins, 1991; Neenan, 1989; Segal, 1989). The equivalent concept of 'separate spheres’ can be described as follows (Skrypnek & Fast, 1996):
The separate spheres model regards work and family as naturally and biologically
determined separate systems. It is assumed that the nuclear family is the universal,
desirable family form, that work and family are static, unchanging institutions, and that
gendered division of labor and gender inequality are inevitable and necessary for societal
and family stability. Conflict is believed to arise when families fail to keep the spheres
separate. (pp. 795-796)

In pre-industrial society the world of work and the world of the family were often the same world.
The industrialisation took much of the work out of the home and into a new world – the work world
– triggering the separation of the spheres of work and family (Andrews & Bailyn, 1993). Men
occupied and controlled the work world while women occupied and largely controlled the
family/home world (Brinkerhoff, 1984). "In short, in pre-industrial times the family unit served as
both producer and consumer, whereas contemporarily the family consumes as a unit but produces
in separate, disjunctive roles that are external to the family” (ibid., p. 5).

This distinction between work and family systems is evident in sociology, which examines two
main social structures (Davis, 1982):

The first is the rational bureaucratic organization, as described by Max Weber (Henderson
and Parsons, 1947); the second is the primary group, as conceptualized by Cooley (1923).
The typical work organization, of course, belongs to the first category; the family unit is
invariably classified in the second. (p. 3)

This first conceptualisation of the relationship between family and work, referred to as the
'separate worlds model,' has dominated much of academic and popular thinking (Andrews &
Bailyn, 1993). The world of work is seen as a masculine world, the world of men, while the family
is seen as the world of women. Issues regarding childcare and family responsibilities are thus
relegated to the private sphere and are seen as having no place at work (ibid.). The world of work
can be thought of as making the following demand on employees: "While you are here, you will act
as though you have no other loyalties, no other life" (ibid., p. 263). The myth of separate worlds
serves the "interests of employers by permitting them to deny the possibility of any spillover of
negative or dysfunctional effects of organizational policies and procedures upon the family life of
employees” (Neenan, 1989, p. 59).

A second conception of the relationship between family and work is referred to as the 'spillover
effects model' (Googins, 1991; Segal, 1989; Skrypnek & Fast, 1996). Here, the two worlds of
work and family are considered intersecting and the characteristics of one or other is thought to
spillover into the other. Most commonly, spillover refers to the negative consequences of the work
spilling over into the family (Brinkerhoff, 1984; Marshall, 1991; Marshall et al., 1991; Skrypnek &
Fast, 1996). There is, however, much interest in the spillover of marital and life satisfaction into
job satisfaction, and vice versa (Neenan, 1989).

A third conception of the relationship between family and work is referred to as the 'interactive
model' (Skrypnek & Fast, 1996). In this model the worlds of work and family are considered to be
closely interrelated and contribute both positively and negatively to the other. The emphasis is on
the mutuality of the relationship between the two systems, and it is believed that the systems can
be better integrated. The close interrelationship between work and the rest of life can be seen in the strong correlations and mutual causation between job and life satisfaction, even longitudinally (Judge & Watanabe, 1993).

Ishii-Kuntz (1994) takes the challenge to the separation of the worlds of paid work and family somewhat further than many other writers. This author notes that in many third world countries there is no physical separation between work and family:

> Many men and women around the world who work in their homes for pay are engaged in a variety of economic activities: They assemble electrical and electronic parts, package and label industrial goods, weave carpets, produce shoes and purses, sew traditional clothes, peel shrimp, and process seaweed. (p. 495)

Such a blurring of work and family is once again becoming increasingly common in the first world as well, particularly with the explosion of information technology and IT-based occupations (Ishii-Kuntz, 1994) and the increasing number of women who are becoming self-employed in order to be at home with their children (Boden, 1999). With the work and family roles so enmeshed it becomes difficult to talk about work-family conflicts as if they are two separate spheres colliding. A different paradigm is required.

**4.3.1.8.2 Work-Family Conflicts**

Work-family conflicts involve difficulty in balancing family and work responsibilities. Portner (1983) identifies several main sources of work-family stress:

- **Perceived Social Expectations.** People may have perceptions about what society expects of them that create stress at the work-family interface.

- **Self-expectations.** People may place unrealistic expectations on themselves to be superhuman – juggling work, family and social responsibilities with ease.

- **Employer Expectations.** Employers may have unrealistic expectations regarding the number of hours to be worked in a week, the flexibility of working hours and travelling, and the expectation that family responsibilities will never intrude on work time.

- **Allocation of Time and Energy.** There is only a finite quantity of time and energy available to any one person, and sometimes there is not enough to meet all the demands and expectations of work and family.

- **Child-Care Responsibilities.** Working parents often worry about their ‘neglect’ of child-care responsibilities.

- **Household Responsibilities.** Managing work and household responsibilities is a source of stress for many employed women, who continue to be largely responsible for housework, even when they are employed fulltime.
Role-Overload. Work-family conflict is the result of an inability to balance the demands of both work and family (Duxbury et al., 1994):

Each of these roles imposes demands requiring time, energy, and commitment to perform the role adequately. The cumulative demands of multiple roles can result in role strain of three types: overload, interference from work to family, and interference from family to work. (p. 450)

Perceived role-overload has been shown to be predictive of perceived stress (Berger et al., 1994), providing support for role strain theory. Role-overload occurs when the cumulative demands from the various roles a person carries reduce the chances of success in any of those roles (ibid.). The scarcity hypothesis, which is part of this theoretical frame, suggests that a person has a finite quantity of personal resources. When a person is carrying an excessive number of roles, their time and energy are diluted, resulting in a sense of role-overload, role strain (trying to juggle these various roles) and stress (ibid.).

Despite the increasing involvement of men in family responsibilities, women continue to experience more role-overload than men (Brinkerhoff, 1984):

In the event of role overload, the wife is often expected to be the adaptive one, because her work role is usually considered lower status. Family emergencies, such as a sick child, are usually handled by the wife’s juggling her occupational responsibilities, not by the husband. (p. 8)

A study of 318 people found that dual-career families experienced the highest work-to-family conflict, and that dual-career and single parent families experienced the highest family-to-work conflict (Eagle et al., 1998). It is likely that these families experience the highest role overload.

Perceived control over one’s life has a moderating effect on role-overload. Even when individuals experience the same objective quantity of role-overload, perceived control reduces the stress effects of the overload (Duxbury et al., 1994, p. 463). This would suggest that giving workers greater control over the structure of their work (e.g., working hours, place of work, flexitime, etc) would contribute to the reduction of the negative consequences of carrying multiple roles.

Work overload was found to predict negative physical health in another study (Barnett, Davidson, & Marshall, 1991). However, being able to help others at work was found to moderate these negative health consequences. Furthermore, getting a higher salary and having a satisfying intimate partnership were as powerful at directly predicting health as was work overload.

Work-to-Family and Family-to-Work Interference. Work-to-family conflict or interference occurs when the general demands of the workplace, the amount of time devoted to work tasks and the stress or strain caused by the work system interfere with the completion of family tasks (Frone et al., 1997; Netemeyer et al., 1996). There are three primary processes of work-to-family interference, viz. time (spending excessive time away from the family), psychological (being psychologically absorbed in work to the exclusion of family) and energy (being physically or emotionally drained by the work demands) (Small & Riley, 1990).
Conversely, family-to-work conflict or interference occurs when the general demands of the family, the amount of time devoted to family tasks and the stress or strain caused by the family system interfere with the completion of work tasks (Frone et al., 1997; Netemeyer et al., 1996). There has been a tendency for researchers to concentrate largely on work-to-family conflict and to equate the term 'work-family conflict' with 'work-to-family conflict' (eg Burley, 1995; Matthews et al., 1996). Part of the reason for this may be that family boundaries appear more permeable than work boundaries, allowing work stress to permeate the family more easily than for family stressors to permeate the workplace (Eagle et al., 1998). Some researchers have begun to examine the reciprocal role of the conflicts (Crouter, 1984).

Various studies on work-family interference have found that:

- Work-to-family conflict and family-to-work conflict both correlate negatively with organisational commitment, job satisfaction, life satisfaction and relationship agreement, and positively with burnout, job tension, role conflict, role ambiguity and the intention to leave the organization or employer (Netemeyer et al., 1996, p. 406).

- Family-to-work conflict correlates positively with searching for another job and negatively with relationship satisfaction, while work-to-family conflict correlates positively with number of hours worked (Netemeyer et al., 1996, p. 406).

- Work-to-family conflict is negatively correlated with marital adjustment (Burley, 1995, p. 490). Two mediating variables (spousal support for one’s career and perceived equity in the division of labour at home) account for 34% of the relationship between work-to-family conflict and marital adjustment (ibid., p. 492).

- Work-to-family conflicts experienced by both partners influence their own and their partner’s psychological distress, which in turn both directly and indirectly (via the impact on the hostility versus warmth and supportiveness of the marital interactions) influence marital satisfaction (Matthews et al., 1996, p. 71).

- Support in the workplace reduces work distress and work overload, which in turn reduces work-to-family conflict. Conversely, support in the family reduces family distress and parental overload, which in turn reduces family-to-work conflict (Frone et al., 1997, p. 162).

- Work-related distress leads to work-to-family conflict, which in turn leads to family distress. Conversely, family related distress leads to family-to-work conflict, which in turn leads to work distress (Frone et al., 1997, p. 163).

- The upsets at work, concerns of the impact of the job on one’s health and safety, the burden on the families of police officers to behave in an exemplary fashion and emotional exhaustion all contributed to reduced job satisfaction among police officers and increased intention to resign (Burke, 1994, p. 794).
4.3.1.9 Resilience

A great deal has been written on individual resilience; indeed, the very notion of resilience emerged within the context of the individual. Family researchers have begun to address the family as a context for the resilience of the individual and even as a unit of analysis in itself (Frankel et al., 1992). This shift has not, however, been easy.

Research on resilience in children demonstrates that although it is conceptualised as a quality of the child him/herself, it is located within the systems of the nuclear family, the extended family and even the broader community (Butler, 1997). Unfortunately, the relationships and causal patterns between individual, family and community levels are not clear – they appear simultaneously independent and interdependent and complementary of each other (Silliman, 1994).

Some family researchers conceive of the family as a system impacting on the resilience of the individual. Caplan’s (1982) study on the family as a support system is one such example. Despite addressing the family in the context of family stress and coping, his paper conceives of the family purely as a support system to the individual family member, and thus as a vehicle for individual resilience.

In this regard, Hawley and DeHann (1996) describe the family in two contexts:

- Firstly, and most commonly, the family can serve as a risk factor raising the vulnerability of family members. Some research outlines the kinds of family factors that create risk for family members (e.g., severe marital conflict, parental mental illness, etc), while other research has identified factors that help family members be resilient in the face of family dysfunction (e.g., research on adult children of alcoholics). Much of the literature on resilience has, in fact, considered resilience in relation to the profoundly dysfunctional family creating a very negative image of families (Walsh, 1996).

- Secondly, the family can serve as a protective factor to boost the resilience of the family members (as Caplan does). Protective factors include “a good fit between parent and child, maintenance of family rituals, proactive confrontation of problems, minimal conflict in the home during infancy, the absence of divorce during adolescence, and a productive relationship between a child and his or her mother” (Hawley & De Haan, 1996, p. 285). Walsh (1996, p. 263) comments that “few have considered the family as a potential source of resilience: that is, as a resource.”

Both of these approaches consider the family merely as a context for the individual. Although there is movement from a purely intrapsychic conceptualisation of resilience to a more contextualised conceptualisation, the family remains in the background.
There is, however, another body of research that conceives of the family as an entity in itself, rather than as merely a context for individuals. McCubbin and McCubbin (1988), for example, have developed a set of typologies of resilient families, which address the family system itself. In these theories, individuals do not occupy centre stage; rather, the family is central and the individuals are merely the components of the family. Walsh (1996, p. 266) refers to this as "relationship resilience" as opposed to the "contextual view of individual resilience" detailed in the previous paragraphs.

There is some debate around whether it is valid to conceive of resilience as a family-level construct. In fact, family stress research which dates back to the 1930s and the family strengths literature which dates back to the 1970s both addressed the family as a unit, although the focus of family stress research was somewhat pathogenic and family strengths research lacked a coherent theoretical frame. More recent theories, such as those of McCubbin and his colleagues, have developed and refined the theory of family-level resilience and have introduced new concepts, such as family schema, which strongly take the family as a unit (Walsh, 1996).

The biggest problem in researching family-level resilience remains measurement (Walsh, 1996). Reiss’ work on “shared constructs” (in Sagy & Antonovsky, 1998) has been assessed through direct observations of family interactions. There is, however, some doubt as to whether there is a direct relationship between an intangible construct such as family resilience or family SOC and the family’s actual behavioural patterns (ibid.). Furthermore, such methods of measuring family constructs are costly.

Most researchers make use of self-reports and scales to measure family constructs. The problem then is how to “build a collective measure on the basis of the interrelations of individual perceptions” (Sagy & Antonovsky, 1998, p. 209). Sagy and Antonovsky propose four alternatives (see also Patterson & Garwick, 1998):

- **Aggregation Model.** The aggregation model, which is the most common method of creating a collective measure of a family construct, involves taking the average or mean of the individual family member scores. The McMaster Model Family Assessment Device (Epstein, Baldwin, & Bishop, 1983) is scored using such a model. This approach, however, ignores the systems theory notion of the whole being more than the sum of its parts, and Sagy and Antonovsky (1998, p. 210) find no theoretically based justification for this practice.

- **Pathogenic Model.** The pathogenic model is based on family systems theory and within the pathogenic paradigm. Here the family score on a construct is taken as the lowest individual family member’s score. “This measure, though it seems an individual one, actually takes into account the entire family by ‘choosing’ the score of only one member according to the relative scores” (Sagy & Antonovsky, 1998, p. 210). This approach to the measurement of family constructs is rare. The approach may, however, be common in clinical work where a family’s overall level of functionality is defined in terms of the worst functioning individual.
Salutogenic Model. The salutogenic model is also based on family systems theory, but within the salutogenic paradigm. Here the highest individual family member score defines the family’s level on a construct. Again, this approach to measurement of family constructs is rare.

Consensus Model. Lastly, the consensus model, which “is based on the assumption that agreement among family members improves its coping and resistance ability” (Sagy & Antonovsky, 1998, p. 210). In this model, the family measurement is the absolute gap between family member scores on the measure. This approach is used quite frequently, in both research and clinical practice.

Sagy and Antonovsky (1998) endeavoured to test which of these four models was most effective but did not reach unequivocal results. They did, however, find considerable support for the salutogenic model of measurement, allowing for:

The characterization of the whole system by one of its subsystems. The pathogenic orientation, which is well known in family therapy, defines the whole unit as ill by identifying the illness of one member. Our findings, however, support a salutogenic orientation, an approach rarely found in family research or clinical work. (p. 223)

Patterson and Garwick (1998) comment on the measurement of family constructs:

Focusing on the family system as a unit of analysis has led to the idea that family meanings are distinct from the meanings held by an individual family member [aggregation model]. Furthermore, family meanings are distinct from consensus between individually held meanings [consensus model]. Family meanings are the interpretations, images, and views that have been collectively constructed by family members as they interact with each other; as they share time, space, and life experience; and as they talk with other and dialogue about these experiences. They are the family’s social constructions, the product of their interactions. They belong to no member, but to the family as a whole. (pp. 80-81)

Clearly, then, there has been considerable progress in family resilience research over the past seventy years, since 1930:

- There has been a move from considering only individual resilience, to also considering family resilience.
- There has been a move from considering the family as only a source of dysfunction over which individuals must rise, to considering families as a source of resilience and strength.
- There has been a move from considering the family only as a context for the development of individual resilience, to considering the family as a unit, in terms of relational resilience.
- There has been a development in the understanding of family-level constructs that are not easily identifiable from individual family members.
- There has been progress in various conceptions of how to measure family-level constructs.
Walsh (1996) has rephrased the salutogenic question in family terms:

While some families are shattered by crisis or persistent stresses, others emerge strengthened and more resourceful. A resiliency-based approach aims to identify and fortify key interactional processes that enable families to withstand and rebound from the disruptive challenges they face. A resiliency lens shifts perspective from viewing families as damaged to seeing them as challenged, and it affirms their reparative potential. This approach is founded on the conviction that both individual and family growth can be forged through collaborative efforts in the face of adversity. (pp. 261-262)

How, then, is family resilience defined?

Family resilience describes the path a family follows as it adapts and prospers in the face of stress, both in the present and over time. Resilient families respond positively to these conditions in unique ways, depending on the context, developmental level, the interactive combination of risk and protective factors, and the family’s shared outlook. (Hawley & De Haan, 1996, p. 293)

[Family resilience refers to the] characteristics, dimensions, and properties of families which help families to be resistant to disruption in the face of change and adaptive in the face of crisis situations. (McCubbin & McCubbin, 1988, p. 247)

[Family] resiliency can be defined as the positive behavioral patterns and functional competence individuals and the family unit demonstrate under stressful or adverse circumstances, which determine the family’s ability to recover by maintaining its integrity as a unit while insuring, and where necessary restoring, the well-being of family members and the family unit as a whole. (McCubbin & McCubbin, 1996, p. 5)

[Family resiliency refers to those] key processes that enable families to cope more effectively and emerge harder from crises or persistent stresses, whether from within or from outside the family. (Walsh, 1996, p. 263)

In the context of the Resilience Model of Social Health, resilience is conceived of comprising four principle dimensions, viz support systems, problem solving, stressor appraisal (which together comprises specific resistance resources) and generalised resistance resources.

**4.3.1.10 Support Systems**

**4.3.1.10.1 Introduction to Support Systems**

Trivette et al (1990, p. 19) indicate that strong families evidence “a balance between the use of internal and external family resources for coping and adapting to life events and planning for the future.” This perspective is echoed by Otto (1963, in H.I. McCubbin & McCubbin, 1992, p. 167) – “active participation in the community” – and Curran (1983, in H.I. McCubbin & McCubbin, 1992, p. 168) – “the healthy family values service to others” and “the healthy family admits to and seeks help with problems.” Research by Olson (1983, in H.I. McCubbin & McCubbin, 1992, p. 168) found that “family and friends” are important to the maintenance of “balance” in families in all stages of the family life cycle except “family in empty nest stage and retirement...
Social support, as a family resilience factor, received intensive study during the 1970s and 1980s (H.I. McCubbin & McCubbin, 1992, p. 160). In 1976, Cobb (in H.I. McCubbin & McCubbin, 1992) identified three primary levels of social support, viz:

1. Emotional support, leading the individual to believe he or she is cared for and loved;
2. Esteem support, leading the individual to believe he or she is esteemed and valued;
3. Network support, leading the individual to believe he or she belongs to a network of communication involving mutual obligation and mutual understanding.  

H.I. McCubbin and McCubbin (1992) observe:

Research on the mediating influence of social support for specific stressor events has emphasized the role of social support in protecting against the effects of stressors and thereby contributing to a family's resiliency. Research has also emphasized the importance of social support in promoting recovery from stress or crisis experienced in the family as a result of life changes, thereby contributing to the family’s adaptive power. (pp. 162-163)

H.I. McCubbin and McCubbin (1992) note that social support has been a main subject of family stress research during the 1970s and 1980s. This research has been targeted at three questions:

- “What is social support?”
- “What kinds of social networks offer support to the family or individuals within the family in times of stress?”
- “In what ways and for which types of stressor events is social support a mediator of family stress?”

These three questions serve to structure the content to follow.

**4.3.1.10.2 Definitions of Social Support**

Many use Sidney Cobb’s work on social support as the basis for all new research and theory related to social support (H.I. McCubbin & McCubbin, 1992). Cobb (1982, pp. 189-190) identified four kinds of support:

- **Social Support.** This kind of support involves the caring exchange of information and has three components:
  - Emotional support leading the recipient to believe that she is cared for and loved.
  - Esteem support leading the recipient to believe that she is esteemed and valued.
  - Network support leading the recipient to believe that she has a defined position in a network of communication and mutual obligation.”
- **Instrumental Support.** This kind of support, also called counselling, helps people towards better coping or adaptation, through advice and guidance, in a way that promotes their self-sufficiency.

- **Active Support.** Active support or "mothering" is a more total support which, when provided unnecessarily, leads to dependency.

- **Material Support.** Material support, involves the provision of goods and services that assist the individual in achieving her/his objectives.

Cobb (1982, p. 190) argues that of these four types of support, social support is by far the most important; "social support is more important than all the others put together".

Sarason, Levine, Basham and Sarason (1983, pp. 128-129) developed the Social Support Questionnaire to measure social support and based it on the notion that support has two basic elements: "(a) the perception that there is a sufficient number of available others to whom one can turn in times of need and (b) a degree of satisfaction with the available support." The authors note that some people may consider a large number of friends necessary for a sense of support, while others may consider one or two friends sufficient. Furthermore, people's satisfaction with support may be influenced by many extraneous factors, such as self-esteem or recent life events. Their research demonstrated that these two components are independent (ibid., p. 137).

Some authors (eg Myers, Lindenthal & Pepper, 1975, in Kobasa, 1982, p. 18) define social support in terms of "social centrality versus social marginality". People who are integrated into the mainstream of society, that is who have a job, are married, are not poor, are not Black, etc, are said to be central and thus to have social support. Other authors (eg Bovard, 1959, in Kobasa, 1982, p. 18) argue that "the mere presence of others is sufficient" for a person to be socially supported.

4.3.1.10.3 **Sources of Social Support**

McCubbin and McCubbin (1992), from their review of family stress literature, indicate that four main sources of support are discussed in the literature:

- **Neighbourhoods.** The role of the local neighbourhood or community has been explored and studies have shown that such support systems are able to provide practical assistance for short-term problems, such as short illnesses or babysitting (H.I. McCubbin & McCubbin, 1992).

- **Family & Kinship Networks.** The extended family is a source of support for many, particularly in "ethnic and minority" families (McAdoo, 1982; H.I. McCubbin & McCubbin, 1992). Caplan in 1976 identified nine characteristics of supportive family and kinship networks (in H.I. McCubbin & McCubbin, 1992):
  1. Collectors and disseminators of information about the world;
  2. a feedback guidance system;
  3. sources of ideology;
  4. guides and mediators in problem-solving;
  5. sources
of practical service and concrete aid; (6) a haven for rest and recuperation; (7) a reference and control group; (8) a source and validator of identity; and (9) a contributor to emotional mastery. (pp. 161-162)

- **Intergeneration Supports.** Reciprocal support between generations is a source of satisfaction for many families, both in terms of quality and frequency of contact. Hill’s 1970 study of three generations (grandparents, parents and young married childless children) revealed that (in H.I. McCubbin & McCubbin, 1992):

  1. The grandparent generation received the most assistance and was viewed as dependent; (2) the parental generation contributed the most assistance and held a patron-like status; and (3) the young married children provided and received moderate assistance and were viewed as reciprocators. The important point is that all three generations – older, middle, and younger – were involved in patterns of support and resource exchange which increased their viability and protected them against the harmful effects of stress. (p. 162)

- **Mutual Self-help Groups.** A mutual self-help group can be defined as an association of “individuals or family units who share the same problem, predicament, or situation and band together for the purpose of mutual aid” (H.I. McCubbin & McCubbin, 1992, p. 162). These groups have often been found to meaningfully enhance the quality of life of its members.

**4.3.1.10.4 Mechanisms of Social Support**

Cobb (1982, p. 198) indicates that social support, rather than acting directly on health, well-being or stress, “operates to facilitate stress reduction by improving the fit between the person and the environment”. It does this in two principal ways. Firstly, a person who has esteem support (and thus self-confidence) and emotional support (and thus a sense of comfort) is in a better position to adapt to environmental stressors. In this way, the person experiences less stress, because the stressor has been accommodated. Secondly, a person who has network support (and thus a sense of participation in decision-making) and esteem support (and thus self-confidence and autonomy) is in a better position to take control of and change the environmental stressor. In this way, the person experiences less stress because the stressor has been modified. Taken together, people who are supported are theoretically better able than people who are not supported to adapt to and/or modify environmental stressors, thereby promoting the person-in-environment fit. This results in better adjustment and psychosocial functioning.

H.I. McCubbin and McCubbin (1992) note that support systems function in two primary ways. Firstly, they protect the family from the effects of the stressor. In this way, support systems act as a buffer working between the stressor and the stress. In theory, individuals and families who have support systems will experience less stress in response to a stressor than unsupported individuals and families exposed to the same stressor. Secondly, support systems enable individuals and families to recover more quickly from stress, thereby promoting the resilience and adaptability of the family system. In theory, individuals and families who have support systems will recover more quickly from a crisis than unsupported individuals and families experiencing the same degree of crisis in response to the same stressor.
4.3.1.10.5 Research on Social Support

Despite the widespread conceptual agreement that social support protects individuals and families from stress and illness, the research on the subject is inconsistent (Ganellen & Blaney, 1984). This inconsistency may result from the diverse ways in which social support is conceptualised and operationalised (Kobasa, 1982). Suls (1982, p. 259), however, in a review of the role of social support in health promotion, concludes, "the bulk of the available evidence suggests a beneficial effect for social support"; nevertheless, there are many exceptions to this general rule.

The following studies reflect the kind of positive results that can be found on the role of social support as a resilience factor:

- High social support scores were associated with: (a) lower levels of anxiety depression and hostility; (b) experiencing more positive/desirable events in life; (c) greater self-esteem, an internal locus of control and a more optimistic view of life; and (d) greater ability in persisting in tasks that are not easily solved (Sarason et al., 1983, p. 137).

- Social support was a frequently used coping resource, and was statistically associated with positive mental health and lower frequencies of mental disorders and alcoholism. Sociable children (i.e., children with high social capacity) were able to mobilise and utilise support systems and consequently experienced less psychopathology as adults (Cederblad et al., 1995).

- Veterans who live with their spouses and/or children are, when other factors are controlled, more likely to survive than those who live alone (Coe et al., 1998, p. 271).

- Higher social interest scores were associated with fewer stressful experiences encountered during the following year and a lower correlation between these stressors and anxiety, depression and hostility, thereby moderating the negative impact of stressors (Crandall, 1984, pp. 164 & 171).

- Social support was found to correlate positively with physical and mental health for both parents and children (Hanson, 1986).

- Workers in low demand and high control jobs and with high social support experienced significantly lower risk for cardiovascular disease than workers in high demand, low control jobs and low social support (Johnson & Hall, 1988, p. 1336).

- Asthmatic patients with good social supports required lower levels of medication to produce clinical improvement than did asthmatics with poor social supports (in Sarason et al., 1983, p. 128).

- "Caregivers ... with more support and less distress at baseline were protected from declines in immune functioning over the 13-month study period" (in O'Leary, 1998, p. 433), leading the researchers to speculate that social supports protect health by mediating the immune system.
Perceived social support moderates the effects of occupational stress on both physical health and symptoms of anxiety, depression and irritation (in Crandall, 1984, p. 166).

“Inadequate work place social support and social isolation has been shown to be associated with a higher incidence of angina pectoris among male workers in Israel; a greater incidence of coronary heart disease among female clerks; psychological problems among air traffic controllers; higher cholesterol values among those whose work mates were constantly changing; higher levels of illness among the unemployed; a greater physical health impact from perceived stress among male petrochemical workers and increased job stress and psychological strain among men in 23 occupations. Studies which have looked at the moderating or so-called ‘buffering’ effect of social support have found that it ameliorates the impact of perceived stress and job strain on physical and mental health” (in Johnson & Hall, 1988, p. 1336).

Just over two thirds (64%) of 482 South African Naval employees indicated that they could rely on another person at work for support with a personal or family problem. These employees, when compared with those who felt they could not rely on anyone, tended to have healthier marriages, healthier social functioning, more satisfaction with work, finances, friendships and family life, more energy, fewer health concerns and less depressed moods (Van Breda, 1996, p.2). Interestingly, sea-going employees were more likely to report being able to rely on a colleague at work than land-based employees (70% vs 59%) (ibid.).

Holmes’ research demonstrated that “tuberculosis ... was more common in people who had no friends, family, or intimate social group to which they could relate” (in Suls, 1982, p. 257).

4.3.1.10.6 Social Support and Deployment Resilience

The literature strongly indicates that social support buffers the family and the deploying member from the stress of deployments (Adler et al., 1995, p. 18; Amen et al., 1988, p. 445; Caliber Associates, 1992, p. I-10; Koshes & Rothberg, 1994, p. 456; Pehrson & Thornley, 1993; Solomon & Mikulincer, 1990). One study found that “more active wives felt less lonely than less active wives” (Duvall 1945, in Farish et al., 1976, p. 332). Other researchers found that “dissatisfaction with social support was predictive of decreased marital happiness between pre-deployment and early deployment” (Frankel et al., 1992, p. 109). The children of mothers who felt supported showed better adjustment at home and school during deployments (Hiew, 1992, p. 219). Even for children, social support systems facilitated better coping with the deployment of their parents (ibid., p. 222). Studies of spouses of soldiers deployed in Operations Desert Storm/Shield indicate that a comprehensive support system reduces the incidence of negative events, which in turn enhances adjustment and emotional well-being (Rosen et al., 1991, p. 9).

Support networks used by women and men during deployments tend to be informal, viz. friends and family (Black, 1993; Decker, 1978; Montalvo, 1976; Pehrson & Thornley, 1993), although more recent studies suggest an increase in the use of formal, non-professional military support
systems (Albano, 1995; Bell et al., 1997; Bell et al., 1996b; Department of Military Psychiatry, 1995; Helms & Greene, 1992; Martin et al., 1993).

A variety of strong support systems become increasingly important as most military families are dual-income families, and many are even dual-military families – 6-10% of military personnel were in dual-military families (that is, married to another military employee) in 1985 (Janofsky, 1989, p. 99; Morrison et al., 1989, p. 2). In the case of dual-military families, it is quite possible for both parents to be deployed simultaneously, requiring greater use of support networks for child care, pet care, home care, etc (Military Family Resource Center, 1998; Morrison et al., 1989, p. 50) – during the Gulf War, for instance, 5,700 military couples were deployed (Martin, 1992).

Four main types of social supports are described in the literature on military families: military, community, family and religious support systems.

**Military Supports.** Women who felt they could rely on another military wife for help with a personal or family problem tended to experience a greater sense of general well-being, especially in the face of greater stress (Rosen & Moghadam, 1988, p. 68; Rosen & Moghadam, 1990, p. 200). Bell and colleagues (1996a) report a similar finding among soldiers who have a ‘confidant’ in the unit with whom to discuss their problems (see also Etzion & Westman, 1994).

These findings have been repeatedly confirmed in South African studies. Amongst sea-going men and their wives, those who felt unsupported tended to experience more sadness and depression during deployments (Van Breda, 1995b, p. 64). In another local study of sea-going and land-based naval personnel, those who felt supported were found to have better overall social functioning, were more satisfied with their work, finances, family and friendships, and experienced better health, less depression and higher levels of energy (Van Breda, 1996).

Much research on deployment resilience indicates that as soldiers and families get older (or perhaps more experienced in coping with deployments) their deployment resilience increases and deployment stress decreases (Aldridge et al., 1997b; Caliber Associates, 1992; Caliber Associates, 1993; Rothberg et al., 1994; Scarville & Dunivin, n.d.; Wong et al., 1995). This finding, however, is not very helpful to military families, nor is the advice, “It will get better as you get older”. One way in which to make use of age is through mentoring. Having a relationship with another military family in the same situation is valuable inasmuch as the families share a common experience. Having a relationship with a person more experienced in deployments opens the possibility for the sharing of deployment resilience factors (Parker et al., 1995, p. 90).

The availability of military support and the perception that the military is a supportive environment (into family friendly policies) have been found to be particularly important for single military parents, both mothers and fathers. “These policies, such as family support during deployment, on-post housing assignment, military child care priority, and emergency financial assistance, provide a supportive context for single parents and reflect a positive respect and appreciation for
the family responsibilities of service members” (Bowen et al., 1993, p. 302). Policies such as these assist single parents in balancing work-family role demands.

There are four main forms of military support systems, viz informal friendships with other military families, formal Family Support Groups, rear detachment systems, and professional military support services.

✧ **Informal Military Friendships.** Friendships with other military families are an important source of support for military families experiencing deployments (Wood et al., 1995). Three quarters (75%) of the spouses of soldiers deployed to Somalia in Operation Restore Hope in 1993 relied on other army spouses for support, the second largest form of support used by these families (after friends and neighbours at 78%) and equal to support from extended family members (Bell, 1993, Figure 9). These families understand the experience of separation and are able to provide a kind of support not easily available elsewhere (Hunter, 1983). Other research suggests that military community cohesion promotes deployment readiness, retention and the overall ability of families to cope with the demands of military life (McClure & Broughton, 1998).

✧ **Formal Family Support Groups.** Family Support Groups (FSG) are a cornerstone of nonprofessional military support systems in the USA and in some units in South Africa – approximately half (52%) of the spouses of soldiers deployed to Somalia in Operation Restore Hope in 1993 made use of FSGs (Bell, 1993, Figure 10). “The Family Support Group is an officially sanctioned voluntary association of Army family members who join together to provide social and emotional support to one another” (Bell et al., 1996a, p. 3). The four primary functions of the FSG are “organizing social events, holding informational meetings, maintaining phone circles (trees), and publishing newsletters” (ibid.).

✧ FSGs have been found to buffer families from the stress of deployments and increase emotional well-being (Martin et al., 1993, p. 26; Rosen et al., 1993b, p. 1592). Families with easy access to well functioning support groups experience lower levels of depression, compared with families with access to poorly functioning support groups or who live far from family support groups (Adler, 1995; Adler et al., 1995). The families of Reservists, who are not permanently attached to a military unit, often experience a lack of military support resulting in a sense of isolation and greater deployment stress (Stuart & Halverson, 1996). FSGs are of value not only for the family, but also for the soldier – knowing that there is a FSG to care for one’s family during a deployment enables the soldier to concentrate on the mission (US Army Community and Family Support Center, 1994h, p. 8; Van Breda, 1995a)

✧ Several manuals for the establishment, guidance and training of Family Support Groups have been developed (101st Airborne Division (Air Assault), n.d.; Caliber Associates, n.d.; Schumm, Bell, Milan, & Segal, 2000; US Army Community and Family Support Center, 1994a, 1994b, 1994c, 1994fr, 1994h)
Rear Detachment. Military units in the USA also have a Rear Detachment, as part of the formal, nonprofessional support system (Bell et al., 1996a; Godwin, 1992). Approximately half (53%) of the spouses of soldiers deployed to Somalia in Operation Restore Hope in 1993 made use of Rear Detachment command staff (Bell, 1993, Figure 10).

The SANDF also used to make use of a form of Rear Detachment. Recent transformation of the SANDF has resulted in the abolition of this system – when a unit deploys, the entire unit deploys and no-one is left behind. This has created various problems regarding the support of families and the liaison/communication between families and deployed soldiers.

Professional Military Support Services. Access to professional military support services plays an increasingly important role in the deployment resilience of military families (Spellman et al., 1991). These services include professional social workers, chaplains, counsellors, financial advisors, etc. A study of army spouses during Operation Desert Storm and Desert Shield found that 17% of military spouses made use of military services during the deployment. Military families who “lived off-post (particularly those who lived beyond a 1 hour drive of the post) reported the greatest number of problems” (Helms & Greene, 1992). Although the authors do not make this interpretation, one can hypothesise that families who live ‘off-post’ have less easy access to military services.

There are various documents and manuals that guide the provision of such services (US Army Community and Family Support Center, 1994e).

Community Support. Developing a social network, for both military employees and their families, has been shown to help families reduce deployment related stress, as well as general life stress (Eastman et al., 1990, p. 114; McCubbin, 1979, p. 240; H.I. McCubbin & McCubbin, 1988, p. 248; Riggs, 1990, p. 152), particularly for couples without children and families with adolescent children (McCubbin & Lavee, 1986, p. 227). The spouses of soldiers deployed to Somalia in Operation Restore Hope in 1993 cited friends and neighbours as the most commonly used (78%) support system (Bell, 1993, Figure 10). Civilian friends are able to provide an important quality of support to military families that is distinct from military friends and that promotes the health and well-being of military families (Martin & Orthner, 1989).

Although being employed has usually been found to be unrelated to wives’ coping with deployments (eg Van Breda, 1995b, p. 29), one study (Wood et al., 1995) found that employment and other social supports (ie religion, church involvement and family support) improved adjustment to separation. The wives in the study who coped well with the separation most often indicated that their job helped them cope well (ibid., p. 228). Perhaps it is the nature of the job, or of the relationships in the workplace, that determine whether being employed is helpful, rather than employment per se. Another study found that soldiers whose partners were employed experienced fewer concerns during separations (Aldridge et al., 1997b, p. 41).
Religious Support. Religious support has been found to buffer families from the stress of deployments and increase emotional well-being (McCubbin, 1979, p. 241; Wood et al., 1995, p. 228), particularly in families with preadolescent children (McCubbin & Lavee, 1986, p. 227). A "religious orientation" and "spiritual support" have also been identified as ingredients that foster family "balance" for families with adolescent members (H.I. McCubbin & McCubbin, 1992, p. 168). Close to one third (29%) of the spouses of soldiers deployed to Somalia in Operation Restore Hope in 1993 made use of church members for support (Bell, 1993, Figure 9).

The use of religion as a coping mechanism during deployments was found to be particularly advantageous to wives who were prepared for the possibility that their husbands might not return, but who were struggling with the demands of being both mother and father (McCubbin et al., 1976b, p. 469).

Family Support. "Family and friends" were found to be an important component of "family balance" in all stages of the family life cycle prior to the empty nest and retirement stages (H.I. McCubbin & McCubbin, 1992, p. 168). Three quarters (75%) of the spouses of soldiers deployed to Somalia in Operation Restore Hope in 1993 made use of extended family members for support (Bell, 1993, Figure 9) – this was the second most common form of support used by these spouses.

Evaluations of the Deployment Resilience Seminar, developed by Van Breda (1997a, 1998a, 1998b, 1999a), found a deterioration in satisfaction with family support following participation in the seminar. Van Breda (1999a, p. 602) explains, “Clinical experience indicates that the relationship with the extended family is a frequent source of conflict and tension during and after separations. It is possible that the [Deployment Resilience Seminar] conscientizes participants to this conflict without providing adequate tools for managing it.” It appears that family support is both important and dangerous – it provides families with important historical support during separations but can be fraught with complex history and baggage.

4.3.1.10.7 Conclusions

In conclusion, it would seem that social support has a potentially stress buffering effect on families, as well as a direct effect on family adaptation. Part of the inconsistencies in research results may be due to very diverse definitions and operationalisations of 'social support'. Furthermore, social networks may not always have a positive effect on people – relationships can introduce stress, irritation, negative role modelling, etc, which may constitute risk rather than protection (Suls, 1982).
4.3.1.11 Stressor Appraisal

4.3.1.11.1 Introduction to Stressor Appraisal

“The family’s appraisal of the stressor is the family’s definition of the seriousness of a stressor and its related hardships” (M.A. McCubbin & McCubbin, 1996, p. 19). This can range from a perception of the stressor as catastrophic and overwhelming, through viewing the stressor as manageable, to perceiving the stressor as irrelevant or benign. The family’s subjective appraisal of a stressor has a greater impact on family adjustment than the standardised severity of a stressor as agreed upon within a given culture or society.

It is perhaps McCubbin and colleagues’ work on family appraisal processes, and in particular the notion of family schema, that is the most unique contribution of family resiliency theorists to the broader field of resiliency theory (Hawley & De Haan, 1996). A review of family appraisal in the various family resiliency models will demonstrate how this construct has evolved. In Hill’s original ABCX Model of 1949, the ‘C’ factor refers to the family’s definition of the seriousness of the changes demanded by the stressor event. In the Double ABCX Model and the FAAR Model of 1983 the ‘CC’ factor was added and refers to the family’s appraisal of the whole situation, including the stressor, the family’s resources and the pileup of stressors or vulnerability. In the T-Double ABCX Model of 1989 and in the first presentation of the Resiliency Model (M.A. McCubbin & McCubbin, 1993) the ‘CCC’ factor was added, which refers to the family’s global appraisals and family schemas.

Finally, in the 1996 presentation of the Resiliency Model (M.A. McCubbin & McCubbin, 1996), the ‘CCCC’ factor of family paradigms, the ‘CCCCC’ factor of family coherence and the ‘CCCCCC’ factor of family schema are added. Consequently, the most current model of family resilience proposes five levels (C to CCCCC) of family appraisal. Depending on the nature of the stressor, higher and higher levels of family appraisal are activated in the family appraisal process. Lower severity stressors may activate only the first two or three levels, while severe or prolonged stressors may activate all five levels.

McCubbin and colleagues have also introduced the important notion of ethnicity, and have begun to explore how a family’s culture or ethnicity influences the appraisal process (McCubbin et al., 1998; M.A. McCubbin & McCubbin, 1996).

4.3.1.11.2 Family Appraisal Process Level 5: Family Schema (CCCCC)

The family schema is defined as “a generalized structure of shared values, beliefs, goals, expectations, and priorities, shaped and adopted by the family unit, thus formulating a generalized informational structure against and through which information and experiences are compared, sifted, and processed” (McCubbin et al., 1998, p. 43). Family schema is a deeply held, largely
unconscious cluster of beliefs that locate the family’s day-to-day experiences within a larger context. Family schema develops gradually over time and comprises a combination of the schemas brought into the family from the individuals’ families of origin.

The value of the schema is stated as follows (M.A. McCubbin & McCubbin, 1996):

> Not only does a family’s schema and its appraisal process give order, harmony, balance and stability to family life, it plays an influential role in shaping and legitimizing the family’s old, established, newly instituted, and maintained patterns of functioning, as well as the family’s problem solving and coping behaviors and patterns. (p. 39)

The family schema plays the equally important role of developing family meanings. “This aspect of family appraisal involves the creation of family ‘stories’ or ‘understandings’ shared by family members for the purpose of facilitating the family’s adaptation to the crisis situation” (McCubbin et al., 1998, p. 45). Family meanings at this worldview level are still very broad and families will probably not be able to be articulate them; nevertheless family meanings may be detected in qualitative research in which families are asked to tell their stories about coping with life stressors (Patterson & Garwick, 1998). Patterson and Garwick (ibid.) state that family worldview meaning “focuses on the family’s orientation to the world, how they interpret reality, what their core assumptions are about their environment, as well as their existential beliefs, such as the family’s purpose and place in life”.

The family schema helps families develop meaning through five primary functions (M.A. McCubbin & McCubbin, 1996, p. 41):

- **Classification.** “The process of framing the family crisis situation in terms of shared values and expectations of the extended family and the tribal structure.”

- **Spiritualization.** “The process of framing the family crisis situation in terms of shared beliefs and the goal of units with the cosmos as a way to achieve harmony.”

- **Temporalization.** “The process of framing the family crisis situation in terms of the long view and long-term consequences but also taking advantage of the positive nature of the present.”

- **Contextualization (nature).** “The process of framing the family crisis situation in terms of nature and the order of living things; harmony with nature and the land is pursued with all aspects of life.”

- **Contextualization (relationships).** “The process of framing the family crisis situation in terms of human relationships, a ‘we’ group orientation whereby the needs of the whole rise above the needs of the individual.”

Family meanings are derived from the broad family schema (M.A. McCubbin & McCubbin, 1996) or family worldview (Patterson & Garwick, 1998), but are expressed at stressor or situational level. “The meanings are often described in cryptic phrases or special phrases such as ‘God’s will’”…,
used to encourage understanding and in some cases the acceptance of adversity” (M.A. McCubbin & McCubbin, 1996, p. 39). There is a reciprocal relationship between the situation specific meanings and the family schema – the schema facilitates the development of family meanings that help the family to adapt to the stressor, but the stressor may also shake the foundation of the family schema leading to alteration in the schema (Patterson & Garwick, 1998). Nevertheless, a family schema is stable and resistant to change. Consequently, it is an important dimension in the ability of families to “transcend the immediate stressor and the situation and place the family crisis in a larger context of experiences” (M.A. McCubbin & McCubbin, 1996, p. 40).

The family has long been regarded as the bastion of cultural beliefs and it has often been said that families pass on cultural beliefs and practices from generation to generation (M.A. McCubbin & McCubbin, 1996). However, there is “a dearth of research and inductive theory-building common to the advancement of family stress and resiliency theories linking cultural and ethnic factors to the ways in which families respond to and cope with catastrophes and life’s crises” (ibid., p. 37).

A family’s ethnic or cultural beliefs are stored in or comprise the family schema (McCubbin et al., 1998; M.A. McCubbin & McCubbin, 1996). For instance, Native Hawaiians place value on the extended family, on mutual concern and care, on a “we” or group orientation, on malama or caring (which is probably similar to the African notion of ubuntu), on spirituality as fundamental to all aspects of life, on the environment as living and thus to be respected and preserved, on the importance of harmony, wholeness and balance, and on time as relative and cyclical (McCubbin et al., 1998, pp. 50-51). These beliefs are clearly the content of the family schema. However, it is also clear that these values and beliefs are specific to and influenced by the Native Hawaiian culture. Thus (M.A. McCubbin & McCubbin, 1996):

In solving problems and managing family life, the family’s culture fundamentally influences three critical levels of family appraisal involved in the process of adaptation: the Family’s Schema, Family Coherence, and Family Paradigms … [which in turn] help families to give meaning to stressful life events and family struggles, and they appear to play a fundamental role in shaping the family’s responses and strategies directed at adaptation. (p. 38)

**4.3.1.11.3 Family Appraisal Process Level 4: Family Coherence (CCCC)**

M.A. McCubbin and McCubbin (1996) describe family coherence as:

A construct that explains the motivational and appraisal bases for transforming the family’s potential resources into actual resources, thereby facilitating changes in the family systems, coping, and promoting the health of family members and the well-being of the family unit. This is a dispositional world view that expresses the family’s dynamic feeling of confidence that the world is comprehensible (internal and external environments are structured, predictable and explicable), manageable (resources are available to meet demands), and meaningful (life demands are challenges worthy of investment). (p. 42)
Research by McCubbin and associates confirmed that family sense of coherence indirectly reduces family dysfunction by mobilising family resources (McCubbin et al., 1998):

The sense of coherence plays a catalytic role in family resiliency by combining with and fostering the family’s resistance resources, such as family hardiness (the family’s dispositional resource of having a sense of commitment, control, confidence, and challenge) and family problem-solving communication (affirming style of communication). (p. 60)

Other researchers also have demonstrated the salutogenic effect of family sense of coherence (eg Anderson, 1998; Sagy & Antonovsky, 1998). Family SOC and family schema seem closely related, but are in fact conceptually distinct. While neither SOC nor schema addresses the specific situation within which the family finds itself, the family schema is related to beliefs about life in general, while the family SOC is related to stressors in general. This is empirically demonstrated in research that found that the family schema is causally related to coherence, and not the other way around (McCubbin et al., 1998, p. 57). In other words, schema influences SOC, suggesting that schema is a higher order construct.

4.3.1.11.4 Family Appraisal Process Level 3: Family Paradigm (CCC)

The family paradigm is (McCubbin et al., 1998):

A model of shared beliefs and expectations shaped and adopted by the family unit to guide the family’s development of specific patterns of functioning around specific domains or dimensions of family life (eg work and family, communication, spiritual/religious orientation, child rearing, etc). (p. 46)

The family paradigm is a lower order appraisal process, more closely connected to daily living and consciousness than either family SOC or family schema. While family SOC and schema both relate to general life events and stressors, family paradigm relates to specific family functions, patterns and dimensions. It is not, however, concerned with specific stressors, but rather with the family that functions around the stressor.

M.A. McCubbin and McCubbin (1996) report on a study demonstrating the effect of family paradigms:

In a recent study of Navaho children with autism and their families, it was shown that despite some families’ conscious choice to follow a less traditional path and thus define themselves as modern (rejection of ethnically based traditional ways) or semi-traditional (living in a non-traditional way, but incorporating some ethnically based traditional ways), the influence of cultural beliefs and definitions of disability had a wide-ranging and powerful effect on the family’s paradigms and the family’s adaptation to the long-term care of their disabled member (Connors, 1992). (p. 43)

The distinction between ‘modern’ and ‘semi-traditional’ families in this study concerns both the family schema (the ethnic beliefs and values held by the family) and the family’s paradigm (the beliefs about patterns of family functioning). Families were able to change their paradigms with greater ease, as evidenced in changes to the family structure, role allocation, power relations, etc. However, the family schema was less malleable, and the traditional ethnic values and beliefs
regarding disability continued to exert an influence on the family paradigm, which in turn influenced the family’s adaptation to the stress of having an autistic child.

Family paradigm is similar to or equivalent to Patterson and Garwick’s (1998) notion of ‘family identity’:

How a family defines itself is reflected in both its structure (who is in the family) and its functioning (the patterns of relationship linking members to each other). Implicit rules of relationship guide family members in how they are to relate to each other. These rules include (1) definitions of external boundaries (who is in the family) and internal boundaries (for example, encouraging subsystem alliances), (2) role assignments for accomplishing family tasks, and (3) rules and norms for interactional behavior. (p. 76)

4.3.1.11.5 Family Appraisal Process Level 2: Situational Appraisal (CC)

Situational Appraisal is defined as (McCubbin et al., 1998):

The family’s shared assessment of the stressor, the hardships created by the stressor, the demands upon the family system to change some of its established patterns of functioning. The appraisal occurs in relation to the family’s capability for managing the crisis situation. (p. 46).

While the family paradigm focused on the family’s functioning in general, situational appraisal focuses on the specific stressor in general, that is on the stressor itself as well as those factors which are contingent on the stressor, including the family’s resources for managing the stressor, the other hardships and strains which the stressor causes, etc.

4.3.1.11.6 Family Appraisal Process Level 1: Stressor Appraisal (C)

Stressor appraisal is the family’s definition of the stressor, its severity and the changes that the stressor requires of the family. It is narrower in focus than Situational Appraisal. Stressor appraisal focuses principally on the stressor itself, while situational appraisal broadens the focus to other factors contingent on the stressor. Hill (in Burr, 1973/1982, p. 8) indicates that there are three types of definitions of the stressor: (1) definitions formulated by an impartial observer, (2) definitions formulated by the community or society within which the family lives, and (3) subjective definitions formulated by the family itself. Hill argues that the family’s own subjective definitions are the most important for influencing their response to a crisis. Burr (ibid., p. 9) proposes that stressor appraisal does not act directly on the degree of family crisis precipitated by the stressor, but rather that it influences the degree of vulnerability in the family (or the resources at the family’s disposal).

4.3.1.11.7 The Process of Appraisal

Not all five levels of stressor appraisal are activated every time a family encounters a stressor. The nature of the stressor influences which levels of appraisal are used. Stressors that “call for predictable and straightforward responses” tend to use fewer and lower levels than stressors which “the established patterns of family functioning are not adequate to manage” (McCubbin et al., 1998, pp. 46-47). In the case of a less stressful situation, the first three levels of family appraisal
(stressor, situation and paradigm) may be activated to assist the family in adapting to the stressor and its various consequence.

In the case of a more profound stressor, such as the birth of a child with a physical disability or the destruction of the World Trade Centres in September 2001, the family’s existing patterns of functioning (paradigms) will be inadequate to help the family adapt. Furthermore, the crisis may precipitate changes in the family’s sense of coherence and the family schema. These higher orders of appraisal are indispensable for helping a family incorporate and adapt to the fundamental changes that are required in the family system.

This process can be described as follows (McCubbin et al., 1998):

Working backward from the initial stressor, family situational appraisals are first called into action by the demands of the crisis situation, challenging the way the family will function. Family routines will likely be altered; family roles related to providing physical care will need to be reexamined; family paradigms, which have served as the family framework to guide, affirm, and reinforce the established patterns of family functioning, will be challenged and called into question; and newly instituted patterns and accompanying roles and expectations will emerge. New paradigms will also emerge to reinforce and legitimate the new patterns of functioning – a necessary process to provide family stability and predictability. The family’s sense of coherence, always available as a dispositional resource to facilitate adaptation, will be of greater importance in fostering the family’s world view in the face of this adversity or challenge. The family’s sense of coherence allows the family to maintain their confidence that the world is comprehensible, manageable, and meaningful. Thus the family’s level of coherence shapes the degree to which the family transforms its extant or potential resources into actual resources and thereby facilitates the creation of new patterns of functioning, promotes harmony and congruency, and fosters coping and adaptation. Because the family’s established patterns of functioning are threatened, the family’s schema, the hub of the family’s appraisal process, is also involved. … culture and ethnicity may play a critical role in helping the family derive meaning by placing the family’s situation into a broader set of values. This new meaning may result in the family framing the crisis situation as less threatening when viewed over time, when viewed in the context of the cultural acceptance of all children in the community, when viewed as a spiritual challenge, and when viewed as part of the natural ebb and flow of nature. This family world view may foster the adoption of new patterns of functioning and coping. When combined with the three other central processes of appraisal (coherence, paradigms, and situational appraisal), the family’s schema serves the family unit by fostering the creation of the family’s unique identity and enhancing the development of the family’s sense of coherence. (pp. 47-48)

Patterson and Garwick (1998) note that changes in the family’s appraisal processes can occur both up and down the levels. For example, if the child in a family is diagnosed with a chronic illness, the family may begin to process this crisis through the meanings derived from the family schema, so as to locate the crisis within a broader and more transcendent context. The family’s patterns of functioning will need to adjust, with a concomitant adjustment in the family paradigm or identity. The changes in functioning will, in part, be guided by the family schema. Should, for example, the family schema hold the value of families caring for themselves, the family may choose to raise the child themselves, whereas if the schema saw the disabled as an intrusion and as needing professional care, the family may choose to place the child in a special home (see McCubbin et al., 1998). If, however, the family directs a “disproportionate share of their resources toward the illness needs, reducing resources needed for normative family needs,” the family may change its
identity to that of an ill family (eg "the diabetic family") (Patterson & Garwick, 1998, p. 85). In such a case, the change to the family's paradigm will precipitate a change in the family schema, whereby the family redefines its goals, values and purpose in terms of the illness. “The illness [then] becomes the center-piece for organizing all family activity” (ibid.).

It can thus be seen that the process of influencing change within the family appraisal process is reciprocal and flexible. However, the higher up the order of appraisal processes one goes (from stressor appraisal to family schema), the more intransigent the process becomes. Consequently, it is more likely that the family schema and coherence will provide stability for a family system and influence the way families handle specific stressors and the resultant situations. When families are exposed to fairly severe or prolonged stressors, the family schema and coherence may be shaken but will probably recover or may shift somewhat. When families experience catastrophic or profound and prolonged stressors, the family schema and coherence may disintegrate and a new schema will gradually take its place.

4.3.1.11.8 Stressor Appraisal and Deployment Resilience

The literature indicates that one’s perception of, or attitude towards, deployments (stressor appraisal) and the military (situational appraisal) has a significant impact on one’s coping with deployments (Bowen, 1984; Bowen, 1986, p. 194; Burnam et al., 1992, p. 46; Frankel et al., 1992, p. 110; Kirby & Naftel, 1998; Milgram & Bar, 1993, p. 37). Knapp and Newman (1993, p. 78) found that wives who perceived the military life as more stressful experienced less psychological well-being than those who perceived the military life as less stressful (see also Amen et al., 1988, p. 442). Another study found that wives’ attitudes to their husband’s units affect their husband’s morale and that personal morale influences one’s perception of the army-family interface (Rosen et al., 1989b, pp. 208-209). Yet another study found that the degree to which spouses identified with the military influenced the adjustment of their children, while the military employee’s identification with the military (family paradigm) was unrelated to child adjustment (Marchant & Medway, 1987, p. 293).

A further study found that perceptions of deployments was a more important factor predicting retention in the military than the actual frequency and duration of separations (Szoc, 1982, in Caliber Associates, 1992):

How the separations are viewed may be as important – if not more important – than actual time away. Indeed among those who left the service, separations were viewed as far more problematic than among those who stayed, but the actual amount of separation was [only] slightly higher among the stayers. (p. I-4)

Although commitment appears to buffer the aversive consequences of deployments, the experience of deployments, conversely, may have a negative effect on the commitment of families to the military. Studies of families involved in Operation Desert Storm found that 26% to 30% of members experienced a deterioration in commitment to the military (from before to after the deployment), and only 2% to 6% experienced an increase in commitment (Caliber Associates, 1992, p. III-63). Factors that were associated with negative changes in commitment included not
feeling adequately informed about the impact of deployment on children, experiencing greater stress around being separated from their children, not receiving pre-deployment briefings and experiencing the military supervisor or unit as unsupportive of families (ibid.). Interestingly, just over half the people who indicated a deterioration in commitment six months after returning from Operation Desert Storm, indicated that they felt more committed six months after that (Janofsky, 1992, p. III-25).

Perceptions of the military-family interface, particularly perceptions by the military spouse (Kirby & Naftel, 1998), have been repeatedly found to influence the military member’s intention to stay in the military (Gill & Haurin, 1998; Green & Harris, 1992; Potts, 1988). One study, for example, found that “married soldiers whose spouses are more committed to the Army tend to be more committed themselves and expect to serve more years in the Army” (Burnam et al., 1992, p. 47). Although intention to stay in the military and retention rates are not directly related to deployment resilience they may suggest deployment resilience (Bowen, 1989a). A military job, whether a combat job or not, requires regular separation between soldier and family (to attend courses, do duties, deploy, etc). Intention to remain in the military can be seen as one outcome of deployment/separation resilience. A family that is resilient to separations will be more likely to remain in the military, and conversely a family that intends to remain in the military must have come to terms with the routine separations required by the military. This principle has been demonstrated in a number of studies of the intentions to remain in the military of soldiers involved in Operation Desert Storm (Kirby & Naftel, 1998; Rosen & Durand, 1995).

Deployments have been found to be less stressful when one has a positive attitude towards them (Eastman et al., 1990, p. 114). A study of wives whose husbands were deployed in the Persian Gulf found that, “Groups with high levels of [emotional] distress also had the highest levels of unsatisfactory use of [military] services and the highest expectations of [what] the Army [should provide for them]” (Rosen et al., 1994, p. 43). Indeed many families report positive results of deployment, such as learning new things, becoming more independent and enhancing the marital relationship (Adler, 1995; Segal, 1989).

A study (Bell et al., 1997) of families during Operation Joint Endeavour (a US deployment to Bosnia and Hungary in 1996) found that spouse support for the deployment correlated with various other relevant factors, viz:

- Just over half (52%) of spouses who felt they were very prepared for the deployment supported the deployment, compared with only 15% of spouses who felt they were very unprepared (Bell et al., 1997, p. 2).

- Spouse support for the deployment was lowest “among spouses who were troubled by or worried about: (1) mission uncertainty, (2) their soldier’s safety, (3) accuracy or timeliness of information about the mission, or (4) news (probably bad news) about Bosnia” (Bell et al., 1997, p. 2).
The following factors were not related to spouse support for the deployment: "spouse gender, pregnancy status, number of children, distance from post, and time assigned to Europe" (Bell et al., 1997, p. 2).

Given the link between support for a deployment and coping with that deployment (as detailed above), it becomes important for families to ensure that they have adequate information about a deployment before it begins and during the deployment, and that families are helped to understand and appreciate the need for and importance of the deployment (Bell et al., 1997).

Studies indicate that identifying with and adopting the identity or lifestyle of the organization decreases the stress that results from the demands of the organization (Boss et al., 1979, p. 83; Fernandez-Pol, 1988, p. 420; McCubbin, 1979, p. 240). With the changes in the role of women in society, naval wives have moved out of the military community and lifestyle (Hunter, 1978; Kohen, 1984; Segal, 1989; Stoddard & Cabanillas, 1976). This may increase their deployment stress. In South African studies, the employment status of women (which may be an indicator of attachment to the military) was not, however, found to correlate with deployment stress (Van Breda, 1995b, p. 29).

Related to perceptions of deployment may be the psychological impact of deployments. One study found that the mental health conditions of 83% of the people diagnosed during a deployment in Bosnia predated the deployment (Winfield & Lafferty, 1997, p. 104). It therefore seems important that soldiers ensure their mental health prior to deployment.

The management of deployments by the military organisation can precipitate negativity among family members (Van Breda, 1997a):

In the South African Navy, there are many external factors which impede the maintenance of positive attitudes. These factors include unpredictable and erratic deployments (which have been found to correlate with high deployment stress), lack of personnel which results in extended sea duty and slow promotions, frequent night duties which disrupt family life, frequent and brief deployments which increase the frequency of family adjustments, and lack of material and interpersonal rewards for going to sea. The subjective impression of naval social workers is that these factors prompt perpetually negative perceptions of deployments that result in poor deployment coping. (p. 20)

Families of deployed soldiers may become preoccupied with concerns over which they have no influence. During Operations Desert Shield/Storm, for instance, 86% of spouses reported at least moderate amounts of distress over the soldier’s well-being and safety, 80% over their inability to predict the length of the deployment, and 61% over the living conditions the soldier was experiencing (Bell, 1991b, p. 2). These concerns, while valid and probably unavoidable, contribute to a perception of deployment which actually reduces deployment resilience, by virtue of their uncontrollability which results in a sense of powerlessness. Families would probably experience greater deployment resilience if they concentrated on what they can control, which would enhance their sense of coherence (ibid., p. 7; see also Covey et al., 1994).
4.3.1.12 Problem Solving

“The ability to engage in problem-solving activities designed to evaluate options for meeting needs and procuring resources” (Trivette et al., 1990, p. 19) is an important characteristic of strong families (Beavers, 1977, in Lee & Brage, 1989; Tallman, 1988). Lewis (1979, in Lee & Brage, 1989, p. 351) notes that strong families are able to “identify problems sooner than dysfunctional families” and are able to follow a concerted problem solving process without blaming each other.

The McMaster Model of Family Functioning (Epstein & Bishop, 1981) details the process of problem solving as comprising seven stages, viz; “(1) identification of the problem, (2) communication of the problem to the appropriate person(s)/resources, (3) development of alternative action, (4) decision on one alternative action, (5) action, (6) monitoring the action, (7) evaluation of the success of action” (Will & Wrate, 1985, p. 14). Strong families are able to follow the entire problem solving process.

A problem can be defined as follows (Tallman, 1988):

A problem is an intrusion in an actor’s [ie a person’s] state of affairs that has the following characteristics: (1) it impedes, blocks, or interferes with the actor’s efforts to attain a particular goal; (2) it creates an undesirable situation for the actor that is alterable if and only if the actor engages in mental and/or motor activities that will eliminate, bypass, or overcome the impediments, obstacles, or barriers that are interfering with goal attainment efforts; (3) there is some degree of uncertainty that the activities listed in the second statement can be successfully completed. (p. 107)

This detailed definition of a problem has several implications (Tallman, 1988). First, since the problem is an intrusion on one’s normal or routine activities, activities to solve the problem must be nonroutine or extraordinary. Secondly, these activities are taken at some risk. Solving a problem may create other problems and inevitably requires change that produces instability. The larger the problem, the greater the risk involved in solving it. Third, a problem can be considered solved when the “barrier, obstacle, or impediment to attaining a goal is removed, ended, or overcome” (ibid., p. 109). Fourth, since the problem is defined as the obstacle that prevents the attainment of some goal, the problem solving process must entail the removal of the obstacle, not the attainment of the goal itself. Fifth, problem solving can be considered effective when the person is able to continue on the path towards achieving his/her goal.

Consequently, the problem solving process can be defined as follows (Tallman, 1988):

The problem-solving process involves nonroutine mental or physical activities in which the actor attempts to overcome a condition that impedes his or her goal attainment efforts. These activities always entail some degree of risk that the problem may not be solved. (p. 112)
Conger and Elder (1999) were able to test the strengthening properties of effective problem solving with couples exposed to economic stress. They measured marital conflict and marital distress on three occasions at yearly intervals. Marital conflict was operationalised as “criticism, defensiveness, escalations in negativity, angry withdrawal, and insensitivity” and marital distress as “negative evaluations of the relationship, including thoughts of or even actions related to divorce or separation” (ibid., p. 56). The researchers concluded:

We proposed that couples with strong problem-solving skills would be most able to effectively respond to marital conflict [at Time II], reducing its impact on later marital distress [at Time III]. … The findings were consistent with these hypotheses. Couples who demonstrated the ability to generate realistic and nonexploitive solutions to their conflicts and disagreements, and who did not engage in protracted solution generation to the neglect of actually resolving a disagreement, were less likely to suffer distress in their marriages as a result of such conflicts compared with less capable couples. Also consistent with expectations, the level of couple supportiveness did not moderate the relationship between marital conflict and marital distress. These findings suggest that, when faced with an internal family stressor, couples need to do more than providing sensitivity and concern. They need to be able to negotiate, bargain, and reach agreement on realistic solutions to internal family matters. (p. 69)

The longitudinal Lundby study in Sweden also found that problem solving acted as a significant resilience factor, reducing the incidence of alcoholism and psychopathology among a sample of high risk people (Cederblad et al., 1995, p. 328).

Family problem solving and coping refers to “the family’s management of stress and distress through the use of its abilities and skills to manage or eliminate a stressor and related hardships” (M.A. McCubbin & McCubbin, 1996, p. 20). Specifically, problem solving and coping can be defined as follows (M.A. McCubbin & McCubbin, 1989):

Problem solving refers to the family’s ability to define a stressor and the situation in manageable components, to identify alternative courses of action, to initiate steps to resolve the discrete issues, and ultimately to resolve the problem.

Coping refers to the family’s strategies, patterns, and behaviors designed to maintain and/or strengthen the organization and stability of the family unit, maintain the emotional stability and well-being of family members, obtain and/or utilize family and community resources to manage the situation, and initiate efforts to resolve the family hardships created by the stressor/transition. (p. 10)

4.3.1.13 Generalised Resistance Resources

The term ‘Generalised Resistance Resources’, as used here, is derived from several sources, viz family resilience work on resistance resources, Antonovsky’s work on generalised resistance resources, family strengths research and individual resilience research.
4.3.1.13.1 Resistance Resources in Family Resilience Theory

In the earliest model of family resilience, Hill’s ABCX model, the B refers to the crisis-meeting resources at the family’s disposal. Resources refer to the family’s ability to prevent a stressor event or transition in the family from creating a crisis (McCubbin & Patterson, 1982; 1983b). Resources, then, refer to the capacity of a family to resist the development of a crisis in the face of stress. Burr (1973/1982, p. 8), following on from Hansen (1965) who worked with Hill on later developments of the ABCX model, indicates that the B factor can also be called ‘vulnerability’. Although this term is more pathogenic in orientation, it is important in that it is incorporated as a separate component into later family resilience models.

The concept of resources (B) was later expanded in the Double ABCX Model (McCubbin & Patterson, 1983a). Families under stress often develop new resources to cope with the pileup of stressors. In the pre-crisis phase (ie in Hill’s ABCX Model), resources (b) referred to existing resources within the family system that help to prevent the stressor from leading to crisis. In the post-crisis phase (ie in the second half of the Double ABCX Model), new resources (B) are added to the existing resources (b). These resources can be individual, family or community resources, and are activated by the demands placed on the family by the pileup of stressors. A resource of particular importance, which is highlighted in the Double ABCX Model, is social support, which promotes the ability of families to resist crisis and to recover from crisis (McCubbin & Patterson, 1983a).

In the most recent model of family resilience, M.A. McCubbin and McCubbin (1996) define resistance resources as:

A family’s abilities and capabilities to address and manage the stressor and its demands and to maintain and promote harmony and balance in an effort to avoid a crisis, or disharmony and imbalance, and substantial changes in or deterioration in the family’s established patterns of functioning. (p. 19)

Resistance resources are initially aimed at avoiding a crisis with the minimum of change to the family system (M.A. McCubbin & McCubbin, 1993). “Critical family resources include social support, economic stability, cohesiveness, flexibility, hardiness, shared spiritual beliefs, open communication, traditions, celebrations, routines, and organization” (M.A. McCubbin & McCubbin, 1996, p. 19). Resources also vary across the life cycle (ibid.) and can vary from culture to culture.

When families are placed under prolonged stress or when they fail to deal with an initial stressor and must then face the pileup of stressors, new family resources are called into service. Family resources comprise family capabilities and resiliency or adaptive resources (M.A. McCubbin & McCubbin, 1993; 1996).

A family’s capability is defined as (M.A. McCubbin & McCubbin, 1993):

A potential the family has for meeting all of the demands it faces. We emphasize two sets of capabilities: (1) resources and strengths, which are what the family has and (2) coping
behaviors and strategies, which are what the family does as individual members and as a family unit. (p. 45)

A resiliency resource is a characteristic, trait or competency found in an individual, family or community that facilitates the family’s adaptation (M.A. McCubbin & McCubbin, 1996). M.A. McCubbin and McCubbin (1996, p. 33, emphasis added) provide a list of eight important individual level resources:

- “The innate intelligence of family members, which can enhance awareness and comprehension of demands and facilitate the family’s mastery of these;
- “Knowledge and skills acquired from education, training, and experience so that individual family members, and the family unit can perform tasks with greater efficiency and ease;
- “Personality traits (for example, a sense of humor, temperament and hardiness) that facilitate coping;
- “Physical, spiritual and emotional health of members so that intact faculties and personal energy may be available for meeting family demands;
- “A sense of mastery, which is the belief that one has some control over the circumstances of one’s life;
- “Self-esteem, that is, a positive judgement about one’s self-worth;
- “Sense of coherence, which is the family member’s world view that life can be trusted, is predictable and manageable;
- “The ethnic identity and cultural background of family members and the ethnic orientation or world view adopted by the family unit to guide the family’s functioning.”

In addition to personal resources, families can also draw on family system resources to assist them in the adaptation process. Many of these resources will be addressed below in the section on family strengths. M.A. McCubbin and McCubbin (1996, p. 34) identify the following important family strengths:

- Cohesion, defined as “the bonds of unity running through the family life."
- Adaptability, defined as “the family’s capacity to meet obstacles and shift course."
- Family organization, which includes “agreement, clarity, and consistency ... in the family role and rule structure."
- “Shared parental leadership and clear family generational boundaries.”
- Communication.
Family problem solving.

Family hardiness, which is "characterized by a sense of control over the outcome of life events and hardships, a view of change as beneficial and growth producing, and an active orientation in responding to stressful situations."

"Family time together and family routines in daily living," which help to facilitate "harmony and balance while inducing changes in the family system."

Family resilience literature lists social support as one important kind of family resource. However, in this conceptualisation of Generalised Resistance Resources, support systems are considered a specific resistance resource and were thus dealt with separately.

4.3.1.13.2 Antonovsky’s Generalised Resistance Resources

Aaron Antonovsky, the originator of the salutogenic paradigm, which is a cornerstone of resilience theory, developed a model of health that incorporated the concept Generalised Resistance Resources. A review of the entire model will help to clarify what he meant by this term.

Antonovsky’s studies concerning the origins of health led him to propose the Salutogenic Model of Health (Figure 25). This model illustrates how various components work together leading to a prediction of an individual’s position along the ease-dis-ease continuum. The following discussion, which clarifies the important components of the model, is summarised from Chapter 7 of Antonovsky’s *Health, Stress and Coping* (1979, pp. 182-197).

- **Sense of Coherence.** Antonovsky’s notion of ‘Sense of Coherence’ is the central tenet of his salutogenic paradigm. He says (Antonovsky, 1979):

  I start the discussion from the sense of coherence. This is, after all, the core of my answer to the problem of salutogenesis. The sense of coherence is measurable; each of us is located at some point on the sense-of-coherence continuum, which can be seen as an ordinal scale. (p. 183)

- **Life Experiences.** Arrow A in Figure 25 indicates the importance of life experiences in the development of a sense of coherence. "The more these experiences are characterized by consistency, participation in shaping outcome, and an underload-overload balance of stimuli, the more we begin to see the world as being coherent and predictable" (Antonovsky, 1979, p. 187). The foundations of the sense of coherence are laid in childhood, during one’s formative life experience, but can change throughout life in response to significant cataclysmic life events or through personal development and growth.
Arrow A: Life experiences shape the sense of coherence.

Arrow B: Stressors affect the generalized resistance resources at one's disposal.

Line C: By definition, a GRR provides one with sets of meaningful, coherent life experiences.

Arrow D: A strong sense of coherence mobilizes the GRRs and SRRs at one's disposal.

Arrow E: Childrearing patterns, social role complexes, idiosyncratic factors, and chance build up GRRs.

Arrow F: The sources of GRRs also create stressors.

Arrow G: Traumatic physical and biochemical stressors affect health status directly; health status affects extent of exposure to psychosocial stressors.

Arrow H: Psychical and biochemical stressors interact with endogenic pathogens and 'weak links' and with stress to affect health status.

Arrow I: Public and private health measures avoid or neutralize stressors.

Line J: A strong sense of coherence, mobilizing GRRs and SRRs, defines stimuli as nonstressors.

Line K: A strong sense of coherence, mobilizing GRRs and SRRs, defines stimuli as nonstressors.

Arrow L: Ubiquitous stressors create a state of tension.

Arrow M: The mobilized GRRs (and SRRs) interact with the state of tension and manage a holding action and the overcoming of stressors.

Arrow N: Successful tension management strengthens the sense of coherence.

Arrow O: Successful tension management maintains one's place on the health ease/dis-ease continuum.

Arrow P: Interaction between the state of stress and pathogens and 'weak links' negatively affects health status.

Arrow Q: Stress is a general precursor that interacts with the existing potential endogenic and exogenic pathogens and 'weak links'.

Arrow R: Good health status facilitates the acquisition of other GRRs.

Note: The statements and arrows in bold are the core of the salutogenic model.
Generalised Resistance Resources. Generalised Resistance Resources (GRRs) are the factors that give life experiences the qualities of "consistency, participation in shaping outcome and neither underload nor overload" (Antonovsky, 1979, p. 189). GRRs, by definition, provide a person with life experiences that are meaningful and coherent. The relationship between life experiences and GRRs is not causal, hence Line C in Figure 25 is a line and not an arrow. GRRs are the ingredients that mix together with life experiences to influence one’s sense of coherence.

Sources of GRRs. As indicated by Arrow E, GRRs are rooted in still earlier experiences that are located within a sociocultural and historical context. One’s position in society affords one certain opportunities and conditions – some better, some worse. These conditions affect the repertoire of and the type of GRRs that can develop. In particular, they influence child rearing patterns and social-role complexes. There are other factors, however, which are not subject to context: idiosyncratic factors such as an individual’s personality, appearance, intelligence, etc as well as chance factors influence the development of GRRs. While people who are poor or isolated from participating in society have fewer opportunities to develop GRRs, they are not entirely without opportunity.

Stressors. Although the sense of coherence occupies the central position of the Salutogenic Model, stressors occupy the most ‘busy’ position. Arrow F indicates that the sources of GRRs (as discussed in the previous paragraph) influence the kinds of stressors present in an individual’s experience. Arrow B indicates that stressors can profoundly influence one’s GRRs by introducing unexpected experiences that promote or shake one’s GRRs. Arrow G indicates that traumatic physical or biochemical stressors (such as poison, a bullet or a car) affect one’s position on the health continuum directly. Arrow H indicates that prolonged exposure to physical and biochemical stressors can indirectly affect one’s health through interaction with potential pathogens and one’s state of stress. Arrow L indicates that the stressors place one in a state of tension.

Management of Tension. Arrow I indicates that advances in preventive and remedial medicine have increased society’s capacity to reduce, restrict or remove some of the stressors. Of course, “the bugs … are smarter” (Antonovsky, 1979, p. 193) making such measures inadequate to ensure health. Arrow D indicates how sense of coherence enables the management of tension that arises from the stressors by mobilising the GRRs and also other Specific Resistance Resources (SRRs). The mobilised GRRs can then be used in three main ways. Firstly, as can be seen by Line J, one can avoid the stressors completely. Secondly, Line K indicates that certain stressors can be redefined “as innocuous or even as welcome” (ibid.). Thirdly, as Arrow M indicates, the GRRs enable one to manage one’s state of tension by holding the stress or by overcoming the stressor. Successful efforts to manage the state of tension contribute to one’s sense of coherence (Arrow N), by enabling one to “learn that existence is neither shattering nor meaningless” (Antonovsky, 1979, p. 194).
Stress. The successful management of stress contributes to one’s sense of coherence (Arrow N) and also maintains one’s position along the health continuum (Arrow O). Unsuccessful management of tension contributes to a state of stress, which, together with the indirect work of stressors and the activation of potential pathogens, leads to illness (Arrow P). Arrow Q indicates that the pathogens that ‘cause’ illness do so only in interaction with a state of stress. This suggests that, “other than the massive traumata that leave none unscathed (Arrow G), all diseases are usefully understood as psychosomatic. In other words, almost all breakdown involves stress. Stress, however, does not determine the particular expression of the breakdown” (Antonovsky, 1979, p. 196).

Health. One’s position on the health or ease/dis-ease continuum is the final stage of the Salutogenic Model. One’s health status acts on one’s life experiences in three main ways. Firstly, Arrow G indicates that one’s health status influences the kinds of stressors one is exposed to. Secondly, Arrow R indicates that “good health is in itself a significant generalized resistance resource by the definition of a GRR as a factor that fosters meaningful and sensible life experiences” (Antonovsky, 1979, p. 197). Thirdly, being healthy “can facilitate the acquisition of other GRRs” (ibid.).

In short, childrearing patterns and social-role complexes build up generalised resistance resources (Arrow E), which provide one with sets of meaningful, coherent life experiences (Line C) which shape an individual’s sense of coherence (Arrow A). When one is exposed to life stress, one enters a state of tension (Arrow L). A strong sense of coherence mobilises one’s available GRRs (Arrow D), which interact with the state of tension to hold the stress and overcome the stressor (Arrow M). Successful management of the tension boosts one’s sense of coherence (Arrow N) and maintains one’s position towards the health end of the ease/dis-ease continuum (Arrow O).

4.3.1.13.3 Family Strengths Research

Family strengths research examined families who, by their own or other’s opinion, were considered strong or resilient. The intention was to identify the characteristics of these families. This is somewhat similar to the salutogenic notion of identifying people who thrive in the face of adversity, except that there is no explicit attempt to identify adversity. There is an implicit assumption that routine life events entail stressors that families must deal with.

Family strengths research is largely theory free and tends to be descriptive (Ponzetti & Long, 1989). As such, it is difficult to present it as a coherent model.

Definitions of Family Strengths. There are various definitions of family strengths:

[Family strengths are] those relationship patterns, interpersonal skills and competencies, and social and psychological characteristics which create a sense of positive family identity, promote satisfying and fulfilling interaction among family members, encourage the development of the potential of the family group and individual family members, and contribute to the family’s ability to deal effectively with stress and crisis. (Williams et al, 1985, in Trivette et al., 1990, p. 17)
Family strengths are the competencies and capabilities of both various individual family members and the family unit that are used in response to crises and stress, to meet needs, and to promote, enhance, and strengthen the functioning of the family system. (Trivette et al., 1990, p. 18)

Many authors, such as Pollack, Jansen, Otto, Stinnett, Olson, Beavers, Barnhill, Epstein & Bishop, Handsen and Trivette, have generated lists of family strengths. In many cases, these lists overlap, so that a separate review of each researcher’s contribution would be repetitive. A synthesis of the findings of these various will, therefore, be presented. Eleven clusters of family strengths are briefly described below.

- **Family Cohesion.** Family cohesion or closeness is one of the most frequently cited characteristics of strong families, and is particularly valued as a family strength by both healthy and clinical families (Bobele, 1989). Cohesion, as conceptualised in the Circumplex Model, can be defined as “the emotional bonding that families have toward one another”, and can range from extremely low cohesion (disengagement), to moderately low cohesion (separation), moderately high cohesion (connection), and to extremely high cohesion (enmeshment)” (Olson et al., 1988, p. 22). The importance and dynamics of family cohesion are also discussed by Minuchin (1974), the McMaster Model of Family Functioning (Epstein & Bishop, 1981; Will & Wrate, 1985) which uses the term “affective involvement” rather than cohesion, Barnhill (1979) who refers to cohesion as ‘mutuality’ (in contrast to ‘isolation’), Otto (1963, in H.I. McCubbin & McCubbin, 1992), Lewis (1979, in Lee & Brage, 1989), Beavers (1977, in Lee & Brage, 1989), Curran (1983, in H.I. McCubbin & McCubbin, 1992) and Stinnett (1979; 1989) who emphasises families spending time together.

- **Communication.** Good communication has long been hailed as the cornerstone of a strong family (Gantman, 1980; H.I. McCubbin & McCubbin, 1992). “These families communicate with a great deal of shorthand, are very spontaneous, and tend to interrupt each other frequently” (Lewis, 1979, in Lee & Brage, 1989, p. 350). Communication is also emphasised by Stinnett (1989), Barnhill (1979), The McMaster Model of Family Functioning (Epstein & Bishop, 1981), Beavers (1977, in Lee & Brage, 1989) and Trivette (1990).

- **Spirituality & Values.** “This is possibly the most controversial finding in our research, and yet it is undeniable that for many strong families religion – or spiritual wellness, or feelings of optimism or hope, or an ethical value system, or whatever you wish to call it – are important themes in their lives” (Stinnett & De Frain, 1989, p. 65). Some families express their spirituality through active involvement in a religious community, leading to Stinnett’s original formulation of this strength as “a high degree of religious orientation” (Stinnett, 1979, p. 28). In his later writings Stinnett was more accommodating of those who, while not participating in religious activities, have a strong sense of transcendent spirituality.
Others researchers have also identified spirituality as a source of family strength: Otto (1963, in H.I. McCubbin & McCubbin, 1992, p. 167) refers to “spirituality commitment” and Curran (1983, in H.I. McCubbin & McCubbin, 1992, p. 167) says, “The healthy family has a shared religious core”. Olson (1983, in H.I. McCubbin & McCubbin, 1992, p. 168) found that religious orientation, congregational activities and spiritual support were particularly important strengths for families with adolescent children. Trivette et al (1990, p. 19) stress the importance of “a sense of purpose that permeates the reasons and basis for ‘going on’ in both bad and good times”, while Beavers (1977, in Lee & Brage, 1989, p. 354) indicates that “optimal families also experience significant transcendent values which are necessary for enjoyable, hopeful, and optimistic living.”

- **Family Identity & Rituals.** Curran (1983, in H.I. McCubbin & McCubbin, 1992, p. 167) found that “the healthy family has a strong sense of family in which ritual and traditions abound.” This raises two related concepts, viz family identity and family ritual.

- **Family Identity.** Gunn (1980, p. 18) argues that family identity “lies at the very heart of what it means to have family strengths as distinct from strengths accruing to the individuals who happen to be living in families”. According to Gunn, family identity comprises the ability of families to contextualise the family in time (looking back at the family’s roots and forward into the family’s future) and environment (locating the family story within the context of the community’s or society’s stories) (ibid.).

- **Family Rituals.** Ritual, while perhaps not as honoured in contemporary society as before, remains a cornerstone of resilient families and societies (Imber-Black et al., 1988; H.I. McCubbin & McCubbin, 1988). Rituals are patterns of behaviour and interaction that provide meaning and continuity in the lives of family members (Roberts, 1988; Wolin & Bennett, 1984). They serve to facilitate both stability and change in family systems, and include family celebrations, family traditions and rituals of daily family life (Wolin & Bennett, 1984).

- **Affective Responsiveness.** Lewis (1979, in Lee & Brage, 1989, p. 351) indicates that “the basic mood of healthy families contains elements of warmth, humor, and concern for each other”. Strong families are able to share their feelings honestly and openly with each other, and respond to the expression of feelings with empathy and acceptance. In particular, feelings of loss in response to the inevitable losses of life can be expressed and dealt with in healthy families. The McMaster Model of Family Functioning (Epstein & Bishop, 1981) conceptualises this as “affective responsiveness”.

- **Boundaries & Hierarchies.** According to Beavers (1977, in Lee & Brage, 1989) and Gantman (1980), strong families have clear boundaries between individual family members (so that they are not enmeshed with each other) and between generations within the family (so that parents do not behave like children and so that children do not serve the functions of spouse or parent) (see also Barnhill, 1979; Minuchin, 1974).
Boundary ambiguity, a concept coined by Boss (1980), focuses not on normative (and hence culture bound) boundary structures, but rather on the ambiguities that can arise in any family structure when there is unclarity regarding who is in and who is out. Boss cites African American families as an example of families who historically used very flexible and need-defined family structures. The elasticity of African American family boundaries allowed for the physical absence of family members for long periods and over great distances, without disrupting the family identity (Boss, 1980; Littlejohn-Blake & Darling, 1993). Informal conversations with African social workers in South Africa suggest that the same may be true in African families who experienced parents separated through migrant labour or exile.

Flexibility/Adaptability. Minuchin (1974, pp. 60-65) indicates that families must constantly adapt to change – change resulting from contact with problems and stressors outside the family, change resulting from transitional or developmental points in the family life cycle, or change from idiosyncratic problems (such as a child being born with a disability). Most families are sufficiently flexible to adjust to these changes. Families who can by termed dysfunctional are those “who in the face of stress increase the rigidity of their transactional patterns and boundaries, and avoid or resist any exploration of alternatives” (ibid., p. 60). Flexibility is also advocated by Barnhill (1979), Gantman (1980) and Olson’s Circumplex Model (Olson et al., 1988).

Autonomy. Strong families are able to strike a balance between intimacy and autonomy (Lewis 1979, in Lee & Brage, 1989). This balance is similar to the cohesion balance between enmeshment and disengagement. The cohesion balance, however, is more concerned with the family system itself, while the intimacy-autonomy balance is concerned with the place of the individual within the system. Part of promoting the autonomy of family members is respecting them (Otto and Curran, in H.I. McCubbin & McCubbin, 1992).

Social Support. Social support was discussed previously as a specific resistance resource.

Coherence. Coherence, which is similar to stressor appraisal processes, was discussed previously as a specific resistance resource.

Problem Solving. Problem solving was discussed previously as a specific resistance resource.

4.3.1.13.4 Individual Resilience Research

The literature on individual resilience, as cited previously, provides a rich source of insight into factors that strengthen individuals in families and equip them to cope with stress, including deployment related stress. Two central constructs are Sense of Coherence and Hardiness.

Sense of Coherence. ‘Sense of Coherence’ (SOC) is the central contribution of Antonovsky’s salutogenic theorising. Antonovsky’s research investigated the source of resilience and found the GRRs. Further research indicated that GRRs were mobilised by another construct, namely SOC.
Ongoing research provided ample evidence to support the notion that people’s SOC contributed substantially to their resilience and health.

Antonovsky identified three main components of SOC, viz: comprehensibility, manageability and meaningfulness, and defined SOC as follows (1987, cited in Antonovsky, 1998b):

A global orientation that expresses the extent to which one has a pervasive, enduring though dynamic feeling of confidence that (1) the stimuli deriving from one’s internal and external environments in the course of living are structured, predictable, and explicable; (2) the resources are available to one to meet the demands posed by these stimuli; and (3) these demands are challenges, worthy of investment and engagement (Antonovsky, 1987, p. 19). (p. 22)

These three components can be discussed in more detail:

- **Comprehensibility.** The comprehensibility component of SOC refers to “the extent to which individuals perceive the stimuli that confront them as making cognitive sense, as information that is ordered, consistent, structured, and clear – and, hence, regarding the future, as predictable – rather than as noisy, chaotic, disordered, random, accidental, and unpredictable” (Antonovsky, 1984, p. 118). Comprehensibility is primarily a cognitive dimension, referring to how the individual thinks about or makes sense of a set of internal or external stimuli or situations. It implies that life, which is currently comprehensible, is expected to comprehensible in the future. It also implies that, although one may undergo great difficulties, challenges and complex situations, there is a fundamental conviction that these situations will make sense.

- **Manageability.** Manageability is “the extent of the belief that not only did one understand the problem, but that the requisite resources to cope with the problem successfully were at one’s disposal” (Antonovsky, 1998a, p. 7). It appears that manageability refers to the sense that life is ‘under my control’ and that it is thus equivalent to Rotter’s Locus of Control (1966). However, Antonovsky (1984) argues that Locus of Control and Manageability are quite different constructs:

  “At one’s disposal” may refer to resources under one’s own control – the … Rotter understanding – but it may also refer to resources controlled by legitimate others – friends, colleagues, God, history – upon whom one can count. No implication exists that untoward things do not happen in life. They do; but when people are high on manageability, they have the sense that, aided by their own resources or by those of legitimate others, they will be able to cope and not grieve endlessly. Moreover, there will be no sense of being victimized by events or of being treated unfairly by life. (p. 119)

- **The concept of ‘legitimate others’ introduces the notion that being tied into a meaningful social network promotes one’s resilience, a subject that was addressed in greater depth earlier. Strümpfer (1990, p. 269) notes “that the mere perception that help is available may operate [to enhance resilience], without any actual support being provided.”**
Meaningfulness. Meaningfulness is the emotional face of comprehensibility (Antonovsky, 1984). While comprehensibility means that life makes cognitive sense, meaningfulness means that life is emotionally worthwhile and sensible. In this way, meaningfulness accounts for an individual's motivation to engage in a difficult life situation (Antonovsky, 1998a). To say that life is meaningful is to say that one cares (Antonovsky, 1984). When a difficult situation is perceived as meaningful, one chooses to invest emotional energy in dealing with it, one sees the difficulty as a challenge in which it is worth investing energy and commitment, rather than as a burden (ibid.).

Hardiness. Kobasa’s construct of hardiness is posited as mediating stress and illness, potentially reducing the negative effects of stress. Hardiness itself comprises three subconstructs, viz commitment, control and challenge:

Commitment as opposed to alienation (Kobasa et al., 1981, p. 369). “Among persons under stress, those who feel committed to the various areas of their lives will remain healthier than those who are alienated” (Kobasa, 1979, p. 4). Commitment is firstly the valuing of one’s life, one’s self, one’s relationships, and secondly the investment of oneself in these valued dimensions of life (Kobasa, 1982). Commitment results in a sense of purpose that can carry a person through difficult turbulent times. Commitment “is based in a sense of community – what existentialists call being-with-others” (ibid., p. 7).

Control as opposed to powerlessness (Kobasa et al., 1981, p. 369). “Among persons under stress, those who have a greater sense of control over what occurs in their lives will remain healthier than those who feel powerless in the face of external forces” (Kobasa, 1979, p. 3). Control involves acting ‘as if’ one has control over what is happening around one. It entails the belief (and consequent actions) that life events are in part a result of one’s own actions and attitudes, and thus amenable to change. People with control “can interpret and incorporate various sorts of events into an ongoing life plan and transform these events into something consistent and not so jarring to the organism” (Kobasa, 1982, p. 7).

Challenge as opposed to threat (Kobasa et al., 1981, p. 369). “Among persons under stress, those who view change as a challenge will remain healthier than those who view it as a threat” (Kobasa, 1979, p. 5). “Challenge is based on the belief that change, rather than stability, is the normative mode of life” (Kobasa, 1982, p. 7). With this outlook on life, stressful life events are viewed neither with surprise (since they are anticipated) nor with dismay (since they are seen as exciting opportunities for growth and development).

4.3.1.13.5 Cultural Resilience

There is a shift in some cross-cultural thinking from a pathogenic to a salutogenic perspective. This is accompanied with a greater respect for diverse forms of resilience and the way in which whole cultures have been resilient in the face of adversity or have even thrived. The importance of cultural identity or ethnic schema has been highlighted as an important ingredient in resilience.
The need for examining resilience within a sociological or power perspective has also been identified. There has, lastly, been some exploration of difference in resilience between cultures.

Several writers have cited the importance of cultural identity as an important component of resilience in individuals, particularly individuals from minority or oppressed cultures. Having a healthy cultural identity requires identifying the innate cultural strengths in that culture. These strengths may or may not differ from the strengths of other cultures – the emphasis here is not comparative, but rather looking at features within individual cultures.

HeavyRunner and Morris (1997) state, in relation to Native American cultures:

> Our world view is the cultural lens through which we understand where we came from, where are today, and where we are going. Our cultural identity is our source of strength. In historical times the cultures and world views of tribal peoples were regarded by non-Indians as impediments to the speedy assimilation of the young. Regrettably, remnants of such viewpoints continue to be held by some professionals who impact the lives of contemporary Indian youth. It is critical that researchers, educators, and social service providers recognize the valid and positive role culture plays in supporting Indian youth and tapping their resilience.

A culture’s world view is grounded in fundamental beliefs which guide and shape life experiences of young people. It is not easy to summarize fundamental Indian values and beliefs because there are 554 federally recognized tribes in the U.S. alone and an almost equal number in Canada. In spite of tribal differences, there are shared core values, beliefs, and behaviors. Ten are highlighted here to guide our thinking about innate or natural, cultural resilience: spirituality, child-rearing/extended family, veneration of age/wisdom/tradition, respect for nature, generosity and sharing, cooperation/group harmony, autonomy/respect for others, composure/patience, relativity of time, and non-verbal communication. (p. 1)

HeavyRunner and Morris (1997) argue that when these cultural values are taught, cherished and nurtured in children, these children develop natural resilience. This resilience is grounded in a healthy and respectful cultural identity.

In a similar vein, Stevenson and Renard (1993) argue that White therapists working with African American clients need to promote the “racial socialisation” of their clients (see Daly, Jennings, Beckett, & Leashore, 1996 for a similar perspective in social work). “Racial socialisation” is held to mean the interpersonal transmission of values about one’s culture. The authors argue that therapists need to nurture racial socialisation, so as to enhance the resilience and strengths of clients. In particular, the authors identify the African American cultural strengths of “dependence on helpful extended relatives, transmission of cultural childrearing values, influence of a religious worldview, and family communication about surviving societal racism struggles, educational achievement, and Black pride and culture” (Stevenson & Renard, 1993, p. 433). These strengths provide African Americans with the resources needed to survive oppression and to develop health and productive family systems.

Sudarkasa (1997, p. 30), regarding African American families, indicates the importance “of rediscovering and instilling the values that made it possible for these families to persist and prevail in the past.” African American families have endured great hardships over the centuries and yet
have survived. Inherent in this survival is strength in the face of adversity, the foundation of resilience (Daly et al., 1996). The promotion of these values will contribute to the resilience of these cultures.

In particular, Sudarkasa (1997, pp. 32-38) highlights seven African American family values:

- **Respect.** Respect to people who are older or more senior.
- **Responsibility.** Believing oneself to be responsible for others, beyond one’s immediate family.
- **Reciprocity.** Giving back to one’s family and community in return for what has been received from them.
- **Restraint.** Putting one’s own needs on hold in order to accommodate the needs of others.
- **Reverence.** A reverence for God, for the ancestors, for spirituality.
- **Reason.** Working towards solutions through reasonable dialogue rather than impulsive action.
- **Reconciliation.** The importance of being reconciled with one’s neighbour.

Sudarkasa (1997) is not arguing that these values are present in all African American families. Rather, the author argues that these are historical values that enabled the survival of the first African families to come to America and which need to be recovered now:

These Seven R’s ... represent African family values that have supported kinship structures (lineages, compounds, and extended families) that have lasted for hundreds, even thousands, of years. The strength of these values is indicated by the fact that most of them were retained and passed on in America, thereby enabling African Americans to create and maintain extended family networks that sustained them here, just as their prototypes had sustained their ancestors on the African continent. Today, in the face of circumstances that threaten the existence of these extended family structures, a revival of the values that allowed them to persist could strengthen the family and community structures on which African Americans must depend in the twenty-first century. (p. 38)

The resilience of African American family values is evident in a study by McAdoo (1982, p. 250) in which it was found that Black families under high stress made greater use of extended family supports than Black families under low stress. However, this pattern continued for families that had moved into a higher socioeconomic bracket – they continued to make use of extended family support and often took on a supporting role for families ‘back home’.

The issue of cultural paradigm is important not only to members of various cultures, but also to researchers. The theoretical perspective of a researcher can influence the conclusions that researcher draws from the data, even from the same data, as Johnson (1997) notes:

The works of Moynihan (1965) and Hill (1972) demonstrate the critical link between data and interpretive frameworks (see Johnson 1978). Although both analyzed the same U.S.
Census data, they employed different theoretical perspectives and arrived at divergent conclusions. Moynihan reported a deteriorating Black family and recommended social policies that would encourage changes in the Black family’s structure and values. Hill observed the resilience of Black families and recommended social policies that could build on the strengths of Black family values and structure. Without arguing the validity of either conclusion, the importance of studying perspectives governing Black family research should be evident. (pp. 94-95)

It would appear, therefore, that the resilience perspective might be valuable not only in directing the kinds of variables that are studied (strengths rather than pathologies), but also the kinds of interpretations given to research results (opportunities for growth rather than maintaining oppressive social systems).

### 4.3.1.14 Conclusion to Step 3

The preceding 60 or so pages have covered a great deal of ground. It should be clear that resilience theory has a rich and broad history. It covers individual, family, community and even policy. The Resilience Model for Social Health (Figure 24) provides a broad framework for this discussion on literature review, since the eight constructs that comprise vulnerability and resilience are what are assessed during the Concurrent Health Assessments. The purpose of the Military Social Health Index is to support these assessments.

The theory covered in this section serves several purposes:

- They provide a broad theoretical paradigm for the Military Social Health Index. The instrument is located within the resilience or salutogenic paradigm. The instrument aims to measure not only social pathology (vulnerability), but also health and strength (resilience). This is quite different from many current ecometric instruments that are focused on measuring pathology, even when they carry health-oriented titles. Hudson’s (1982) Generalised Contentment Scale is a good example of this, since it in fact measures depression and not contentment.

- The theory has guided the identification of the key constructs that the Military Social Health Index will measure. Although it was stated at the beginning of Section 4.3 that the constructs had in fact been identified prior to this comprehensive literature review, the constructs were not plucked out of the air, but rather emerged from the Resiliency Model of Family Adjustment and Adaptation (M.A. McCubbin & McCubbin, 1996). This will be described in more detail in Step 4.

- The theory, albeit at times varied and multifaceted, guided the identification of the facet maps that will be presented in Step 6. Through a review of the literature summarised in Section 4.3, the candidate identified the facets that were used in the design phase to generate items. Consequently, there is a very close link between the theory and the items in the instrument.

The three steps that follow serve to move from the broad and, at times, abstract theory, closer to the scale that will be designed in the following chapter.
4.3.2  **Step 4: Identify Operational Assessment Areas**

The identification of the operational assessment areas for the *Military Social Health Index* was determined through an interaction between the client’s needs, the theory of resilience and the model of family resilience used in the Directorate Social Work’s Concurrent Health Assessment.

When a team, including the candidate, designed the Concurrent Health Assessment in 1999, it was agreed to utilise the Resiliency Model of Family Adjustment and Adaptation (M.A. McCubbin & McCubbin, 1996). Since the model was highly complex and focused on research rather than clinical practice, a simplified version of the model was formulated for use during the Assessments. The formulation of this simplified model incorporated the main findings in resilience theory and deployment resilience research, as summarised above in section 4.3.1. Since 1999, this model has become an umbrella framework for all social work assessment in the SANDF.

During the initial discussions concerning the design of the *Military Social Health Index*, and in light of the candidate’s detailed resilience theory literature review (Van Breda, 2001), it was noted that the assessment model focused unduly on the soldier and family, and led only to casework interventions. The Directorate Social Work’s commitment to organisational interventions, within the context of occupational social work (Kruger & Van Breda, 2001), led to the identification of a new assessment area for inclusion in the assessment model, viz work-to-family interference.

During the early stages of the design of the *Military Social Health Index*, it became apparent that family life cycle, one of the four components of vulnerability, could not be measured in a summated rating scale. It was agreed that models of the family life cycle are highly normative, Western and out of date with contemporary society. Furthermore, it was agreed that a different set of items would be required for each stage of the life cycle. The construct remains relevant, but it was agreed that it should be assessed clinically and not through the *Military Social Health Index*.

Further processes of dialogue between the candidate and Directorate Social Work led to the finalisation of seven assessment areas for the *Military Social Health Index*. These are illustrated in the resilience model in Figure 26, where the seven constructs are emphasised in bold, italic script.
FIGURE 26: RESILIENCE MODEL FOR THE MILITARY SOCIAL HEALTH INDEX
The seven areas are grouped as three vulnerability constructs and four resilience constructs, viz:

- **Vulnerability Constructs:**
  - Social Problems
  - Pileup
  - Work-to-Family Interference

- **Resilience Constructs:**
  - Social Support
  - Problem Solving
  - Stressor Appraisal
  - Generalised Resistance Resources

### 4.3.3 Step 5: Explore Cross-cultural Comparability of Assessment Areas

The cross-cultural comparability of the seven assessment areas was explored by a team of eight military social workers – two Zulu, two Setswana, one White English (the candidate), one Asian English, one White Afrikaans and one Coloured Afrikaans. The profile of this team is described in more detail in Step 8 in the following chapter (section 5.1.2).

All members of this research team have experience of working with the resilience model during the SANDF’s Concurrent Health Assessments. They were, thus, familiar with the broad theoretical framework used in the design of the *Military Social Health Index*.

A work session was held with the research team, during which the construct definitions were discussed and the initial facet maps reviewed. Through this process, a number of adjustments were made to the formulation of the construct definitions and facet maps (which are presented in the following step). For instance, the original definition of generalised resistance resources was, “The presence of a variety of creative and dynamic resources that enable families to resist the stress of deployments”. This was subsequently reformulated as, “the presence of a variety of creative and dynamic resources in family members and the family system, that enable families to resist life stress, which contributes to increased resilience and social health.” The adjustments served to incorporate the perspectives of the research team and were all related to ensuring clear and unambiguous statements.

By the end of these discussions, the team was satisfied that all seven constructs were meaningful and measurable in their cultures. There were, however, a number of specific concerns regarding how certain aspects of the constructs would be measured, eg anxiety as a facet of social problems.
in not translatable in Zulu and Setswana. These concerns were pended to the design of the scale items in Step 8 and resulted in a number of changes to the facet maps.

4.3.4 **STEP 6: DEFINE CONSTRUCTS TO BE MEASURED**

Drawing on the literature referred to under Step 3, operational and constitutive definitions of the seven constructs to be included in the *Military Social Health Index* were formulated, along with definitions of family, social health, vulnerability and resilience.

4.3.4.1 **Family**

It will be noted that the definitions that follow all refer to the ‘family system’ as the target of definition. ‘Family,’ as traditionally defined according to marital ties and blood-related children, excludes many South African families. Indeed, as has been noted in several places in this dissertation, ‘family’ has evolved vastly over the past few decades. Its definition has become elusive.

For the purposes of the *Military Social Health Index*, family is defined as follows:

<table>
<thead>
<tr>
<th>Family is the network of significant and meaningful relationships between a group of individuals who experience a sense of emotional affiliation and mutual obligation.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Although family is not defined according to blood or legal relations, most families are comprised of individuals who have a kin or romantic connection. Family refers to the group of individuals one cares for or who care for one. The family is “the ecological system that nourishes the individual” (Zimmerman, 1980, in Hepworth &amp; Larson, 1986). Family may include one or more spouses or partners, children (biological, adopted, or otherwise), parents, siblings, extended family relatives, etc. Family includes any individuals that consider themselves to be a family.</td>
</tr>
</tbody>
</table>

4.3.4.2 **Social Health**

The Social Work Concurrent Health Assessment process developed by the Directorate Social Work of the SANDF is focused on determining the ‘social health’ of military employees. Since the *Military Social Health Index* is designed to support this process, it too measures social health overall. As could be seen in the resilience model in the previous step, social health is the result of the interaction between a stressor, vulnerability and resilience.

In light of this, the Directorate Social Work adopted the following definition of social health:

| Social health is the relatively low vulnerability and high resilience of people that enables them to deal effectively with life stress, notably the stress of a military operation (Directorate Social Work, 2001, p. 5). |

Social health is thus the result of a stressor such as a military deployment impacting on a family system, mediated by the relative absence of social problems, pileup and work-to-family interference and the relative presence of social support, problem solving abilities, positive stressor appraisal and generalized resistance resources.

### 4.3.4.3 Vulnerability

Drawing on the literature related to vulnerability, especially the notion of “wellness breakdown” of Maddi (1999, p. 68) the following definition of Vulnerability was accepted:

**Vulnerability** is the likelihood of wellness breakdown in a family system in response to life stress, notably the stress of a military operation.

This ‘likelihood of wellness breakdown’ is driven by three main factors, viz the presence of social problems, pileup of life stressors and work-to-family interference or spillover. Vulnerability is a positive quality – it refers to the presence of ‘weakness’, rather than the mere absence of strength.

### 4.3.4.4 Social Problems

Drawing on social work literature, resilience theory and the Directorate Social Work’s experience of working with soldiers, the following definition of Social Problems was accepted:

**Social problems** is the presence of persistent (non-crisis) social pathology in the family system over the previous six months, which combines to create vulnerability and social unhealth.

Social problems can be located within any individual within the family or in the family system itself or in the system of relationships that family members are connected to. Social problems do not refer to problems in macro environment, unless these problems impinge directly and consciously on the family. Social problems are defined according to the perceptions of one member of the family system – the member that is assessed. Social problems are persistent and enduring over a period of time, rather than crises or short-term events.

### 4.3.4.5 Pileup

Drawing on the literature on family resilience and life stress, and utilizing concepts of stress in the individual resilience literature, the following definition of pileup was accepted:

**Pileup** is the accumulation, over a six-month period, of multiple life stressors, crises or events (including transitional events in the family life cycle), which require complex and multiple role changes in the family system, which contributes to increased vulnerability and social unhealth.
Pileup refers to non-normative life events (such as the death of a colleague) as well as normative family life cycle events (such as the death of a parent).

4.3.4.6 Work-to-Family Interference

In light of literature, theory and research on the work-family interface, the following definition of work-to-family interference was formulated:

**Work-to-family interference** is the presence of stressors in the workplace that may spill over into the family system, which combines to create vulnerability and social unhealth.

The focus is exclusively on events and processes within the soldier’s workplace (i.e. the military) that may impact negatively on family resilience and well-being. This may include the lack of military support for families or the poor management of military deployments.

4.3.4.7 Resilience

Drawing on the breadth of resilience theory, especially the definition of family resiliency by Walsh (1996, p. 263), the following definition of resilience was formulated:

**Resilience** is the presence of key processes and properties of family systems that enable them to cope more effectively and emerge stronger from life stress, notably the stress of deployments.

The most salient ‘key processes and properties of family systems’ are the presence of quality social support systems, effective problem solving skills, positive and constructive appraisal of the stressor and generalised resistance resources. Resilience is a positive quality – it refers to the presence of strength, rather than the mere absence of ‘weakness’.

4.3.4.8 Social Support

Drawing on family and deployment resilience literature, social support is defined as follows:

**Social support** is the ability of the family system to access quality and sufficient support systems in times of need, which contributes to increased resilience and social health.

The source of social support is not of interest here – families can obtain support from any source. The quality and adequacy of social support is, however, important. The quality of social support comprises emotional support (feeling cared for and loved), esteem support (feeling valued), network support (feeling of belonging) and instrumental support (practical help).
4.3.4.9 Problem Solving

Problem solving is defined as follows, drawing on the problem solving literature described earlier:

**Problem solving** is the ability of the family system to identify problems, generate alternatives, implement solutions and evaluate solutions, which contributes to increased resilience and social health.

The focus here is on the family’s ability to follow a systematic process of solving problems, rather than on the family’s ability to communicate in a constructive manner about problems or the belief of family members in their ability to solve or overcome problems. Problem solving addresses the process of solving problems, not the resolution of problems as such.

4.3.4.10 Stressor Appraisal

Stressor appraisal draws on the family resilience literature on family appraisal processes and the individual resilience literature on sense of coherence and hardiness, and is defined as follows:

**Stressor appraisal** is the way in which the stress of deployments is perceived (seen), appraised (evaluated) and interpreted (given meaning) by family systems, which contributes to increased resilience and social health.

The ‘stressor’ is defined as a military deployment – the appraisal of the stressor thus focuses specifically on deployments (stressor appraisal – C) or more broadly on the military (situation appraisal – CC). Stressor appraisal focuses on the cognitive processes concerning deployments, rather than on the deployments itself – it is not a measure of the stressfulness of the deployment, but rather of the thinking about the stressor.

4.3.4.11 Generalised Resistance Resources

The last operational assessment area, generalised resistance resources, draws on the broad individual resilience literature and on the family strengths and deployment resilience literature, and is defined as follows:

**Generalised resistance resources** is the presence of a variety of creative and dynamic resources in family members and the family system, that enable families to resist life stress, which contributes to increased resilience and social health.

Social supports and problem solving processes, although also resistance resources, are excluded here as they constitute specific rather than generalized resistance resources. The focus here, unlike with stressor appraisal, is on life stress in general, rather than on the specific stress of deployments.
4.3.4.12 Facet Maps

The above definitions provide an operational definition (the first italicized sentence in each block), and a combined constitutive (defining the construct in terms of other constructs) and divergent definition (defining what the construct does not measure).

The identification of constitutive facets, dimensions or attributes is a helpful step leading from defining to measuring the constructs. It also assists in the establishment of the content validity of the instrument. A thorough review of the resilience literature summarized in step 3, focused by the above definitions, yielded seven ‘facet maps’ which are presented on the following pages (Figures 27 to 33).

In order to compile these maps, the candidate reviewed all the literature relevant to each operational assessment area, as summarized earlier in this chapter. Using the content analysis procedures for extracting themes (see for example, Neuendorf, 2001; Patton, 1990), any dimension that appeared in the literature as being a facet of the total construct was written down. All possible facets were extracted from the literature in order to ensure that the content domains were thoroughly sampled. The lists of facets were then formatted into a mind-map.

The facet maps were prepared by the candidate, reviewed by the research team (particularly the cultural comparability of the facets), finalized and then (in the next phase) used to guide the generation of items. In this way, the team acted as a multicultural focus group to ensure the cultural comparability and functional equivalence of the facets that constitute each construct.

4.4 Summary of Chapter

This extended chapter presented the results of the first phase of multicultural ecometric scale development process, viz the Analysis Phase. Six steps were described, grouped into two main moments.

During the first main moment, Identify Problem, the problem faced by the Directorate Social Work was defined and described. The organisational and historical processes leading to the design of the *Military Social Health Index* were detailed. Thereafter, the study end results were formulated in the form of an innovation requirement.

During the second main moment, Formulate Theory, four steps were followed. In Step 3 the domain of resilience theory was identified as the theoretical foundation of the new instrument, and a review of that theory was provided. In Step 4 this culminated in the identification of seven assessment areas to be incorporated in the instrument, illustrated within a resilience model of social health. In Step 5, a multicultural research team reviewed these seven assessment areas to evaluate their cultural comparability. Finally, in Step 6, formal operational and constitutive definitions of the seven constructs were provided, together with a facet map for each construct.
4.5 **IN THE FOLLOWING CHAPTER**

With this foundation set, the candidate is ready to move into the second phase of multicultural ecometric scale development, viz the Design Phase. During this phase the instrument will be designed in draft form, ready for testing in the following Development Phase. Chapter 5 will provide a detailed description of the process of designing the *Military Social Health Index*. 
FIGURE 28: FACET MAP FOR PILEUP

- Injury
- Hospitalisation
- Change of address
- Change of work
- Significant cultural event
- Separation/divorce
- Promotion
- Arrest
- Death of friend/colleague
- Unplanned pregnancy
- Major financial crisis
- Planned pregnancy
- Buying a home
- Child born out of wedlock
- Loss of job
- Death of spouse/partner
- Experience of violent assault
- Premature death of adult
- Community crisis
- Death of child
- Natural disaster
- Death of elderly family member
- Increase in petrol price
- Child leaves home
- Kin child enters family
- Moving in with partner
- Child fails/drops out of school
- Wedding ceremony
- Child changes school
- Child born in wedlock
- Lobola/marriage
FIGURE 29: FACET MAP FOR WORK TO FAMILY INTERFERENCE

- Social workers not available
- Excessive after-hours duties
- Social workers not accessible
- Work impacts on health
- Organisation’s unrealistic expectations
- Conflicts at work
- Communication to families is lacking
- Work insensitive to family needs
- Unhappy in job
- Sexual harassment
- Gender conflicts at work
- Excessive absence from home due to deployments
- Leaders not supportive of families
- Lack of supervisor support for soldiers
- Work insensitive to family diversity
- Work insensitive to family needs
- Work not interested in developing employees
- Unmarried employees treated worse than married
- Merit system unfair
- Health workers not available
- Unmarried employees treated worse than married
- No facilities to communicate with families during deployments
- No opportunity to prepare families for deployments
- Not able to go on military courses
- No promotion
- Work ignores long travelling distances
- Racial conflicts at work
- Deployments occur with little warning
- Lack of briefing for deployments
- Workplace violence
- Health workers not available
- Work is frustrating
- Jobs not know what’s going on
- Bad relationships at work
- Families don’t know what’s going on
- Soldiers not safe in work
- Merit system unfair
- Unmarried employees treated worse than married
- Not allowed to get medical attention
- No opportunity to prepare families for deployments
- Not able to go on military courses
- No promotion
FIGURE 30: FACET MAP FOR SOCIAL SUPPORT

- Feeling of belonging
- Feel respected by others
- Support when upset/distressed
- People will help in an emergency
- Supports make constructive contribution to family life
- Feel secure/safe/protected
- Often spend time with others
- Able to make use of supports when needed
- Willing to make use of supports when needed
- Feel cared for by others
- Feel important to others
- Feel understood by others
- Feel loved by others
- Feel valued or appreciated by others
- Good relationships with others
- Practical support from others
- Regular/frequent contact with others
- Large number of supports available
- Can rely on others
- Children feel safe in community
- Satisfaction with available supports
- Provide support to others
- Feel listened to by others
- Feel cared for by others
- Feel important to others
- Feel understood by others
- Feel loved by others
- Feel valued or appreciated by others
- Good relationships with others
- Practical support from others
- Regular/frequent contact with others
- Large number of supports available
- Can rely on others
- Children feel safe in community
- Satisfaction with available supports
- Provide support to others
- Feel listened to by others
- Feel valued or appreciated by others
- Good relationships with others
- Practical support from others
- Regular/frequent contact with others
- Large number of supports available
- Can rely on others
- Children feel safe in community
- Satisfaction with available supports
- Provide support to others
- Feel listened to by others
FIGURE 31: FACET MAP FOR PROBLEM SOLVING

- Problems are identified
- Family doesn’t avoid problems
- Family faces problems directly
- Family resolves most problems

- Family learns from mistakes
- Family considers solutions to find problems
- Family looks for solutions to problems
- Family talks about problems

- Family consults with others for help
- Family looks for solutions to problems
- Family looks to past for solutions
- Family works together to find solutions

- Family avoids blaming people
- Family is confident when solving problems
- Family solves problems step-by-step
- Family talks about whether solutions worked

- Think of different ways to solve problems
- Family collaborates in solving problems
- Family is confident when solving problems
- Family looks to past for solutions

- Family puts into practice the solutions
- Family works together to find solutions
- Family looks to past for solutions
- Family talks about whether solutions worked

- Family acts on decisions
- Family works together to find solutions
- Family looks to past for solutions
- Family talks about whether solutions worked

- Family considers culture to find solutions
- Family looks for solutions to problems
- Family looks to past for solutions
- Family talks about whether solutions worked

- Problems do not persist indefinitely
- Family doesn’t avoid problems
- Family faces problems directly
- Family talks about problems

- When solutions don’t work, family consults with others
- When solutions don’t work, family talks
- When solutions don’t work, family seeks professional help
- When solutions don’t work, family looks for another solution

- When solutions don’t work, family talks
- When solutions don’t work, family seeks professional help
- When solutions don’t work, family talks
- When solutions don’t work, family looks for another solution

- When solutions don’t work, family doesn’t ignore problem
- When solutions don’t work, family looks for another solution
- When solutions don’t work, family gets more determined to succeed
- When solutions don’t work, family talks about another solution
FIGURE 32: FACET MAP FOR STRESSOR APPRAISAL

**Stressor Appraisal**

- Family can get help during deployments if needed
- Able to handle problems resulting from deployments
- Concentrate on positive aspects of deployments
- Happy to deploy with colleagues
- Deployments are not very stressful
- Enjoy military life
- Enjoy deployments
- Proud of being a soldier
- Deployments provide additional income
- Family sees deployments as being important
- Family sees deployments as necessary part of job
- Deployments have purpose
- Deployments are an opportunity to grow
- Deployments are an opportunity to learn new things
- Deployments are manageable
- Deployment stress is manageable
- Commitment to military
- Commitment to South Africa
- SANDF’s mission is important
- SANDF contributes to stability in RSA
- Deployments make life interesting
- Deployments prevent boredom
- Deployments are meaningful
- Deployments are not very stressful
- Problems resulting from deployments aren’t overwhelming
- Problems resulting from deployments are manageable
- Problems resulting from deployments are manageable
- Military life is rewarding
- Can handle stress of deployments
- Danger not a concern
- Happy to deploy with colleagues
- SANDF contributes to stability in RSA
- Commitment to military
- SANDF’s mission is important
- Deployments prevent boredom
- Deployments are meaningful
- Deployments are not very stressful
- Problems resulting from deployments aren’t overwhelming
- Problems resulting from deployments are manageable
- Problems resulting from deployments are manageable
- Military life is rewarding
- Can handle stress of deployments
- Danger not a concern
FIGURE 33: FACET MAP FOR GENERALISED RESISTANCE RESOURCES

Believe things will work out okay
Enjoy eating meals together
Family involved in community care
Family has more than one income
Family enjoys spending time together
Family agrees on most important things
Family sees difficulties as a challenge/opportunity
Sharing family stories
Caring family relationships
Close family relationships
Strong family relationships
Family stands closely together
Cultural roots are important
Availability of funds in case of emergency
Family members are healthy
Family has strong religious/spiritual beliefs
Family is happy in life
Practice family traditions
Mutual respect in family
Family fixes things
Family has strong cultural identity
Family members have interests/hobbies
Family has learned to cope in difficult times
Open communication in family
Family adjusts to change
Family can function independently
Family has access to transport
Family has access to shops
Family has access to health care
Family has access to security/police
Family proud of own culture
See self as coping with life
Feel good about self
Family has enough food
Family has adequate shelter
Family know how to deal with life stress
Living healthily
Bounce back quickly after difficulties
Problems don’t get them down
Believe in own abilities
Difficulties in life have purpose
CHAPTER FIVE: DESIGN PHASE

5.1 INTRODUCTION TO DESIGN PHASE

5.1.1 CHAPTER OVERVIEW

The analysis phase, described in the previous chapter, had two major outputs. First, a clear definition of the problem was formulated, including the client’s innovation requirements. This study is different from many other studies in that a client, who had a specific need for a multicultural scale that would achieve certain organisational objectives, commissioned it. Second, a clear formulation of the theory underpinning the scale was achieved, culminating in operational definitions and facet maps of the seven constructs. At this point, however, there is no scale – only ideas about what should go into the scale.

Chapter five addresses the creation of the scale. This involves a pulling together of everything that was achieved in the previous chapter and placing it out into an actual scale with items and response categories, instructions, answer sheets and scoring formulae.

This chapter will present the process and results of the Design Phase of multicultural scale development in social work. The Design Phase, which is the second phase in the overall process, comprises only one main moment, viz “Design Scale”. This main moment is subdivided into five steps, as illustrated in Figure 34:

<table>
<thead>
<tr>
<th>PHASES</th>
<th>MAIN MOMENTS</th>
<th>STEPS</th>
</tr>
</thead>
<tbody>
<tr>
<td>DESIGN</td>
<td>DESIGN SCALE</td>
<td>7 Scale the items</td>
</tr>
<tr>
<td></td>
<td></td>
<td>8 Design the items</td>
</tr>
<tr>
<td></td>
<td></td>
<td>9 Determine reading level</td>
</tr>
<tr>
<td></td>
<td></td>
<td>10 Develop a scoring formula</td>
</tr>
<tr>
<td></td>
<td></td>
<td>11 Write instructions for respondents</td>
</tr>
</tbody>
</table>

5.1.2 WHAT’S NEW IN THIS PHASE?

On the surface, much of the design phase appears identical to Faul’s (1995) model of ecometric scale development, upon which the candidate is developing. The main obvious contribution is the inclusion of Fry’s method for determining the reading level of the instrument. Measuring and
reducing the reading level of a scale is especially important when the scale will be utilised in a multicultural setting.

The process of designing items, however, is radically different from Faul’s (1995), since it is multilingual and multicultural in orientation. This model requires a multicultural team of researchers to design items in multiple languages simultaneously, which is quite different from Faul’s work, and indeed from most other scales. In hindsight, and after running this same process in the development of another scale, the candidate is convinced that the multi-focus approach to designing scales is the essential ingredient in multicultural scale development, even if the instrument is not going to be translated into different languages.

5.2 Main Moment C: Design Scale

5.2.1 Step 7: Scale the Items

The identification of the assessment areas or constructs in the Analysis Phase, and in particular the identification of construct facets, guides the researcher in determining how to scale the items. Through this process it was agreed that category partition scaling or Likert scaling would be used to measure the intensity of the different constructs. This follows the procedures used by many ecometric developers (Hudson and his associates; Faul; and Perspective Training College).

A five-point scale was accepted for all scale formats, in line with the World Health Organization’s Quality of Life surveys (Skevington & Tucker, 1999).

Vulnerability Constructs. The formulation of the facets of the four vulnerability constructs, viz Social Problems, Pileup and Work to Family Interference, led to the decision to adopt a scaling format different from that used by ecometric developers. This format is, however, similar to that used by other developers of similar scales. For example, McCubbin and colleagues used this format in their pileup scales (McCubbin et al., 1996).

This format involves first asking whether or not respondents have experienced the described event and if they answer yes, to evaluate how great the impact of the event was on them or how big a problem the event was for them. This format is appropriate given that most of these events occur seldom in the life of any individual. The relative frequency estimation scaling used frequently by ecometric developers would therefore not be appropriate for these constructs.

The main flaw with this response format is that the intervals between the five points are probably not equidistant (Faul, 1995). Nevertheless, given that other developers of similar scales use this format, it was accepted.

The intervals were thus defined in the following manner, using a 5-point likert scale:

- 1 = No, did not happen
- 2 = Yes, no problem
3 = Yes, small problem

4 = Yes, medium problem

5 = Yes, big problem

In the instructions preceding the scaling, respondents are instructed to colour in circle 1 if the event described did not happen to them. If the event did, in fact, happen, they are instructed to decide how big a problem the event was for them and their family.

**Resilience Constructs.** The four resilience constructs, viz Problem Solving, Social Support, Stressor Appraisal and Generalised Resistance Resources, all measure perceptions. Again, relative frequency estimation scaling would not be appropriate here. The decision was thus made to adopt the classic Likert scaling format (De Vellis, 1991), as follows:

1 = Strongly disagree

2 = Disagree

3 = Uncertain

4 = Agree

5 = Strongly agree

**Translation.** The research team translated the partition labels into all four target languages, to ensure the understanding of all respondents.

**Direction of Item Wording.** It was decided to word all items within the vulnerability and resilience sections in one direction – negatively and positively, respectively. While it is often the case that items are scored in both positive and negative directions, to prevent response bias, it was agreed that this would not be appropriate for the Military Social Health Index. The Problem Solving scale, for instance, has an item, "We resolve most of the problems in our family". A strong positive endorsement of this item suggests that the family has good problem solving skills. A strong negative endorsement of the negative wording of the same item, "We do not resolve most of the problems in our family," would not necessarily indicate strong problem solving ability, but merely the absence of poor problem solving ability. In other words, the absence of a problem does not indicate health, while the absence of a strength does not imply a problem.

It was the intention of the research team to create vulnerability and resilience scales that met at a hypothetical middle point between vulnerability and resilience, which would be conceived as the absence of both resilience and vulnerability. So, for instance, there are items concerning finances in both the vulnerability and resilience sections of the Military Social Health Index. In the vulnerability section, the items focus on the presence of financial problems (eg "The sheriff of the court took away the possessions of someone in my family"), while in the resilience section the
items focus on the presence of financial resources (e.g., "My family has money available in case of an emergency"). Not having debt does not imply financial health; and conversely, not having savings does not imply that one is in financial straits.

To further illustrate, the four vulnerability items that tapped financial problems (items 19, 20, 32, and 45) had a mean interitem correlation of .342, while the three resilience items tapping financial health (items 159, 160 and 161) had a mean interitem correlation of .478. The mean interitem correlation between the vulnerability and resilience items, however, was only -.168. This suggests that negatively worded financial items appear not to measure the same construct as positively worded financial items.

Notwithstanding these reasons, the research team did recognise that having items worded in only one direction increases the risk of acquiescence and extreme response tendency (Nunnally & Bernstein, 1994). Other plans, external to this dissertation, have been made to attempt to reduce unhelpful response styles. Specifically, this entails developing a measure of impression management that will detect response styles.

5.2.2 Step 8: Design the Items

The multi-focus approach to formulating or designing the items was adopted (as described in Section 3.4.1.2.1, Section 3.4.1.3 and Section 3.4.2.2). This approach is an efficient means to ensure that items are culturally and linguistically equivalent. The team of researchers referred to previously (in step 5) was used to design the items. This team comprised eight social workers:

- One White, English speaker (the candidate)
- One Asian, English speaker – a manager of social work services
- One White, Afrikaans speaker – a social work researcher, working with the candidate, who had recently moved from field practice into research
- One Coloured, Afrikaans speaker – a social worker still in the field
- Two African, Zulu speakers – both still in the field
- Two African, Setswana speakers – both still in the field, one in a military hospital and the other in a military unit

The research team had an average of 10.4 years social work experience each (range of 6-18 years). Three researchers were busy with Masters studies in social work, two already had a Masters degree in social work and one (the candidate) was busy with Doctoral studies. Four researchers rated their English proficiency as excellent and four as good. All researchers had some understanding of Afrikaans (ranging from poor to excellent). The four ‘non-African’ researchers had no proficiency in Zulu or Setswana. The four African researchers had limited
understanding of the other African language (ranging from poor to fair). Six researchers rated their proficiency in their home language as excellent and two as good.

English was used as the main language of communication, since it was the only language shared by all eight researchers. The list method of scale design was used (Faul, 1995), whereby facets were taken one at a time and an item written to tap into that facet. For example, the Stressor Appraisal facet, “Deployments have purpose,” resulted in item 137, “My family understands the purpose for deployments.” Similarly, the GRRs facet, “Difficulties in life have purpose,” resulted in item 174, “Difficult times are an opportunity to learn.”

The procedure of formulating an item in one language (predominantly in English), followed by the asking the question “How would we say that in another language?” was followed. This procedure proved effective and the first generation of 175 items took place over two and a half days.

During this process it became apparent that items in other languages did not need to be written as paragraphs as considered in Chapter 3. Most African language items were only slightly longer than English and Afrikaans items. There were, however, several instances where a single English word had to be translated using a description rather than the single word. In some instances, these items were back translated into English and Afrikaans and the single word was replaced with a near-verbatim description. In a number of instances, English words were included in the African language items in brackets to ensure understanding (eg merits, AWOL, deployments).

During this process, items were evaluated according to the rules for writing items. These rules did not, however, apply easily to other language versions. This is especially true of the rule for keeping items short. Zulu sentences have few but very long words. Setswana has many but very short words (often only one or two letters). Afrikaans makes use of double negatives (the word “nie” appearing twice in most negatively worded items).

Other rules, however, were most appropriate. Double-barrelled items were identified and omitted. A number of items were identified that used metaphors. For example, the English item “I work long hours” was proposed. One of the Zulu researchers stated that an hour is only 60 minutes – it cannot be longer or shorter than that. The item was prepared in Zulu and back translated as “I work too many hours”. This new item has an ‘African feel’ (the use of the phrase “too many”), but was accepted as clear and understandable.

Once the items were designed, the team reviewed all items. Through this process, about half the items were revised in most languages, particularly the first few dozen items. It was clear that as the team developed items over the three days, their adeptness increased. In many instances, items were accepted in a non-English language and then back translated into English – this seemed to result in cleaner, simpler and more direct English items.
The process of designing items generated several insights:

- There are no African words for depression, anxiety, worry, etc. These emotions cannot stand alone, as in English and Afrikaans – they must be linked to a specific situation. The focus is thus on the situation causing the worry, rather than on the worry itself. The facets “depression” and “anxiety” were thus rendered in English as “Someone in my family is depressed (feels down)”. In the African languages the sentence was rendered simply as “Someone in my family feels down”.

- There was no way to say “Someone in my family has housing problems” in the African languages. The concept ‘housing problems’ had to be very specific (e.g., house leaks, no housing, house too small, etc). The item was eventually phrased as “Someone in my family has no place to stay.”

- The facet “helplessness” could not be translated into the African languages – there was no word for ‘helpless’. It was eventually agreed to drop the word ‘helpless’ and rather state, “Someone in family feels unable to cope with his/her life situation.” Although the meaning of this item, or its content validity to the concept ‘helpless’, has been somewhat reduced, the research team agreed that the item was at least translatable and thus equivalent. This led to a general rule being formulated by the research team: Rather compromise slightly on meaning in one language to achieve conceptual equivalence between languages, than retain the depth of meaning in one language at the expense of equivalence.

- On several occasions, the process of back-translation produced better items in the original version. For instance, the item “Someone in my family cannot pay their accounts” was translated into Afrikaans as “Iemand in my familie kan nie hul skuld betaal nie” and then back translated as “Someone in my family cannot pay his/her debts”. The team believed this revised English item to be better than the original.

- In the African cultures, the word ‘health’ refers to the total health of a person (body, mind, spirit combined) (Buhrmann, 1984; Hadebe, 1986; Mtalane, Uys, & Preston-Whyte, 1993; Thorpe, 1991). In Western cultures, the word ‘health’ refers primarily to the physical health of a person, indicating the tripartite view of humanity. This fundamental paradigm difference between cultures resulted in the items being lengthier, so as to ensure conceptual equivalence: “Someone in my family has health problems (physical, emotional or spiritual)”. This inclusion of the three components of health in brackets was incorporated across language versions to ensure linguistic equivalence, even though it is clearly implied by the word ‘health’ in Zulu and Setswana.

- Coloured people often have no sense of cultural identity. There was much debate over the inclusion of cultural items in the Generalised Resistance Resources construct, as they were perceived as being potentially discriminatory against certain cultures. The team decided to retain these items and test them in the Development Phase.
The expression “bounce back after a difficult time”, which is an English way of tapping into resilience, could only be translated directly and meaningfully into Zulu. In Setswana the concept was translated as “carry on after a difficult time” and in Afrikaans as “recover quickly after a difficult time”. The team agreed that although a different phrasing was used across language versions, the items tapped into the same construct.

Several facets were abandoned when it was found to be extremely difficult to formulate items in all four languages. For instance, the facet ‘psychological problems’ meant different things in the different cultures and was eventually discarded. Similarly, the facet ‘abuse of prescription medication’ introduced such complex issues around traditional medicines that it was abandoned.

The multilingual version of the questionnaire generated through this process, after field testing and linguistic review, is included in Appendix C.

5.2.3 Step 9: Determine Reading Level

Two sections of the first draft of the Military Social Health Index were used to determine the scale’s English reading level: A selection of items and a selection of instructions.

Three 100-word sections of items were selected, viz items 17-28, 93-104 and 151-163. Portions of items 28, 104 and 163 were omitted due to their extending beyond the 100-word limit. Following the procedures described in Chapter 3 under Step 9, the following were found:

- An average of 11.8 sentences per 100 words.
- An average of 157 syllables per 100 words.
- A reading level of approximately Grade 7 (Standard 5).
- The word “family” appeared 29 times in these 300 words. The word “family” is, in the candidate’s opinion, a well-known word and does not warrant the three-syllable load it receives. It is, moreover, extensively utilised throughout the scale. If the syllable weighting of the word “family” is reduced from three to two syllables, the average reading level is reduced to Grade 6 (Standard 4).

Three 100-word sections of instructions were selected, viz the initial instructions (before the biographical information questions), the instructions before item 17 and the instructions before item 93. The following were found:

- An average of 9.4 sentences per 100 words.
- An average of 146 syllables per 100 words.
- A reading level of approximately Grade 7 (Standard 5).
The word “family” appeared 11 times in these 300 words. If the syllable weighting of the word “family” is reduced from three to two syllables, the average reading level is reduced to Grade 6 (Standard 4).

The innovation requirement was for a reading level of Grade 9 or lower, and preferably around Grade 7. The unadjusted reading level (Grade 7) is thus well within target. The level of Grade 6 (adjusted for the word ‘family’) can be considered excellent. This reading level remains reasonably consistent throughout the questionnaire, with a range of Grades 4 to 8 across the six text samples.

The highest reading level (Grade 8) was obtained for selection of items 93-104. Once this selection was adjusted for the word ‘family’, which appeared 11 times, the reading level was reduced to Grade 7.

It is noteworthy that the highest reading level obtained remains below the lowest educational level accepted among soldiers in the SANDF. It is likely, therefore, that all soldiers should be able to complete the entire questionnaire, including those items that are somewhat more complex.

5.2.4 **STEP 10: DEVELOP A SCORING FORMULA**

Hudson’s universal scoring formula will be used for the *Military Social Health Index*. This formula is well utilized in ecometrics and provides a score that can range from zero to 100 – it can thus be treated like a percentage. All items within each scale are phrased in the same direction, requiring no reverse scoring.

The formula is thus: 

\[
S = \frac{(\sum X - N)(100)}{N(4)}
\]

where:

- \( S \) = Final score
- \( X \) = Item responses
- \( N \) = Number of correctly completed items

5.2.5 **STEP 11: WRITE INSTRUCTIONS FOR RESPONDENTS**

The instructions for this instrument are important to ensure that all respondents understand the purpose and format of the instrument. The instructions were formulated in English by the candidate, and then translated into the three additional languages (Afrikaans, Zulu and Setswana) by the research team.

To promote linguistic equivalence, the two researchers from each language group translated the instructions independently and then compared their translations. Through a process of dialogue,
each pair of researchers reached consensus regarding the most accurate translation. This is the Committee Approach to translation (Butcher, 1996a).

The instructions can be found on the questionnaire in Appendix C.

5.3 **SUMMARY OF CHAPTER**

The Design Phase of the Multicultural Ecometric Scale Development process was described in detail in this chapter. The various steps followed were described and the product resulting from this phase presented in an Appendix. (It should be noted that the instrument presented in Appendix C is the one used for the validation study, and thus includes adjustments to the instrument made in the Development Phase.)

Regarding the scale development process designed and followed here, the candidate found the process to be clear and effective. In practice, the research team that designed the instrument simultaneously conducted part of the Analysis and Development phases. Nevertheless, the team experienced these processes as distinct and warranting their location in different phases.

5.4 **IN THE FOLLOWING CHAPTER**

Now that the *Military Social Health Index* has been designed or created, it is necessary to test it to see how well it works in practice, and to review its adequate in terms of design. This is the function of the development phase of scale development. The following chapter presents the process and results of the Development Phase of the multicultural ecometric scale development process.
CHAPTER SIX: DEVELOPMENT PHASE

6.1 INTRODUCTION TO DEVELOPMENT PHASE

6.1.1 CHAPTER OVERVIEW

By the end of the design phase, one has the first draft of a new social technology, in this case the Military Social Health Index. The instrument has not yet been reviewed or tested. Before collecting large quantities of data for validation (the subject of Chapter 7), it is important to review and test the instrument. Through this process, failures in item clarity, construct validity, linguistic equivalence, translation, etc can be detected and rectified. Once data has been collected for validation, it is virtually impossible to revise the wording of an item without having to repeat the data collection – a tremendous waste of limited human and financial resources.

This chapter therefore presents the processes and results of the third phase of the multicultural ecometric scale development process, viz the Development Phase. The Development Phase comprises all activities that take place between the initial design of the instrument and the validation proper. This phase is divided into two main moments and further into three steps (illustrated in Figure 35):

- Review items
  - Obtain expert review of items
  - Field test items
- Investigate linguistic equivalence
  - Investigate linguistic equivalence of items

<table>
<thead>
<tr>
<th>PHASES</th>
<th>MAIN MOMENTS</th>
<th>STEPS</th>
</tr>
</thead>
<tbody>
<tr>
<td>DEVELOPMENT</td>
<td>D REVIEW ITEMS</td>
<td>12 Obtain expert reviews of items</td>
</tr>
<tr>
<td></td>
<td></td>
<td>13 Field test the items</td>
</tr>
<tr>
<td>E INVESTIGATE L</td>
<td>Linguistic Equivalence</td>
<td>14 Investigate linguistic equivalence of items</td>
</tr>
</tbody>
</table>

FIGURE 35: THE DEVELOPMENT PHASE: MAIN MOMENTS & STEPS
The execution of this phase was complicated by the fact that after the completion of Step 14 (Investigate linguistic equivalence of items), which entailed collecting data from respondents, the candidate submitted the revised instrument to linguistic experts for review. These experts changed a significant percentage of the items in the instrument, and consequently Step 14 was repeated. In hindsight, the review by linguistic experts should have been conducted as part of Step 12 (Obtain expert review of items), thereby obviating the need to repeat Step 14. When Step 14 is presented below, details of both evaluations of linguistic equivalence will be referred to, with the focus on the second evaluation.

6.1.1 WHAT’S NEW IN THIS PHASE?

This phase of the candidate’s model of multicultural scale development, which is an extension of Faul’s (1995) model, contains virtually nothing that is included in Faul’s model:

- The expert review of items has been expanded to include not only a review of content relevance (which is step 20 in Faul’s model), but also conceptual equivalence or content comparability (which was motivated by the discussion on equivalence in Chapter 2) and content representivity (which emerged from a review of content validity literature).

- In Faul’s (1995) model, there is no opportunity to field test items. This is considered an essential step in scale development, since valuable feedback can be derived from members of the population. This is particularly important in multicultural scale development, since field testing creates an extra opportunity to check the conceptual and functional equivalence of the items.

- The assessment of linguistic equivalence is a new contribution to this model ecometric scale development. Brislin and colleagues (1973) developed the procedures. Given the very dissimilar syntax between Western and African languages, assessing linguistic equivalence is especially important.

6.2 MAIN MOMENT D: REVIEW ITEMS

As discussed in chapter 3, Main Moment D: Review Items is an important moment in the entire scale development process. It is at this point that the candidate had to ensure the content validity of the instrument. This validity had to be ensured before proceeding with administering the instrument on a larger scale. If the item pool did not possess content validity, the entire scale would be flawed. No amount of statistical manipulation of data would improve the basic structure of the instrument.

This review, then, comprised two steps, viz the expert review of items by the research team and the field-testing of the items with groups of soldiers.
6.2.1 **STEP 12: OBTAIN EXPERT REVIEW OF ITEMS**

The research team used in previous steps (and described in Section 5.1.2) was utilised as the pool of expert reviewers. The team spent two days reviewing the items to assess their content validity. This process was closely tied with the design phase. If the team considered an item to lack content validity or content comparability, the item was immediately adjusted. The revised item was then reviewed formally. Consequently, the team’s review of items was largely positive.

The four language-pairs of researchers reviewed each item using the following criteria (as described in Chapter 3):

- **Content Relevance.** *How relevant is each item to the construct? To what extent does each item measure the construct as defined and not some other construct?*

- This criteria was evaluated on a five-point scale, where 4 = extremely, 3 = very much, 2 = more or less, 1 = not much and 0 = not at all.

- **Conceptual Equivalence or Content Comparability.** *Is the item equivalent in meaning across languages? Will the item be understood similarly in each target culture?* This criterion was further subdivided into three domains:
  - **Conceptual Equivalence.** *Does the item mean the same thing in the different languages/cultures?*
  - **Language Difficulty.** *Is the language equally simple in the different languages/cultures?*
  - **Cultural Relevance.** *Is the item equally relevant to the different cultures/languages?*

- Conceptual equivalence was evaluated on a five-point scale, where 4 = completely, 3 = a great deal, 2 = moderately, 1 = not much and 0 = not at all.

Once each of the items within an assessment area had been reviewed, the **content representivity** of the items was reviewed. This was done by addressing three questions:

- How well covered is the construct at the top of the page by the items in the table above?

- To what degree do the items address all aspects of the construct, without leaving any facets out?

- If you had not been given the construct definition, how well would you have been able to describe the construct based only on the items?

This criteria was evaluated on a five-point scale, where 4 = extremely, 3 = very much, 2 = more or less, 1 = not much and 0 = not at all.
Crude coefficients of content relevance, content representivity and content comparability were calculated by dividing the average scores received on each rating by four (Table 1 below). The closer these scores approach one (1), the higher their content validity.

**TABLE 1: EXPERT RATING OF CONTENT VALIDITY**

<table>
<thead>
<tr>
<th>SCALES</th>
<th>CONTENT RELEVANCE</th>
<th>CONTENT REPRESENTIVITY</th>
<th>CONTENT COMPARABILITY</th>
</tr>
</thead>
<tbody>
<tr>
<td>Social Problems</td>
<td>.97</td>
<td>1.0</td>
<td>1.0</td>
</tr>
<tr>
<td>Pileup</td>
<td>1.0</td>
<td>1.0</td>
<td>.99</td>
</tr>
<tr>
<td>Work-to-Family Interference</td>
<td>1.0</td>
<td>1.0</td>
<td>1.0</td>
</tr>
<tr>
<td>Social Support</td>
<td>1.0</td>
<td>1.0</td>
<td>1.0</td>
</tr>
<tr>
<td>Problem Solving</td>
<td>1.0</td>
<td>1.0</td>
<td>1.0</td>
</tr>
<tr>
<td>Stressor Appraisal</td>
<td>1.0</td>
<td>1.0</td>
<td>1.0</td>
</tr>
<tr>
<td>Generalised Resistance</td>
<td>.99</td>
<td>1.0</td>
<td>.98</td>
</tr>
</tbody>
</table>

As can be seen from the above table, there was a very high rating of the content validity of the draft instrument by the research team. It is possible that the team was lenient or biased in their ratings. When challenged with this possibility, however, the team affirmed that their ratings were considered and that they were satisfied with their review of the instrument.

There was a high degree of concordance between raters and language groups. This may be partially attributed to the discussions held between research team members prior to finalising the rating. The following 11 items were consistently identified as of concern to the team (ie received a rating of 3 – no items were rated lower than 3 out of 4 – by one or more team members):

- Item 16: There is conflict between my partner and I. (Social Problems item could be viewed as absence of Generalised Resistance Resources.)
- Item 17: There is conflict between members of my family. (Social Problems item could be viewed as absence of Generalised Resistance Resources.)
- Item 22: Someone in my family has problems at work. (Social Problems item could overlap with Work-to-Family Interference.)
- Item 26: Someone in my family feels unable to cope with his/her life situation. (Social Problems item could be viewed as absence of Generalised Resistance Resources, viz learned resourcefulness.)
- Item 28: Someone in my family physically hurts/hits another family member. (Social Problems item could be viewed as Pileup.)
Item 63: My child or a child I care for left home. (Pileup item may be interpreted differently across cultures.)

Item 166: In our family we have a strong cultural identity. (Generalised Resistance Resource item’s meaning in White and Coloured cultures uncertain.)

Item 167: We are proud of our culture. (Generalised Resistance Resource item’s meaning in White and Coloured cultures uncertain.)

Item 168: Our family’s cultural roots are important. (Generalised Resistance Resource item’s meaning in White and Coloured cultures uncertain.)

Item 182: We talk openly with each other in our family. (Generalised Resistance Resource item could be viewed as absence of Social Problem.)

Item 183: My family has learned how to cope in difficult times. (Generalised Resistance Resource item could be viewed as Problem Solving.)

It was agreed to retain these items. Concerns about content comparability would be addressed during the field-testing of the instrument in the next step. Concerns about content relevance would be determined during the validation of the instrument in the following phase.

6.2.2 Step 13: Field Test Items

Following the procedures described for Step 13 in Chapter 3, the research team convened small culturally homogeneous groups of soldiers for the field-testing of the Military Social Health Index. Four focus groups were run (English, Afrikaans, Zulu and Setswana), each comprising about ten participants. Soldiers participated voluntarily. Members of the research team who designed the instrument ran the groups.

The participants were presented with a monolingual version of the instrument and asked what they understood by each of the items. If there was disagreement or misunderstanding among the participants, the field researcher requested the group to generate a recommendation or alternative item. The field researchers provided written feedback to the candidate on the recommended changes.

Most of the changes involved relatively minor adjustments or corrections. For example, the item “My eenheid respektee nie my verantwoordelikheid teenoor my breer familie nie” was changed to “My eenheid respektee nie my verantwoordelikheid teenoor my uitgebreide familie nie.” Another item was corrected from “My family lives is an unsafe community” to “My family lives in an unsafe community.”

In total, 32 items (4.6%) were adjusted in response to the field test – 1 English item (0.6%), 20 Zulu items (11.4%), 7 Afrikaans items (4%) and 4 Setswana items (2.3%).
6.3 MAIN MOMENT E: INVESTIGATE LINGUISTIC EQUIVALENCE

Establishing linguistic equivalence is an important step in the development phase of scale development. It is the first time people will complete the entire scale, and provides evidence that the various language versions in which the scale is designed are equivalent.

Earlier in this chapter, reference was made to the fact that the linguistic equivalence of the Military Social Health Index was evaluated twice. The events that led to this are briefly outlined below.

First Linguistic Equivalence Study. The first linguistic equivalence study was conducted at this point, following the methodology described in Chapter 3 (Section 3.5.2), after the adjustments to the instrument were made, based on feedback from the field-testing. The results were largely positive and the following conclusions were drawn (Van Breda, 2002a):

- It would appear that the Afrikaans version of the Military Social Health Index can be considered linguistically equivalent to the English version.
- It would appear that the Zulu version of the Military Social Health Index can be considered largely linguistically equivalent to the English version. The three poorly performing items must be reviewed.
- It would appear that the Setswana version of the Military Social Health Index can be considered largely linguistically equivalent to the English version. The eight poorly performing items must be reviewed.

Review by Linguistic Experts. After this first linguistic equivalence study was completed, however, the instrument was submitted to the Language Services Directorate of the SANDF for linguistic review. The candidate requested the linguists to ensure that the translations were equivalent to the English and to ensure that simple language was used (suitable for people reading in a second language). Three linguists reviewed the instrument, using their own specialised procedures, and provided detailed feedback to the candidate. Overall, the reviewers were complimentary about the translations and about the multi-focus approach followed. The linguistic review was guided by the translations that the research team had generated. The linguists could understand what the research team’s intentions were with the items and translations, rather than imposing their own interpretations on the item translations.

The linguistic review and linguistic equivalence study prompted adjustments to many of the items in the instrument. In total, 152 items (21.7%) were adjusted – 4% of the English items, 6.9% of the Zulu, 54.9% of the Afrikaans and 30.9% of the Setswana items.

Second Linguistic Equivalence Review. Given that over a fifth of the items were adjusted subsequent to the initial linguistic equivalence study, a second study was conducted to evaluate the linguistic equivalence of the Military Social Health Index. This follow up study was conducted...
at the same time as the validation study, and thus was not directly intended to serve a developmental function. Rather, the second linguistic equivalence study was conducted to:

- Assess the linguistic equivalence of the instrument *per se*.
- Identify items that should be earmarked for possible exclusion from the final instrument during the validation proper.

In retrospect, it would have been sensible to conduct the linguistic review prior to field testing the instrument. The linguistic review should be considered a subcomponent of Step 12: Obtain Expert Review of Items.

**Presentation of Results.** The results presented in the pages that follow are thus derived from the second investigation of the linguistic equivalence of the instrument. The procedures followed in the two investigations were identical. Comparative results (between the two linguistic equivalence studies) are provided where meaningful.

## 6.3.1 **Step 14: Investigate Linguistic Equivalence**

### 6.3.1.1 Procedures

Split-half, bilingual versions of the scale were constructed, following the instructions in Step 14 of Chapter 3. English was utilised as a link language, giving three *language groups*: English-Afrikaans, English-Zulu and English- Setswana.

For each language group, four *questionnaire versions* were developed: English only; other language only; first half English – second half other language; and first half other language – second half English. Scales were split in half in the order they were provided at the end of the previous Step. A number of scales had an odd number of items and were consequently split with an additional item in one of the halves.

Random splitting was not used, since it was decided to not alter the order of the items and that items should not alternate item-by-item between languages. Consequently, the bilingual scales contained 16 small sets of items (7-12 items per set) in alternating languages. All instructions and demographic questions were provided in both languages, across all four questionnaire versions.

The four questionnaire versions per language group were randomly sorted using a computerised random numbers generator (Urbaniak & Plous, 2003). A blocked design was used, whereby respondents were assigned to a questionnaire version in blocks of four, whereby each of the four questionnaire versions was assigned within the block. The intention was to obtain 15 respondents per questionnaire version. It is, however, common in the SANDF that fewer respondents are obtained. The blocked design ensures that equal numbers of respondents are assigned to each of the questionnaire versions.
A social work researcher, who is an associate of the candidate on this project, accessed members of the SANDF at two military units in the Gauteng area. She requested members who were bilingual in English plus Afrikaans, Zulu or Setswana. The researcher was not, however, confident that all respondents were truly bilingual. This could have a depressing effect on the linguistic equivalence statistics.

The researcher consequently obtained 53 Afrikaans, 54 Zulu and 53 Setswana questionnaires. To ensure equal sample sizes in each of the 12 subgroups (four questionnaire versions for three language groups), the first 52 respondents per language group were used in the analyses, yielding a total of 13 respondents per questionnaire version and a total sample for this study of 156. This is slightly larger than the sample obtained for the first linguistic equivalence study (11 per group, with a total of 132 respondents).

The Afrikaans and Setswana questionnaires were mostly (96%) completed at a unit where soldiers are trained to become officers. The Zulu questionnaires were mostly (76%) completed by soldiers at an infantry unit. This discrepancy was necessary due to limited number of people with Zulu as a home language at the training unit. Nevertheless, this discrepancy is likely to have an impact on the demographic profiles of the three language groups in this study, which could have an impact on the study results. This will be reported in the section below.

6.3.1.2 Sample Characteristics

Descriptive statistics are presented to detail the demographic characteristics of the sample used in this study. In addition, a series of chi-square ($\chi^2$), Kruskal-Wallis ($\chi^2_{K-W}$) and Mann-Whitney ($Z$) tests were used to investigate differences across language group, questionnaire version and linguistic equivalence study (first or second study2).

**Age.** The majority of respondents (72.7%) were aged 25 or younger.

There were significant differences in age across the three language groups ($\chi^2_{K-W}=63.3, p<.001$), with people who completed the Zulu questionnaire being significantly older than those completing the Afrikaans or Setswana questionnaires.

There were no significant differences in age between the first and second linguistic equivalence studies.

**Military Rank.** The majority of respondents (52.6%) were junior officers, and further 35.7% were Privates. This reflects that most respondents (88.3%) were junior members (officers or non-commissioned officers) of the SANDF.

2 Sample for the first linguistic equivalence study was n=132, while the for the second study n=156.
There were significant differences in rank across the three language groups ($\chi^2=74.1$, $df=12$, $N=154$, $p<.001$), with the majority of Zulu questionnaires (74.5%) being completed by Privates, while the majority of Afrikaans (78.8%) and Setswana (64.7%) questionnaires were completed by junior officers. A sizable number of Setswana questionnaires were also completed by Privates (29.4%).

There were significant differences in military rank between the first and second linguistic equivalence study ($\chi^2=161.4$, $df=9$, $N=280$, $p<.001$), with the first study having a majority of Lance Corporals (61.9%), and the second study having a majority of junior officers (52.6%) and Privates (35.7%).

**Home Language.** Two thirds (68.6%) of respondents completed a questionnaire in their home language:

- 78.8% of Afrikaans questionnaires were completed by respondents with Afrikaans as their home language;
- 80.8% of Zulu questionnaires were completed by people with Zulu as home language;
- 46.2% of Setswana questionnaires were completed by respondents with Setswana as home language, and a further 21.2% with Sepedi and 19.2% with Sesotho as home language.

The Afrikaans and Zulu questionnaires were significantly more likely to be completed by a respondent in their home language than the Setswana questionnaires ($\chi^2=18.3$, $df=2$, $N=156$, $p=.000$). The high percentage of Setswana questionnaires completed by respondents who had neither English nor Setswana as home language, may compromise the integrity of the linguistic equivalence study.

There were no significant differences in language distribution between the first and second linguistic equivalence studies.

**Gender.** The majority of respondents (76.9%) were male.

The distribution of gender across three language groups varied significantly ($\chi^2=10.6$, $df=2$, $N=156$, $p=.005$), with 92.3% of Zulu questionnaires completed by men, compared with 71.2% of Setswana and only 67.3% of Afrikaans questionnaires. It is unclear whether this would influence the results. The gender distribution across the four questionnaire versions was, however, consistent for gender ($\chi^2=1.7$, $df=3$, $N=156$, $p=.630$) – a consequence of the random assignment to questionnaire version.

There were no significant differences in gender distribution between the first and second linguistic equivalence studies.
**Marital Status.** Only a small percentage of respondents (16.7%) were married. Half the respondents (49.4%) were unmarried and without a long term partner, while a third (34.0%) were unmarried but with a long term partner.

There were significant differences in marital status across the three language groups ($\chi^2=54.7$, $df=4$, $N=156$, $p<.001$), with almost half of Zulu questionnaires (46.2%) being completed by married people, and only a small percentage of Afrikaans (3.8%) and Setswana (0%) questionnaires being completed by married people.

There were no significant differences in marital status between the first and second linguistic equivalence studies.

**Education.** The majority of respondents (85.3%) have studied as far as Matric (Grade 12). There were significant differences in education across the three language groups ($\chi^2_{K-W}=41.1$, $p<.001$), with people who completed the Zulu questionnaire having a lower level of education than those completing the Afrikaans or Setswana questionnaires.

The results of the Mann-Whitney test indicate that respondents in the first linguistic equivalence study had a higher level of education than those in the second study ($Z=-3.8$, two-tailed $p<.001$).

**Seen a Social Worker.** The majority of respondents (84.6%) reported that they had not seen a social worker for counselling in the previous six months.

Respondents completing the Zulu (21.2%) and Afrikaans (17.3%) language versions were more likely to have seen a social worker during the previous six months for counselling than people completing the Setswana (3.8%) questionnaire ($\chi^2=11.5$, $df=4$, $N=156$, $p<.05$).

There were no significant differences in rates of receiving social work counselling between the first and second linguistic equivalence studies.

**Race.** The majority of respondents completing the Zulu (94.2%) and Setswana (98.1%) questionnaires classified themselves as African, while respondents completing the Afrikaans questionnaire were White (63.5%) and Coloured (21.2%). Notwithstanding these expected differences, race groups were evenly distributed across the four questionnaire versions within the three language groups.

There were no significant differences in race distribution between the first and second linguistic equivalence studies.

**Salary.** The majority of respondents (76.5%) have a take-home salary of R1000 to R1999.

There were significant differences in salary across the three language groups ($\chi^2_{K-W}=17.3$, $p<.001$), with people who completed the Setswana questionnaire having significantly lower salaries than those completing the Afrikaans or Zulu questionnaires.
Participants in the second linguistic equivalence study had significantly lower income than participants in the first study ($Z=-10.4$, two tailed $p<.001$).

**Difficulties Understanding the Questionnaire.** The majority of respondents (81.0%) indicated that they had no difficulties understanding the questionnaire. This is consistent across language groups.

There were no significant differences in understanding across the four questionnaire versions – people completing a home language version, for instance, were not less likely to understand all the questions than people completing an English version. Furthermore, people completing a questionnaire in a language other than English or their home language (e.g., Sotho speaking people completing a Setswana questionnaire) were not more likely to report having difficulty understanding the questionnaire.

There were no significant differences in understanding the questionnaire between the first and second linguistic equivalence studies.

**Summary.** Respondents who completed the Zulu questionnaire stand out as having a very different demographic profile, compared with those completing the Afrikaans and Setswana questionnaires. They are:

- Older and thus more likely to be married and have children.
- Less educated and thus have lower ranks.
- More likely to have seen a social worker.

This could have a depressive effect on the reliability of their responses to the *Military Social Health Index*, which could in turn impact negatively on the linguistic equivalence of the English-Zulu analyses.

**6.3.1.3 Item Equivalence**

The Mann-Whitney U test, a nonparametric test to compare two independent samples, was used to investigate item equivalence. It is expected that the responses to items should be equivalent across questionnaire versions – respondents completing an item in English should perform similarly to respondents completing the same item in Zulu, provided the respondents were randomly assigned to the questionnaire versions.

The four questionnaire versions were condensed into two groups, according to the language used to answer an individual item. Each item was analysed separately for each of the three language groups. Due to the small sample size, which could undermine the assumptions necessary for reliable results using the standard asymptotic methods of determining significance, the exact test facility of SPSS was used. This provides the significance level based on the exact distribution of a test statistic.
Significance was set at \( p = .01 \). Any statistic that was significant at \( p < .01 \) would indicate lack of item equivalence for that item. Given the large number of tests conducted (175 per language group), there is a distinct possibility of Type I errors (generating a significant, but erroneous statistic). When only a small number (perhaps one or two) significant results are found, it could be argued that this may be a chance finding and not of practical significance.

The items that failed to meet this standard are presented in the table below.

### TABLE 2: ITEM EQUIVALENCE ACROSS LANGUAGE VERSIONS

<table>
<thead>
<tr>
<th>CONSTRUCT</th>
<th>ITEM</th>
<th>AFRIKAANS (N=52)</th>
<th>ZULU (N=52)</th>
<th>SETSWANA (N=52)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Problems</td>
<td>21. I am concerned about the general care of the children in my family.</td>
<td>145 (.000)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>34. I have difficulty taking care of my family.</td>
<td>198 (.006)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>35. I have to pay maintenance to support my children.</td>
<td>220 (.008)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pileup</td>
<td>51. My family experienced a crisis because of the weather (storm, fire, flood, drought, etc).</td>
<td>228 (.005)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>55. Someone in my family got separated/divorced.</td>
<td>198 (.001)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>62. My child or a child I care for failed/dropped out of school.</td>
<td>243 (.004)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Work to Family</td>
<td>83. There have been violent incidents at work.</td>
<td>215 (.006)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Interference</td>
<td>103. My family is satisfied with their support systems.</td>
<td>182 (.003)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>105. My family knows that others listen to them.</td>
<td>145 (.000)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>111. People help our family when we are in trouble.</td>
<td>196 (.005)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Support Systems</td>
<td>144. Deployments prevent boredom.</td>
<td>161 (.001)</td>
<td>154 (.000)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>145. Deployments make life interesting.</td>
<td>109 (.000)</td>
<td>196 (.001)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>151. My family thinks deployments are important.</td>
<td>202 (.009)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>155. I like to deploy.</td>
<td>120 (.000)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Stressor Appraisal</td>
<td>161. My family knows how to get money from the bank when I am not available.</td>
<td>170 (.001)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>162. My family can get transport when they need it.</td>
<td>189 (.004)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>172. My family is able to bounce back after difficult times.</td>
<td>188 (.003)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Note 1: The comparisons of Afrikaans, Zulu & Setswana are all with the English link language version.

Note 2: All tests refer to the Mann-Whitney U test, a nonparametric test for the comparison of two independent means. The test result is indicated on the left of each cell.

Note 3: The significance level is indicated in brackets. Due to the small sample sizes (26 in each group), the exact test function of SPSS was used.
From the above table it can be seen that 1.71% of Afrikaans items, 5.1% of Zulu items and 4.0% of Setswana items showed statistically significant differences at $p<.01$. Overall (175 items across three languages) only 3.6% significant differences were demonstrated.

It is possible that the three Afrikaans items indicating a difference may be due to Type I error. However, the nine Zulu and seven Setswana items evidencing significant differences cannot be due only to chance. These items should, therefore, be reviewed and possibly rephrased. Given that validation data was already being collected when this linguistic equivalence study was being conducted, the 17 items that demonstrated a lack of item equivalence in one or more language pairs will be highlighted for possible exclusion from the Military Social Health Index during validation.

These items were resubmitted to the Language Services Division of the SANDF for further examination. The linguists proposed alternative translations for the all the items, suggesting that there may indeed be problems with the item-level equivalence of these items.

### 6.3.1.4 Split-half Equivalence

If each scale is randomly split into two halves, one would expect a high correlation between the two halves. Indeed, this is how split-half reliability is calculated. In this study, however, the scales were not randomly halved. Rather, the first half of the items formed one half, while the latter half of the items formed the other half. The items in some scales are not randomly arranged – they are grouped according to theme. In the case of problem solving, for instance, they are ordered by stage of the problem solving process. It is thus possible that respondents completing even a monolingual questionnaire could produce a low correlation between the two halves – this would be due to the ordering and difficulty of items, rather than the linguistic equivalence of the items per se.

Consequently, the size of the correlations is less significant than the similarity of the correlations. The procedure to compare these sizes, as described in Step 13, is utilised here and significance is set at $p<.01$. Owing to the small sample sizes, yielding 12 degrees of freedom, large differences in correlations are permissible in some instances. For instance, if the larger correlation is .80, the smaller correlation can be as low as .17 and still be acceptable. However, when the larger correlation is very high (e.g., .98), the other correlation must also be quite large (.92 or larger in this instance). In principle, the larger the one correlation, the larger the other correlations must be; when the largest correlation is not very large, the other correlations can be very low.

Since the two halves should correlate strongly, correlations below .70 can be cause for concern. Using the above procedures to compare two correlations, if the higher correlation is .70, the other correlation can be zero and the difference will not be significant at $p<.01$.

When both groups have $n=13$ (as is the case in the following comparisons of correlation coefficients), the F ratio must be greater than 4.155 to achieve a significance level of $p<.01$ ($df_1=12$, $df_2=12$).
### Table 3: Split-Half Linguistic Equivalence for English-Afrikaans

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Social Problems</td>
<td>.580</td>
<td>.786</td>
<td>.723</td>
<td>.860</td>
</tr>
<tr>
<td>Pileup</td>
<td>.153</td>
<td>.903</td>
<td>.883</td>
<td>.548</td>
</tr>
<tr>
<td>W2F Interference</td>
<td>.744</td>
<td>.354</td>
<td>.695</td>
<td>.683</td>
</tr>
<tr>
<td>Social Support</td>
<td>.471</td>
<td>.755</td>
<td>.748</td>
<td>.553</td>
</tr>
<tr>
<td>Problem Solving</td>
<td>.912</td>
<td>.865</td>
<td>.579</td>
<td>.724</td>
</tr>
<tr>
<td>Stressor Appraisal</td>
<td>.599</td>
<td>.844</td>
<td>.732</td>
<td>.507</td>
</tr>
<tr>
<td>Resistance Resources</td>
<td>.117</td>
<td>.816</td>
<td>.908</td>
<td>.386</td>
</tr>
</tbody>
</table>

### Table 4: Split-Half Linguistic Equivalence for English-Zulu

<table>
<thead>
<tr>
<th>Scale</th>
<th>English-English (N=13)</th>
<th>Zulu-Zulu (N=13)</th>
<th>English-Zulu (N=13)</th>
<th>Zulu-English (N=13)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Social Problems</td>
<td>.658</td>
<td>.566</td>
<td>.743</td>
<td>.790</td>
</tr>
<tr>
<td>Pileup</td>
<td>.809</td>
<td>.499</td>
<td>.509</td>
<td>.503</td>
</tr>
<tr>
<td>W2F Interference</td>
<td>.621</td>
<td>.271</td>
<td>.923</td>
<td>.484</td>
</tr>
<tr>
<td>Social Support</td>
<td>.796</td>
<td>.800</td>
<td>.545</td>
<td>.851</td>
</tr>
<tr>
<td>Problem Solving</td>
<td>.725</td>
<td>.822</td>
<td>.611</td>
<td>.309</td>
</tr>
<tr>
<td>Stressor Appraisal</td>
<td>.614</td>
<td>.788</td>
<td>.506</td>
<td>.609</td>
</tr>
<tr>
<td>Resistance Resources</td>
<td>.589</td>
<td>.876</td>
<td>.876</td>
<td>.785</td>
</tr>
</tbody>
</table>

### Table 5: Split-Half Linguistic Equivalence for English-Setswana

<table>
<thead>
<tr>
<th>Scale</th>
<th>English-English (N=13)</th>
<th>Setswana-Setswana (N=13)</th>
<th>English-Setswana (N=13)</th>
<th>Setswana-English (N=13)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Social Problems</td>
<td>.614</td>
<td>.690</td>
<td>.855</td>
<td>.563</td>
</tr>
<tr>
<td>Pileup</td>
<td>.855</td>
<td>.790</td>
<td>.294</td>
<td>.242</td>
</tr>
<tr>
<td>W2F Interference</td>
<td>.355</td>
<td>.342</td>
<td>.120</td>
<td>.679</td>
</tr>
<tr>
<td>Social Support</td>
<td>.652</td>
<td>.543</td>
<td>.729</td>
<td>.742</td>
</tr>
<tr>
<td>Problem Solving</td>
<td>.910</td>
<td>.636</td>
<td>.898</td>
<td>.888</td>
</tr>
<tr>
<td>Stressor Appraisal</td>
<td>.670</td>
<td>.470</td>
<td>.798</td>
<td>.865</td>
</tr>
<tr>
<td>Resistance Resources</td>
<td>.445</td>
<td>.224</td>
<td>.898</td>
<td>.385</td>
</tr>
</tbody>
</table>

All possible pairs of correlations from the above tables were compared using the previously described procedures (see Step 13 of Chapter 3), generating 42 statistics per language group. Those results that demonstrated statistically significant differences at $p<.01$ are presented in the table below.
### TABLE 6: COMPARISONS YIELDING SIGNIFICANT DIFFERENCES BETWEEN CORRELATION COEFFICIENTS

<table>
<thead>
<tr>
<th>CONSTRUCT</th>
<th>COMB</th>
<th>r1</th>
<th>r2</th>
<th>F</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>PROBLEM SOLVING</td>
<td>EA:EE</td>
<td>.579</td>
<td>.912</td>
<td>4.784</td>
<td>.006</td>
</tr>
<tr>
<td>PILEUP</td>
<td>EE:AA</td>
<td>.153</td>
<td>.903</td>
<td>8.732</td>
<td>.000</td>
</tr>
<tr>
<td>PILEUP</td>
<td>AE:AA</td>
<td>.548</td>
<td>.903</td>
<td>4.660</td>
<td>.006</td>
</tr>
<tr>
<td>RESISTANCE RESOURCES</td>
<td>EE:EA</td>
<td>.117</td>
<td>.908</td>
<td>9.598</td>
<td>.000</td>
</tr>
<tr>
<td>RESISTANCE RESOURCES</td>
<td>EE:AA</td>
<td>.117</td>
<td>.816</td>
<td>4.799</td>
<td>.006</td>
</tr>
<tr>
<td>RESISTANCE RESOURCES</td>
<td>AE:EA</td>
<td>.386</td>
<td>.908</td>
<td>6.674</td>
<td>.001</td>
</tr>
<tr>
<td>W2F INTERFERENCE</td>
<td>ZZ:EZ</td>
<td>.271</td>
<td>.923</td>
<td>9.468</td>
<td>.000</td>
</tr>
<tr>
<td>W2F INTERFERENCE</td>
<td>ZE:EZ</td>
<td>.484</td>
<td>.923</td>
<td>6.701</td>
<td>.001</td>
</tr>
<tr>
<td>PILEUP</td>
<td>ES:EE</td>
<td>.242</td>
<td>.855</td>
<td>5.228</td>
<td>.004</td>
</tr>
<tr>
<td>PILEUP</td>
<td>SE:EE</td>
<td>.294</td>
<td>.855</td>
<td>4.869</td>
<td>.005</td>
</tr>
<tr>
<td>RESISTANCE RESOURCES</td>
<td>SS:ES</td>
<td>.224</td>
<td>.898</td>
<td>7.608</td>
<td>.001</td>
</tr>
<tr>
<td>RESISTANCE RESOURCES</td>
<td>EE:ES</td>
<td>.445</td>
<td>.898</td>
<td>5.441</td>
<td>.003</td>
</tr>
</tbody>
</table>

The above table indicates that six of the Afrikaans comparisons (14.3%) were statistically significant, compared with two of the Zulu (4.8%) and five of the Setswana (11.9%) comparisons.

According to Step 13, the correlations of the monolingual versions should not be consistently higher than the correlations for the bilingual versions. Of the 13 significant differences (across language groups), four involved a higher correlation in a monolingual version and a lower correlation in a bilingual version (Problem Solving, EA:EE; Pileup, AE:AA; Pileup, ES:EE & SE:EE). Four of the differences involved the opposite, viz a higher bilingual correlation and a lower monolingual correlation; three of the differences involved two bilingual versions; and two involved two monolingual versions.

Given that there were 63 pairs of correlations that involved a monolingual and bilingual version, across three languages, the failure rate was only 6.3%, which is considered a small rate. According to the criteria, therefore, it does not appear that monolingual versions of the questionnaire performed better than bilingual versions, suggesting that the differences between correlations may be due to the error resulting from the small sample sizes.

### 6.3.1.5 Response to Split-half Equivalence

A review of the correlation tables above will indicate a high percentage of correlation coefficients that fall below .70: 46% of Afrikaans, 54% of Zulu and 61% of Setswana correlations. This can be compared favourably with the first linguistic equivalence study, which found respective percentages of 69%, 59% and 69%. These low coefficients may be due to the small sample sizes within each analysis (n=13). It was thus decided to calculate Cronbach’s Alpha per scale for each of the four questionnaire versions, as well as for the monolingual and bilingual combined versions.
and the total sample per language group. It was hoped that this would yield reliability coefficients that more accurately illustrate the principle of split-half equivalence.

**TABLE 7: RELIABILITY COEFFICIENTS FOR ENGLISH-AFRIKAANS**

<table>
<thead>
<tr>
<th>SCALE</th>
<th>ENGLISH-ENGLISH (N=11)</th>
<th>AFRIKAANS-AFRIKAANS (N=12)</th>
<th>ENGLISH-AFRIKAANS (N=12)</th>
<th>AFRIKAANS-ENGLISH (N=9)</th>
<th>MONOLINGUAL (N=23)</th>
<th>BILINGUAL (N=21)</th>
<th>TOTAL (N=44)</th>
</tr>
</thead>
<tbody>
<tr>
<td>SOCIAL PROBLEMS</td>
<td>.8047</td>
<td>.8171</td>
<td>.8459</td>
<td>.9126</td>
<td>.8103</td>
<td>.9020</td>
<td>.8651</td>
</tr>
<tr>
<td>PILEUP</td>
<td>.6120</td>
<td>.8710</td>
<td>.8390</td>
<td>.9185</td>
<td>.8262</td>
<td>.9011</td>
<td>.8736</td>
</tr>
<tr>
<td>W2F INTERFERENCE</td>
<td>.8588</td>
<td>.8023</td>
<td>.7933</td>
<td>.7241</td>
<td>.8572</td>
<td>.7578</td>
<td>.8171</td>
</tr>
<tr>
<td>SOCIAL SUPPORT</td>
<td>.9180</td>
<td>.9383</td>
<td>.9178</td>
<td>.7908</td>
<td>.9300</td>
<td>.8852</td>
<td>.9105</td>
</tr>
<tr>
<td>PROBLEM SOLVING</td>
<td>.9263</td>
<td>.9551</td>
<td>.9415</td>
<td>.9090</td>
<td>.9419</td>
<td>.9293</td>
<td>.9339</td>
</tr>
<tr>
<td>STRESSOR APPRAISAL</td>
<td>.6342</td>
<td>.9108</td>
<td>.8375</td>
<td>.8566</td>
<td>.8288</td>
<td>.8431</td>
<td>.8330</td>
</tr>
<tr>
<td>RESISTANCE RESOURCES</td>
<td>.8415</td>
<td>.9479</td>
<td>.9430</td>
<td>.8420</td>
<td>.9119</td>
<td>.9140</td>
<td>.9113</td>
</tr>
</tbody>
</table>

**TABLE 8: RELIABILITY COEFFICIENTS FOR ENGLISH-ZULU**

<table>
<thead>
<tr>
<th>SCALE</th>
<th>ENGLISH-ENGLISH (N=7)</th>
<th>ZULU-ZULU (N=8)</th>
<th>ENGLISH-ZULU (N=7)</th>
<th>ZULU-ENGLISH (N=8)</th>
<th>MONOLINGUAL (N=15)</th>
<th>BILINGUAL (N=15)</th>
<th>TOTAL (N=30)</th>
</tr>
</thead>
<tbody>
<tr>
<td>SOCIAL PROBLEMS</td>
<td>.8031</td>
<td>.7688</td>
<td>.9444</td>
<td>.8736</td>
<td>.7695</td>
<td>.9134</td>
<td>.8751</td>
</tr>
<tr>
<td>PILEUP</td>
<td>.8038</td>
<td>.7398</td>
<td>.9261</td>
<td>.7545</td>
<td>.7817</td>
<td>.8964</td>
<td>.8754</td>
</tr>
<tr>
<td>W2F INTERFERENCE</td>
<td>.8918</td>
<td>.7505</td>
<td>.8886</td>
<td>.8879</td>
<td>.8636</td>
<td>.8779</td>
<td>.8710</td>
</tr>
<tr>
<td>SOCIAL SUPPORT</td>
<td>.8194</td>
<td>.9598</td>
<td>.7284</td>
<td>.9171</td>
<td>.9350</td>
<td>.8785</td>
<td>.9098</td>
</tr>
<tr>
<td>PROBLEM SOLVING</td>
<td>.7682</td>
<td>.9736</td>
<td>.7306</td>
<td>.6807</td>
<td>.9365</td>
<td>.6962</td>
<td>.8851</td>
</tr>
<tr>
<td>STRESSOR APPRAISAL</td>
<td>.7783</td>
<td>.8133</td>
<td>.8966</td>
<td>.7834</td>
<td>.8496</td>
<td>.8556</td>
<td>.8468</td>
</tr>
<tr>
<td>RESISTANCE RESOURCES</td>
<td>.9412</td>
<td>.9662</td>
<td>.8291</td>
<td>.8332</td>
<td>.9562</td>
<td>.8886</td>
<td>.9373</td>
</tr>
</tbody>
</table>
The procedure for comparing reliability coefficients, as used above, was conducted on the combined monolingual scores and combined bilingual scores. This was done to test the expectation that monolingual coefficients should not be consistently higher than bilingual coefficients. A total of 21 comparisons (seven constructs across three language groups) were conducted, only three of which (14.3%) yielded significant differences (at $p<.01$).

- **Problem Solving for the Zulu Versions.** The monolingual reliability (.9365) was significantly higher than the bilingual reliability (.6962); $F=4.784$, $p<.01$, $df_1=14$, $df_2=14$, $p<.01$. This difference may be due to the three items that performed poorly in the item equivalence evaluations of the Problem Solving items.

- **Work-to-Family Interference for Setswana Versions.** The bilingual reliability (.9269) was significantly higher than the monolingual reliability (.7639); $F=3.230$, $p<.01$, $df_1=16$, $df_2=18$, $p<.01$. This difference may be due to the one item that performed poorly in the item equivalence evaluations of the Work-to-Family Interference items.

- **Generalised Resistance Resources for Setswana Versions.** The bilingual reliability (.9655) was significantly higher than the monolingual reliability (.7467); $F=7.342$, $p<.01$, $df_1=16$, $df_2=18$, $p<.01$. This difference may be due to the two items that performed poorly in the item equivalence evaluations of the Generalised Resistance Resources items.

It can be seen from the first four data columns of the above reliability tables that the percentage of reliability coefficients that fall below .70 has been substantially reduced: 7% of Afrikaans reliability coefficients (compared with 46% of the split-half reliabilities and 31% of reliability coefficients for the first linguistic equivalence study), 4% of Zulu (compared with 54% of the split-half reliabilities and 28% in the first study), and 11% of Setswana (compared with 61% of the split-half reliabilities and 16% in the first study).

### Table 9: Reliability Coefficients for English-Setswana

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Social Problems</td>
<td>.7263</td>
<td>.8846</td>
<td>.7324</td>
<td>.8864</td>
<td>.8237</td>
<td>.8577</td>
<td>.8453</td>
</tr>
<tr>
<td>Pileup</td>
<td>.7773</td>
<td>.9045</td>
<td>.6286</td>
<td>.8451</td>
<td>.8476</td>
<td>.8473</td>
<td>.8491</td>
</tr>
<tr>
<td>W2F Interference</td>
<td>.7728</td>
<td>.7736</td>
<td>.2835</td>
<td>.9469</td>
<td>.7639</td>
<td>.9269</td>
<td>.9012</td>
</tr>
<tr>
<td>Social Support</td>
<td>.9781</td>
<td>.7925</td>
<td>.9734</td>
<td>.9235</td>
<td>.9439</td>
<td>.9577</td>
<td>.9549</td>
</tr>
<tr>
<td>Problem Solving</td>
<td>.9727</td>
<td>.8714</td>
<td>.9632</td>
<td>.9762</td>
<td>.9443</td>
<td>.9701</td>
<td>.9616</td>
</tr>
<tr>
<td>Stressor Appraisal</td>
<td>.9179</td>
<td>.9658</td>
<td>.9049</td>
<td>.9562</td>
<td>.9498</td>
<td>.9545</td>
<td>.9510</td>
</tr>
<tr>
<td>Resistance Resources</td>
<td>.8432</td>
<td>.6608</td>
<td>.9038</td>
<td>.9726</td>
<td>.7467</td>
<td>.9655</td>
<td>.9453</td>
</tr>
</tbody>
</table>
Furthermore, a large percentage of items achieved reliabilities of .90 or above:

- 43% of Afrikaans reliabilities were .90 or higher, and a further 39% were .80 or higher.
- 25% of Zulu reliabilities were .90 or higher, and a further 39% were .80 or higher.
- 50% of Setswana reliabilities were .90 or higher, and a further 18% were .80 or higher.

Given the very small sample sizes (13 cases per group), these reliability coefficients suggest that the scale is, on the whole, linguistically equivalent. Furthermore, these figures compare favourably with those generated in the first linguistic equivalence study: 31% and 22% of Afrikaans reliabilities; 28% and 19% of Zulu reliabilities; and 31% and 28% of Setswana reliabilities were above .90 and .80 respectively.

The ‘Total’ column in the above reliability tables gives the reliability coefficients for the combined samples per language version. It can here be seen that 100% of the coefficients are greater than .80, an increase from the 75% in the first linguistic equivalence study.

It is encouraging to note that the African language versions (Zulu & Setswana) performed at a comparable level (with average reliability coefficients of .8858 and .9155 respectively) with the Western language version (Afrikaans, with an average reliability coefficient of .8778). In light of the concerns in South Africa around developing instruments for non-Western people, these results suggest the value of developing instruments through the multi-focus approach.

When the total sample used in this study is combined, the following reliability coefficients are obtained:

| TABLE 10: RELIABILITY COEFFICIENTS FOR COMBINED LINGUISTIC EQUIVALENCE STUDY DATA |
|-----------------------------------------------|-----|-----|-----|
| SCALE                                         | ALPHA | CASES | ITEMS |
| SOCIAL PROBLEMS                               | .8647 | 110   | 22   |
| PILEUP                                        | .8726 | 110   | 31   |
| W2F INTERFERENCE                              | .8843 | 110   | 23   |
| SOCIAL SUPPORT                                | .9408 | 110   | 23   |
| PROBLEM SOLVING                               | .9402 | 110   | 22   |
| STRESSOR APPRAISAL                            | .9021 | 110   | 23   |
| RESISTANCE RESOURCES                          | .9381 | 110   | 31   |

The results in the above table suggest that the scale is performing well. All scales generated reliability coefficients above .80. The four resilience constructs all had coefficients above .90. Given the small sample sizes and the nature of the questionnaires completed (many in a second language or a combined language version), these results auger well for the evaluation phase.
6.3.1.6 Scale-level Equivalence

The final step in the linguist equivalence study is to examine whether there are significant differences in the mean scores of each scale across the four questionnaire versions, per language group. This was done using the Kruskal-Wallis analysis of variance, a nonparametric version of the ANOVA for four independent samples.

Due to the small sample sizes, the exact significance was desired. However, this required more computer memory than was available to the candidate. An estimated form of exact significance, the Monte Carlo method, was therefore used. Significance was set at $p<.01$.

The results of these analyses are presented in the following table.

**TABLE 11: SCALE-LEVEL LINGUISTIC EQUIVALENCE**

<table>
<thead>
<tr>
<th>SCALE</th>
<th>ENGLISH-AFRIKAANS (N=52)</th>
<th>ENGLISH-ZULU (N=52)</th>
<th>ENGLISH-SETSWANA (N=52)</th>
</tr>
</thead>
<tbody>
<tr>
<td>SOCIAL PROBLEMS</td>
<td>2.604 (.462)</td>
<td>3.320 (.348)</td>
<td>2.903 (.417)</td>
</tr>
<tr>
<td>PILEUP</td>
<td>1.524 (.688)</td>
<td>8.638 (.028)</td>
<td>6.334 (.095)</td>
</tr>
<tr>
<td>W2F INTERFERENCE</td>
<td>3.080 (.380)</td>
<td>4.185 (.245)</td>
<td>6.223 (.101)</td>
</tr>
<tr>
<td>SOCIAL SUPPORT</td>
<td>7.123 (.069)</td>
<td>4.504 (.211)</td>
<td>5.420 (.145)</td>
</tr>
<tr>
<td>PROBLEM SOLVING</td>
<td>5.526 (.136)</td>
<td>1.199 (.590)</td>
<td>3.513 (.322)</td>
</tr>
<tr>
<td>STRESSOR APPRAISAL</td>
<td>0.522 (.918)</td>
<td>8.922 (.028)</td>
<td>1.968 (.583)</td>
</tr>
<tr>
<td>RESISTANCE RESOURCES</td>
<td>6.270 (.099)</td>
<td>5.518 (.150)</td>
<td>7.846 (.046)</td>
</tr>
</tbody>
</table>

Note 1: The above table presents the results of the Kruskal-Wallace analysis of variance, a nonparametric test for the comparison of k means (in this case 4 means). The Kruskal-Wallis statistic (Chi-square) is presented in the left of each cell.

Note 2: Due to the small sample sizes ($n=13$ in each of the four groups per analysis), the significance level was calculated using the Monte Carlo method of estimating exact significance, based on 10,000 sampled tables. The significance levels are presented in brackets.

All analyses were nonsignificant. This suggests that the version of the questionnaire completed had no impact on the mean score generated by the respondents. Furthermore, the Military Social Health Index appears to have demonstrated scale-level equivalence.

6.3.1.7 Summary of Linguistic Equivalence Study Results

Afrikaans Version. The item equivalence study generated three significant findings (Table 2), which could be a chance occurrence (Type I error).

The split-half equivalence generated six statistically significant differences (Table 3). Only two of these differences involved a higher monolingual correlation than bilingual correlation.

In the study of the reliability coefficients, 23 of the 28 language pair coefficients (82%) were found to be .80 or higher (Table 6). No statistical differences between monolingual and bilingual
reliability coefficients were found, suggesting that the Afrikaans scale has acceptable ‘split-half’ reliability.

Finally, no differences between the mean scale scores could be found across the four language pair versions of the questionnaire (Table 11).

It would appear that the Afrikaans version of the Military Social Health Index can be considered linguistically equivalent to the English version. The three poorly performing items should be reviewed and considered for possible exclusion during the validation phase.

**Zulu Version.** The item equivalence study generated nine significant findings (Table 2). These could not be due to chance, and therefore require review. Four of the items are located in the Stressor Appraisal scale and three in the Social Problems scale. These problematic items may be a result of the different demographic profile of this sample, compared with the Afrikaans and Setswana respondents, as detailed in section 6.3.1.2 above.

The split-half equivalence generated two statistically significant differences (Table 4), both in the Work-to-Family Interference scale. Neither of these differences involved a higher monolingual correlation than bilingual correlation.

In the study of the reliability coefficients, 18 of the 28 language pair coefficients (64%) were found to be .80 or higher (Table 6). Only one statistical difference between the monolingual and bilingual coefficients was found, involving a higher monolingual reliability than the bilingual. This was located in the Problem Solving scale. Since none of the items in the Problem Solving scale demonstrated item inequivalence, it is difficult to explain the cause of this finding.

Finally, no differences between the mean scale scores could be found across the four language pair versions of the questionnaire (Table 11).

There is no apparent coherence between these findings: item inequivalence was located primarily in Stressor Appraisal and Social Problems; split-half inequivalence was located in Work-to-Family Interference; and Cronbach Alpha inequivalence was located in Problem Solving. The scattered nature of these findings could, perhaps, be attributed more to the nature of the sample than to the Zulu translation itself.

It would appear that the Zulu version of the Military Social Health Index can probably be considered largely linguistically equivalent to the English version. The nine poorly performing items must be reviewed and considered for exclusion during the validation phase.

**Setswana Version.** The item equivalence study generated seven significant findings (Table 2). These require review.

The split-half equivalence generated five statistically significant differences (Table 5). Two of these involved a higher monolingual reliability than bilingual, both in Pileup. The other three
differences were located in the Generalised Resistance Resources scale, where two of the seven item inequivalences were also located.

In the study of the reliability coefficients, 19 of the 28 language pair coefficients (68%) were found to be .80 or higher (Table 6). Two statistical differences between the monolingual and bilingual coefficients were found, involving higher bilingual reliabilities in both cases. These were located in the Work-to-Family Interference and Generalised Resistance Resources scales.

Finally, no differences between the mean scale scores could be found across the four questionnaire versions (Table 11).

It would appear that the Setswana version of the Military Social Health Index can be considered largely linguistically equivalent to the English version. The seven poorly performing items must be reviewed and considered for possible exclusion during the validation phase. The Generalised Resistance Resources scale should be carefully reviewed for linguistic equivalence.

6.4 **SUMMARY OF CHAPTER**

This chapter has outlined a series of analyses conducted on the newly designed *Military Social Health Index* to assess its adequacy before being distributed on a large scale for validation. These analyses involved:

- Obtaining expert review of the content validity and cultural equivalence of the items.
- Linguistic review of the instrument.
- Qualitative field testing of the instrument with representative groups of respondents.
- Quantitative investigations of the linguistic equivalence of the instrument.

The importance of a thorough linguistic review of the instrument, prior to field testing and a formal linguistic equivalence study, was highlighted. The sequencing of analyses used in this dissertation (obtaining the linguistic review after field testing and the linguistic equivalence study) resulted in the candidate having to repeat the linguistic equivalence study.

Overall, however, the instrument appears to be performing well. Apart from a number of specific items that appear to lack linguistic equivalence, the instrument overall can be considered linguistically equivalent.

6.5 **IN THE FOLLOWING CHAPTER**

In the following chapter the procedures for collecting large scale validation data are described. The results of the statistical analyses are presented, which result in the elimination of poorly performing items from the *Military Social Health Index* and the generation of a brief multicultural instrument for use by military social workers in the SANDF.
CHAPTER SEVEN: EVALUATION PHASE

7.1 INTRODUCTION TO EVALUATION PHASE

7.1.1 CHAPTER OVERVIEW

This chapter presents the processes and results of the fourth phase of the multicultural ecometric scale development process, viz the Evaluation Phase. The Evaluation Phase comprises all activities that constitute the validation proper, viz procedures to omit items in such a way as to enhance the reliability and validity of the instrument. This phase, the busiest – though probably briefest – of the entire process, is divided into six main moments and further into 16 steps (illustrated in Figure 36 below).

FIGURE 36: THE EVALUATION PHASE: MAIN MOMENTS & STEPS

<table>
<thead>
<tr>
<th>PHASES</th>
<th>MAIN MOMENTS</th>
<th>STEPS</th>
</tr>
</thead>
<tbody>
<tr>
<td>F</td>
<td>DESIGN VALIDATION STUDY</td>
<td>15 Formulate the research problem</td>
</tr>
<tr>
<td></td>
<td></td>
<td>16 Select a sample</td>
</tr>
<tr>
<td></td>
<td></td>
<td>17 Prepare the research package</td>
</tr>
<tr>
<td>G</td>
<td>COLLECT DATA</td>
<td>18 Administer research package to sample</td>
</tr>
<tr>
<td>H</td>
<td>CONCEPT-LEVEL ANALYSIS</td>
<td>19 Consolidate evidence supporting content validity</td>
</tr>
<tr>
<td>I</td>
<td>ITEM-LEVEL ANALYSIS</td>
<td>20 Conduct item analysis</td>
</tr>
<tr>
<td></td>
<td></td>
<td>21 Investigate item cultural bias</td>
</tr>
<tr>
<td></td>
<td></td>
<td>22 Compute coefficient alpha</td>
</tr>
<tr>
<td></td>
<td></td>
<td>23 Compare reliabilities across cultures</td>
</tr>
<tr>
<td></td>
<td></td>
<td>24 Compute standard error of measurement</td>
</tr>
<tr>
<td></td>
<td></td>
<td>25 Conduct multiple group confirmatory analysis at item level</td>
</tr>
<tr>
<td></td>
<td></td>
<td>26 Conclude multicultural item-level analysis</td>
</tr>
<tr>
<td>J</td>
<td>SCALE-LEVEL ANALYSIS</td>
<td>27 Conduct convergent and discriminant validity analysis at scale level</td>
</tr>
<tr>
<td></td>
<td></td>
<td>28 Conduct known groups validity analysis</td>
</tr>
<tr>
<td></td>
<td></td>
<td>29 Conclude multicultural scale-level analysis</td>
</tr>
<tr>
<td>K</td>
<td>ESTABLISH CLINICAL CUTTING SCORES</td>
<td>30 Establish clinical cutting scores</td>
</tr>
</tbody>
</table>

The data collection procedures and the resultant samples will be detailed first. Thereafter the initial and final reliability and validity of the scales, both within and across culture groups, will be detailed. Items that were omitted from the instrument will be indicated. Finally, the clinical cutting scores will be determined.
The reliability analyses were conducted using a demonstration copy of Statistica 6, since the Statistica outputs of the reliability analyses interfaced more effectively with Microsoft Excel than the SPSS outputs. All other analyses were conducted using SPSS 11.5.1. Statistical outputs were imported into Excel for examination.

Although the candidate validated the entire Military Social Health Index (all seven scales), only the validation of the four Resilience scales will be reported here. This is for two main reasons. Firstly, the three Vulnerability scales do not conform to the assumptions of classical test theory – they do not measure a coherent construct, as such, but rather can be viewed as behavioural indicators that cannot be expected to co-occur and that cannot be assumed to be caused by a latent variable (Hudson & Faul, 1998). Consequently, the reliability and inter-item correlations will be suppressed. Secondly, reporting on four scales across four cultures already produces 16 data sets, which is considered more than enough to illustrate the process of multicultural scale development – as stated in Chapter 1, the primarily purpose of this dissertation is not to develop a scale, but to design and test a process model of multicultural scale development.

### 7.1.2 What’s New in this Chapter?

All of the steps in the validation phase of Faul’s (1995) model are included here in the evaluation phase. The sequencing and conceptualisation of the steps has been adjusted, however – whereas Faul works from reliability to validity and then to the cutting scores, the candidate’s model works from concept-level to item-level to scale-level and then to cutting scores. The rationale for this adjustment is to group processes that co-occur, rather than to group types of analyses. Thus in the candidate’s model, the researcher completes each main moment before moving on to the next, which is not the case in Faul’s model.

The most significant addition to this phase, however, is the incorporation of multicultural comparisons. Whereas Faul’s model is focused on validating an instrument based on a single, monocultural sample, the candidate’s model focuses on validating an instrument based on multiple, multicultural samples. Validation thus entails not only analysing each culture in parallel, but also comparing results across cultures. While this is probably not a great deal more difficult technically, it requires a great deal more analytical procedures and careful data management. To facilitate this, the candidate kept a carefully numbered validation log, in which each change to the data set, each procedure run and each output generated were recorded (See Appendix E for an illustrative extract from the log). In addition, syntax (SPSS programming code) or macros (Statistica visual basic) were kept of all procedures.

### 7.2 Main Moment F: Design Validation Study

As with all research, it is important to design the validation study carefully, so as to ensure that data will be collected that can adequately answer the research questions. Given the cost of validation studies, such planning is essential.
7.2.1 **Step 15: Formulate Research Questions**

Although it may be tempting to utilise this study to investigate the nature of social health, resilience across cultures and deployment resilience, these are not relevant research questions here. Indeed, such questions could be addressed in future research using the validated instrument.

Rather, the evaluation phase is concerned only with establishing a measuring instrument that is valid, reliable and multiculturally appropriate. Consequently, the research questions were formulated as follows:

- Is the *Military Social Health Index* reliable for each culture group?
- Is the *Military Social Health Index* valid for each culture group?
- Is the *Military Social Health Index* reliable and valid across the target culture groups?

7.2.2 **Step 16: Select a Sample**

Ecometric procedures do not require representative samples, as is the case with psychometric validation. However, the samples do need to be heterogeneous (to avoid artificial attenuation of reliability and validity), reasonably reflective of the demographic profile of the population in which the instrument will be used, and containing approximately 500 people per culture group.

Given that the *Military Social Health Index* will be used only within the SANDF community, it was decided that the validation sample would comprise only military personnel. Because the instrument is being developed for use in the Concurrent Health Assessments, it will be validated only on uniformed members of the SANDF.

The population is thus defined as all uniformed members in the employ of the SANDF during 2003. By implication, the population will be adult, employed, literate, reasonably proficient in English, testwise and largely male.

In order to ensure a high level of heterogeneity and representivity, and also to broadly spread the workload of collecting validation data, the Director Social Work agreed that every social work practitioner in the SANDF would be required to collect a specified amount of *Military Social Health Index* data.

The candidate set as a target, 600 members of each of eight target culture groups: White English-speakers, White Afrikaans-speakers, Asian English-speakers, Coloured Afrikaans-speakers, African Zulu-speakers and African Setswana-speakers. This results in a total of 4,800 participants.

Furthermore, casework data is required to evaluate known-groups validity and to determine clinical cutting scores. The target for casework was 2,000 participants. There would, naturally, be some overlap between these two sets of data.
After considerable negotiation with the Director Social Work and her staff officers, agreement was reached regarding the method of data collection and the nature of the samples:

- Each practising social worker (108 professionals) would be sent 70 questionnaires, and tasked to collect:
  - 20 casework respondents (which would be used for known groups validity and clinical cutting scores).
  - 40 community work respondents (from people participating in life skills groups, HIV prevention programmes, or any other available people).
  - 10 extra questionnaires were sent in case documents were defaced.

- Each province was tasked to focus on specific target culture groups, so as to ensure a spread of target cultures in the final sample. Field researchers were requested to avoid collecting data from non-target culture groups, except for casework where all uniformed respondents would be acceptable.

- A colleague of the candidate (who was out of the country at the time) provided training in the research protocol (Appendix D) to provincial managers. They were given an envelope for each social worker containing the questionnaires, answer sheets and a research protocol.

- Provincial managers were given six weeks to train their personnel. Personnel were given three months to collect the data.

- Data were to be sent back to the candidate for scanning.

Consequently, 7,560 questionnaires were sent out, with the hope of receiving back 2,160 casework and 4,320 community work questionnaires from the six target cultures (a total of 6,480 questionnaires). Having 108 social workers collect data would ensure that data were reflective of the provinces, Arms of Service, ranks, genders, etc of the SANDF community.

In short, a national convenience sample was drawn in such a way as to maximize sample heterogeneity.

### 7.2.3 **STEP 17: PREPARE THE RESEARCH PACKAGE**

The *Military Social Health Index* was prepared as a multilingual instrument, printed in landscape format, as indicated in the innovation requirements, and containing the original 175 items.

A covering letter was prepared and signed by the Director Social Work, Brigadier General N.E. Motumi. It was believed that her signature would give soldiers confidence to participate in the study.
A set of 14 demographic questions was designed for use in describing the sample profile, identifying the respondents’ culture group and investigating aspects of validity.

A separate answer sheet was designed, as a single double-sided page. This reduced printing costs considerably (only 400 questionnaires were printed, compared with 10,000 answer sheets) and also simplified the data scanning process.

The complete research package can be found in Appendix C.

### 7.3 MAIN MOMENT G: COLLECT DATA

#### 7.3.1 STEP 18: ADMINISTER RESEARCH PACKAGE TO SAMPLE

The 108 social work practitioners of the SANDF, as indicated in Step 16 above, collected the data.

Social workers were requested to collect casework data only from uniformed soldiers that they had already assessed. When the participant had completed the instrument, the social worker was requested to complete a final section in which they were asked whether the participant had significant problems or strengths in the various dimensions that the Military Social Health Index was designed to measure (see Appendix D for the research protocol in this regard).

Data were extremely slow in returning. Furthermore, about a third (32.1%) of the data received came from non-target cultures, resulting in significant truncation of the target sample sizes. Social workers struggled to get data from English-speaking respondents, both White and Asian. African Xhosa-speakers, who were not an identified target culture, completed a large number of questionnaires. Casework data were particularly difficult to obtain – clients were reluctant to complete the instrument, for fear of how the data would be used.

These difficulties resulted in an extension of the time frame for completion of the data collection. The candidate identified military units with high percentages of outstanding target culture groups and requested social workers in those provinces to concentrate more specifically on those respondents. Furthermore, it was agreed to drop Asian English-speakers from the sample (there are only about 600 people from this culture group in the SANDF nationally), and to add African Xhosa-speakers (who would then be completing the Military Social Health Index in a second language – probably Zulu or English). Continued difficulties in obtaining White English-speakers resulted in this group being dropped from the study. Consequently, there were no English-speaking respondents in the validation study. Later it also emerged that insufficient African Zulu-speaking respondents could be sampled, and this group was also dropped from the study.

It was decided to use respondents from non-target culture groups for a cross-validation study – not reported in this dissertation.

Before scanning of the data, questionnaires were visually examined to determine if they were adequately completed for inclusion in the study. A number of questionnaires were only partially
completed – some respondents got tired of the lengthy instrument and withdrew from the study midway. A number of questionnaires were obviously ‘faked’ (completed in a disingenuous way), as illustrated in Figure 37 below.

FIGURE 37: EXAMPLE OF AN OBVIOUSLY FAKED QUESTIONNAIRE
After scanning of data, it became apparent that several questionnaires contained many missing items. Hudson (1982) indicates that 80% of items should be completed before scoring an instrument. Since the Military Social Health Index comprises seven scales, it was decided to raise this standard to 90%. Of the 4171 captured questionnaires, 50 (1.2%) had less than 90% of the items completed (ie 157 or fewer of the 175 items). These questionnaires were deleted from the sample.

Ultimately, usable data were received as follows:

**TABLE 12: BASIC PROFILE OF USABLE DATA RECEIVED**

<table>
<thead>
<tr>
<th>Culture</th>
<th>Nonclinical</th>
<th>Clinical</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>White Afrikaans</td>
<td>466</td>
<td>114</td>
<td>580</td>
</tr>
<tr>
<td>Coloured Afrikaans</td>
<td>403</td>
<td>122</td>
<td>525</td>
</tr>
<tr>
<td>African Setswana</td>
<td>439</td>
<td>158</td>
<td>597</td>
</tr>
<tr>
<td>African Xhosa</td>
<td>403</td>
<td>132</td>
<td>535</td>
</tr>
<tr>
<td>Non-target Culture</td>
<td>1459</td>
<td>425</td>
<td>1884</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>3170</strong></td>
<td><strong>951</strong></td>
<td><strong>4121</strong></td>
</tr>
</tbody>
</table>

In order to control the artificial impact of different sample sizes on the validation statistics, the four target culture samples were reduced to equal sizes, viz \( n = 500 \), using the simple random sampling function of SPSS. All analyses that follow are based on the reduced samples. The table below summarises the resultant sample data that will be used for the main validation.

**TABLE 13: BASIC STUDY SAMPLE PROFILE**

<table>
<thead>
<tr>
<th>Culture</th>
<th>Nonclinical</th>
<th>Clinical</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>White Afrikaans</td>
<td>402</td>
<td>98</td>
<td>500</td>
</tr>
<tr>
<td>Coloured Afrikaans</td>
<td>383</td>
<td>117</td>
<td>500</td>
</tr>
<tr>
<td>African Setswana</td>
<td>370</td>
<td>130</td>
<td>500</td>
</tr>
<tr>
<td>African Xhosa</td>
<td>376</td>
<td>124</td>
<td>500</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>1531</strong></td>
<td><strong>469</strong></td>
<td><strong>2000</strong></td>
</tr>
</tbody>
</table>

The casework sample was not reduced in size. The entire sample of casework data (both target culture and non-target culture respondents) was used to assess known groups validity and determine the cutting scores. Thus the sample size for these analyses is \( n = 951 \). A total of 469 respondents appear in both data sets.

Crosstabulations of demographic data and target culture were prepared to describe the demographic profiles of the target cultures and to investigate potential differences in profile across cultures. The chi-square test was used in the case of nominal data (eg rank, gender and marital status), and the Kruskal-Wallis test in the case of ordinal data (eg age, education and number of children). Significance was set at \( p < .01 \). In addition to the chi-square statistic, Cramer’s V is also
reported. Cramer’s V indicates the strength of the relationship, with statistics of .70 and above indicating a strong or very strong relationship, statistics in the range .50 to .69 indicating a moderate relationship and statistics below .50 indicating low to weak relationships (Peck, 1997).

All statistics were significant, indicating significant differences in demographic profile between the four culture groups. It will, however, be noticed that Cramer’s V tended to be small, indicating that the differences are weak.

7.3.1.1 Age

There were significant differences in age between the four culture groups ($\chi^2_{K-W}=72.0, p<.001$), with Xhosa-speaking respondents being significantly older than the other three groups. This is illustrated in the graph below.

**FIGURE 38: AGE PER CULTURE GROUP**
7.3.1.2 Rank

The results of the chi-square test indicated a significant association between culture group and rank ($\chi^2=639.0, p<.001, \text{Cramer’s } V=.33$). It appears that the majority of African respondents were junior non-commissioned officers (NCOs) and privates (73% of Setswana speakers and 59% of Xhosa speakers), while the majority of White respondents were senior NCOs or officers (66%). Coloured respondents were largely spread throughout the non-officers ranks (87%). This is illustrated in the graph below.

**FIGURE 39: RANK PER CULTURE GROUP**
7.3.1.3 Gender

The results of the chi-square test indicated a significant association between culture group and gender ($\chi^2=84.1$, $p<.001$, Cramer’s $V=.21$). There is a disproportionately large percentage of women among White Afrikaans respondents (41.3%), compared with other cultures (25.9% of Coloured, 16.6% of Setswana-speaking and 22.8% of Xhosa-speaking respondents). This is illustrated in the graph below.

**FIGURE 40: GENDER PER CULTURE GROUP**
7.3.1.4 Marital Status

The results of the chi-square test indicated a significant association between culture group and marital status ($\chi^2=99.6$, $p<.001$, Cramer’s $V=.16$). Setswana speakers were less likely than other groups to be married, yet more likely to be unmarried with a long-term partner. White respondents were more likely than other respondents to be unmarried without a partner. This is illustrated in the graph below.

**FIGURE 41: MARITAL STATUS PER CULTURE GROUP**

What is your marital status?
7.3.1.5 Duration of Relationship

There were significant differences in duration of their relationship between the four culture groups ($\chi^2_{K-W}=23.9$, $p<.001$). White Afrikaans respondents were more likely to have either no partner or a short relationship, while Xhosa-speaking respondents had the longest relationship. This is illustrated in the graph below.

FIGURE 42: DURATION OF RELATIONSHIP PER CULTURE GROUP

How long have you been in the relationship with your partner?
7.3.1.6 Arm of Service

The results of the chi-square test indicated a significant association between culture group and Arm of Service ($\chi^2=41.5$, $p<.001$, Cramer’s $V=.21$). The majority of Army respondents comprised African respondents. White respondents were over represented among Air Force and SAMHS (SA Military Health Service) respondents (although a third of these respondents were from the Army), while Coloured respondents were overrepresented among Navy respondents (although half these respondents were from the Army). This is illustrated in the graph below.

**FIGURE 43: ARM OF SERVICE PER CULTURE GROUP**
7.3.1.7 Educational Qualification

There were significant differences in educational qualifications between the four culture groups ($\chi^2_{K-W}=217.3, p<.001$). White respondents had the highest levels of education. This is illustrated in the graph below.

**FIGURE 44: EDUCATIONAL QUALIFICATION PER CULTURE GROUP**

![Graph showing educational qualifications by culture group](image-url)
7.3.1.8 Number of Times Married

There were significant differences in the number of marriages between the four culture groups ($\chi^2_{K-W}=57.9$, $p<.001$). White and Xhosa-speaking respondents had the most number of marriages, and Setswana-speakers the least. This is illustrated in the graph below.

FIGURE 45: NUMBER OF TIMES MARRIED PER CULTURE GROUP

![Bar graph showing number of times married per culture group]
7.3.1.9 Number of Children

There were significant differences in number of children between the four culture groups ($\chi^2_{K-W}=136.5, \ p<.001$). Xhosa-speaking respondents had the most children and White respondents the least. This is illustrated in the graph below.

**FIGURE 46: NUMBER OF CHILDREN PER CULTURE GROUP**
7.3.1.10   Access to Social Work Services

The results of the chi-square test indicated a significant association between culture group and likelihood of having seen a social worker in the previous six months ($\chi^2=60.7$, $p<.001$, Cramer’s $V=.12$). African respondents were more likely to have seen a social worker for counselling than White or Coloured respondents. This is illustrated in the graph below.

Figure 47: Access to Social Work Services per Culture Group

Have you seen a social worker for counseling in the past six months?

- Yes
- No
- Unsure

Culture:
- White Afrikaans
- Coloured Afr
- African Setswana
- African Xhosa
7.3.1.11 Monthly Net Income

There were significant differences in monthly net income between the four culture groups ($\chi^2_{K-W} = 385.4, p < .001$). White respondents have the highest income, followed by Coloured respondents. African respondents have the lowest income. This is illustrated in the graph below.

**FIGURE 48: MONTHLY INCOME PER CULTURE GROUP**

![Bar chart showing monthly income per culture group.](image)

What is your monthly take-home salary?

- More than R5000
- R3000 to R5000
- R2000 to R2999
- R1000 to R1999
- Less than R1000

Percent

- White Afrikaans
- Coloured Afn
- African Setswana
- African Xhosa

Percent
7.3.1.12 Language Used in Completing MSHI

The results of the chi-square test indicated a significant association between culture group and language used in completing the Military Social Health Index ($\chi^2=1280.7, p<.001$, Cramer’s $V=.47$). White respondents were the group most likely to read the questionnaire in their home language (77.3%), followed by Coloured respondents (57.8%). Most Setswana-speaking respondents (57.1%) read the questionnaire in English, while about a third (34.9%) read the instrument in Setswana. Most of the Xhosa-speaking respondents (82.8%) read the questionnaire in English, with a small percentage reading in Zulu (9.4%). This is illustrated in the graph below.

**FIGURE 49: LANGUAGE USED PER CULTURE GROUP**

![Graph showing language used per culture group](image-url)
7.3.1.13  Difficulties Understanding the Questionnaire

The results of the chi-square test indicated a significant association between culture group and difficulties in understanding the questions in the Military Social Health Index ($\chi^2=25.5$, $p<.001$, Cramer’s $V=.08$). Xhosa-speaking respondents (the only group not to have the instrument in their home language) were most likely to report difficulties in understanding the questionnaire. This is illustrated in the graph below.

**FIGURE 50: DIFFICULTIES UNDERSTANDING QUESTIONNAIRE PER CULTURE GROUP**

7.3.1.14  Region

The results of the chi-square test indicated a significant association between culture group and the region in which the questionnaire was completed ($\chi^2=1818.1$, $p<.001$, Cramer’s $V=.55$). This is, by far, the most significant finding reported in this section, and the only Cramer’s $V$ to exceed .50. This is, however, expected and not highly salient, since it merely confirms that different regions did indeed collect data from specific culture groups, as they were tasked to (Steps 16 and 18). Furthermore, the culture groups that each region was tasked to target were derived from the actual distribution of culture groups throughout the country.
Almost half (45.4%) of White Afrikaans respondents were sampled in Gauteng, which is also the region with the largest sample overall (22.5% of all respondents were sampled in Gauteng). A third (33.4%) of the Coloured Afrikaans respondents were sampled in the Northern Cape and a further quarter (26.8%) in the Western Cape. Almost two thirds (61.8%) of the African Setswana respondents were sampled in the North West. A third (33.8%) of the African Xhosa respondents were sampled in the Eastern Cape, the rest scattered throughout the country, especially Gauteng (18.2%) and Western Cape (15.4%).

After Gauteng, which collected the most data (22.5%), data were collected in large amounts in North West (16.2%), Northern Cape (15.0%), Western Cape (14.8%) and Eastern Cape (10.2%). It will be noticed that no data were collected in the Free State. This was due to a number of problems internal to the region. Data were, apparently, sent to the candidate, but were never received.

This is illustrated in the graph below.

**FIGURE 51: REGION PER CULTURE GROUP**

Note 1: 1M=1 Military Hospital (Pretoria); 2M=2 Military Hospital (Cape Town); 3M=3 Military Hospital (Bloemfontein); EC=Eastern Cape; GT=Gauteng; IM=Institute for Maritime Medicine (Simonstown); KZ=Kwazulu-Natal; LP=Limpopo; MP=Mpumalanga; NC=Northern Cape; NW=North West; WC=Western Cape.
7.4 **Main Moment H: Concept-Level Analysis**

It was argued in Chapter 3, that concept-level analysis, specifically assessment of content validity, is a process of judgement, rather than a statistical procedure. While some authors (e.g., Faul, 1995; Hudson, 1982) do refer to statistical aspects of content validity, the overwhelming perspective reflected in the literature is that content validity is more about process than about numbers.

To assist in assessing content validity, a set of questions was derived from a framework compiled by Haynes et al. (1995, p. 247), and is included in Appendix A to this dissertation. The section below will assess the *Military Social Health Index* in light of this framework.

7.4.1 **Step 19: Consolidate Evidence Supporting Content Validity**

**How were the domains defined?** Four constructs were identified, viz support systems, problem solving, stressor appraisal and generalised resistance resources (see Step 4). A detailed literature review was conducted on each construct and on the broader theoretical framework within which the constructs are located, viz resilience theory (see Step 3). The constructs were operationally defined, both in terms of what is included in the construct and in what is excluded (see Step 6). A facet map was developed for each construct, based on the theoretical review (see Step 6). The constructs are all relatively broad, particularly in the case of generalised resistance resources. Stressor Appraisal is probably the narrowest of the four constructs, since it addresses a person’s perspectives on deployments in specific. All four constructs are relatively overt – none measures a personality trait.

During the development phase (see Step 12), a panel of experts reviewed the items to evaluate the degree to which the items that were designed were representative of the domain. The reviewers gave the *Military Social Health Index* a perfect rating. While this is probably an unrealistically high rating, it is likely that the instrument demonstrates adequate domain sampling.

**What methods were used to generate the initial item pool?** The multi-focus approach to formulating or designing the items was adopted (see Step 8). A multicultural, multilingual team of social workers was used to generate items in multiple languages simultaneously. No items were generated in advance. The design team worked from the facet maps, using the content of the facets to generate items. In this way, the items generated were strongly linked with theory.

The design team used their own experience (as members of a culture group, as well as as practitioners with various culture groups) to assess items as they were formulated. The team repeatedly asked the question, “Will our clients understand this item?” Although target populations were not invited to participate in the generation of items, the fact that the design team work with target populations on a daily basis increases the likelihood that the items are relevant to the population.
Are the items matched with the facets? The list method of scale design was used (Faul, 1995), whereby facets were taken one at a time and an item written to tap into that facet (see Step 8). Consequently, there is, in most instances, one item per facet. During the item design process, a number of facets were found to be difficult to formulate into an item that worked across cultures/languages. These facets consequently did not have an item attached to it.

A panel of experts evaluated the construct relevance of each item (see Step 12), and considered that the Military Social Health Index items had a very high level of construct relevance.

In terms of what were the items evaluated? Items were evaluated in terms of the clarity of questions and their adherence to the rules of item formulation (see Step 8), construct relevance and representivity (see Step 12), simplicity and clarity (see Step 13) and linguistic equivalence (see Step 14). Overall, the final item pool was considered to be clear, unambiguous, non-metaphorical, relevant, representative of the domain and linguistically equivalent.

How were the items evaluated and what were the results? The items were evaluated through four processes. Firstly, the design team served as a panel of reviewers (see Step 12). These reviewers were, therefore, multicultural and multilingual social workers, comprising eight individuals. Each reviewer independently evaluated the items in terms of content/construct relevance, conceptual equivalence or content comparability, and content representivity. The reviewers identified 6.3% of the items as of potential concern.

Secondly, members of the population reviewed the instrument (see Step 13). Four focus groups (one per language) were run, in which the participants (soldiers in the Gauteng area) were asked to review each item in terms of clarity and simplicity. These reviews resulted in changes to 4.6% of the items.

Thirdly, linguistic experts at the language services division of the DOD reviewed the instrument (see Step 14). These experts checked the equivalence of the translations, and made changes to 21.7% of the items.

Fourthly, the items were subjected to an analysis of linguistic equivalence – twice in fact, due to substantial changes to the instrument subsequent to the first analysis (see Section 6.3).

Conclusion. The above evidence seems to point towards strong content validity for the Military Social Health Index. Throughout the scale development process – from the initial formulation of the design specifications, through to the compilation of the research package for formal validation – the candidate has endeavoured to ensure a strong theoretical foundation to the instrument, to ensure that the items are strongly linked to theory, and to ensure that the items are culturally and linguistically equivalent.
7.5 **MAIN MOMENT I: ITEM-LEVEL ANALYSIS**

Given that the scale appears to have strong content validity, the study can progress to item-level analysis. This is, in many ways, the heart of the validation, since it is here that poorly performing items are identified and omitted. The goal is to generate an instrument that is both short and valid/reliable. This entails seven steps:

- Conduct item analysis.
- Investigate item cultural bias.
- Compute coefficient alpha.
- Compare reliabilities across cultures.
- Compute standard error of measurement.
- Conduct multiple group confirmatory analysis at item level (ie construct validity at item level).
- Conclude multicultural item-level analysis.

The four Resilience scales initially comprised a total of 99 items – 23 items in Support Systems, 22 in Problem Solving, 23 in Stressor Appraisal and 31 in Generalised Resistance Resources (more items were generated for this fourth scale, since the construct was considered to be broader, as mentioned in step 19). It was decided to aim towards reducing each scale to 14 items, which would involve deleting a total of 43 items and retaining 56 – this goal was, in fact, achieved.

The initial performance of each of the four scales, as well as the scales’ performance after the removal of poorly performing items, will be presented in the following sections. Appendix G contains a detailed listing of all items, indicating which were omitted from the final scale, together with the reasons why.

7.5.1 **STEP 20: CONDUCT ITEM ANALYSIS**

According to the guidelines in Chapter 3, four aspects of the performance of items should be evaluated, viz item variance, item means, item omissions and corrected item-total correlations. These analyses were conducted across the four culture groups and used in determining which items to delete from the Military Social Health Index.

The results of the item analysis, before the removal of items and after the reduction of the scale from 99 to 56 items, are provided in the table below. Rather than reporting average item variance and item means, the scale variance and means are reported.
### TABLE 14: SUMMARY OF ITEM ANALYSIS ACROSS CULTURES

<table>
<thead>
<tr>
<th>SCALE</th>
<th>CULTURE</th>
<th>SCALE VARIANCE</th>
<th>SCALE MEANS</th>
<th>OMISSION</th>
<th>ITEM-TOT CORR</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>INI</td>
<td>FIN</td>
<td>INI</td>
<td>FIN</td>
</tr>
<tr>
<td>Social Support</td>
<td>WA</td>
<td>346</td>
<td>379</td>
<td>71.3</td>
<td>72.7</td>
</tr>
<tr>
<td></td>
<td>CA</td>
<td>308</td>
<td>334</td>
<td>70.5</td>
<td>71.4</td>
</tr>
<tr>
<td></td>
<td>AS</td>
<td>306</td>
<td>333</td>
<td>69.1</td>
<td>70.1</td>
</tr>
<tr>
<td></td>
<td>AX</td>
<td>285</td>
<td>312</td>
<td>67.9</td>
<td>69.1</td>
</tr>
<tr>
<td>Problem Solving</td>
<td>WA</td>
<td>314</td>
<td>350</td>
<td>73.5</td>
<td>75.2</td>
</tr>
<tr>
<td></td>
<td>CA</td>
<td>310</td>
<td>343</td>
<td>72.0</td>
<td>73.2</td>
</tr>
<tr>
<td></td>
<td>AS</td>
<td>345</td>
<td>387</td>
<td>71.2</td>
<td>73.0</td>
</tr>
<tr>
<td></td>
<td>AX</td>
<td>282</td>
<td>321</td>
<td>70.7</td>
<td>73.1</td>
</tr>
<tr>
<td>Stressor Appraisal</td>
<td>WA</td>
<td>327</td>
<td>402</td>
<td>62.6</td>
<td>63.2</td>
</tr>
<tr>
<td></td>
<td>CA</td>
<td>271</td>
<td>316</td>
<td>70.1</td>
<td>70.9</td>
</tr>
<tr>
<td></td>
<td>AS</td>
<td>287</td>
<td>367</td>
<td>67.4</td>
<td>68.1</td>
</tr>
<tr>
<td></td>
<td>AX</td>
<td>309</td>
<td>399</td>
<td>66.3</td>
<td>67.2</td>
</tr>
<tr>
<td>GRRs</td>
<td>WA</td>
<td>209</td>
<td>264</td>
<td>78.3</td>
<td>79.2</td>
</tr>
<tr>
<td></td>
<td>CA</td>
<td>215</td>
<td>272</td>
<td>77.2</td>
<td>79.2</td>
</tr>
<tr>
<td></td>
<td>AS</td>
<td>277</td>
<td>360</td>
<td>74.2</td>
<td>78.0</td>
</tr>
<tr>
<td></td>
<td>AX</td>
<td>240</td>
<td>298</td>
<td>73.6</td>
<td>77.2</td>
</tr>
</tbody>
</table>

**Note 1:** Figures to the left of dotted lines indicate initial findings, before the removal of poorly performing items. Figures to the right of the dotted lines indicate final findings, based on the reduced item pool.

**Note 2:** Scale variance should increase; scale means should move closer to 50; percentage items omitted should decrease; and percentage items with corrected item-total correlations below .45 should decrease.

**Variance.** From the above table, it can be seen that scale variance increased in all 16 analyses. The mean variance (across all cultures and scales) increased from 289 to 340. This increase in variance indicates that the final version of the *Military Social Health Index* would be better able to discriminate between those with higher levels of resilience and those with lower levels of resilience.

**Means.** It can be seen in the above table that none of the scale means moved closer to the midpoint of the scale range (viz 50). Indeed, the average scale mean increased slightly from 71.0 to 72.6. This could make it slightly harder for the final version of the *Military Social Health Index* to discriminate between higher and lower resilience.

**Omission.** It can be seen that 75% of the scales demonstrated a decrease in the number of item omissions. On average, item omissions decreased from 0.45% to 0.41%. The percentage of item omissions was, in fact, very low from the start. The highest percentage of missing items for any item was 2.0% – for item 27 within the African Setswana group and item 93 within the African Xhosa group. No item reached the 5% standard indicated in Chapter 3.
**Item-Total Correlations.** The mean corrected item-total correlations improved in all cases, as indicated in the table above. No scales (neither before nor after items were discarded) had a mean item-total correlation of .45 or less. On average, the item-correlations improved from .662 to .728, indicating that the items included in the final version of the *Military Social Health Index* are strongly related to the constructs they measure.

**Summary.** The items that were omitted from the *Military Social Health Index* appear to have had a positive impact on the variance and item-total correlations of the instrument. The percentage of item omissions remained very low. The primary concern is that the scale means increased rather than decreased, which could potentially reduce the discriminant properties of the instrument.

### 7.5.2 **Step 21: Investigate Item Culture Bias**

In order to develop an instrument without cultural bias, it is necessary to reduce the number of items that are culturally biased. A procedure to investigate item cultural bias was described in Chapter 3, based on guidelines provided by Van De Vijver and Leung (1997, pp. 62-68).

After removal of scale scores of 0 and 100, the sample size was, in some instances, reduced substantially from the original 2000 respondents. It was thus decided to use eight levels. The categorisation function of SPSS was used to automatically create the levels for each construct. The ANOVAs were run as indicated in Chapter 3, after which the ANOVA results were studied to identify items that were culturally biased. The results were utilised in determining which items to omit from the instrument. After removal of the 43 items, the process was repeated.

The results of these analyses are presented in the table below.

<table>
<thead>
<tr>
<th>Table 15: Summary of Item Cultural Bias</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>INITIAL % BIASED</strong></td>
</tr>
<tr>
<td>Social Support</td>
</tr>
<tr>
<td>Problem Solving</td>
</tr>
<tr>
<td>Stressor Appraisal</td>
</tr>
<tr>
<td>Generalised Resistance Resources</td>
</tr>
</tbody>
</table>

Note 1: Percentage of biased items should decrease.

It can be seen that the percentage of biased items decreased for three of the four scales, viz Problem Solving, Stressor Appraisal and Generalised Resistance Resources. The percentage of biased items in the Social Support scale increased slightly. Overall, the percentage of biased items in the *Military Social Health Index* decreased from 65.7% to 53.6% – a drop of more than 10%.

Although the candidate endeavoured to omit items that were culturally biased – or rather to retain those that were unbiased – it was often found that an unbiased item performed poorly in item-total correlations or construct (factorial) validity, and had to be dropped.
It is of concern that so many items (more than half of the items in the final instrument) evidence cultural bias. It would appear that items are more vulnerable to cultural bias than anticipated. A more rigorous process during the design and development phases may be required to reduce the risk of bias. This could entail asking of each item, “If a number of people from different culture groups are all high on the construct under examination, will they all score high on this item?” If the answer is not “Yes”, the item is likely to be biased.

7.5.3 **STEP 22: COMPUTE COEFFICIENT ALPHA**

Coefficient Alpha is an important measure of reliability. It quantifies the degree of internal consistency within the scale. Alpha is dependent, among other things, on the number of items in an instrument – the more items (of the same quality), the higher the alpha coefficient. It is thus necessary to discard poorly performing items, in order to retain as high an alpha as possible with as few items as possible. In the process, however, it is possible that alpha will decrease as the number of items decreases. The alpha standard of .90, however, as indicated in Chapter 3, must be maintained.

The table below provides the alpha coefficients for each culture and scale, before and after the removal of the 43 poorly performing items.

<table>
<thead>
<tr>
<th>SCALE</th>
<th>CULTURE GROUP</th>
<th>INITIAL α</th>
<th>FINAL α</th>
</tr>
</thead>
<tbody>
<tr>
<td>Social Support</td>
<td>White Afrikaans</td>
<td>.954</td>
<td>.943</td>
</tr>
<tr>
<td></td>
<td>Coloured Afrikaans</td>
<td>.952</td>
<td>.942</td>
</tr>
<tr>
<td></td>
<td>African Setswana</td>
<td>.946</td>
<td>.932</td>
</tr>
<tr>
<td></td>
<td>African Xhosa</td>
<td>.935</td>
<td>.917</td>
</tr>
<tr>
<td>Problem Solving</td>
<td>White Afrikaans</td>
<td>.967</td>
<td>.970</td>
</tr>
<tr>
<td></td>
<td>Coloured Afrikaans</td>
<td>.967</td>
<td>.969</td>
</tr>
<tr>
<td></td>
<td>African Setswana</td>
<td>.961</td>
<td>.960</td>
</tr>
<tr>
<td></td>
<td>African Xhosa</td>
<td>.949</td>
<td>.952</td>
</tr>
<tr>
<td>Stressor Appraisal</td>
<td>White Afrikaans</td>
<td>.941</td>
<td>.932</td>
</tr>
<tr>
<td></td>
<td>Coloured Afrikaans</td>
<td>.942</td>
<td>.932</td>
</tr>
<tr>
<td></td>
<td>African Setswana</td>
<td>.932</td>
<td>.925</td>
</tr>
<tr>
<td></td>
<td>African Xhosa</td>
<td>.930</td>
<td>.925</td>
</tr>
<tr>
<td>Generalised Resistance Resources</td>
<td>White Afrikaans</td>
<td>.960</td>
<td>.953</td>
</tr>
<tr>
<td></td>
<td>Coloured Afrikaans</td>
<td>.960</td>
<td>.957</td>
</tr>
<tr>
<td></td>
<td>African Setswana</td>
<td>.963</td>
<td>.962</td>
</tr>
<tr>
<td></td>
<td>African Xhosa</td>
<td>.953</td>
<td>.952</td>
</tr>
</tbody>
</table>

In the table above, it can be seen that the alpha coefficient dropped in 75% of the instances. Indeed, the average alpha dropped from .951 to .945. However, it must be observed that none of
the alpha coefficients, neither before nor after the removal of almost half the items, fell below .90. In fact, in the final instrument, the lowest alpha was .917, while the highest was .970. The drop in levels of internal consistency can be attributed to the reduction in the number of items. Given that the levels of alpha remain above .90 in all instances, the reduced length of the instrument justifies the drop in alphas.

### 7.5.4 Step 23: Compare Reliabilities Across Cultures

As indicated in Chapter 3, multicultural equivalence requires that scales not only have acceptably high levels of reliability within cultures (as demonstrated in the previous section), but also that scales should have similar levels of reliability across cultures. This latter requirement is necessary before the scale can be said to have equivalence of reliability across cultures.

A procedure to investigate the equivalence of pairs of reliability coefficients was taken from Van de Vijver and Leung (1997). Pairs of correlations, together with their respective sample sizes were copied into Excel 2000 and analysed using Excel’s FDIST function. The results of these analyses are presented in the two tables on the following page.

From the tables 17 and 18 it can be seen that the percentage of reliability pairs that differed significantly increased from 25% to 33% – the discarding of items led to a decrease in equivalence of reliabilities across cultures. This was despite efforts by the candidate to delete items to advantage the culture with the poorest reliability – it was hoped that this would result in a narrowing of the range between the highest and lowest reliabilities. It is possible, however, that the obtained reliabilities are the most similar reliabilities that can be obtained with 14 of the original items in each scale.

Overall, however, the degree of equivalence of reliability did not alter – the mean $F$ score was 1.196 both before and after the removal of items. A review of the Mean row in each table will indicate that the mean $F$ score deteriorated for all scales, except Stressor Appraisal, where there was a slight improvement. Interestingly, this is the only scale to demonstrate equivalence of reliability both before and after the removal of items.

The Problem Solving scale performed worst in its equivalence of reliability. It had the highest mean $F$ score in the final version (1.326) and the greatest number of failed comparisons (four out of six). Only the two Afrikaans speaking cultures and the two African cultures demonstrated equivalence of reliability in the Problem Solving scale.
Interestingly, Stressor Appraisal, which had the best equivalence of reliability, also had the lowest mean reliability (.929), while Problem Solving, which had the worst equivalence of reliability, had the highest mean reliability (.963). Stressor Appraisal also had the smallest difference between the highest and lowest reliability (.932 - .925 = .007), while Problem Solving had the second highest (.970 - .952 = .018), after Social Support (.943 - .917 = .026). Problem Solving had the single highest alpha coefficient (.970), which resulted in the smallest tolerable difference between highest and lowest alpha across cultures – this is a good case of high reliability not always being a good thing.

In summary, one can conclude that the Stressor Appraisal scale demonstrates equivalence of reliability across these four culture groups. Social Support and GRRs demonstrate reasonable equivalence (in 67% of comparisons), while Problem Solving demonstrates the least equivalence of
reliability (in only one third of comparisons). Overall, the Military Social Health Index appears to demonstrate equivalence of reliability coefficients in two thirds of comparisons.

### 7.5.5 Step 24: Compute Standard Error of Measurement

Chapter 3 indicated that when evaluating the reliability of an instrument, SEM should be considered together with alpha. SEM, unlike alpha, is not as vulnerable to sample homogeneity and thus provides a complementary perspective on the measurement error of an instrument.

When a scale is scored from 0 to 100, as is the case with the Military Social Health Index, an SEM of 5% or less is sought. The SEMs for the Military Social Health Index are provided in the table below.

<table>
<thead>
<tr>
<th>SCALE</th>
<th>CULTURE GROUP</th>
<th>INITIAL SEM</th>
<th>FINAL SEM</th>
</tr>
</thead>
<tbody>
<tr>
<td>Social Support</td>
<td>White Afrikaans</td>
<td>3.803</td>
<td>4.649</td>
</tr>
<tr>
<td></td>
<td>Coloured Afrikaans</td>
<td>4.892</td>
<td>4.397</td>
</tr>
<tr>
<td></td>
<td>African Setswana</td>
<td>6.219</td>
<td>4.754</td>
</tr>
<tr>
<td></td>
<td>African Xhosa</td>
<td>6.238</td>
<td>5.086</td>
</tr>
<tr>
<td>Problem Solving</td>
<td>White Afrikaans</td>
<td>4.936</td>
<td>3.269</td>
</tr>
<tr>
<td></td>
<td>Coloured Afrikaans</td>
<td>5.649</td>
<td>3.257</td>
</tr>
<tr>
<td></td>
<td>African Setswana</td>
<td>6.266</td>
<td>3.935</td>
</tr>
<tr>
<td></td>
<td>African Xhosa</td>
<td>6.377</td>
<td>3.932</td>
</tr>
<tr>
<td>Stressor Appraisal</td>
<td>White Afrikaans</td>
<td>4.002</td>
<td>5.228</td>
</tr>
<tr>
<td></td>
<td>Coloured Afrikaans</td>
<td>3.839</td>
<td>4.632</td>
</tr>
<tr>
<td></td>
<td>African Setswana</td>
<td>4.074</td>
<td>5.250</td>
</tr>
<tr>
<td></td>
<td>African Xhosa</td>
<td>4.293</td>
<td>5.473</td>
</tr>
<tr>
<td>Generalised Resistance Resources</td>
<td>White Afrikaans</td>
<td>3.200</td>
<td>3.510</td>
</tr>
<tr>
<td></td>
<td>Coloured Afrikaans</td>
<td>3.191</td>
<td>3.422</td>
</tr>
<tr>
<td></td>
<td>African Setswana</td>
<td>3.686</td>
<td>3.683</td>
</tr>
<tr>
<td></td>
<td>African Xhosa</td>
<td>3.801</td>
<td>3.766</td>
</tr>
</tbody>
</table>

A review of the table above will indicate that the SEMs decreased in 50% of the instances, and that the number of SEMs above 5% decreased from five to four. Overall, SEM decreased from 4.65 to 4.27. The greatest initial SEM decreased from 6.38 to 5.47. The final mean SEM for Stressor Appraisal remains a little high (5.15), while the mean SEMs for the three other scales are all below 5. The mean SEMs for each culture are below 5 – 4.16 for White Afrikaans, 3.93 for Coloured Afrikaans, 4.41 for African Setswana and 4.56 for African Xhosa.

One of the challenges of determining which items to omit is the issue of item variance. In the item analysis items with high variance are desired – and an increase in scale variance was achieved in
all instances. However, the higher the variance, the greater the SEM. Thus, by selecting items with high variance, the candidate has increased the likelihood that SEM will deteriorate. Nevertheless, all SEMs remain reasonably low, and if rounded to the nearest whole number, will not exceed the standard of SEM=5.

In summary, the standard error of measurement of the Military Social Health Index appears to be within the acceptable range, indicating low levels of measurement error.

7.5.6 **Step 25: Conduct Multiple Group Confirmatory Analysis at Item Level**

The validity of the items in the Military Social Health Index was investigated using Multiple Group Confirmatory Analysis, as described in Chapter 3. This involved correlating each item in the instrument with each of the four scales, correcting for item-self correlations in the case of item-own-scale correlations. This procedure was conducted using Statistica, rather than SPSS, since Statistica produces a spreadsheet output for this procedure compared with the text output of SPSS. The spreadsheet output interfaces more easily with Excel, where the candidate integrated all statistics for review.

The initial and final factor matrixes for each culture are provided in Appendix F due to their size and detail. Each item in the four matrixes was analysed according to two criteria, as indicated in Chapter 3:

- **Criterion 1.** Items should correlate with their own corrected scale total more highly than with any other scale.

- **Criterion 2.** Items should correlate with their own corrected scale total at .45 or higher.

Items that did not meet these criteria were earmarked for deletion from the instrument. The results of these criteria are provided in table 20 on the following page.

A review of table 20 will indicate that, with the exception of the African Xhosa responses to one item in the Social Support scale, all other scales in the final version of the Military Social Health Index met the first criterion, and that all scales in the final version met the second criterion. The instrument thus demonstrates strong factorial validity within and across cultures.
### TABLE 20: CONSTRUCT VALIDITY ASSESSMENT AT ITEM LEVEL

<table>
<thead>
<tr>
<th>SCALE</th>
<th>CULTURE GROUP</th>
<th>CRITERION 1</th>
<th></th>
<th>CRITERION 2</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>INITIAL</td>
<td>FINAL</td>
<td>INITIAL</td>
<td>FINAL</td>
</tr>
<tr>
<td>Social Support</td>
<td>White Afrikaans</td>
<td>0</td>
<td>0</td>
<td>4.3</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>Coloured Afrikaans</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>African Setswana</td>
<td>0</td>
<td>0</td>
<td>4.3</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>African Xhosa</td>
<td>4.3</td>
<td>7.1</td>
<td>8.7</td>
<td>0</td>
</tr>
<tr>
<td>Problem Solving</td>
<td>White Afrikaans</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>Coloured Afrikaans</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>African Setswana</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>African Xhosa</td>
<td>4.5</td>
<td>0</td>
<td>9.1</td>
<td>0</td>
</tr>
<tr>
<td>Stressor Appraisal</td>
<td>White Afrikaans</td>
<td>0</td>
<td>0</td>
<td>4.3</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>Coloured Afrikaans</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>African Setswana</td>
<td>4.3</td>
<td>0</td>
<td>17.4</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>African Xhosa</td>
<td>8.7</td>
<td>0</td>
<td>8.7</td>
<td>0</td>
</tr>
<tr>
<td>Generalised Resistance</td>
<td>White Afrikaans</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Resources</td>
<td>Coloured Afrikaans</td>
<td>3.2</td>
<td>0</td>
<td>3.2</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>African Setswana</td>
<td>0</td>
<td>0</td>
<td>6.5</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>African Xhosa</td>
<td>0</td>
<td>0</td>
<td>12.9</td>
<td>0</td>
</tr>
<tr>
<td>Mean</td>
<td></td>
<td>1.56%</td>
<td>0.44%</td>
<td>2.10%</td>
<td>0%</td>
</tr>
</tbody>
</table>

Note 1: Criterion 1 requires items to correlate more highly with own scale than any other scale.

Note 2: Criterion 2 requires items to correlate with own scale at .45 or higher.

Note 3: All figures represent percentages of items failing the criterion.

The two tables on the following page provide further summary information regarding construct validity at item level. The mean item-total correlations for the clusters of items within each scale are provided. The mean corrected item-own-total correlations are shaded. The shaded mean correlations should, in all cases, be markedly higher than the mean correlation with the other three scales.
### Table 21: Initial Construct Validity at the Item Level of Analysis

<table>
<thead>
<tr>
<th>SCALE</th>
<th>CULTURE</th>
<th>SUPPORT</th>
<th>PSOLVE</th>
<th>APPRAISE</th>
<th>GRRs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Social Supports</td>
<td>WA</td>
<td>.682</td>
<td>.415</td>
<td>.243</td>
<td>.395</td>
</tr>
<tr>
<td></td>
<td>CA</td>
<td>.676</td>
<td>.505</td>
<td>.329</td>
<td>.403</td>
</tr>
<tr>
<td></td>
<td>AS</td>
<td>.648</td>
<td>.518</td>
<td>.408</td>
<td>.451</td>
</tr>
<tr>
<td></td>
<td>AX</td>
<td>.610</td>
<td>.439</td>
<td>.347</td>
<td>.407</td>
</tr>
<tr>
<td>Problem Solving</td>
<td>WA</td>
<td>.442</td>
<td>.755</td>
<td>.280</td>
<td>.559</td>
</tr>
<tr>
<td></td>
<td>CA</td>
<td>.535</td>
<td>.752</td>
<td>.403</td>
<td>.534</td>
</tr>
<tr>
<td></td>
<td>AS</td>
<td>.564</td>
<td>.719</td>
<td>.460</td>
<td>.570</td>
</tr>
<tr>
<td></td>
<td>AX</td>
<td>.462</td>
<td>.680</td>
<td>.411</td>
<td>.527</td>
</tr>
<tr>
<td>Stressor Appraisal</td>
<td>WA</td>
<td>.233</td>
<td>.249</td>
<td>.624</td>
<td>.270</td>
</tr>
<tr>
<td></td>
<td>CA</td>
<td>.312</td>
<td>.358</td>
<td>.635</td>
<td>.441</td>
</tr>
<tr>
<td></td>
<td>AS</td>
<td>.383</td>
<td>.397</td>
<td>.597</td>
<td>.426</td>
</tr>
<tr>
<td></td>
<td>AX</td>
<td>.342</td>
<td>.380</td>
<td>.588</td>
<td>.426</td>
</tr>
<tr>
<td>GRRs</td>
<td>WA</td>
<td>.365</td>
<td>.493</td>
<td>.263</td>
<td>.660</td>
</tr>
<tr>
<td></td>
<td>CA</td>
<td>.384</td>
<td>.481</td>
<td>.439</td>
<td>.661</td>
</tr>
<tr>
<td></td>
<td>AS</td>
<td>.455</td>
<td>.533</td>
<td>.456</td>
<td>.677</td>
</tr>
<tr>
<td></td>
<td>AX</td>
<td>.409</td>
<td>.502</td>
<td>.429</td>
<td>.634</td>
</tr>
</tbody>
</table>

Note 1: All values indicate mean item-total correlations based on the complete item set.
Note 2: Shaded figures indicate mean corrected item-total correlations with own scale.

### Table 22: Final Construct Validity at the Item Level of Analysis

<table>
<thead>
<tr>
<th>SCALE</th>
<th>CULTURE</th>
<th>SUPPORT</th>
<th>PSOLVE</th>
<th>APPRAISE</th>
<th>GRRs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Social Supports</td>
<td>WA</td>
<td>.715</td>
<td>.406</td>
<td>.250</td>
<td>.367</td>
</tr>
<tr>
<td></td>
<td>CA</td>
<td>.713</td>
<td>.506</td>
<td>.352</td>
<td>.383</td>
</tr>
<tr>
<td></td>
<td>AS</td>
<td>.679</td>
<td>.534</td>
<td>.409</td>
<td>.449</td>
</tr>
<tr>
<td></td>
<td>AX</td>
<td>.635</td>
<td>.448</td>
<td>.348</td>
<td>.400</td>
</tr>
<tr>
<td>Problem Solving</td>
<td>WA</td>
<td>.449</td>
<td>.820</td>
<td>.271</td>
<td>.624</td>
</tr>
<tr>
<td></td>
<td>CA</td>
<td>.551</td>
<td>.818</td>
<td>.424</td>
<td>.560</td>
</tr>
<tr>
<td></td>
<td>AS</td>
<td>.591</td>
<td>.779</td>
<td>.457</td>
<td>.606</td>
</tr>
<tr>
<td></td>
<td>AX</td>
<td>.493</td>
<td>.748</td>
<td>.422</td>
<td>.553</td>
</tr>
<tr>
<td>Stressor Appraisal</td>
<td>WA</td>
<td>.240</td>
<td>.237</td>
<td>.679</td>
<td>.228</td>
</tr>
<tr>
<td></td>
<td>CA</td>
<td>.338</td>
<td>.375</td>
<td>.681</td>
<td>.427</td>
</tr>
<tr>
<td></td>
<td>AS</td>
<td>.402</td>
<td>.405</td>
<td>.657</td>
<td>.409</td>
</tr>
<tr>
<td></td>
<td>AX</td>
<td>.358</td>
<td>.393</td>
<td>.658</td>
<td>.385</td>
</tr>
<tr>
<td>GRRs</td>
<td>WA</td>
<td>.380</td>
<td>.582</td>
<td>.245</td>
<td>.755</td>
</tr>
<tr>
<td></td>
<td>CA</td>
<td>.403</td>
<td>.543</td>
<td>.465</td>
<td>.770</td>
</tr>
<tr>
<td></td>
<td>AS</td>
<td>.503</td>
<td>.614</td>
<td>.465</td>
<td>.788</td>
</tr>
<tr>
<td></td>
<td>AX</td>
<td>.451</td>
<td>.563</td>
<td>.419</td>
<td>.749</td>
</tr>
</tbody>
</table>

Note 1: All values indicate mean item-total correlations after removal of poorly performing items.
Note 2: Shaded figures indicate mean corrected item-total correlations with own scale.
The two tables above demonstrate no failures, neither before nor after the deletion of items. This further confirms the construct validity of the Military Social Health Index.

The tables below extract the mean corrected item-total correlations with own scale from the above two tables. These mean correlations serve as coefficients of construct validity.

**TABLE 23: INITIAL ITEM-LEVEL CONSTRUCT VALIDITY COEFFICIENTS**

<table>
<thead>
<tr>
<th>SCALE</th>
<th>WA</th>
<th>CA</th>
<th>AS</th>
<th>AX</th>
<th>AVG</th>
</tr>
</thead>
<tbody>
<tr>
<td>Social Support</td>
<td>.682</td>
<td>.676</td>
<td>.648</td>
<td>.610</td>
<td>.654</td>
</tr>
<tr>
<td>Problem Solving</td>
<td>.755</td>
<td>.752</td>
<td>.719</td>
<td>.680</td>
<td>.727</td>
</tr>
<tr>
<td>Stressor Appraisal</td>
<td>.624</td>
<td>.635</td>
<td>.597</td>
<td>.588</td>
<td>.611</td>
</tr>
<tr>
<td>GRRs</td>
<td>.660</td>
<td>.661</td>
<td>.677</td>
<td>.634</td>
<td>.658</td>
</tr>
<tr>
<td>Average</td>
<td><strong>.680</strong></td>
<td><strong>.681</strong></td>
<td><strong>.660</strong></td>
<td><strong>.628</strong></td>
<td><strong>.662</strong></td>
</tr>
</tbody>
</table>

Note 1: Values are based on corrected mean item-total correlations of all scales across culture groups based on complete item set.

**TABLE 24: FINAL ITEM-LEVEL CONSTRUCT VALIDITY COEFFICIENTS**

<table>
<thead>
<tr>
<th>SCALE</th>
<th>WA</th>
<th>CA</th>
<th>AS</th>
<th>AX</th>
<th>AVG</th>
</tr>
</thead>
<tbody>
<tr>
<td>Social Support</td>
<td>.715</td>
<td>.713</td>
<td>.679</td>
<td>.635</td>
<td>.686</td>
</tr>
<tr>
<td>Problem Solving</td>
<td>.820</td>
<td>.818</td>
<td>.779</td>
<td>.748</td>
<td>.791</td>
</tr>
<tr>
<td>Stressor Appraisal</td>
<td>.679</td>
<td>.681</td>
<td>.657</td>
<td>.658</td>
<td>.669</td>
</tr>
<tr>
<td>GRRs</td>
<td>.755</td>
<td>.770</td>
<td>.788</td>
<td>.749</td>
<td>.766</td>
</tr>
<tr>
<td>Average</td>
<td><strong>.742</strong></td>
<td><strong>.746</strong></td>
<td><strong>.726</strong></td>
<td><strong>.698</strong></td>
<td><strong>.728</strong></td>
</tr>
</tbody>
</table>

Note 1: Values are based on corrected mean item-total correlations of all scales across culture groups after removal of poorly performing items.

A review of the above two tables will indicate that the construct validity coefficients improved in all instances – a result of deleting items that did not correlate highly with their own scale total. All coefficients in the final instrument exceed the .60 standard for validity coefficients, as indicated in Chapter 3. Based on these data, one can conclude that the instrument demonstrates strong construct validity at item level.

The construct validity coefficients were compared across cultures using the same procedures for comparing the equivalence of reliabilities (see Step 23 of Chapter 3). Although the validity coefficients were equivalent across cultures for the Stressor Appraisal and GRRs scales, the White and Coloured Afrikaans groups had significantly higher validity coefficients than the African Xhosa group for the Social Support and Problem Solving scales. Overall, 17% of the comparisons indicated non-equivalence of validity coefficients.

**7.5.7 Step 26: Conclude Multicultural Item-Level Analysis**

In Appendix G an integration of the item-level analysis, per item, is provided. Items that performed poorly in terms of mean, variance, missing values, construct validity and bias are...
indicated. The items that were deleted from the initial version of the instrument are shaded, allowing a comparison of deleted and retained items.

In summary, the following results were obtained during the item-level analysis of the *Military Social Health Index*:

- All scales were reduced to 14 items each, a total reduction from 99 to 56 items – almost half the items were discarded, resulting in a much shorter instrument.
- All scales demonstrated an increase in variance as a result of item reduction.
- All scales demonstrated an undesirable increase in mean scores.
- 75% of the scales demonstrated a decrease in item-level missing values – the mean percentage of missing values was 0.41%.
- All scales demonstrated an increase in corrected item-total correlations as a result of item reduction, with a mean of .728.
- Three of the four scales (with the exception of Social Support) demonstrated a decrease in the percentage of biased items – 53.6% of items in the final scale were culturally biased.
- A quarter (25%) of the scales demonstrated an increase in reliability (Cronbach’s alpha) – the mean alpha for the final scale was .945. All scales had an alpha coefficient above .90, with the lowest being .917.
- Two thirds of the pairs of reliability coefficients were equivalent across culture. Stressor Appraisal was the only scale to demonstrate equivalency of reliability across all four cultures. Problem Solving demonstrated the weakest equivalence of reliability coefficients.
- The standard error of measurement (SEM) of the four scales improved overall, with the highest final SEM being only 5.47. The mean SEM is 4.27. Overall, the instrument demonstrates acceptably low levels of SEM.
- Only one item in the final scale, among Xhosa respondents, correlated more highly with another scale than its own scale. All items correlated with their own scale total at .45 or above. The *Military Social Health Index* demonstrated excellent levels of factorial validity.
- All scales demonstrated an increase in construct validity – the mean construct validity coefficient for the final scale was .728. All scales, across cultures, had construct validity coefficients above .60, with the lowest being .627.
- Most (83%) of the pairs of validity coefficients were equivalent across culture. The Social Support and Problem Solving scales did not demonstrate equivalency of validity across all four cultures. The Stressor Appraisal and GRRs scales demonstrated equivalency of validity.
With the high levels of reliability and validity, the low levels of SEM, and the reasonably good levels of equivalency across cultures, it can be concluded that the Military Social Health Index demonstrates excellent measurement properties (both reliability and validity) at item level and reasonable levels of cultural equivalence.

7.6 Main Moment J: Scale-Level Analysis

The statistical analyses involved in scale validation work from the micro to the macro. The analyses reported in Main Moment I demonstrate that the reduction of items from the initial 99 to the final 56 resulted in strong reliability (all above .90), low measurement error (all below 6%) and excellent construct validity (all above .60). Furthermore, efforts were made to reduce the proportion of biased items from 66% to 54%. Over two thirds of the reliability and validity coefficients were equivalent across cultures.

With this foundation of strong performance at item level in place, one is now ready to assess the performance of the scales at scale-level. Hopefully, the well-performing items should result in a well-performing scale. This main moment comprises three steps:

- Conduct convergent and discriminant construct validity analysis at scale level.
- Conduct known groups validity analysis.
- Conclude multicultural scale-level analysis.

The processes followed, together with the initial and final results, will be presented in the following sections.

7.6.1 Step 27: Conduct Convergent and Discriminant Validity Analysis at Scale Level

The guidelines in Chapter 3 require that three sets of variables be identified for correlation with the scale scores. The researcher must determine, before hand, what relationships should exist between the scale and the predictor variables. The following three hypotheses were formulated:

- **Class I Predictors.** The four Military Social Health Index Resilience scales should correlate insignificantly (below .10) with the variables gender, marital status, duration of relationship, educational qualification, number of times married, number of children, shoe size, net income and having difficulties understanding the questionnaire. This would provide evidence of discriminant validity – this is, evidence that the scales do not measure constructs they should not measure.

- **Class II Predictors.** The four Military Social Health Index Resilience scales should negatively correlate at a moderately low level (-.10 to -.30) with three other scales developed simultaneously to these four, viz Social Problems (a measure of the degree to which a family is experiencing social problems such as relationship difficulties, substance abuse and financial
problems), Pileup (the degree to which a family has experienced acute life stressors over the previous six months) and Work-to-Family Interference (the degree to which a family has experienced a negative spill-over of work problems into the family nexus). Resilience, which the four Military Social Health Index scales measure, is largely separate from the occurrence of life stressors, yet resilience may moderate or reduce the negative influence of such events on the well-being of the family. Consequently, moderately low, negative correlations are hypothesised. This would provide beginning evidence of convergent validity – that is, initial evidence that the scales do measure what they should measure.

Class III Predictors. The four Military Social Health Index scales should intercorrelate strongly and positively (.40 to .70) with each other. The four constructs are, in fact, different aspects or facets of a larger construct, viz resilience. In particular, a strong relationship between GRRs and Problem Solving is anticipated, since these both concern processes internal to the family system. Social Support, while related to GRRs, concerns relationships external to the family system, and may therefore have a slightly lower set of correlations with GRRs and Problem Solving. Stressor Appraisal can be expected to have a somewhat more moderate correlation with the other three scales, since it is very specific to the family’s perception of the military and deployments, while the other scales are more generic. In the analyses that follow, however, the intercorrelations between these four constructs will be averaged and are hypothesised to fall between .40 and .70. This would provide evidence of convergent validity – that is, evidence that the scales do measure what they should measure.

The four tables below provide the raw correlations between the four Military Social Health Index scales and the various predictor variables, both before and after the omission of items.
### Table 25: Initial Construct Validity Class I Predictors

<table>
<thead>
<tr>
<th>SCALE</th>
<th>CULT</th>
<th>Q1</th>
<th>Q4</th>
<th>Q5</th>
<th>Q6</th>
<th>Q8</th>
<th>Q9</th>
<th>Q10</th>
<th>Q12</th>
<th>Q14</th>
<th>Q191</th>
</tr>
</thead>
<tbody>
<tr>
<td>Social Supports</td>
<td>WA</td>
<td>.003</td>
<td>.069</td>
<td>-.004</td>
<td>-.002</td>
<td>.067</td>
<td>-.003</td>
<td>-.033</td>
<td>-.016</td>
<td>.083</td>
<td>.104</td>
</tr>
<tr>
<td></td>
<td>CA</td>
<td>.029</td>
<td>.007</td>
<td>-.052</td>
<td>.083</td>
<td>-.009</td>
<td>.039</td>
<td>.003</td>
<td>.050</td>
<td>.080</td>
<td>.037</td>
</tr>
<tr>
<td></td>
<td>AS</td>
<td>.013</td>
<td>-.041</td>
<td>.003</td>
<td>.075</td>
<td>.063</td>
<td>.047</td>
<td>.051</td>
<td>.071</td>
<td>.064</td>
<td>.047</td>
</tr>
<tr>
<td></td>
<td>AX</td>
<td>-.004</td>
<td>.055</td>
<td>-.013</td>
<td>.068</td>
<td>.082</td>
<td>-.023</td>
<td>.036</td>
<td>.062</td>
<td>.069</td>
<td>.042</td>
</tr>
<tr>
<td>Problem Solving</td>
<td>WA</td>
<td>.124</td>
<td>-.027</td>
<td>-.079</td>
<td>.098</td>
<td>.021</td>
<td>.048</td>
<td>.034</td>
<td>.073</td>
<td>.121</td>
<td>.086</td>
</tr>
<tr>
<td></td>
<td>CA</td>
<td>.067</td>
<td>-.110</td>
<td>-.113</td>
<td>.135</td>
<td>-.028</td>
<td>.049</td>
<td>.059</td>
<td>.067</td>
<td>.078</td>
<td>.025</td>
</tr>
<tr>
<td></td>
<td>AS</td>
<td>-.029</td>
<td>-.089</td>
<td>-.026</td>
<td>.127</td>
<td>.058</td>
<td>-.004</td>
<td>.003</td>
<td>.098</td>
<td>.056</td>
<td>.077</td>
</tr>
<tr>
<td></td>
<td>AX</td>
<td>.059</td>
<td>-.023</td>
<td>.002</td>
<td>.063</td>
<td>.110</td>
<td>.007</td>
<td>.060</td>
<td>.121</td>
<td>.063</td>
<td>.024</td>
</tr>
<tr>
<td>Stressor Appraisal</td>
<td>WA</td>
<td>.042</td>
<td>-.245</td>
<td>.083</td>
<td>-.098</td>
<td>-.134</td>
<td>-.073</td>
<td>-.057</td>
<td>.193</td>
<td>.059</td>
<td>.011</td>
</tr>
<tr>
<td></td>
<td>CA</td>
<td>.083</td>
<td>-.278</td>
<td>-.071</td>
<td>.085</td>
<td>-.141</td>
<td>.015</td>
<td>.116</td>
<td>.177</td>
<td>-.022</td>
<td>.157</td>
</tr>
<tr>
<td></td>
<td>AS</td>
<td>.033</td>
<td>-.162</td>
<td>-.053</td>
<td>.091</td>
<td>-.066</td>
<td>.025</td>
<td>.061</td>
<td>.127</td>
<td>-.025</td>
<td>.067</td>
</tr>
<tr>
<td></td>
<td>AX</td>
<td>.022</td>
<td>-.129</td>
<td>-.042</td>
<td>.091</td>
<td>-.012</td>
<td>.020</td>
<td>.106</td>
<td>-.117</td>
<td>-.007</td>
<td>.026</td>
</tr>
<tr>
<td>GRRs</td>
<td>WA</td>
<td>.095</td>
<td>-.083</td>
<td>-.038</td>
<td>.068</td>
<td>.024</td>
<td>.024</td>
<td>-.033</td>
<td>.072</td>
<td>.135</td>
<td>.094</td>
</tr>
<tr>
<td></td>
<td>CA</td>
<td>.086</td>
<td>-.098</td>
<td>-.097</td>
<td>.127</td>
<td>-.034</td>
<td>.034</td>
<td>.083</td>
<td>.051</td>
<td>.081</td>
<td>.079</td>
</tr>
<tr>
<td></td>
<td>AS</td>
<td>-.008</td>
<td>-.025</td>
<td>-.010</td>
<td>.095</td>
<td>.065</td>
<td>.033</td>
<td>.028</td>
<td>.049</td>
<td>.033</td>
<td>.110</td>
</tr>
<tr>
<td></td>
<td>AX</td>
<td>.009</td>
<td>.045</td>
<td>.046</td>
<td>.022</td>
<td>.124</td>
<td>-.038</td>
<td>.036</td>
<td>.052</td>
<td>.099</td>
<td>.050</td>
</tr>
</tbody>
</table>

Note 1: Column headings refer to questions in the Military Social Health Index: Q1=Age; Q4=Gender; Q5=Marital Status; Q6=Duration of Relationship; Q8=Educational Qualification; Q9=Number of Times Married; Q10=Number of Children; Q12=Shoe Size; Q14=Monthly Net Income; Q191=Difficulties Understanding Questionnaire.

### Table 26: Final Construct Validity Class I Predictors

<table>
<thead>
<tr>
<th>SCALE</th>
<th>CULT</th>
<th>Q1</th>
<th>Q4</th>
<th>Q5</th>
<th>Q6</th>
<th>Q8</th>
<th>Q9</th>
<th>Q10</th>
<th>Q12</th>
<th>Q14</th>
<th>Q191</th>
</tr>
</thead>
<tbody>
<tr>
<td>Social Supports</td>
<td>WA</td>
<td>-.009</td>
<td>.065</td>
<td>-.006</td>
<td>.006</td>
<td>.074</td>
<td>-.011</td>
<td>-.040</td>
<td>-.006</td>
<td>.086</td>
<td>.105</td>
</tr>
<tr>
<td></td>
<td>CA</td>
<td>.035</td>
<td>-.003</td>
<td>-.057</td>
<td>.092</td>
<td>-.014</td>
<td>.035</td>
<td>-.003</td>
<td>.054</td>
<td>.081</td>
<td>.026</td>
</tr>
<tr>
<td></td>
<td>AS</td>
<td>.018</td>
<td>-.034</td>
<td>-.015</td>
<td>.087</td>
<td>.056</td>
<td>.069</td>
<td>.052</td>
<td>.067</td>
<td>.063</td>
<td>.060</td>
</tr>
<tr>
<td></td>
<td>AX</td>
<td>-.001</td>
<td>.055</td>
<td>-.025</td>
<td>.079</td>
<td>.080</td>
<td>.022</td>
<td>.040</td>
<td>.059</td>
<td>.053</td>
<td>.031</td>
</tr>
<tr>
<td>Problem Solving</td>
<td>WA</td>
<td>.112</td>
<td>-.018</td>
<td>-.070</td>
<td>.092</td>
<td>.025</td>
<td>.038</td>
<td>.018</td>
<td>.066</td>
<td>.114</td>
<td>.078</td>
</tr>
<tr>
<td></td>
<td>CA</td>
<td>.056</td>
<td>-.102</td>
<td>-.109</td>
<td>.136</td>
<td>-.027</td>
<td>.033</td>
<td>.042</td>
<td>.034</td>
<td>.081</td>
<td>-.001</td>
</tr>
<tr>
<td></td>
<td>AS</td>
<td>-.035</td>
<td>-.095</td>
<td>-.028</td>
<td>.125</td>
<td>.052</td>
<td>-.015</td>
<td>.002</td>
<td>.104</td>
<td>.035</td>
<td>.072</td>
</tr>
<tr>
<td></td>
<td>AX</td>
<td>.059</td>
<td>-.052</td>
<td>.000</td>
<td>.073</td>
<td>.105</td>
<td>.006</td>
<td>.090</td>
<td>.129</td>
<td>.038</td>
<td>.021</td>
</tr>
<tr>
<td>Stressor Appraisal</td>
<td>WA</td>
<td>.049</td>
<td>-.237</td>
<td>.085</td>
<td>-.095</td>
<td>-.124</td>
<td>-.076</td>
<td>-.061</td>
<td>.175</td>
<td>.060</td>
<td>.007</td>
</tr>
<tr>
<td></td>
<td>CA</td>
<td>.076</td>
<td>-.257</td>
<td>-.057</td>
<td>.068</td>
<td>-.137</td>
<td>.016</td>
<td>.093</td>
<td>.169</td>
<td>-.020</td>
<td>.151</td>
</tr>
<tr>
<td></td>
<td>AS</td>
<td>.045</td>
<td>-.152</td>
<td>-.072</td>
<td>.116</td>
<td>-.050</td>
<td>.042</td>
<td>.070</td>
<td>.119</td>
<td>-.006</td>
<td>.051</td>
</tr>
<tr>
<td></td>
<td>AX</td>
<td>.000</td>
<td>-.107</td>
<td>-.025</td>
<td>.084</td>
<td>-.026</td>
<td>.001</td>
<td>.093</td>
<td>.103</td>
<td>-.012</td>
<td>-.003</td>
</tr>
<tr>
<td>GRRs</td>
<td>WA</td>
<td>.110</td>
<td>-.072</td>
<td>-.068</td>
<td>.086</td>
<td>.022</td>
<td>.041</td>
<td>-.026</td>
<td>.067</td>
<td>.110</td>
<td>.099</td>
</tr>
<tr>
<td></td>
<td>CA</td>
<td>.088</td>
<td>-.074</td>
<td>-.100</td>
<td>.119</td>
<td>-.028</td>
<td>.034</td>
<td>.090</td>
<td>.032</td>
<td>.079</td>
<td>.059</td>
</tr>
<tr>
<td></td>
<td>AS</td>
<td>-.023</td>
<td>-.004</td>
<td>.014</td>
<td>.080</td>
<td>.073</td>
<td>.010</td>
<td>.023</td>
<td>.032</td>
<td>.028</td>
<td>.099</td>
</tr>
<tr>
<td></td>
<td>AX</td>
<td>.020</td>
<td>.049</td>
<td>.033</td>
<td>.016</td>
<td>.100</td>
<td>-.044</td>
<td>.032</td>
<td>.036</td>
<td>.073</td>
<td>.048</td>
</tr>
</tbody>
</table>

Note 1: Column headings are the same as for Table 25.
### Table 27: Initial Construct Validity Class II & III Predictors

<table>
<thead>
<tr>
<th>Scale</th>
<th>Culture</th>
<th>Class II Predictors</th>
<th>Class III Predictors</th>
<th>GRRs</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>PROBLEM</td>
<td>PILEUP</td>
<td>W2F</td>
</tr>
<tr>
<td>Social Supports</td>
<td>WA</td>
<td>-.243</td>
<td>-.201</td>
<td>-.207</td>
</tr>
<tr>
<td></td>
<td>CA</td>
<td>-.226</td>
<td>-.131</td>
<td>-.159</td>
</tr>
<tr>
<td></td>
<td>AS</td>
<td>-.221</td>
<td>-.145</td>
<td>-.182</td>
</tr>
<tr>
<td></td>
<td>AX</td>
<td>-.064</td>
<td>-.057</td>
<td>-.086</td>
</tr>
<tr>
<td>Problem Solving</td>
<td>WA</td>
<td>-.350</td>
<td>-.165</td>
<td>-.128</td>
</tr>
<tr>
<td></td>
<td>CA</td>
<td>-.272</td>
<td>-.120</td>
<td>-.185</td>
</tr>
<tr>
<td></td>
<td>AS</td>
<td>-.215</td>
<td>-.127</td>
<td>-.135</td>
</tr>
<tr>
<td></td>
<td>AX</td>
<td>-.068</td>
<td>-.072</td>
<td>-.060</td>
</tr>
<tr>
<td>Stressor Appraisal</td>
<td>WA</td>
<td>-.144</td>
<td>-.122</td>
<td>-.286</td>
</tr>
<tr>
<td></td>
<td>CA</td>
<td>-.121</td>
<td>-.075</td>
<td>-.158</td>
</tr>
<tr>
<td></td>
<td>AS</td>
<td>-.150</td>
<td>-.062</td>
<td>-.172</td>
</tr>
<tr>
<td></td>
<td>AX</td>
<td>-.008</td>
<td>.022</td>
<td>-.092</td>
</tr>
<tr>
<td>GRRs</td>
<td>WA</td>
<td>-.293</td>
<td>-.183</td>
<td>-.169</td>
</tr>
<tr>
<td></td>
<td>CA</td>
<td>-.295</td>
<td>-.147</td>
<td>-.189</td>
</tr>
<tr>
<td></td>
<td>AS</td>
<td>-.241</td>
<td>-.126</td>
<td>-.162</td>
</tr>
<tr>
<td></td>
<td>AX</td>
<td>-.083</td>
<td>-.044</td>
<td>-.042</td>
</tr>
</tbody>
</table>

### Table 28: Final Construct Validity Class II & III Predictors

<table>
<thead>
<tr>
<th>Scale</th>
<th>Culture</th>
<th>Class II Predictors</th>
<th>Class III Predictors</th>
<th>GRRs</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>PROBLEM</td>
<td>PILEUP</td>
<td>W2F</td>
</tr>
<tr>
<td>Social Supports</td>
<td>WA</td>
<td>-.225</td>
<td>-.178</td>
<td>-.187</td>
</tr>
<tr>
<td></td>
<td>CA</td>
<td>-.230</td>
<td>-.158</td>
<td>-.175</td>
</tr>
<tr>
<td></td>
<td>AS</td>
<td>-.235</td>
<td>-.127</td>
<td>-.170</td>
</tr>
<tr>
<td></td>
<td>AX</td>
<td>-.058</td>
<td>-.077</td>
<td>-.059</td>
</tr>
<tr>
<td>Problem Solving</td>
<td>WA</td>
<td>-.370</td>
<td>-.175</td>
<td>-.131</td>
</tr>
<tr>
<td></td>
<td>CA</td>
<td>-.287</td>
<td>-.142</td>
<td>-.200</td>
</tr>
<tr>
<td></td>
<td>AS</td>
<td>-.233</td>
<td>-.104</td>
<td>-.127</td>
</tr>
<tr>
<td></td>
<td>AX</td>
<td>-.102</td>
<td>-.080</td>
<td>-.034</td>
</tr>
<tr>
<td>Stressor Appraisal</td>
<td>WA</td>
<td>-.161</td>
<td>-.104</td>
<td>-.289</td>
</tr>
<tr>
<td></td>
<td>CA</td>
<td>-.153</td>
<td>-.099</td>
<td>-.178</td>
</tr>
<tr>
<td></td>
<td>AS</td>
<td>-.186</td>
<td>-.061</td>
<td>-.150</td>
</tr>
<tr>
<td></td>
<td>AX</td>
<td>-.048</td>
<td>.000</td>
<td>-.127</td>
</tr>
<tr>
<td>GRRs</td>
<td>WA</td>
<td>-.314</td>
<td>-.208</td>
<td>-.149</td>
</tr>
<tr>
<td></td>
<td>CA</td>
<td>-.294</td>
<td>-.134</td>
<td>-.178</td>
</tr>
<tr>
<td></td>
<td>AS</td>
<td>-.245</td>
<td>-.131</td>
<td>-.110</td>
</tr>
<tr>
<td></td>
<td>AX</td>
<td>-.126</td>
<td>-.095</td>
<td>-.017</td>
</tr>
</tbody>
</table>
It can be seen from the above tables that there are ten (in the case of Class I predictors) or three (in the case of Classes II and III predictors) raw correlations per scale. The means of these correlations are summarised in the table below, and then averaged across cultures. The absolute values of the correlations were used in these calculations.

**TABLE 29: SUMMARY OF CONSTRUCT VALIDITY AT SCALE LEVEL**

<table>
<thead>
<tr>
<th>SCALE</th>
<th>CULTURE</th>
<th>CLASS I</th>
<th></th>
<th>CLASS II</th>
<th></th>
<th>CLASS III</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>INITIAL</td>
<td>FINAL</td>
<td>INITIAL</td>
<td>FINAL</td>
<td>INITIAL</td>
<td>FINAL</td>
</tr>
<tr>
<td>Social Supports</td>
<td>WA</td>
<td>.038</td>
<td>.041</td>
<td>.217</td>
<td>.197</td>
<td>.485</td>
<td>.447</td>
</tr>
<tr>
<td></td>
<td>CA</td>
<td>.039</td>
<td>.040</td>
<td>.172</td>
<td>.188</td>
<td>.568</td>
<td>.539</td>
</tr>
<tr>
<td></td>
<td>AS</td>
<td>.048</td>
<td>.052</td>
<td>.182</td>
<td>.177</td>
<td>.674</td>
<td>.636</td>
</tr>
<tr>
<td></td>
<td>AX</td>
<td>.046</td>
<td>.045</td>
<td>.069</td>
<td>.065</td>
<td>.608</td>
<td>.569</td>
</tr>
<tr>
<td></td>
<td>Mean</td>
<td>.043</td>
<td>.045</td>
<td>.160</td>
<td>.157</td>
<td>.584</td>
<td>.548</td>
</tr>
<tr>
<td>Problem Solving</td>
<td>WA</td>
<td>.071</td>
<td>.063</td>
<td>.214</td>
<td>.225</td>
<td>.552</td>
<td>.529</td>
</tr>
<tr>
<td></td>
<td>CA</td>
<td>.073</td>
<td>.062</td>
<td>.193</td>
<td>.209</td>
<td>.636</td>
<td>.614</td>
</tr>
<tr>
<td></td>
<td>AS</td>
<td>.057</td>
<td>.056</td>
<td>.159</td>
<td>.155</td>
<td>.717</td>
<td>.683</td>
</tr>
<tr>
<td></td>
<td>AX</td>
<td>.053</td>
<td>.057</td>
<td>.066</td>
<td>.072</td>
<td>.669</td>
<td>.632</td>
</tr>
<tr>
<td></td>
<td>Mean</td>
<td>.064</td>
<td>.060</td>
<td>.158</td>
<td>.165</td>
<td>.644</td>
<td>.615</td>
</tr>
<tr>
<td>Stressor Appraisal</td>
<td>WA</td>
<td>.099</td>
<td>.097</td>
<td>.184</td>
<td>.184</td>
<td>.368</td>
<td>.319</td>
</tr>
<tr>
<td></td>
<td>CA</td>
<td>.115</td>
<td>.104</td>
<td>.118</td>
<td>.143</td>
<td>.541</td>
<td>.515</td>
</tr>
<tr>
<td></td>
<td>AS</td>
<td>.071</td>
<td>.072</td>
<td>.128</td>
<td>.132</td>
<td>.629</td>
<td>.565</td>
</tr>
<tr>
<td></td>
<td>AX</td>
<td>.057</td>
<td>.045</td>
<td>.041</td>
<td>.059</td>
<td>.590</td>
<td>.525</td>
</tr>
<tr>
<td></td>
<td>Mean</td>
<td>.086</td>
<td>.080</td>
<td>.118</td>
<td>.130</td>
<td>.532</td>
<td>.481</td>
</tr>
<tr>
<td>GRRs</td>
<td>WA</td>
<td>.067</td>
<td>.070</td>
<td>.215</td>
<td>.223</td>
<td>.552</td>
<td>.509</td>
</tr>
<tr>
<td></td>
<td>CA</td>
<td>.077</td>
<td>.070</td>
<td>.210</td>
<td>.202</td>
<td>.629</td>
<td>.583</td>
</tr>
<tr>
<td></td>
<td>AS</td>
<td>.046</td>
<td>.039</td>
<td>.176</td>
<td>.162</td>
<td>.698</td>
<td>.645</td>
</tr>
<tr>
<td></td>
<td>AX</td>
<td>.052</td>
<td>.045</td>
<td>.056</td>
<td>.080</td>
<td>.680</td>
<td>.605</td>
</tr>
<tr>
<td></td>
<td>Mean</td>
<td>.061</td>
<td>.056</td>
<td>.164</td>
<td>.167</td>
<td>.640</td>
<td>.586</td>
</tr>
<tr>
<td></td>
<td>Total Mean</td>
<td>.063</td>
<td>.060</td>
<td>.150</td>
<td>.155</td>
<td>.600</td>
<td>.557</td>
</tr>
</tbody>
</table>

In most instances, the three hypotheses are confirmed.

- The Class I correlations are all, with the exception of the Coloured culture on Stressor Appraisal, below .10. Overall, the Class I correlations are .06.

- With the exception of the African Xhosa culture (whose correlations are all below .10), the Class II correlations all lie between .10 and .30. Overall, the Class II correlations are .16.
The Class III correlations are all above .40, except for a handful of correlations between Stressor Appraisal and GRRs (in the .32 range), as predicted. Most of the Class III correlations are below .70, except for a handful between GRRs and Problem Solving, as predicted, and one between Social Supports and Problem Solving (which was not anticipated). Overall, the Class III correlations are .56.

Overall, therefore, the Military Social Health Index demonstrates excellent construct validity at scale level, with all hypotheses being supported by evidence.

7.6.2 Step 28: Conduct Known Groups Scale-Level Analysis

Known groups validity, a subset of concurrent criterion validity, provides an important perspective on the performance of a scale, by linking the scale’s performance with ‘objective reality’. In this study, participants were allocated to a known group by a social worker, based on the social worker’s judgment as to whether the participant did or did not have a significant strength regarding the constructs being measured. It was expected that the Military Social Health Index should successfully discriminate between these two groups.

The Military Social Health Index was distributed by 108 social workers throughout the country, as described in Steps 16 and 18. Social workers were requested to collect data from casework clients whom the social worker had already assessed. In addition to the client completing the questionnaire, the social worker was requested to complete a section of the questionnaire. She was asked the following four questions, in response to which she could answer ‘Yes’, ‘Unsure’ or ‘No’ (See Appendix D):

- In your professional opinion, does this client/family have access to high quality and sufficient social support?
- In your professional opinion, does this client/family demonstrate good problem solving ability?
- In your professional opinion, does this client/family demonstrate positive stressor appraisal?
- In your professional opinion, does this client/family demonstrate a variety of generalised resistance resources?

All social workers have been trained in the Resilience Model for Social Health that was presented in Chapter 4. They use the Model during the biannual Concurrent Health Assessments, for which the Military Social Health Index is being developed. However, there has been some concern regarding their actual competence to understand and apply the model, as well as to conduct assessments and draw reliable conclusions (Van Breda, 2002b). Notwithstanding this concern, however, social workers in the SANDF should be au fait with the Resilience Model and thus able to answer these four questions accurately.
These questions differ from those typically asked in known groups validity, since they focus on strength rather than pathology. This is in keeping with the resilience orientation of the Military Social Health Index, as detailed in Chapter 4. The concern of the instrument is not so much to determine whether people have problems in these areas, but rather whether or not they have assets in these areas. The absence of a strength does not necessarily mean there is a problem. However, the absence of an asset does mean that the soldier and family are unable to draw on that resource to assist them in coping during the stress of deployment, which makes them more vulnerable to social unhealth. For ease of interpretation, people who were classified as having a strength (a ‘Yes’ answer) are referred to as the ‘nonclinical’ group, while those who were classified as not having a strength (a ‘No’ answer) are referred to as the ‘clinical’ group. People about whom the social worker was unsure were not used in the analyses.

In total, 951 casework clients participated in the study, including 114 White Afrikaans, 122 Coloured Afrikaans, 158 African Setswana and 132 African Xhosa respondents. Given the very small numbers of respondents in each of the four target cultures, it was decided to also analyze the complete data set. There is a very high risk of sampling error and spurious results owing to the small sample sizes among specific cultures. The cultural analyses will thus be interpreted as subordinate to the total sample results.

Table 30 on the following page provides a description of the clinical and nonclinical groups, both before and after the omission of poorly performing items. It will be seen that the sample sizes remain the same from the initial to final columns – this is because the sample size is determined by the social workers’ judgements and not by the scale. The means and standard deviations, however, do differ from initial to final.
### Table 30: Description of Criterion Groups

<table>
<thead>
<tr>
<th>Scale</th>
<th>Culture</th>
<th>Initial</th>
<th>Nonclinical</th>
<th>Clinical</th>
<th>Final</th>
<th>Nonclinical</th>
<th>Clinical</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>N</td>
<td>MEAN</td>
<td>SD</td>
<td>N</td>
<td>MEAN</td>
<td>SD</td>
</tr>
<tr>
<td>Social Supports</td>
<td>WA</td>
<td>59</td>
<td>75.3</td>
<td>16.8</td>
<td>27</td>
<td>65.1</td>
<td>21.4</td>
</tr>
<tr>
<td></td>
<td>CA</td>
<td>78</td>
<td>73.3</td>
<td>15.1</td>
<td>27</td>
<td>68.4</td>
<td>14.1</td>
</tr>
<tr>
<td></td>
<td>AS</td>
<td>102</td>
<td>72.8</td>
<td>13.8</td>
<td>40</td>
<td>67.7</td>
<td>13.6</td>
</tr>
<tr>
<td></td>
<td>AX</td>
<td>82</td>
<td>71.1</td>
<td>13.4</td>
<td>37</td>
<td>64.9</td>
<td>15.8</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>591</td>
<td>72.3</td>
<td>15.2</td>
<td>226</td>
<td>64.6</td>
<td>18.7</td>
</tr>
<tr>
<td>Problem Solving</td>
<td>WA</td>
<td>51</td>
<td>73.6</td>
<td>18.3</td>
<td>34</td>
<td>67.7</td>
<td>17.8</td>
</tr>
<tr>
<td></td>
<td>CA</td>
<td>71</td>
<td>71.6</td>
<td>15.2</td>
<td>36</td>
<td>69.3</td>
<td>18.7</td>
</tr>
<tr>
<td></td>
<td>AS</td>
<td>98</td>
<td>73.9</td>
<td>13.3</td>
<td>45</td>
<td>67.9</td>
<td>18.6</td>
</tr>
<tr>
<td></td>
<td>AX</td>
<td>75</td>
<td>70.4</td>
<td>15.1</td>
<td>44</td>
<td>62.0</td>
<td>21.6</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>538</td>
<td>72.7</td>
<td>15.3</td>
<td>282</td>
<td>64.2</td>
<td>20.5</td>
</tr>
<tr>
<td>Stressor Appraisal</td>
<td>WA</td>
<td>56</td>
<td>68.2</td>
<td>13.7</td>
<td>33</td>
<td>57.7</td>
<td>19.4</td>
</tr>
<tr>
<td></td>
<td>CA</td>
<td>77</td>
<td>72.8</td>
<td>14.5</td>
<td>22</td>
<td>64.2</td>
<td>19.4</td>
</tr>
<tr>
<td></td>
<td>AS</td>
<td>97</td>
<td>72.7</td>
<td>11.1</td>
<td>45</td>
<td>67.1</td>
<td>15.7</td>
</tr>
<tr>
<td></td>
<td>AX</td>
<td>76</td>
<td>68.7</td>
<td>15.3</td>
<td>44</td>
<td>63.7</td>
<td>19.1</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>567</td>
<td>70.0</td>
<td>14.3</td>
<td>259</td>
<td>59.9</td>
<td>19.3</td>
</tr>
<tr>
<td>GRRs</td>
<td>WA</td>
<td>55</td>
<td>78.1</td>
<td>11.7</td>
<td>34</td>
<td>72.0</td>
<td>13.5</td>
</tr>
<tr>
<td></td>
<td>CA</td>
<td>72</td>
<td>78.8</td>
<td>13.3</td>
<td>34</td>
<td>70.6</td>
<td>13.6</td>
</tr>
<tr>
<td></td>
<td>AS</td>
<td>109</td>
<td>77.5</td>
<td>9.7</td>
<td>38</td>
<td>72.0</td>
<td>16.5</td>
</tr>
<tr>
<td></td>
<td>AX</td>
<td>74</td>
<td>74.7</td>
<td>13.2</td>
<td>36</td>
<td>68.0</td>
<td>18.1</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>558</td>
<td>76.3</td>
<td>12.8</td>
<td>257</td>
<td>68.5</td>
<td>17.6</td>
</tr>
</tbody>
</table>

**Note 1:** ‘Total’ is based on total available casework data, incorporating the four indicated cultures, together with non-target culture groups.

**Note 2:** ‘Clinical’ refers to the social worker’s judgement that the client does not have a significant strength with that construct.

Data were subjected to an Analysis of Variance (ANOVA), with scale score as dependent variable and group membership as independent variable, to compare the differences in mean scores between the clinical and nonclinical groups for each scale. The point-biserial correlation between scale score and group membership was also computed, and then squared to provide an indication of the proportion of variance in the criterion groups accounted for by the scale scores. The results of these analyses, before and after the removal of poorly performing items, are provided in Table 31 on the following page.
The above table indicates that the known groups validity data is extremely weak. In the culture group analyses, only three of the 16 \( F \) scores for the final scale are significant at \( p < .01 \) (two in Stressor Appraisal and one in GRRs). This indicates that at the level of culture groups, there are very few significant differences in mean scores on the scale between clinical and nonclinical groups. These findings may, however, be spurious due to the very small sample sizes, which in fact require nonparametric statistics. The \( F \) scores for the total sample, however, performed better, with all being significant at \( p < .01 \). Overall, the mean \( F \) scores dropped slightly from initial (14.1) to final (13.2), indicating that some of the items that were eliminated from the Military Social Health Index were those that discriminated better between the known groups.

The point-biserial correlations, which serve as coefficients of known groups validity, were extremely low for the four culture groups – ranging from .05 to .33, with a mean of .19 – none met or exceeded the .60 standard described in Chapter 3. In contrast with the \( F \) scores, which were better for the total sample than the cultural samples, the mean correlation for the total
sample had a mean of .19 – identical to the mean of the culture groups. Again, none of these correlations met the .60 standard. There was a slight drop in the mean correlation from initial (.20) to final (.19), again indicating that some of the items that were omitted were better discriminators.

The squared point-biserial correlations indicate that the Military Social Health Index accounts for only about 4% of the variance in group membership.

Using the procedures to compare pairs of reliability coefficients across cultures (see Step 23), it was found that there were no significant differences in the pairs of validity coefficients. This indicates that the validity coefficients are equivalent across the four cultures.

Scalar equivalence was evaluated using the procedures described in Step 28 of Chapter 3. Taking each scale sequentially, first the clinical then the nonclinical groups were selected for analysis. A one-way ANOVA was conducted with the scale being evaluated as the dependent variable and culture as the independent variable. All resultant $F$ scores were nonsignificant at $p<.01$ – indeed, none were significant at even $p<.10$. This finding provides initial evidence of scalar equivalence across cultures (Butcher & Han, 1996).

Overall, the Military Social Health Index demonstrates very weak known groups validity. This is of great concern, given that the instrument is intended for clinical use. It is possible, perhaps even likely, that there is a problem with the social workers’ assessments. Social workers may be better at assessing pathology, and may have had difficulty assessing client assets. It is possible that they did not conduct an adequate clinical assessment of client assets and that their judgement, as recorded on the Military Social Health Index, was based on assumptions and not on clinical evidence.

However, the scales do appear to be performing equivalently, albeit equally poorly, across cultures; this despite the large percentage of items that were culturally biased. This finding seems to suggest that Military Social Health Index is performing well across cultures.

Certainly, a great deal of further exploration will be required to understand the dynamics of known groups validity.

### 7.6.3 Step 29: Conclude Multicultural Scale-Level Analysis

This main moment has yielded chequered results. On the one hand, the Military Social Health Index has demonstrated excellent construct validity at scale level, comparable with the high levels of construct validity at item level. Furthermore, the scale provides initial evidence of scalar equivalence, something that is highly difficult to achieve (Butcher & Han, 1996, p. 48; Van De Vijver & Leung, 1997, p. 145).

However, the scale demonstrates very poor levels of known groups validity. Hudson (1982) points out that this form of validity in fact taps into two sources of error – both the scale and the
judgements of social workers – but attributes both to the scale. It is impossible, using the available data, to determine what proportion of the poor criterion validity should be attributed to the instrument itself. While it is possible that the bulk could be attributed to the judgements of social workers, this cannot be determined here. Notwithstanding this caveat, however, given the very strong performance of the scale (ito reliability, SEM, factorial validity and construct validity), it seems curious that the scale should be primarily responsible for the very poor known groups validity. It seems likely, though perhaps naively optimistic, to consider that a substantial portion of the error lies with the judgements of social workers.

Clearly, further research in this regard is required. One possibility may be to obtain clinical data from social workers who are known to be highly competent in assessment and in the Resilience Model of Social Health, and to ensure that they collect data only from clients who have been thoroughly assessed according to the model. A related option may be to compare the known groups validity coefficients between such social workers and other social workers who are less familiar with the Resilience Model.

Alternatively, one could incorporate the judgements of the clients together with those of the social workers, as Hudson (1982) suggests. This procedure tends to reduce the rates of false positives and negatives.

Finally, one could augment the known groups component of concurrent criterion validity with concurrent instrument validity. Here one would correlate the Military Social Health Index scales with other scales measuring similar constructs. One would anticipate high correlations with the comparable scales and low correlations with the other scales, providing evidence that the Military Social Health Index scales are in fact measuring the four constructs they were designed to measure. Unfortunately, this would not provide clinical cutting scores, which is the subject of the next main moment.

### 7.7 MAIN MOMENT K: ESTABLISH CLINICAL CUTTING SCORES

#### 7.7.1 ESTABLISH CLINICAL CUTTING SCORES

The poor known groups validity findings mitigate against identifying accurate clinical cutting scores. Nevertheless, the Military Social Health Index will probably be used in the clinical field, during which time further evidence will be collected to investigate known groups validity. Cutting scores will be necessary to assist in the utilisation of the instrument. Determining the percentage of false positives and negatives will be especially important, since it can be expected that there will be a much higher percentage of incorrect classifications by the Military Social Health Index than had been hoped for.

The discriminant analysis procedures described in the Chapter 3 were followed, with the scale score being entered as the sole discriminator (independent variable) and known group as dependent or grouping variable (as before, the ‘Unsure’ responses were omitted from the...
analyses). The mean between the maximum score for the clinical group and the minimum score for the nonclinical group was identified as the cutting score. A cross tabulation of predicted group membership and actual group membership was used to determine the percentage of correctly classified participants, as well as the percentage of false positives and negatives. The SEMs for the four culture groups, as presented in step 24, were used to determine cutting score ranges. For the total casework sample, new SEMs were calculated³.

As in the known groups validity assessments, the total casework sample is used as the primary source of cutting scores, ranges and classification rates, since the sample sizes for the four culture groups are extremely small. The table below provides the results of these investigations.

**TABLE 32: SUMMARY OF CLINICAL CUTTING SCORES**

<table>
<thead>
<tr>
<th>SCALE</th>
<th>CULTURE</th>
<th>SAMPLES</th>
<th>CLASSIFICATION</th>
<th>RANGE</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>CULT</td>
<td>CUT</td>
<td>% CORR</td>
<td>FALSE POS</td>
</tr>
<tr>
<td>Social</td>
<td>NONC</td>
<td>70.54</td>
<td>67.40</td>
<td>16.95</td>
</tr>
<tr>
<td>Supports</td>
<td>CLIN</td>
<td>56.20</td>
<td>42.31</td>
<td>48.15</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>68.75</td>
<td>63.30</td>
<td>30.63</td>
</tr>
<tr>
<td>Problem</td>
<td>NONC</td>
<td>72.26</td>
<td>56.50</td>
<td>31.37</td>
</tr>
<tr>
<td>Solving</td>
<td>CLIN</td>
<td>71.28</td>
<td>52.30</td>
<td>40.85</td>
</tr>
<tr>
<td></td>
<td>AS</td>
<td>72.32</td>
<td>65.00</td>
<td>23.47</td>
</tr>
<tr>
<td></td>
<td>AX</td>
<td>68.75</td>
<td>63.90</td>
<td>21.33</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>69.44</td>
<td>64.00</td>
<td>24.54</td>
</tr>
<tr>
<td>Stressor</td>
<td>NONC</td>
<td>62.50</td>
<td>68.50</td>
<td>25.00</td>
</tr>
<tr>
<td>Appraisal</td>
<td>CLIN</td>
<td>68.75</td>
<td>60.60</td>
<td>40.26</td>
</tr>
<tr>
<td></td>
<td>AS</td>
<td>70.54</td>
<td>61.30</td>
<td>32.99</td>
</tr>
<tr>
<td></td>
<td>AX</td>
<td>66.97</td>
<td>62.50</td>
<td>31.58</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>65.73</td>
<td>67.30</td>
<td>28.57</td>
</tr>
<tr>
<td>GRRs</td>
<td>NONC</td>
<td>74.11</td>
<td>64.00</td>
<td>23.64</td>
</tr>
<tr>
<td></td>
<td>CLIN</td>
<td>75.90</td>
<td>60.40</td>
<td>40.28</td>
</tr>
<tr>
<td></td>
<td>AS</td>
<td>77.68</td>
<td>52.40</td>
<td>48.62</td>
</tr>
<tr>
<td></td>
<td>AX</td>
<td>74.11</td>
<td>60.90</td>
<td>27.73</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>74.11</td>
<td>65.20</td>
<td>27.42</td>
</tr>
</tbody>
</table>

Note 1: "Total" is based on total available casework data, incorporating the four indicated cultures, together with non-target culture groups.

³ Alphas for total casework sample for the four scales (in usual order) were: .9274; .9588; .9229; and .9520. Variances for the four scales were: 299; 373; 352; and 322.
From the above table it can be seen that the cutting scores for the total sample range from 66 to 74, and from 63 to 78 for the four culture groups. On average, 65% of respondents (in the total sample) were correctly classified using these cutting scores, 28% of nonclinical participants were incorrectly classified as clinical (false positives), and 51% of clinical participants were incorrectly classified as nonclinical (false negatives). This represents an extremely high failure rate – indeed, for clients who are considered to not be resilient, the *Military Social Health Index*’s success rate was equivalent to flipping a coin.

Cutting score ranges become increasingly important given this high failure rate. A range could help to reduce the failure rates outside of the score range. One SEM was subtracted from and added to each cutting score to create a cutting score range. The cutting scores of the four culture groups were compared with the cutting score range of the total sample, with the following results:

- **Social Supports.** The cutting scores for the culture groups range from 68.8 to 72.3, all of which fall within the total sample cutting score range of 64.1 to 73.4.

- **Problem Solving.** The cutting scores for the culture groups range from 68.8 to 72.3, all of which fall within the total sample cutting score range of 65.5 to 73.4.

- **Stressor Appraisal.** The cutting scores for the culture groups range from 62.5 to 70.5, all of which fall within the total sample cutting score range of 60.5 to 70.9.

- **GRRs.** The cutting scores for the culture groups range from 74.1 to 77.7, all of which fall within the total sample cutting score range of 70.2 to 78.0.

It thus appears that the *Military Social Health Index* demonstrates scalar equivalence, with all cultural cutting scores falling within the cutting score ranges of the combined sample. The cutting scores and ranges of the combined sample can thus be used with confidence across cultures.

In order to evaluate the effect of the cutting score ranges on the classification rates, three groups were calculated based on scale scores: Scores below the lower cutting range (hypothesized to be mostly clinical), scores within the cutting range (hypothesized to have both clinical and nonclinical respondents) and scores above the upper cutting range (hypothesized to be mostly nonclinical). The procedures for calculating false positives and negatives could not be applied here, since approximately a quarter of the sample fell within the cutting score range. Rather, the percentages of ‘True Clinical’ respondents who fell into each of the three categories were calculated. For comparative purposes, these statistics were also calculated for the original two cutting score categories (predicted clinical and predicted nonclinical)\(^4\). The results of these analyses are presented in Table 33 on the following page.

\(^4\) It is important to not confuse the percentages that follow with the percentages reported in the table above. False Positives and Negatives are calculated as a ratio of known group. The figures
The table above illustrates a very slight improvement in the ability of the Military Social Health Index to predict actual group membership. Using the original cutting scores, an average of 44.5% of respondents who were classified by the scale as being clinical, were in fact clinical. Using the new cutting score range, an average of 49.27% of those classified as clinical by the scale were in fact clinical. By contrast, there was no noticeable improvement in the percentages of those classified by the scale as nonclinical being actually clinical – 24.2 of the original classification versus 24.1 of the new cutting score ranges. Furthermore, a quarter of the respondents (24.9%) fell within the cutting score range and could thus not be classified by the scale as either clinical or nonclinical.

Overall, therefore, the use of cutting score ranges does not appear to have added value to the clinical utilisation of the Military Social Health Index. One can conclude that the instrument does not have useful cutting scores, and that extensive further research is required before one can determine and place any confidence in the cutting scores produced by the instrument.

It could be hoped that the problem lies with the social workers’ clinical assessments, since this would mean that were the social workers to conduct better assessments, more accurate cutting scores could be determined. Conversely, if the problem lay with the social workers’ assessments, the Military Social Health Index could assist social workers conduct more accurate and consistent assessments.

### 7.8 Summary of Chapter

This chapter has reported the results of intensive statistical analysis that has endeavoured to answer the three research questions posed in Step 15. In this summary, evidence towards answering each of these questions will be collated.
7.8.1 **Is the Military Social Health Index reliable for each culture group?**

The answer to this question appears to be, "Yes, the Military Social Health Index is indeed valid for each culture group".

- The instrument demonstrates excellent reliability.
  - The alpha coefficients for all four scales across all four cultures are all above .90.
  - The mean alpha across all scales and cultures is .945.
  - The lowest (weakest) alpha coefficient is .917 (Social Support for African Xhosa respondents).
  - This highest alpha coefficient is .970 (Problem Solving for White Afrikaans respondents).
  - The mean alpha coefficients for the four scales (averaged across cultures) are: .934 for Social Supports; .963 for Problem Solving; .928 for Stressor Appraisal; and .956 for GRRs.

- The instrument demonstrates very good standard error of measurement (SEM).
  - The SEMs for all four scales across all four cultures are all below 5.5.
  - The mean SEM across all scales and cultures is 4.27.
  - The highest (weakest) SEM is 5.47 (Stressor Appraisal for African Xhosa respondents).
  - The lowest SEM is 3.2 (Problem Solving for Coloured Afrikaans respondents).
  - The mean SEMs for the four scales (averaged across cultures) are: 4.72 for Social Supports; 3.60 for Problem Solving; 5.15 for Stressor Appraisal; and 3.60 for GRRs.

These figures reflect very high levels of reliability and low levels of measurement error. It can be concluded that the Military Social Health Index is consistent and reliable.

7.8.2 **Is the Military Social Health Index valid for each culture group?**

The answer to this question appears to be, "Largely yes, except for known groups validity, the Military Social Health Index is valid for each culture group."

- The instrument demonstrates excellent factorial validity:
  - 99.6% of the items correlate more highly with their own scale total than with any other scale total.
All items correlate with their own scale total (after removal of the item-self component) at .45 or higher.

The instrument demonstrated excellent construct validity at item level.

- The mean item-total correlations for all scales across all four cultures are all above .60.
- The average mean item-total correlation across scales and cultures is .728.
- The lowest (weakest) mean item-total correlation is .635 (Social Supports for African Xhosa respondents).
- The highest mean item-total correlation is .820 (Problem Solving for White Afrikaans respondents).
- The average mean item-total correlations for the four scales (averaged across cultures) are: .686 for Social Supports; .791 for Problem Solving; .669 for Stressor Appraisal; and .766 for GRRs.

The instrument demonstrated excellent construct validity (convergent and discriminant) at scale level.

- As predicted, the scales, with the exception of Stressor Appraisal for the Coloured Afrikaans respondents, all correlated with demographic variables (Class I predictors) below .10. The mean Class I correlation, across cultures and scales, is .06.
- As predicted, the scales, with the exception of all scales for the African Xhosa respondents, correlated with vulnerability scales (social problems, pileup of life stressors and work-to-family interference) (Class II predictors) between .10 and .30. The mean Class II correlation, across cultures and scales, is .16.
- As predicted, the most of the scales correlated with each other (Class III predictors) between .40 and .70. Exceptions to this include a handful of correlations between Stressor Appraisal and GRRs (in the .32 range) as predicted, a handful of correlations between GRRs and Problem Solving (in the .70 range) as predicted, and one between Social Supports and Problem Solving (.733) which was not expected. The mean Class III correlation, across cultures and scales, is .56.

The instrument demonstrated very poor known groups validity in all instances.

- The mean coefficient of known groups validity was .19.
- The highest coefficient of known groups validity was .23.
The mean percentage of variance in known groups accounted for by the instrument was 4%.

Cutting scores had, on average, a successful categorisation rate of 65%, with 28% false positives and 51% false negatives.

These figures reflect very high levels of factorial and construct validity at both item and scale levels. Known groups validity is extremely poor, which could possibly be attributed, at least in part, to the adequacy of the criterion. It can be concluded that the Military Social Health Index is largely valid. Further research into known groups validity is imperative.

7.8.3 **Is the Military Social Health Index reliable and valid across target culture groups?**

The answer to this question appears to be, "Yes, the instrument appears to be largely reliable and valid across cultures, and can be regarded as largely culturally equivalent."

- The instrument demonstrates poor levels of item bias.
  - Just over half (54%) of the items are culturally biased, with Stressor Appraisal showing the highest percentage of biased items (64%) and GRRs the lowest (43%).

- The instrument demonstrates reasonable levels of equivalence of reliability across cultures.
  - The alpha coefficients for the different cultures (averaged across the four scales) are: .950 for White Afrikaans; .950 for Coloured Afrikaans; .945 for African Setswana; and .937 for African Xhosa.
  - Two thirds (67%) of the reliability coefficients are equivalent across cultures.
  - Stressor Appraisal demonstrates complete equivalence of reliability across cultures.
  - Problem Solving demonstrates the poorest equivalence of reliability across cultures (only in one third of comparisons).
  - The SEMs for the different cultures (averaged across the four scales) are: 4.16 for White Afrikaans; 3.93 for Coloured Afrikaans; 4.41 for African Setswana; and 4.56 for African Xhosa.

- The instrument demonstrates very good equivalence of construct validity across cultures.
  - The average mean item-total correlations for the different cultures (averaged across the four scales) are: .742 for White Afrikaans; .746 for Coloured Afrikaans; .726 for African Setswana; and .698 for African Xhosa.
The majority (83%) of the item-level construct validity coefficients demonstrated equivalence across cultures. Stressor Appraisal and GRRs demonstrated complete equivalence of validity across cultures.

The instrument demonstrates equivalence of known groups validity across cultures.

All known groups validity coefficients demonstrated equivalence across cultures.

The instrument demonstrates excellent levels of scalar equivalence.

ANOVAs conducted separately on clinical and nonclinical groups, comparing scale scores across cultures, were all nonsignificant.

All culture group cutting scores fell within the cutting score ranges (cutting score ± 1SEM) of the total casework sample, so that the same cutting scores can be used across cultures.

Despite a large percentage of biased items, the remainder of the figures reflect very good levels of equivalence across cultures. In particular, the finding of scalar equivalence (which may need to be revised if new known groups data are obtained) indicates that the instrument is performing similarly across cultures. It can be concluded that the Military Social Health Index is largely valid and reliable across cultures.

7.9 IN THE FOLLOWING CHAPTER

The four phases of scale development to date are relatively private processes – they involve reading, talking, creating and analysing. The fifth and final phase of scale development is public and active – it involves taking what has been created and placing it out into the world where it can be used. The final phase, Diffusion and Adoption, comprises two steps, viz to write a manual to equip users of the Military Social Health Index with sufficient knowledge to reliably and responsibly use the instrument, and to publish an article on the instrument in order to place the product in the permanent archive of professional developments. These will both be briefly discussed in the following chapter.
CHAPTER EIGHT: DIFFUSION & ADOPTION PHASE

8.1 INTRODUCTION TO THE DIFFUSION & ADOPTION PHASE

8.1.1 CHAPTER OVERVIEW

This chapter presents the processes and results of the fifth and final phase of the multicultural ecometric scale development process, viz the Diffusion & Adoption Phase. The Diffusion & Adoption Phase involves preparing materials related to the newly validated instrument for distribution to users, as well as the actual distribution of these materials (in paper form as well as through training). The goal of this phase is to ensure that the instrument is adopted for use. This phase is divided into one main moment and two steps (illustrated in Figure 52 below).

FIGURE 52: PROCESS OF MULTICULTURAL ECOMETRIC SCALE DEVELOPMENT

<table>
<thead>
<tr>
<th>PHASES</th>
<th>MAIN MOMENTS</th>
<th>STEPS</th>
</tr>
</thead>
<tbody>
<tr>
<td>DIFFUSION &amp; ADOPTION</td>
<td>DISSEMINATE INFORMATION</td>
<td>31 Write a manual &amp; present training</td>
</tr>
<tr>
<td></td>
<td></td>
<td>32 Write a journal article</td>
</tr>
</tbody>
</table>

Given that this dissertation reports on only a fragment of the complete Military Social Health Index, and since the validation of the instrument is still ongoing, this phase cannot be completed at this time. The sections below will outline the intended actions that will yet be taken in regard to this phase.

8.1.2 WHAT’S NEW IN THIS CHAPTER

This phase is identical to that of Faul (1995). The only change is the title of the phase, which has been changed from ‘Utilisation’ to ‘Diffusion & Adoption’ as part of the broader agenda (described at the end of Chapter 2) to locate the multicultural ecometric scale development model within the developmental research model of Thomas (1984).
8.2 **Main Moment L: Disseminate Information**

Two main modes of dissemination are advocated by Faul (1995), viz:

- dissemination to users and potential users of the instrument (through the preparation of a manual and the presentation of training in the instrument), and
- dissemination to the broader professional community (through publishing academic papers about the instrument).

While the former has the advantage of ensuring that the instrument will be utilised or adopted, and utilised correctly and ethically, the latter has the advantage of placing the instrument into an enduring and international forum, from which it can be accessed across time and space.

8.2.1 **Step 31: Write a Manual & Present Training**

At the time of concluding this dissertation, the Ecometrics Committee of SACSSP was finalising the criteria by which to review and accredit ecometric instruments. A review checklist had been drafted and was in the final stages of approval. Developers would be required to complete the checklist and submit it together with the instrument and an accompanying manual to the Committee for review. The Committee would make a recommendation to the SACSSP regarding the accreditation of the instrument, whereafter it could be used by social workers.

The review checklist requires several aspects to be addressed in the manual:

- **Instrument Design.** This covers issues such as the ecosystemic basis of the instrument, the target group for which it was designed, the rationale for the constructs that are measured, the procedures followed for item generation, reading level, cultural sensitivity, etc.

- **Empirical Evidence.** This addresses issues such as the number of validation studies that have been conducted, the sample characteristics (size, diversity, etc) used for validations, the validation procedures employed, cutting scores, etc.

- **Validity.** This addresses the procedures used to determine the validity of the instrument and the results obtained, with specific reference to content validity, construct validity and criterion-referenced validity.

- **Reliability.** This addresses the procedures used to determine the reliability of the instrument, and the results obtained, with specific reference to internal consistency, standard error of measurement, intercultural reliability, etc.

- **Administration.** This addresses the procedures for administration, scoring and interpretation of the instrument.
The process of writing the manual for the Military Social Health Index is well under way. However, two important components of the instrument have yet to be completed (described below). It is envisaged that these will both be completed by the end of 2004, and that the final instrument and manual will be submitted to the Ecometrics Committee in early 2005.

It is envisaged that training will be provided by the developers to all military social workers on a decentralised basis, and that the training will address:

- The resilience model, on which the instrument is based.
- Clinical assessment processes, within the framework of the resilience model, utilising a clinical assessment tool that the candidate and his colleagues have developed.
- The design, development and validation of the Military Social Health Index.
- The administration, scoring and interpretation of the Military Social Health Index.

### 8.2.2 Step 32: Write a Journal Article

The second step in Diffusion and Adoption is the publication of academic papers on the Military Social Health Index. For the reasons given above, this is not currently possible. A number of papers are, however, under consideration:

- A straightforward validation article on the Military Social Health Index, in which the scale is introduced and its reliability and validity are presented. Suitable journals for such a paper could include Social Work Research, a US-based journal addressing empirical research in social work.

- An article on resilience-based assessments, drawing on both the Military Social Health Index and the clinical assessment tool that the candidate has developed outside of the scope of this dissertation. Suitable journals for such a paper could include Social Work / Maatskaplike Werk, a South African journal.

- An article on multicultural assessment using ecometric instruments, in which the issues of developing multilingual/multicultural standardised measurement tools is explored within the emic-etic framework. Suitable journals for such a paper could include Social Work Research Practitioner, a RAU journal.

### 8.3 Future Plans for the Military Social Health Index

Two pieces of research related to the Military Social Health Index are ongoing and must be completed before the instrument can be released for use within the SANDF:

- New data are being collected to determine the known groups validity and cutting scores of the instrument. A group of 30 social workers from four different regions were invited to
participate in the project. They were provided with an intensive five-hour training session in the Resilience Model, assessment techniques and a new clinical assessment tool, based on the Resilience Model, which the candidate and his colleagues developed. Each social worker has been tasked to conduct thorough clinical assessments, to make more valid and empirically based judgements about the social health of their clients, and to collect fresh Military Social Health Index data from these clients. We expect to receive these data later in 2004.

- The candidate and another colleague have developed an additional scale that will be embedded in the Military Social Health Index, called the Impression Management Index (IMI). The IMI is based on extensive reading into impression management, faking and social desirability. It aims to determine the degree to which people completing the Military Social Health Index are inclined to promote an unrealistically positive image of themselves, in order to meet a perceived organisational demand for social health. The instrument was designed and piloted following the same procedures used for the Military Social Health Index. Validation involved two primary aspects:
  - Selecting items that correlated highly with two existing social desirability instruments (concurrent instrument validity).
  - Selecting items that discriminated between three forms of administration of the research package, viz anonymous survey, non-anonymous survey, high stakes data collection (known groups validity).

In addition to the above, a number of ideas are being explored for future research with the Military Social Health Index:

- A new clinical assessment tool has been developed that facilitates a thorough resilience assessment of clients that parallels the Military Social Health Index more closely. Further developmental testing of this is required. So far, the tool looks promising and feedback from social workers who are using has been positive.

- The predictive validity of the Military Social Health Index could be explored, comparing the instrument scores with the actual ability of soldiers and families to cope during deployments.

- The utilisation of the instrument to conduct programme evaluations should be considered. If certain programmes can promote the social health of military families (as defined in the Resilience Model), this will, by definition, improve their ability to cope with deployments. This will allow the instrument to serve a developmental function and not only a screening function.

- Concurrent instrument validity may be explored, in order to assemble further evidence of the instrument’s validity.
Finally, theoretical research could be conducted to gain greater insight into the dynamics of social health, which could lead to enhancements to the Resilience Model, to programme design and perhaps also to the instrument itself.

8.4 In the Following Chapter

This chapter brings to a close the empirical component of this study, in which the process of multicultural ecometric scale development, which was introduced in Chapter 3, was tested in the field. Chapter 4 presented the process and results of the Analysis Phase, Chapter 5 presented the Design Phase, Chapter 6 the Development Phase, Chapter 7 the Evaluation Phase, and Chapter 8 the Diffusion & Adoption Phase. These five chapters served to test how the proposed process model performs in practice, and thus serve as a field testing (development phase) of the process model, as described in the introduction to Chapter 4.

In the following chapter, the process model will be reviewed in light of the experience of this field testing. Shortcomings of the model will be identified, adjustments made if required and suggestions for further development of the process model will be proposed. A number of concluding comments will be made to bring the dissertation to a close.
CHAPTER NINE: CONCLUSIONS & RECOMMENDATIONS

9.1 INTRODUCTION TO THE CHAPTER

Chapters 2 and 3 of this dissertation introduced a proposed model of multicultural ecometric scale development. Chapter 2 emphasised context and conceptual issues pertaining to multicultural ecometric scale development, while Chapter 3 formally introduced and described the proposed process model.

In Chapters 4 to 8, the process model of multicultural scale development was empirically tested in the field. A new scale was designed for use within the military community by the Directorate Social Work. The instrument was designed as multilingual and thus designed for multicultural use. The purpose of this exercise was to examine how the scale development process works in practice, so as to identify potential pitfalls and make final adjustments to the procedures.

As stated in Section 1.4.3, the goal of this dissertation is “to design a process model for the development of social work scales for multicultural use in South Africa.” The development of a scale, using the process model, is, as stated in Section 1.4.4, a secondary objective of the study. The development of a scale is considered an empirical ‘test’ of the process model. The actual resultant scale is subordinate to the opportunity to discover components of the process model that are flawed, particularly challenging, unnecessary, etc.

This chapter, the final chapter of this dissertation, serves to review the process model, in light of the empirical experience documented in Chapters 4 to 8, and conclude the dissertation. This chapter will be structured as follows:

- The multicultural scale development process will be evaluated.
- Recommendations regarding multicultural ecometrics will be made.
- Conclusions will be drawn.
9.2 Evaluation of Multicultural Scale Development Process

The evaluation of the newly tested process of multicultural scale development consists of the fifth and penultimate phase of this research project. It will be conducted in two ways:

- Each phase of the process model will be reviewed in terms of its workability, clarity and efficacy in generating a scale that is valid and reliable both within and across cultures.

- The entire process model will be evaluated using Thomas’ (Thomas, 1984) criteria for assessing human service interventions.

9.2.1 Review of Process Model Phases

This first aspect of evaluation addresses the lessons learned by the candidate during each phase of the scale development process, through the experience of designing the Military Social Health Index.

9.2.1.1 Review of Analysis Phase

This first phase is about establishing the conceptual and theoretical foundation of the scale. All ecometric scales have a strong and explicit theoretical grounding. As with all research, of which scale development within the broader framework of developmental research is one example, scale development must start with the identification and formal statement of a problem followed by a conceptual, theoretical and research-based exploration of the problem.

During the implementation of this phase, by the analysis of the need for the Military Social Health Index, the candidate discovered the following:

- The contracting of the developmental research need with the client is extremely important. This is facilitated through the detailed definition of the innovation requirements. The candidate did, in fact, conduct a detailed determination of the study end results, which paid dividends over the rest of the process. Scale development is a long-term, expensive and demanding process, which taxes the endurance of the social work department(s) that will be involved. The process of negotiating a detailed contract (including all aspects of Main Moment A: Identify Problem) was found to be helpful in sustaining the process into the future.

- A thorough literature review was found to be helpful for the success of Main Moment B: Formulate Theory. The theory formed a strong foundation from which to design the
instrument, and yielded the content of virtually all items. It later also facilitated the integration of the standardised assessment of social health (through the Military Social Health Index) and the clinical assessment (which was developed separately by the candidate). The integrated theoretical framework resulted in an integrated, theoretically-based assessment framework, that will be utilised broadly by all military social workers.

- Determining the cross-cultural comparability of the assessment areas (Step 5) was found to be difficult, as there was little or no literature available for use. The candidate was thus obliged to use a focus group of social workers, in the form of the scale design team, to explore the cross-cultural comparability of the constructs. In reality, this process appeared to work and could perhaps be used as a minimum standard for this step.

- The procedure for identifying facets of each operational assessment area is not adequately articulated in Step 6: Define the constructs to be measured. The candidate in fact used a form of theme identification common to content analysis. The procedures for extracting facets from the literature should be written up more fully into the scale development procedures.

### 9.2.1.2 Review of Design Phase

All developmental research is about designing some kind of new social work technology. Ecometric scales are a prime example of such technology. The design phase of developmental research is about creating the technology, about generating it and placing it into the real world of things. Within this second phase, then, the scale developer writes and refines the questions or items that will comprise the ecometric scale.

During the implementation of this phase, by design of the Military Social Health Index, the candidate discovered the following:

- The sequencing of Step 7: Scale the items and Step 8: Design the items, which was reversed from Faul’s (1995) model, made good sense. The scaling of the items used in the Military Social Health Index had a direct and dramatic impact on the phrasing of the items.

- The multifocus approach to item generation advocated in Step 8: Design the items, proved highly effective. The simultaneous generation of items in multiple languages led to an immediate exclusion of certain items that could not be formulated in all languages. It also led to better wording of items in all languages, due to the benefits of immediate back translation. It was highly efficient, in that the entire process of generating, translating and reviewing 200 items was completed within one week. The candidate repeated this procedure in the development of another instrument, which confirmed this experience. It is likely that this is the appropriate procedure to follow, even if the instrument is intended to be monolingual and not multilingual – ensuring that items can be expressed in multiple languages ensures the equivalence of the items later.
A very practical lesson that was learned through this experience is that the developer should endeavour to use a data projector during the item generation process, so that as items are formulated in multiple languages they can immediately be typed and displayed for the entire group. In this study, members of the development team drafted items on pieces of paper that the candidate typed up in the evenings. Invariably, typing errors were made which were hard to detect because the candidate did not understand all the languages. In a later and separate study, the candidate used a data projector, and found that the error rate was hugely reduced. In addition, the design team was able to see all item translations next to each other, which helped to identify linguistic inequivalence timeously. It was found that fewer changes were made to these items by the linguistic experts than made for the Military Social Health Index items that were developed without the data projector.

9.2.1.3 Review of Development Phase

The development phase of developmental research involves initial testing of the social technology in the field, to determine what works and what doesn’t, and to allow a chance to refine the technology before subjecting it to full-scale evaluation. In ecometric scale development, therefore, this entails initial testing and reviewing of the scale, as well as the establishment of the linguistic equivalence of the scale if it has been translated into multiple languages.

During the implementation of this phase, by development of the Military Social Health Index, the candidate discovered the following:

- Step 12: Obtain expert review of items, needs to be expanded to include a linguistic review by qualified linguists. The candidate obtained such a review only after conducting the linguistic equivalence assessment (Step 14). The linguists made so many changes to the instrument that the equivalence assessment had to be repeated – which was costly and inefficient. The developer could, as an alternative (or addition), consider adding a linguistic expert to the design team that generates the items.

- The linguistic equivalence review (Step 14) is a complex and demanding piece of research, albeit with a relatively small sample. Within the military context, obtaining such data was difficult but possible. In a less structured environment, it may be extremely difficult to obtain the required data. This step should possibly be considered “preferred, but not required” in such studies, provided the developer can demonstrate a highly rigorous process of item design (using the multifocus approach) and expert review of the items by linguists.

9.2.1.4 Review of Evaluation Phase

The evaluation phase of developmental research involves evaluating the effectiveness and adequacy of a new social technology. In the instance of scale development, then, evaluation concerns the testing of the reliability and validity of the scale – that is, judging whether or not the scale is ‘good’.
During the implementation of this phase, by validation of the *Military Social Health Index*, the candidate discovered the following:

- The main difficulty associated with this phase was obtaining sufficient data from each culture group. Despite the large client population served by the Directorate Social Work of the SANDF, and despite a large number of social workers available for data collection, data were hard to obtain and much of the data could not be used because it was obtained from non-target cultures. Further research is needed to determine whether smaller samples per culture group could be used for cross-cultural comparisons, within a prescribed total sample size. For instance, if five cultures are to be targeted, perhaps 100 respondents per culture group, giving a total of 500 respondents, would be sufficient for the validation.

- The validation procedures were time consuming and technically difficult. Nevertheless, the candidate found that the guidelines provided in Chapter 7 were clear and sufficiently detailed to guide the process. It should be remembered that there was an interval of three years between the writing of Chapter 3 (which prescribes the data analysis procedures) and Chapter 7 (which describes the execution of the data analysis procedures). The candidate involved a co-researcher in this process – who has little quantitative research experience – who found the data analysis manageable.

- The poor results obtained from the known groups validity analysis suggests that field workers were inadequately prepared to collect clinical data – a failure of Step 18: Administer the research package to sample. This step should be more detailed regarding what training field workers require to collect reliable and valid clinical data. Known groups validity depends on accurate definitions of known groups, which does not appear to have been achieved in this study. In response to this, the candidate and his colleagues provided a five-hour training programme to four groups of social workers who were tasked to collect fresh known groups validity data. The programme involved teaching the resilience model in more detail and linking the model strongly to a procedure for a clinical assessment based on the resilience model. A clinical assessment tool was designed (using structured questions for each component of the model, a data collection sheet for recording client information, and a logical assessment procedure for converting clinical data into a clinical assessment) and social workers were tasked to use this tool when collecting known groups clinical data. Many of the social workers indicated that this was the first time they really understood what we had expected of them, and said that we should have done this from the start.

- The procedures detailed in Phases one to three appear to have been successful in generating reliability and validity statistics that are, on the whole, acceptable both within and across cultures. It is the candidate’s opinion that the primary step that contributed to this was the multifocus approach used in Step 8, which resulted in items that were fundamentally of a good quality and culturally equivalent.
9.2.1.5 Review of Diffusion & Adoption Phase

This final phase of multicultural ecometric scale development involves diffusing the research and the resultant scale, now validated, to those who will use the scale. It said that poetry is not poetry until someone else has heard it. The same is, no doubt, true of developmental research. The research cannot truly be called research until it has been shared with others who can use the technologies generated by the research.

Scale development research is a long-term and complex process. The validation of the Military Social Health Index has not yet been completed and consequently this phase has not yet been completed. No lessons have been learned from this phase.

9.2.2 Review of the Process Model as a Human Service Intervention

Thomas (1984: 97) developed a framework for appraising human service interventions. Although the process model for developing multicultural scales in social work is not an intervention, but rather a broader social technology, Thomas’ criteria provide a helpful framework for broadly reviewing the process model. The criteria have been slightly adjusted to be applicable to the technology that has been developed. Four criteria, each with several components, are used, viz objective capability, adequacy of scale development procedure, ethical suitability and usability.

9.2.2.1 Objective Capability

“Objective capability refers to the ability of the intervention to accomplish what it was intended to achieve” (Thomas, 1984: 98). The process model for multicultural ecometric scale development was intended to achieve scales with excellent reliability and validity both within and across targeted culture groups. In Section 1.4.3, the research goal of this dissertation was defined as “To design a process model for the development of social work scales for multicultural use in South Africa.” Objective capability thus asks, in this context, “To what extent is the process model effective in generating social work scales for multicultural use in South Africa?”

Thomas’ (1984) delineates two aspects of objective capability:

- **Effectiveness.** Effectiveness addresses the question of whether the process model produces the desired outcome. The evidence provided in Chapter 7 indicates that the Military Social Health Index, which was developed using the process model, demonstrates good to excellent reliability and validity within and across the target cultures. The only exception to this is that of the known groups validity, which is probably a result of invalid clinical data. The primary change that is required to the process model in order to enhance its effectiveness appears to be the need to require better preparation of the social workers who will collect clinical data.

- **Efficiency.** Efficiency addresses the question of whether the process map “can be implemented without excessive effort or investment of time” (Thomas, 1984: 98).
primary area of inefficiency appears to be the large data sets that are required per culture group, as mentioned previously in this chapter. Further research is required to explore the possibility of reducing the required sample sizes, without compromising the effectiveness of the process map.

In summary, the process map for multicultural scale development in social work appears to be largely effective and efficient, with two areas identified as possible ways to enhance the model’s objective capability.

9.2.2.2 Adequacy of Scale Development Procedure

“ Adequacy refers to aspects of the intervention procedure considered as a practical guide to action. An intervention procedure should have a valid basis, and be relatively complete, specific, correct, and behavior guiding” (Thomas, 1984: 98).

- **Validity of the Basis.** The process model for multicultural scale development in social work, as proposed and tested in this dissertation, has a strong theoretical foundation, drawing on ecometrics, psychometrics, cross-cultural research and linguistics. Extensive review of literature pertaining to the topic was consulted and integrated. The empirical evidence derived from the developmental testing of the model, through the creation of the *Military Social Health Index*, suggests that the model has a valid basis.

- **Completeness.** A procedure, such as the procedure for developing a multicultural ecometric scale, can be judged to be complete if “a typically trained reader could replicate the procedure well enough to produce the same results, given only a reading of the description” (Thomas, 1984: 99). Presumably, a “typically trained reader” in this context refers to the “average social worker”. In the candidate’s estimation, all information required to execute the process of multicultural scale development has been included in this dissertation. However, many (even most) social workers probably have insufficient background of quantitative, empirical research to be able to effectively execute the process unsupported. Colleagues of the candidate who have studied the process model found the concepts foreign and difficult to grasp, despite the very detailed information. It is likely that a social worker, who has at least some experience of quantitative research, will be able to execute the procedures as prescribed. Perhaps social workers who received at least some training in ecometrics at university would find the model accessible. Further testing would be required to confirm this.

- **Specificity.** Specificity, closely related to completeness, asks if the procedure denotes “precisely the relevant details involved in the domain of the procedure” (Thomas, 1984: 100). The procedures provided in the multicultural scale development process are highly specific. Theoretical foundational text was separated from the procedural steps. For instance, the theory of reliability is provided separately from the specific steps to be followed in calculating reliability. In this way, the process does not only describe what needs to be done at a
conceptual level, but also provides detailed, step-by-step instructions for how to do what needs to be done.

- **Correctness.** A number of changes to the process map have been proposed, such as the need to provide more detailed information regarding the preparation of social workers collecting clinical data and the issue of review by linguistic experts. Until these changes are incorporated into the process, it cannot be considered correct. These changes are summarised later in this chapter.

- **Behaviour Guiding.** “A procedure is behavior guiding to the extent that the behaviors of its user are consistent with those specified by the procedure” (Thomas, 1984: 101). Given that the procedure has been implemented only once – by the candidate who designed the procedure – the degree to which the process is behaviour guiding cannot as yet be determined. Someone who is unfamiliar with the procedure would need to attempt to implement it, and discrepancies between what was intended and what the naïve user understood should be identified. The degree of discrepancies would indicate the degree to which the procedure is behaviour guiding.

Overall, the process model for multicultural scale development in social work appears to be adequate. However, this is hugely limited by two main factors: firstly, the procedure has only been implemented once and that by the candidate himself; and secondly, the procedure may be too complex for the average social worker.

### 9.2.2.3 Ethical Suitability

“An intervention that is ethically suitable is one that protects the rights of participants on whom it is used” (Thomas, 1984:101). Thomas identifies three important components involved in protecting the rights of participants:

- **Informed Consent.** Participants who provide data by completing the draft questionnaire during the development and evaluation phases should provide informed consent. Although this was, in fact, implemented during the development and validation of the *Military Social Health Index*, it is not written explicitly into the procedure. This will need to be remedied in order to ensure the ethical suitability of the process map.

- **Benefit-Risk Ratio.** The benefits of participating in a scale development study should outweigh any risks. The process map attempts to ensure this by subjecting the instrument to rigorous developmental testing before collecting validation data. The degree to which respondents are exposed to the instrument is graded from the focus groups (Step 13), to the linguistic equivalence assessment (Step 14) and only then to the validation proper (Step 18). Even before respondents are exposed to the instrument, it is reviewed by subject and linguistic experts (Step 12). Although merely completing a questionnaire poses no obvious risks to participants, the process is graded in such a way as to minimize the exposure of people to a poorly formulated instrument.
Confidentiality. During the implementation of the design of the Military Social Health Index, all data were anonymous, thereby ensuring that confidentiality could not be compromised. As with the issue of informed consent, however, this has not been written into the procedure as a guideline (Step 18). This should be remedied.

Overall, while the process of multicultural scale development appears to be ethically suitable, the issues of informed consent and confidentiality/anonymity need to be written explicitly into the procedures for Step 18.

9.2.2.4 Usability

“Usability refers to the extent to which the characteristics of the intervention itself make it likely to be used by the interventionists for whom it is intended. ... Among the factors that relate to usability of an intervention are whether it is relevant, codified, simple, flexible, modular, inexpensive, satisfactory to consumers, sustainable, and socially and technologically compatible. ... Such technology is intended to be relatively easy to implement and is advanced as being more likely to be adopted” (Thomas, 1984: 102).

Relevant. The problem addressed by this process model, viz “How can we develop a scale that can be used with confidence by social workers in multicultural practice?” is highly relevant in South Africa and probably internationally, especially within the social work profession. This was extensively argued in Chapter 1. The relevance of standardised assessment within a multicultural context makes it more likely that this scale development process will be used by other social workers.

Codified. Chapter 3 of this dissertation provides a detailed, codified procedure for developing multiculturally valid ecometric scales, making it more likely to be used by other social workers.

Simple. The procedure for developing any ecometric scale, let alone one that is multiculturally valid, is far from simple – it is probably highly complex. This complexity is likely to result in the process being used by very few social workers. However, the simplification of the process will not yield the desired outcome. Consequently, a very small target group (perhaps only a handful of social workers in South Africa) is likely to adopt this technology.

Flexible. Section 3.2.1 indicated that this dissertation was striving to create a standardised, one-size-fits-all model of multicultural scale development, which would serve as a basic template or default for such procedures. That section also indicated that more experienced users would tailor the process to fit their own needs and styles. As such, the model is flexible, which is likely to increase its utilisation.

Modular. Although the entire process is required to produce a multiculturally valid scale, it is possible for researchers to implement only certain components (or modules) of the process. For instance, using the validation procedures described in the Evaluation Phase, the candidate
has conducted a cross-cultural validation of the Heimler Scale of Social Functioning. The other four phases of the process model were not applicable. This modular approach may increase the usability of the process model.

- **Inexpensive.** This process model is not inexpensive – indeed, it would probably cost hundreds of thousands of rands to have outsourced the development of the *Military Social Health Index*. This is consequently not a process that will be widely used within social work. Methods to reduce the cost of multicultural scale development – such as reducing the number of respondents required per target culture – could increase its usability.

- **Consumer Satisfaction.** Scale development processes do not have the same kind of consumer as intervention processes. However, social workers who were involved in the development of the *Military Social Health Index* have related that the experience was interesting and gratifying. For example, the social workers who made up the design team indicated that the process of generating items was interesting, fun and reconnected them with their home languages. The social worker who worked with the candidate during the validation of the instrument reported finding the process exciting, though tiring and difficult. It appears that the process of creating multicultural scales can be satisfying, which may increase its usability.

- **Sustainable.** Given that the process is expensive, as discussed above, the process model is perhaps not sustainable. However, given the pressing demand for instruments that are multiculturally valid, the model may perhaps prove to be more self-sustaining than simpler monocultural approaches to scale development.

- **Social Compatibility.** This process map is highly compatible with certain segments of the social work community – those who recognise the value of standardised measurement. Within this group, there is a growing recognition that instruments must be multiculturally valid, making this process map highly compatible. There is, however, a large group of social workers who do not value standardised measurement and for whom this model may be incompatible. At least some of these social workers may undervalue standardised measurement due to concerns regarding cultural compatibility. A scale development model that aggressively seeks cultural equivalence may well shift the scales in favour of standardised measurement.

- **Technological Compatibility.** This model of multicultural scale development is highly compatible with the broader technological field of developmental research. Psychologists who address similar problems in the field of psychometrics have also shown interest in the model. It seems, therefore, that the process model is technologically compatible, which is likely to increase its usability.

Overall, the process model is likely to be used increasingly in the South African context, by a small group of social workers. Its cost and complexity are the main detractors from its usability.
9.2.3 **Recommended Adjustments to Process Model**

Based on the above reviews, the following adjustments must be made to the process model described in Chapter 3:

- **Step 5: Explore the cross-cultural comparability of the assessment area(s).** The procedure should include an option for the multicultural design team to review the cross-cultural comparability of the operational assessment areas.

- **Step 6: Define the construct(s) to be measured.** The content analysis procedures used to extract facets from theory should be written into this step.

- **Step 8: Design the items.** The involvement of a linguistic expert as a member of the design team should be recommended.

- **Step 8: Design the items.** The use of a data projector during item generation should be recommended.

- **Step 12: Obtain expert reviews of items.** The inclusion of linguistic experts into the expert review of the instrument should be strongly recommended.

- **Step 16: Select a sample.** Further research should be conducted to determine whether the sample sizes per culture group can be reduced.

- **Step 18: Administer research package to sample.** The importance of training clinicians to conduct accurate clinical assessments of the same constructs as in the instrument that is being validated should be written into this step.

- **Step 18: Administer research package to sample.** The importance of obtaining the informed consent of participants and of assuring them of confidentiality should be prescribed.

- **Overall.** Finally, the degree to which someone other than the candidate can use the process model should be explored.

### 9.3 Achievement of the Research Goal & Objectives

Section 1.4.3 stated that the research goal for this dissertation is as follows:

| To design a process model for the development of social work scales for multicultural use in South Africa. |

The research goal was divided into two key research objectives:

| To design a process model for the development of social work scales for multicultural use in South Africa. |
To test this model in practice, through the development of a multicultural scale that accurately measures the social health of military employees/families.

The question then arises, have these goals and objectives been achieved?

The following evidence has been provided in this dissertation:

- A process model has been designed.
- The model addresses scale development.
- The model is located within the professional paradigm of social work.
- The model addresses the issue of multiculturalism in social work.
- The model is aligned to the sociocultural needs of South African society.
- The model is located within a broader theoretical paradigm, that of developmental research.
- The model draws on a diverse range of theories – ecometrics, psychometrics, cross-cultural theories and language.
- The model extends on an existing and well-tested monocultural model of scale development in social work.
- The model has been tested in the real world.
- The resultant scale has demonstrated good reliability and validity across and within four culture groups.

Overall, then, the conclusion can be reached that the research goal, together with the two research objectives, has been achieved.

9.4 **Recommendations for Multicultural Ecometrics**

Section 9.2.2.4 hinted at the ambivalence within the South African social work community towards the use of standardised scales. Various recent experiences, however, suggest that this attitude may be shifting.

- The formation of the Adhoc Ecometrics Committee by the SACSSP is one clear instance – the SACSSP is instrumental in directing the profession and at a minimum is responsible for regulating professional behaviour. The fact that the SACSSP has instituted a formal
mechanism to regulate and promote ecometrics is an auspicious indicator that the profession is beginning to recognise the importance of standardised measurement.

- Another salient experience took place during and after the presentation of a paper on ecometrics by the candidate and his supervisor at the 2003 Joint Universities Conference (Roestenburg & Van Breda, 2003).

  - Firstly, the candidate was amazed at the number of people who chose to attend the presentation – just before the paper, the venue was almost empty, but during the first few minutes of presenting, the venue became so full that people were sitting on the floor and standing at the back. Given that the JUC primarily attracts academics, this suggests that ecometrics is of interest to the academic community, which takes the lead in determining the training received by forthcoming social workers.

  - Secondly, after the paper, several people indicated to the presenters how much they needed measuring instruments that would be suitable for their practice settings, again indicating the growing felt need for standardised measurement.

Such experiences serve as indicators of a positive shift of attitude towards ecometrics.

Nonetheless, the only existing models of scale development, as taught by the Rand Afrikaans University and as implemented by scale development experts such as Perspective Training College, are built on the premise of monoculturalism. This poses a serious threat to this attitudinal shift towards measurement. Multiculturalism is such a fundamental reality of South African society that any process that is premised on monoculturalism is inconceivable – in Thomas’ (1984) language, such processes lack objective capability, ethical suitability and usability.

This study has aimed to remedy this threat by creating a process model of scale development that is premised on multiculturalism. Although this substantially increases the complexity of the scale development process, it is the candidate’s firm belief that such complexity is an essential component of the sustainability of the model.

Based on the experience of developing the Military Social Health Index, the candidate has concluded that the use of the multifocus approach to item design is perhaps the sin qua non of multicultural scale development. Even if the scale that is to be designed is planned to be monolingual, if it is intended for use in a multicultural context (which is surely true for all scales developed in South Africa), the items in the instrument should certainly be translatable. This would inform the researcher that the items ‘work’ across cultures. If an item cannot be equivalently translated, it is likely that the item will introduce cultural bias, which will undermine the performance of the instrument.

In short, it is the candidate’s contention that the future and sustainability of ecometrics in South Africa is dependent on one primary condition: the degree to which ecometric instruments are and are perceived to be multicultural.
9.5 **DIFFUSION OF THE MULTICULTURAL SCALE DEVELOPMENT MODEL**

The question then arises, how will the model itself be diffused or disseminated, in order that it may be adopted and utilised more broadly. This constitutes the fifth and final phase of this study.

There are a number of possibilities:

- The requirement for ecometric scales to be multiculturally valid has been incorporated into the criteria for instrument review adopted by the Ecometrics Committee of the SACSSP. As such, developers of instruments will be required to address the issue of multiculturalism when they develop new instruments and in validating existing instruments. Currently, the process model introduced in this dissertation is the only integrated model of multicultural scale development available within the discipline of social work.

- The candidate must publish a paper on multicultural scale development itself (ie not on the Military Social Health Index as such), in order to place the process model in the professional community. Similarly, a paper on the topic could be presented at social work conferences locally and internationally. Merely archiving this dissertation in the university library will not be adequate to ensure the adoption of the model by other developers.

- The candidate hopes to undertake multicultural scale development work for other organisations. Through this, it is hoped that the value of standardised measurement in principle, and the use multiculturally valid instruments specifically, will be increasingly perceived by social work agencies in South Africa.

- Training programmes in ecometrics should be advanced. The Ecometrics Committee has, as one of its mandates, the responsibility to advance such training and, where possible, to integrate it into core university curricula. If social workers are, on the whole, more equipped with knowledge and skills to understand and utilise ecometry, it is likely that they will be more able to develop multicultural ecometric instruments. Training in ecometry will thus not only increase the utilisation of ecometry, but also the development of new ecometry.

- Finally, the Ecometrics Committee has introduced the category of 'ecometrist', defined as follows (SACSSP, 2003, p. 5):

  An ecometrist is a social worker who uses (and possibly develops) ecometric instruments. A person who wishes to become an ecometrist will have to adhere to the following conditions:

  - Registered as a social worker with the SACSSP;
- Satisfactorily complete a theoretical and practical module in ecometric assessment at a recognized training institution;

- Obtain a 70% pass mark in the national examination, which must include both theory and practice, as developed by the Ecometrics Committee of the SACSSP; and

- Be registered as an ecometrister with the SACSSP and provide a registration certificate to this effect.

- If the SACSSP requires social workers to register as ecometristers in order to use ecometric instruments, the important of multiculturalism in ecometrics will be a key theme and will results in the broader diffusion and adoption of elements and principles described in this dissertation.

### 9.6 Conclusion

In conclusion, this dissertation the candidate has attempted to address a number of themes:

- The importance of incorporating a cultural perspective into scale development has been aggressively emphasised. The trend within the social work profession towards multiculturalism, together with the changing demographic of our clientele and the culturally diverse profile of social workers, make multiculturalism in scale development inescapable. It has been argued that incorporating a multicultural perspective into scale development is a critical factor in the sustainability of ecometrics in South Africa – without a cultural lens, ecometrics will be seen as serving no valid function.

- A process model for developing a multicultural scale was detailed, based on a number of conceptual and philosophical themes. This model attempts to articulate, in detail, the theory of scale development as well as the action steps required in each phase of the scale development process. The model was located within Thomas’ (1984) Design and Development research model, in order to contextualise the process of scale development within a more generic process of social technology development.

- A new ecometric instrument was developed in order to field test the multicultural scale development model. This instrument, the Military Social Health Index, will be utilised by over 100 military social workers, with several thousand respondents per year, throughout the country. The utilisation of the scale is thus massive and, more importantly, multicultural. The scale was validated and found to be, with the exception of known groups validity, reliable and valid both within and across the four target culture groups.

- The Military Social Health Index was located within the theoretical framework of resilience theory, reflecting the candidate’s commitment to a salutogenic paradigm. This framework emphasises not only the pathologies and failings of human beings and systems, but also the strengths and capabilities of people and systems.
The instrument was strongly focused on measuring the family system, thereby demonstrating a measurement application of the person-in-environment principle of social work.

Finally, the adequacy of the process model of multicultural scale development was reviewed, several changes and further developments were highlighted, and a number of mechanisms to promote the diffusion and adoption of the model were described.

Social workers are mandated to provide a meaningful, relevant and ethical service to the community. One important part of this service is to conduct accurate and responsible assessments. The ecometric instrument is one valuable way to assess client systems. When such systems are multicultural, however, as is typically the case in South Africa, the demands placed on the instrument increase substantially. Unfortunately, most ecometric instruments are not adequate in such settings.

This dissertation has attempted to create a solution to this problem, by designing and testing a model for developing ecometric instruments that can be used in a multicultural environment. The challenge now is to promote the development and use of new, meaningful and relevant multicultural instruments. When the social work profession in South Africa embraces this challenge, we will be able to have confidence that our services have become more comprehensive and ethical. Furthermore, the utilisation of these instruments will equip us to demonstrate the value that social work has in society, to quantify the difference we make and to raise the social health of all communities.
REFERENCES


Antonovsky, A. (1998b). The structure and properties of the Sense of Coherence Scale. In H. I. McCubbin, E. A. Thompson, A. I. Thompson, & J. E. Fromer (Eds.), *Stress, coping, and


Cederblad, M., Dahlin, L., Hagnell, O., & Hansson, K. (1994). Salutogenic childhood factors reported by middle-aged individuals: Follow-up of the children from the Lundby Study grown up in families experiencing three or more childhood psychiatric risk factors. European Archives of Psychiatry and Clinical Neuroscience, 244(1), 1-11.


Van Breda, A. D. (in review). Enhancing an instrument's measurement properties through extending its response range. .


APPENDIXES

Appendix A: Evidence of Content Validity
Appendix B: Item Level Analysis Form
Appendix C: Validation Version of the *Military Social Health Index*
Appendix D: Research Protocol for Validation Study
Appendix E: Data Analysis Log
Appendix F: Factor Matrixes
Appendix G: Integration of Item Analysis
APPENDIX A: EVIDENCE OF CONTENT VALIDITY

How was the domain defined?

- Has the construct to be measured been specified?
- Has the domain of the construct been defined in terms of:
  - What is to be included?
  - What is to be excluded?
- Have the facets of the construct been specified?
- Can the facets be considered to be representative of the totality of the construct?
- Has the construct been located within a credible theoretical framework?
- How specific or broad is the construct?
- How overt or latent is the construct?

Which of the following methods were used to generate the initial item pool?

- Rational deduction.
- Clinical experience.
- Theories relevant to the construct.
- Empirical literature relevant to the construct.
- Other assessment instruments (ie. borrowing).
- Suggestions by experts.
- Suggestions by target populations.

Are the items matched with the facets?

- Is there at least one item per facet?
- Are there multiple items for each facet?
- Is the number of items per facet proportional to the relative weighting or importance of the facet in the construct?
Are the items appropriate samples of each facet?

**Were the items evaluated, in terms of:**

- Association between items and constructs or facets?
- Clarity of questions?
- Relevance?
- Representativeness?

**How were these item evaluations conducted?**

- Single expert reviewers?
- Multiple expert reviewers?
- The scale developer?
- Sample of population?

**What were the results of these evaluations?**
## APPENDIX B: ITEM LEVEL ANALYSIS FORM

<table>
<thead>
<tr>
<th></th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
<th>10</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Item variance low:</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Culture 1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Culture 2</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Culture 3</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Low in all</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Item means far from centre:</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Culture 1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Culture 2</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Culture 3</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Far in all</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Item omitted by 5%:</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Culture 1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Culture 2</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Culture 3</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Omitted in all</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Item-total correlations too low:</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Culture 1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Culture 2</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Culture 3</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Low in all</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Item biased (uniform or nonuniform)</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Reliability will improve if removed:</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Culture 1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Culture 2</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Culture 3</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Improve in all</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Validity will improve if removed:</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Culture 1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Culture 2</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Culture 3</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Improve in all</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Sum of Failures per Item:</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

MULTICULTURAL SCALE DEVELOPMENT IN SOCIAL WORK
Instructions For The Use Of The Item Level Analysis Form

This form is completed during steps 20 to 25 of the multicultural scale development process, and is analysed in step 26. Once the most poorly performing items have been removed, steps 20 to 25 are repeated, the form is completed a second time and analysed a second time in step 26. The process will be completed at least once more, hopefully without further removal of items.

If one item performs poorly across all cultures on a particular category (eg Item variance low), mark each of the cultures as well as the 'low in all' cell, since the item has performed very poorly and should probably be removed.

This form has been designed to evaluate the performance of ten items at item level, across three culture groups.

The form can be adapted for use with more or less culture groups and more or less items. The form can most simply be used by converting it into a spreadsheet.
APPENDIX C: VALIDATION VERSION OF THE MILITARY SOCIAL HEALTH INDEX

The research package (question book and answer sheet) used for the evaluation phase of this study is included on the following pages.
Dear SANDF Member

PARTICIPATION IN MILITARY SOCIAL HEALTH RESEARCH PROJECT

1. **What Is The Project About?** The Directorate Social Work is currently researching the social health of members of the SANDF. We will use this information to provide better services to soldiers and their families. We will also use the information to provide better support to the SANDF in its operational role in Southern Africa.

2. **What Do We Need From You?** You can help us in this study by completing the questionnaire called the *Military Social Health Index*. Your participation will help us greatly in understanding and promoting the social health of all members of the SANDF. It will take 30-60 minutes to complete the questionnaire.

3. We are paying special attention to issues of language and culture in this research project. Some social workers have, therefore, been asked to collect questionnaires from only one language or culture group. In the end, however, we will be collecting a total of about 8 000 questionnaires from all culture and language groups, across the whole country.

4. **Is The Questionnaire Confidential?** The questionnaire is anonymous – you will not write your name or force number anywhere on the questionnaire. We do not want to know who you are.

5. **What If You Are Seeing A Social Worker For Counselling?** If you are seeing a social worker for counselling, the social worker will also complete a part of the questionnaire after you leave. In this section we ask the social worker what she or he thinks about your social health. Although the social worker will know that you completed this questionnaire, once she or he sends the questionnaire to my researchers, no one will know who completed it.

6. **Who Will See The Questionnaire?** The completed questionnaires are sent to my social work researchers at the Military Health Research Centre in Pretoria. Only they will see your questionnaire – no one else will have access to your completed questionnaire. Remember that your name will not appear on the questionnaire.

7. **Is The Study Voluntary?** This research project is voluntary. You can choose to stop completing the questionnaire for any reason. You do not have to provide a reason for not participating in the study. There will be no negative consequences if you do not participate.

8. **Who Can Give Me More Information?** Speak directly to your social worker if you have any questions about the project. If you still have questions about the study, please contact Major Lynette Kleynhans at (012) 319 3262 – she is coordinating the study on my behalf.

(BRIG GEN N.E. MOTUMI)
SURGEON GENERAL: LT GEN
### Military Social Health Index – v 2.0
#### Question Booklet

<table>
<thead>
<tr>
<th>English</th>
<th>Zulu</th>
<th>Afrikaans</th>
<th>Setswana</th>
</tr>
</thead>
<tbody>
<tr>
<td>This questionnaire is provided in four languages: English, Zulu, Afrikaans and Setswana. These are the most common home languages in the SANDF.</td>
<td>Leli phepha lohlelo lemibuzo lubhalwe ngolimi: IweSingisi, IwesiZulu, IwesiBhunu nesiTswana. Lezi yizo izilimi ezijwaynelekile kakhulu kumbutho we-SANDF.</td>
<td>Hierdie vraelys word in vier tale voorsien: Engels, Zoeloe, Afrikaans en Setswana. Hierdie is die algemeneste tale in die SANW.</td>
<td>Dipotsi di kwadiliwe ka diteme tse nne: sejathapi, sezulu, seafrikaans le setswana. Tse, ke dipuo tse di tiwaelesegile ngewe di ka thaloganywa ke bontsi jwa batho.</td>
</tr>
<tr>
<td>This questionnaire measures how you see yourself in your work and family environments. There are no right or wrong answers.</td>
<td>Leli phepha lohlelo lemibuzo lilinganisa ukuthi uzibona kanjani endaweni yakho yomsebenzi nalapho umndeni uhala khona. Ayikho impendulo elungile nengalungile.</td>
<td>Hierdie vraelys meet hoe u uself in u werksomgewing en familieverband sien. Daar is geen rege of verkeerde antwoorde nie.</td>
<td>Dipotsi tse di batla go bona jaaka o ipona kwa tirong le kwa lapeng. Ga gona karabo e e siameng kgotsa e e sa siamang.</td>
</tr>
<tr>
<td>Please answer all questions on the separate Answer Sheet. Mark only one answer per question. To mark your answer, colour in the circle that best reflects your answer. Colour in the circle completely -- do not colour outside the lines of the circle. The numbers next to the circles correspond with the numbers on this questionnaire.</td>
<td>Ngicela uphendule lemibuzo ephepheni elibomyu elisecelele onikwe lona. Nika impendulo eyodwa kumbuzo ngamunye. Ukuphendula umbuzo shikisha indilingiza evezal impendulo yakho kahle. Shikisha ughoselwe indilingiza -- ungashikishi ngaphandle kwendilingilia. Izinombolo ezingaphakathi kwendilingilia zihambisana/qonde nezinombolo ezikuleli phepha lohlelo.</td>
<td>Antwoord asseblief al die vrae op die aparte antwoordblad. Merk selgs een antwoord per vraag. Om u vraag te beantwoord, kleur die sirkel in wat u antwoord die beste pas. Maak seker dat u die volle sirkel inkleur -- moenie buite die lyne van die sirkel inkleur nie. Die nommers langs die sirkels stem ooreen met die nommers op hierdie vraeys.</td>
<td>O kopiwa go araraba dipotsi tsotho mo letlakaleng le le kwadiweng ka boshibidu. Araba ka go tshwaya ka botoho mo sedikong se se maleba. Ntshofatsa sediko sothe – o kopiwa gore o se tshwae ka kwa ntle ga sediko. Dinomoro tse di mo didikong di tsamaelana le dinomoro tse di mo dipotsong.</td>
</tr>
<tr>
<td>English</td>
<td>Zulu</td>
<td>Afrikaans</td>
<td>Setswana</td>
</tr>
<tr>
<td>-----------------------------------------------------------------------</td>
<td>-----------------------------------------------------------------------</td>
<td>--------------------------------------------------------------------------</td>
<td>--------------------------------------------------------------------------</td>
</tr>
<tr>
<td><strong>Biographical Information</strong></td>
<td><strong>Biographical Information</strong></td>
<td><strong>Biografiese Inligting</strong></td>
<td><strong>Biographical Information</strong></td>
</tr>
<tr>
<td>The 15 questions that follow provide information about yourself.</td>
<td>Lemibuzo eyishumi nesihlanu elandelayo inikeza/imininglwane ngawe.</td>
<td>Die 15 vrae wat volg bevat inligting oor u self. Lees asseblief die vrae versigtig deur en beantwoord dit op die antwoordblad.</td>
<td>Dipotso tse di lesome le botlhano tse di latelang di ka ga wena. O kopiwa go buisa dipotso ka kelotlhoko o be o araba mo pampiring e khibidu le leshibidu.</td>
</tr>
<tr>
<td>Please read the questions carefully and answer them on the Answer</td>
<td>Uyacelwa ukuthi ufundile lemibuzo ngokucophelela bese uphendula ephepheni lezimpendulo elibomvu.</td>
<td>Lees asseblief die vrae versigtig deur en beantwoord dit op die antwoordblad.</td>
<td></td>
</tr>
<tr>
<td>Sheet.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>For example:</strong></td>
<td><strong>Isibonelo:</strong></td>
<td><strong>Byvoorbeeld:</strong></td>
<td><strong>Sekai:</strong></td>
</tr>
<tr>
<td>#0. Are you a uniformed SANDF member?</td>
<td>#0. Ingabe uyilunga le SANDF eligqoka inyufomu?</td>
<td>#0. Is u 'n uniformdraende lid?</td>
<td>#0. A o lesole?</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>**In this example circle one (1) is coloured in since you are a</td>
<td>Kulesibonelo, shikisha kwi-ndlingiliyo yokuqala (1), uma uyilunga eligqoka inyufomu.</td>
<td>In hierdie voorbeeld is sirkel een (1) ingekleur omdat u 'n uniformdraende lid is.</td>
<td>Mo sekaing seno, o ntshofatsa (1) fa o le lesole.</td>
</tr>
<tr>
<td>uniformed member.**</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>#1. How old are you?</td>
<td>#1. Uneminyaka emingakhi yobudala?</td>
<td>#1. Hoe oud is u?</td>
<td>#1. O dingwaga di le kae?</td>
</tr>
<tr>
<td>1. 16-20</td>
<td>1. 16-20</td>
<td>1. 16-20</td>
<td>1. 16-20</td>
</tr>
<tr>
<td>2. 21-25</td>
<td>2. 21-25</td>
<td>2. 21-25</td>
<td>2. 21-25</td>
</tr>
<tr>
<td>4. 31-35</td>
<td>4. 31-35</td>
<td>4. 31-35</td>
<td>4. 31-35</td>
</tr>
<tr>
<td>5. 36-40</td>
<td>5. 36-40</td>
<td>5. 36-40</td>
<td>5. 36-40</td>
</tr>
<tr>
<td>6. 41-45</td>
<td>6. 41-45</td>
<td>6. 41-45</td>
<td>6. 41-45</td>
</tr>
<tr>
<td>7. 46-50</td>
<td>7. 46-50</td>
<td>7. 46-50</td>
<td>7. 46-50</td>
</tr>
<tr>
<td>9. 56-60</td>
<td>9. 56-60</td>
<td>9. 56-60</td>
<td>9. 56-60</td>
</tr>
<tr>
<td>10. 61+</td>
<td>10. 61+</td>
<td>10. 61+</td>
<td>10. 61+</td>
</tr>
<tr>
<td>English</td>
<td>Zulu</td>
<td>Afrikaans</td>
<td>Setswana</td>
</tr>
<tr>
<td>--------</td>
<td>-------</td>
<td>-----------</td>
<td>----------</td>
</tr>
<tr>
<td>#2. What is your rank?</td>
<td>#2. Iyini irenke (rank) yakho?</td>
<td>#2. Wat is u rang?</td>
<td>#2. Maemo a gago ke afe?</td>
</tr>
<tr>
<td>Colour in the circle that best reflects your rank or its equivalent (for Air Force, Navy, etc):</td>
<td>Shikisha kwindilinga eveza kangcono i-rank noma ehambisana (ne Air Force, Navy, etc):</td>
<td>Kleur die sirkel in wat u rang die beste reflekteer (vir SA Lugmag, Vloot, ens):</td>
<td>Ntshofatsa maemo a gago kgotsa selekanyo sa maemo a gago (diphofo, metsing ja-lojo-lo),</td>
</tr>
<tr>
<td>1. Pte, Amn, Sea, Rfn</td>
<td>1. Pte, Amn, Sea, Rfn</td>
<td>1. Wm, Imn, see, sktr</td>
<td>1. Pte, Amn, Sea, Rfn</td>
</tr>
<tr>
<td>2. L Cpl, AB</td>
<td>2. L Cpl, AB</td>
<td>2. Okpl, bes</td>
<td>2. L Cpl, AB</td>
</tr>
<tr>
<td>6. 2 Lt–Capt, Esn–Lt (SAN)</td>
<td>6. 2 Lt–Capt, Esn–Lt (SAN)</td>
<td>6. 2 lt–kapt, vdg–lt (SAV)</td>
<td>6. 2 Lt–Capt, Esn–Lt (SAN)</td>
</tr>
<tr>
<td>9. PSAP (civilian)</td>
<td>9. PSAP (civilian)</td>
<td>9. PSAP (siviele lid)</td>
<td>9. PSAP (civilian)</td>
</tr>
<tr>
<td>10. Other rank</td>
<td>10. Other rank</td>
<td>10. Ander rang</td>
<td>10. Other rank</td>
</tr>
<tr>
<td>#3. What is your home language (mother tongue)?</td>
<td>#3. Ukhuluma luphi ulimi ekhaya?</td>
<td>#3. Wat is u huistaal (moedertaal)?</td>
<td>#3. O bua puo efe?</td>
</tr>
<tr>
<td>2. English</td>
<td>2. English</td>
<td>2. Engels</td>
<td>2. Sekgowa</td>
</tr>
<tr>
<td>5. Setswana</td>
<td>5. Setswana</td>
<td>5. Setswana</td>
<td>5. Setswana</td>
</tr>
<tr>
<td>7. Sesotho</td>
<td>7. Sesotho</td>
<td>7. Sesotho</td>
<td>7. Sesotho</td>
</tr>
<tr>
<td>8. Tshivenda</td>
<td>8. Tshivenda</td>
<td>8. Tshivenda</td>
<td>8. Sevenda</td>
</tr>
<tr>
<td>English</td>
<td>Zulu</td>
<td>Afrikaans</td>
<td>Setswana</td>
</tr>
<tr>
<td>------------------------------------------------------------------------</td>
<td>----------------------------------------------------------------------</td>
<td>------------------------------------------------------------------</td>
<td>-------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td><strong>#5. What is your marital status?</strong></td>
<td><strong>#5. Sinjani isimo sakho somshado?</strong></td>
<td><strong>#5. Wat is u huwelikstaat?</strong></td>
<td><strong>#5. A o nyetse/nyetswe?</strong></td>
</tr>
<tr>
<td>1. Married (also lobola)</td>
<td>1. Ngishadile (lobola)</td>
<td>1. Getroud (ook lobola)</td>
<td>1. Ke nyetse/nyestwe (bogadi)</td>
</tr>
<tr>
<td>2. Unmarried, with a long-term sexual partner</td>
<td>2. Angishadile (ukhona engiya ocansini naye kusuka kudala)</td>
<td>2. Ongetroud, in 'n langtermyn interie verhouding</td>
<td>2. Ga ka nyala/nyalwa, ke na le motha yo ke sa bollong go ratana le ene</td>
</tr>
<tr>
<td><strong>#6. How long have you been in the relationship with your partner?</strong></td>
<td><strong>#6. Unesikhathi esingakanani uzwana nomlingani wakho?</strong></td>
<td><strong>#6. Hoe lank is u in die verhouding met u lewens-/saamleefmaat?</strong></td>
<td><strong>#6. O na le nako e kae mo setswalleng seo?</strong></td>
</tr>
<tr>
<td>2. Less than one year</td>
<td>2. Ngaphansi konyaka</td>
<td>2. Minder as een jaar</td>
<td>2. Ka fa tlase ga ngwaga</td>
</tr>
<tr>
<td>4. Three to five years</td>
<td>4. Emithathu kuya kweyisihtlanu</td>
<td>4. Drie tot vyf jaar</td>
<td>4. Ngwaga tse tharo go ya go tse thano</td>
</tr>
<tr>
<td>5. Six or more years</td>
<td>5. Evile kweyisithupha</td>
<td>5. Ses jaar of meer</td>
<td>5. Ngwaga tse thataro go ya kwa godimo</td>
</tr>
<tr>
<td>4. SAMHS</td>
<td>4. SAMHS</td>
<td>4. SAMGD</td>
<td>4. Sesole sa pholo</td>
</tr>
<tr>
<td>5. Other</td>
<td>5. Okunye</td>
<td>5. Ander</td>
<td>5. Tse dingwe</td>
</tr>
<tr>
<td>English</td>
<td>Zulu</td>
<td>Afrikaans</td>
<td>Setswana</td>
</tr>
<tr>
<td>--------------------------------------------------</td>
<td>-----------------------------------------------</td>
<td>-----------------------------------------------</td>
<td>-----------------------------------------------</td>
</tr>
<tr>
<td>#8. What is your highest educational qualification?</td>
<td>#8. Yisiphi isigaba semfundo esiphakeme onaso?</td>
<td>#8. Wat is u hoogste opvoedkundige kwalifikasie?</td>
<td>#8. O fitheletse dithuto dife?</td>
</tr>
<tr>
<td>1. Below standard 6 (grade 8 or equivalent)</td>
<td>1. Ngaphansi kwebanga 6 (below grade 8 noma e</td>
<td>1. Onder standerd 6 (onder graad 8 of gelykstaande)</td>
<td>1. Ka fa tlase ga seema sa borataro (below grade 8)</td>
</tr>
<tr>
<td>2. Standard 6 or 7 (grade 8-9, or equivalent)</td>
<td>8-9 nama e</td>
<td></td>
<td>2. Setlhopha sa borataro kgotsa sa bosupa (grade 8-9)</td>
</tr>
<tr>
<td>3. Standard 8 or 9 (grade 10-11, or equivalent)</td>
<td>8-9 nama e</td>
<td></td>
<td>3. Setlhopha sa borobedi kgotsa sa borobonngwe (grade 10-11)</td>
</tr>
<tr>
<td>4. Standard 10 (grade 12 or equivalent)</td>
<td>8-9 nama e</td>
<td></td>
<td>4. Setlhopha sa bolesome (grade 12)</td>
</tr>
<tr>
<td>5. Tertiary qualification</td>
<td>e</td>
<td></td>
<td>5. Dithuto tse di kwa godingwana</td>
</tr>
<tr>
<td>5. Four times or more</td>
<td>5. Kane noma ngaphezulu</td>
<td>5. Vier keer of meer</td>
<td>5. Gane le go feta</td>
</tr>
<tr>
<td>2. One</td>
<td>2. Ynye</td>
<td>2. Een</td>
<td>2. A le mongwe</td>
</tr>
<tr>
<td>5. Six or more</td>
<td>5. Ziyisithupha noma ngaphezulu</td>
<td>5. Ses of meer</td>
<td>5. Ba barataro le go feta</td>
</tr>
<tr>
<td>#11. Have you seen a social worker for counseling in the past six months?</td>
<td>#11. Uke wabonana nosonhlalahakhe kulezi nyanga eziyisithupha ezedlude?</td>
<td>#11. Het u gedurende die laaste ses maande ’n maatskaplike werker vir berading besoek?</td>
<td>#11. A o kite wa kopa kgakolo go modireliloago mo kgweding tse thataro tse di feticeng?</td>
</tr>
<tr>
<td>English</td>
<td>Zulu</td>
<td>Afrikaans</td>
<td>Setswana</td>
</tr>
<tr>
<td>---------</td>
<td>------</td>
<td>-----------</td>
<td>-----------</td>
</tr>
<tr>
<td>#12. <strong>What is your shoe size?</strong> (This information is required for research purposes)</td>
<td>#12. <strong>Yini isayizi yesicathulo sakho?</strong> <em>(Lokhu kuyadingeka mayelana nalolucwaningo)</em></td>
<td>#12. <strong>Watter grootte skoen dra u?</strong> <em>(Hierdie inligting is nodig vir navorsings-doeleindes)</em></td>
<td>#12. <strong>Bogolo jwa setlhako sa gago ke bokae?</strong> <em>(Se se bothokwa mo dipatlisisong tse di dirwang)</em></td>
</tr>
<tr>
<td>2. Size 5-6</td>
<td>2. Size 5-6</td>
<td>2. Nommer 5-6</td>
<td>2. Size 5-6</td>
</tr>
<tr>
<td>#13. <strong>To what race/population group do you belong?</strong> (This information is needed for research purposes)</td>
<td>#13. <strong>Ukuluphi uhlobo lombala (race/population)?</strong> <em>(Lokhu kuyadingeka mayelana nalolucwaningo)</em></td>
<td>#13. <strong>Tot watter ras/bevolkingsgroep hoort u?</strong> <em>(Hierdie inligting is nodig vir navorsingsdoeleindes)</em></td>
<td>#13. <strong>O motlhobo mang?</strong> <em>(Se se bothokwa mo dipatlisisong tse di dirwang)</em></td>
</tr>
<tr>
<td>5. I prefer not to answer this question</td>
<td>5. Ngikhetha ukungawuphenduli lombuzo</td>
<td>5. Ek verkie om nie die vraag te beantwoord nie</td>
<td>5. Ke bona go le botoka fa ke sa arabe potso e</td>
</tr>
<tr>
<td>#14. <strong>What is your monthly take-home salary?</strong> Your “take-home salary” is the amount “due to you” on your pay sheet each month.</td>
<td>#14. <strong>Usala neholo elingakanani emva kokuba ingxenye isidonsiwe?</strong> Iholo lakho yilelo osala nalo ephepheni lakho lomhlo.</td>
<td>#14. <strong>Wat is die maandelikse salaris wat u huis toe neem?</strong> Die “salaris wat u huis toe neem” is die bedrag op u betaalstaat wat sê “aan u verskuldig”.</td>
<td>#14. <strong>O amogela bokae morago ga ditloso?</strong> Pe raya madi a o yang gae ka ona kgwedi le kgwedi.</td>
</tr>
<tr>
<td>1. Less than R1000</td>
<td>1. Ngaphansu ku R1000</td>
<td>1. Minder as ‘n R1000</td>
<td>1. Ka fa tlase ga R1000</td>
</tr>
<tr>
<td>English</td>
<td>Zulu</td>
<td>Afrikaans</td>
<td>Setswana</td>
</tr>
<tr>
<td>---------</td>
<td>------</td>
<td>-----------</td>
<td>----------</td>
</tr>
<tr>
<td><strong>Military Social Health Index</strong></td>
<td><strong>Military Social Health Index</strong></td>
<td><strong>Military Social Health Index</strong></td>
<td><strong>Military Social Health Index</strong></td>
</tr>
<tr>
<td>Answer the questions as quickly as you can. Do not spend too much time thinking about the questions – the first answer that comes to your mind is probably the right one.</td>
<td>Phedula lembuzo ngesivinini esikhulu onaso. Ungachithi isikhathi esiningi kakhulu ucabanga ngemibuzo – impendulo eyokuqala efika emqondweni wakho kungenzeka ibe ngelungile.</td>
<td>Beantwoord die volgende vrae so yinng moontlik. Moenie te veel tyd spandeer om oor die vrae na te dink nie – die eerste antwoord wat by u opkom is moontlik die regte antwoord.</td>
<td>Araba dipotso ka bonako jo o ka bo kgonang. Se diege o akanya thata. Karabo e e tlang pele e ka nna yone e siameng.</td>
</tr>
<tr>
<td>If you do not understand a question, please ask the social worker for help.</td>
<td>Uma ungaqondi umbuzo ngicela ubuze ku sontla lakahle.</td>
<td>As u ’n vraag nie verstaan nie vra gerus die maatskaplike werker vir raad.</td>
<td>Fa o sa thaloganeye potso, o kopiwa go botsa modirediloago go bona thuso.</td>
</tr>
<tr>
<td>All of the questions that follow relate to your family. Different people have different kinds of families. Family can be your wife or husband. Family can be your children. Family can be your girlfriend or boyfriend. Family can be your parents or brothers or sisters. Family can be people you love who live far away. Your family is yourself and anyone that you care for or that cares for you.</td>
<td>Yonke imibuzo elandelayo imayelana nawe nomndeni wakho. Abantu abahlukile banemindeni ehukile. Umndeni kungaba umyeni noma inkosikazi yakho. Umndeni kungaba abantu abanzwana bakho. Umndeni kungaba yintombi noma yisoka lakh. Umndeni kungaba abazali bakho, umfowenu, noda dewenu. Umndeni kungaba ngebantu obathandayo kodwa abahlana kude nawe. Umndeni wakho ngwue noma ngubani omnakkelayo kumbe okunakekelayo.</td>
<td>Al volgende vrae handel oor u familie. Verskillende mense het verskillende soorte families. Familie kan u man of vrou wees. Familie kan u kinders wees. Familie kan u intieme vriend of vriendin wees. Familie kan u ouers, broers of susters wees. Familie kan mense wees wat u liefhet en ver weg woon. U familie is usef en enigeen vir wie u sorg of wat u versorg.</td>
<td>Dipotso tsothe di latelang ke ka ga ba lapa la gago. Batho ba ba faraloganeng ba na le malapa a a faraloganeng. Lelapa e ka nna monna kgotsa mosadi wa gago. Lelapa la gago e ka nna bana ba ga go. Lelapa la gago e ka nna moratani wa gago. Lelapa la gago e ka nna botsadi le bokgaitsadio. Lelapa la gago e ka nna batho ba o ba ratang ba ba nnang kgakala le wena. Lapa la gago ke wena, mongwe le mongwe yo o mo thokomelang kgotsa yo go thokomelang.</td>
</tr>
</tbody>
</table>
The first statements describe things that you or your family may have experienced. If these things have not happened in the past six months, colour in the first circle (No, did not happen). If these things did happen in the past six months, decide how big a problem they were for you and your family. Colour in the appropriate circle for each statement, as follows:

<table>
<thead>
<tr>
<th>Statement</th>
<th>Code</th>
<th>Zulu</th>
<th>English</th>
</tr>
</thead>
<tbody>
<tr>
<td>#15. Someone in my family drinks too much alcohol.</td>
<td>15</td>
<td>Kukhona ilunga lomndeni wami eliphuzza kakhulu utshwala.</td>
<td>The first statements describe things that you or your family may have experienced.</td>
</tr>
<tr>
<td>#16. There is conflict between my partner and I.</td>
<td>16</td>
<td>Kukhona ukuxabana phakathi kwami nomlingani wami.</td>
<td>The first statements describe things that you or your family may have experienced.</td>
</tr>
<tr>
<td>#17. There is conflict between members of my family.</td>
<td>17</td>
<td>Kukhona ukuxabana phakathi kwamalunga omndeni wami.</td>
<td>The first statements describe things that you or your family may have experienced.</td>
</tr>
<tr>
<td>#18. Someone in my family uses drugs.</td>
<td>18</td>
<td>Kukhona osebenzisa izidakwa-mizwa emndenini wami.</td>
<td>The first statements describe things that you or your family may have experienced.</td>
</tr>
<tr>
<td>#19. Someone in my family cannot pay his/her debts.</td>
<td>19</td>
<td>Emndenini wami kukhona ilunga elinobunzima bokukhokha izikweletu zalo.</td>
<td>The first statements describe things that you or your family may have experienced.</td>
</tr>
<tr>
<td>#20. My family has financial problems.</td>
<td>20</td>
<td>Emndenini wami kukhona izinkinga zemali.</td>
<td>The first statements describe things that you or your family may have experienced.</td>
</tr>
<tr>
<td>No.</td>
<td>English</td>
<td>Afrikaans</td>
<td>IsiXhosa</td>
</tr>
<tr>
<td>-----</td>
<td>---------</td>
<td>-----------</td>
<td>-----------</td>
</tr>
<tr>
<td>1.</td>
<td>No, did not happen</td>
<td>No, dit het nie gebeur nie</td>
<td>Nee, dit het nie gebeur nie</td>
</tr>
<tr>
<td>2.</td>
<td>Yes, no problem</td>
<td>Ja, geen probleem</td>
<td>Ja, geen probleem</td>
</tr>
<tr>
<td>3.</td>
<td>Yes, small problem</td>
<td>Ja, klein probleempie</td>
<td>Ja, klein probleempie</td>
</tr>
<tr>
<td>4.</td>
<td>Yes, medium problem</td>
<td>Ja, medium probleem</td>
<td>Ja, medium probleem</td>
</tr>
<tr>
<td>5.</td>
<td>Yes, big problem</td>
<td>Ja, groot probleem</td>
<td>Ja, groot probleem</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>No.</th>
<th>English</th>
<th>Afrikaans</th>
<th>IsiXhosa</th>
<th>Tswana</th>
</tr>
</thead>
<tbody>
<tr>
<td>21.</td>
<td>I am concerned about the general care of the children in my family.</td>
<td>Ek is bekommerd oor die algemene versorging van die kinders in my familie.</td>
<td>Ek is bekommerd oor die algemene versorging van die kinders in my familie.</td>
<td>Ke a tshwenyega ka thokomelo ya bana ka mo lapeng.</td>
</tr>
<tr>
<td>22.</td>
<td>Someone in my family has problems at work.</td>
<td>Iemand in my familie het probleme by die werk.</td>
<td>Iemand in my familie het probleme by die werk.</td>
<td>Mongwe mo lapeng o na le mathata kwa tirong.</td>
</tr>
<tr>
<td>23.</td>
<td>I was absent from work without leave (AWOL).</td>
<td>Ek was afwesig van die werk sonder verlof (ASV/AWOL).</td>
<td>Ek was afwesig van die werk sonder verlof (ASV/AWOL).</td>
<td>Ga ke a ya kwa tirong ntle ga tseta (AWOL).</td>
</tr>
<tr>
<td>24.</td>
<td>Someone in my family has trouble with the law.</td>
<td>Iemand in my familie bots met die gereg (wet).</td>
<td>Iemand in my familie bots met die gereg (wet).</td>
<td>Mongwe mo lapeng o na le mathatha a semolao.</td>
</tr>
<tr>
<td>25.</td>
<td>Someone in my family is depressed (feels down).</td>
<td>Iemand in my familie is depressief (voel af).</td>
<td>Iemand in my familie is depressief (voel af).</td>
<td>Mongwe mo lapeng mowa wa gagwe o kwa tla.</td>
</tr>
<tr>
<td>26.</td>
<td>Someone in my family feels unable to cope with his/her life situation.</td>
<td>Iemand in my familie voel dat hy/sy nie sy/haar lewensituasie kan hanteer nie.</td>
<td>Iemand in my familie voel dat hy/sy nie sy/haar lewensituasie kan hanteer nie.</td>
<td>Mongwe mo lapeng o bona fa a ka se kgonane le maemo a botshelo jwa gagwe.</td>
</tr>
<tr>
<td>27.</td>
<td>Someone in my family has health problems (physical, emotional or spiritual).</td>
<td>Iemand in my familie ervaar gesondheidsprobleme (fisiek, emosioneel of godsdienstig).</td>
<td>Iemand in my familie ervaar gesondheidsprobleme (fisiek, emosioneel of godsdienstig).</td>
<td>Mongwe mo lapeng o na le mathatha a boitshakane.</td>
</tr>
<tr>
<td>30.</td>
<td>I regret things I do after drinking alcohol.</td>
<td>Ek is spyt oor wat ek doen as ek alkohol gebruik.</td>
<td>Ek is spyt oor wat ek doen as ek alkohol gebruik.</td>
<td>Ke ikotha a dua tse ke die dirang fa ke nolo bojalwa.</td>
</tr>
<tr>
<td>#31.</td>
<td>Someone in my family has no place to stay.</td>
<td>#31.</td>
<td>Omunye welunga lomndeni wami alinayo indawo yokuhlala.</td>
<td>#31.</td>
</tr>
<tr>
<td>#32.</td>
<td>My family does not have enough food to survive.</td>
<td>#32.</td>
<td>Emndenini wami akukho ukudla okudingekayo ukuze siphile.</td>
<td>#32.</td>
</tr>
<tr>
<td>#33.</td>
<td>I work far away from where my family lives.</td>
<td>#33.</td>
<td>Ngisebenza kude nalapho umndeni wami uhlala khona.</td>
<td>#33.</td>
</tr>
<tr>
<td>#34.</td>
<td>I have difficulty taking care of my family.</td>
<td>#34.</td>
<td>Ngithola ubunzima bokunakekela umndeni wami.</td>
<td>#34.</td>
</tr>
<tr>
<td>#35.</td>
<td>I have to pay maintenance to support my children.</td>
<td>#35.</td>
<td>Kufanele ngikhokhe isondlo sabantwana bami bonke.</td>
<td>#35.</td>
</tr>
<tr>
<td>#36.</td>
<td>My family lives in an unsafe community.</td>
<td>#36.</td>
<td>Indawo lapho umndeni wami uhlala khona ayiphephile.</td>
<td>#36.</td>
</tr>
<tr>
<td>#37.</td>
<td>Someone in my family was injured.</td>
<td>#37.</td>
<td>Emndenini wami kukhona oye walimala.</td>
<td>#37.</td>
</tr>
<tr>
<td>#38.</td>
<td>Someone in my family was hospitalised.</td>
<td>#38.</td>
<td>Emndenini wami kukhona oye walaliswa esibhlediela.</td>
<td>#38.</td>
</tr>
<tr>
<td>#40.</td>
<td>Someone in my family changed jobs.</td>
<td>#40.</td>
<td>Kukhona oye washintsha umsebenzi emndenini wami.</td>
<td>#40.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>---</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td>1.</td>
<td>No, did not happen</td>
<td>1.</td>
<td>Cha, akwenzekanga</td>
<td>1.</td>
</tr>
<tr>
<td>2.</td>
<td>Yes, no problem</td>
<td>2.</td>
<td>Yebo, akunankinga</td>
<td>2.</td>
</tr>
<tr>
<td>5.</td>
<td>Yes, big problem</td>
<td>5.</td>
<td>Yebo, yinkinga enkulu</td>
<td>5.</td>
</tr>
<tr>
<td>#41.</td>
<td>Our family celebrated an important cultural/religious event.</td>
<td>#41.</td>
<td>Umndeni wami oye wagubha umkhosi obalulekile wesintu noma wesikholwa.</td>
<td>#41.</td>
</tr>
<tr>
<td>#42.</td>
<td>A friend of my family died.</td>
<td>#42.</td>
<td>Umngane womndeni wami ushonile.</td>
<td>#42.</td>
</tr>
<tr>
<td>#43.</td>
<td>Someone in my family was promoted at work.</td>
<td>#43.</td>
<td>Omunye womndeni wami ukhushuliwe emsebenzini.</td>
<td>#43.</td>
</tr>
<tr>
<td>#44.</td>
<td>Someone in my family was arrested.</td>
<td>#44.</td>
<td>Omunye womndeni wami uboshiwe.</td>
<td>#44.</td>
</tr>
<tr>
<td>#45.</td>
<td>The sheriff of the court took away the possessions of someone in my family.</td>
<td>#45.</td>
<td>Omunye womndeni wami uuthathelwe impahla yinkundla yomthetho.</td>
<td>#45.</td>
</tr>
<tr>
<td>#46.</td>
<td>Someone in my family bought a house.</td>
<td>#46.</td>
<td>Omunye womndeni wami uuthenge indlu.</td>
<td>#46.</td>
</tr>
<tr>
<td>#47.</td>
<td>Someone in my family lost his/her job.</td>
<td>#47.</td>
<td>Omunye emndenini wami ulahlekelwe umsebenzi.</td>
<td>#47.</td>
</tr>
<tr>
<td>#48.</td>
<td>Someone in my family was assaulted/raped.</td>
<td>#48.</td>
<td>Ukhona oye wagetshengwa noma wadlwengulwa emndenini wami.</td>
<td>#48.</td>
</tr>
<tr>
<td>#49.</td>
<td>The price of petrol/transport increased.</td>
<td>#49.</td>
<td>Upethiloli noma amafutha ezimoto anyukile/akhushuliwe.</td>
<td>#49.</td>
</tr>
<tr>
<td>#50.</td>
<td>There was a crisis in the community where my family lives.</td>
<td>#50.</td>
<td>Bekukhona inxubevange (crisis) emphakathini lapho umndeni wami uhlala khona.</td>
<td>#50.</td>
</tr>
</tbody>
</table>

© 2003, Directorate Social Work & Military Health Research Centre – *Military Social Health Index* – v 2.0
<table>
<thead>
<tr>
<th>#51. My family experienced a crisis because of the weather (storm, fire, flood, drought, etc).</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ngaqale ukukhlishana nesithandwa sami.</td>
</tr>
<tr>
<td>Weeromstandighede (storm, vuur, orstomings, droogte, ens) het my familie ‘n krisis laat beleef.</td>
</tr>
<tr>
<td>Ngehetshi lapha le sa lokhale.</td>
</tr>
<tr>
<td>Daar was ‘n huwelikseremonie in my familie.</td>
</tr>
<tr>
<td>Iemand in my familie is vervreem van sy/haar maat of het geskei.</td>
</tr>
<tr>
<td>Daar was ‘n onbeplande swangerskap in my familie.</td>
</tr>
<tr>
<td>‘n Buite-egtelike kind is in my familie gebore.</td>
</tr>
<tr>
<td>‘n Getroude paar in my familie se kind het by my kom woon.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>#52. I started living with my partner.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sengishadile (lobola).</td>
</tr>
<tr>
<td>Ek het ‘n saamleefverhouding met my intieme maat begin.</td>
</tr>
<tr>
<td>Ke simolisebo go nna le molekani won.</td>
</tr>
<tr>
<td>Ke nyesi neyetswe (lobola).</td>
</tr>
<tr>
<td>Ke nyetswe/nyetswe (bogadi).</td>
</tr>
<tr>
<td>Ke nyetswe go nna le molekani.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>#53. I got married (also lobola).</th>
</tr>
</thead>
<tbody>
<tr>
<td>Umndeni wami ubha nomshado emndeni.</td>
</tr>
<tr>
<td>Emndeni wami uhloniphi uchithe umshado (divorce)/isahlukaniso (separation).</td>
</tr>
<tr>
<td>Oruntuwe ukuhlele wa esenzekile emndeni.</td>
</tr>
<tr>
<td>Onyonye ukuhlele ukuhlele esenzekile emndeni.</td>
</tr>
<tr>
<td>Amalinga omndeni wami lasiaatlile athalotho engashidile.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>#54. Someone in my family got separated/divorced.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ngiqale ukuba lodlula nesithandwa sami.</td>
</tr>
<tr>
<td>Emndeni wami uchithe umshado (divorce)/isahlukaniso.</td>
</tr>
<tr>
<td>Oruntuwe ukuhlele waphakathi emndeni.</td>
</tr>
<tr>
<td>Oruntuwe ukuhlele ukuhlele esenzekile emndeni.</td>
</tr>
<tr>
<td>Inganye omndeni umfundo lapha le molekani won.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>#55. There was a wedding ceremony in my family.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Emndeni wami ufikesho emndeni.</td>
</tr>
<tr>
<td>Emndeni wami uhloniphi uchithe umshado (divorce)/isahlukaniso.</td>
</tr>
<tr>
<td>Oruntuwe ukuhlele esenzekile emndeni.</td>
</tr>
<tr>
<td>Onyonye ukuhlele ukuhlele esenzekile emndeni.</td>
</tr>
<tr>
<td>Inganye omndeni wami umfundo lapha le molekani won.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>#56. There was an unplanned pregnancy in my family.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Kuhlelele ukukhlele we esenzekile emndeni.</td>
</tr>
<tr>
<td>Kuhlelele ukukhlele we esenzekile emndeni.</td>
</tr>
<tr>
<td>Onyonye ukuhlele enxhalukani.</td>
</tr>
<tr>
<td>Onyonye ukuhlele enxhalukani.</td>
</tr>
<tr>
<td>Inganye omndeni wami umfundo lapha le molekani won.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>#57. A baby was born to a married couple in my family.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Oruntuwe umndeni ukuhlele enxhalukani.</td>
</tr>
<tr>
<td>Onyonye ukuhlele enxhalukani.</td>
</tr>
<tr>
<td>Inganye omndeni wami umfundo lapha le molekani won.</td>
</tr>
<tr>
<td>Inganye omndeni wami umfundo lapha le molekani won.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>#58. A baby was born out of wedlock (out of marriage).</th>
</tr>
</thead>
<tbody>
<tr>
<td>Oruntuwe umndeni umfundo le ntle go nna.</td>
</tr>
<tr>
<td>Oruntuwe umndeni ukuhlele enxhalukani.</td>
</tr>
<tr>
<td>Inganye omndeni wami umfundo lapha le molekani won.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>#59. A child of a family member came to live with me.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Inganye omndeni we loemende omndeni wami le khalalela.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>#60. A child of a family member came to live with me.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Inganye omndeni we loemende omndeni wami le khalalela.</td>
</tr>
</tbody>
</table>

© 2003, Directorate Social Work & Military Health Research Centre – Military Social Health Index – v 2.0
<table>
<thead>
<tr>
<th></th>
<th>My child or a child I care for moved to a new school.</th>
<th></th>
<th>My child or a child I care for failed/dropped out of school.</th>
<th></th>
<th>My child or a child I care for left home.</th>
<th></th>
<th>An elderly member of my family died.</th>
<th></th>
<th>An adult member of my family died.</th>
<th></th>
<th>My partner died.</th>
<th></th>
<th>A child in my family died.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>No, did not happen</td>
<td>1</td>
<td>Cha, akwenzekanga</td>
<td>1</td>
<td>Nee, dit het nie gebeur nie</td>
<td>1</td>
<td>Nyaa, ga go ise go diragale</td>
<td>1</td>
<td>Ngwanake/yo ke mo thokomelang o tswile mo sekolog se a neng a se tsena, o kwa go se sengwe.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Yes, no problem</td>
<td>2</td>
<td>Yebo, akunankinga</td>
<td>2</td>
<td>Ja, geen probleem</td>
<td>2</td>
<td>Ee, ga gona mathata</td>
<td>2</td>
<td>Ngwanake/yo ke mo thokomelang o paletswe ke go falola dithuto tsa gagwe/o lesitse sekolo.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Yes, small problem</td>
<td>3</td>
<td>Yebo, yinkinga encane</td>
<td>3</td>
<td>Ja, klein probleempie</td>
<td>3</td>
<td>Ee, ke mhatatanyana</td>
<td>3</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Yes, medium problem</td>
<td>4</td>
<td>Yebo, yinkinga ephakathi</td>
<td>4</td>
<td>Ja, medium probleem</td>
<td>4</td>
<td>Ee, ke mathata a magolo</td>
<td>4</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Yes, big problem</td>
<td>5</td>
<td>Yebo, yinkinga enkulu</td>
<td>5</td>
<td>Ja, groot probleem</td>
<td>5</td>
<td>Ee, ke mathata a a boitshegang/magologolo</td>
<td>5</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

© 2003, Directorate Social Work & Military Health Research Centre – Military Social Health Index – v 2.0
The following statements describe things that may happen in your workplace. If these things have not happened in the past six months, colour in the first circle (No, did not happen). If these things did happen in the past six months, decide how big a problem they were for you and your family. Colour in the appropriate circle for each statement as follows:

<table>
<thead>
<tr>
<th>Statement</th>
<th>Circle Options</th>
</tr>
</thead>
<tbody>
<tr>
<td>2. I work too many hours.</td>
<td>1. No, did not happen 2. Yes, no problem 3. Yes, small problem 4. Yes, medium problem 5. Yes, big problem</td>
</tr>
<tr>
<td>5. I have poor relationships with people at work.</td>
<td>1. No, did not happen 2. Yes, no problem 3. Yes, small problem 4. Yes, medium problem 5. Yes, big problem</td>
</tr>
</tbody>
</table>

Note: Colour in the appropriate circle for each statement as follows:

1. No, did not happen
2. Yes, no problem
3. Yes, small problem
4. Yes, medium problem
5. Yes, big problem
| #74. | It does not help to talk to my section head about my family problems. |
| #74. | Akusizi ukukhuluma nomphathi wami ngezinkinga zomndeni wami. |
| #74. | Dit help nie om my familieprobleme met my afdelingshoof te bespreek nie. |
| #74. | Ga go thuse go bua le moetapele wa me ka mathata a lapa lame. |

| #75. | My unit does not give me enough time to prepare my family for deployments. |
| #75. | Umsebenzi wami awunginiqelezi isikhathi esanele sokulungisela umndeni una ngizosebenza kude nasekhaya (deployed). |
| #75. | My eenheid gee my nie genoeg tyd om my familie vir ontplooiings voor te berei nie. |
| #75. | Kwa tiron ga ba mphe nako e lekaneng go rulaganya le bapa lapa la me pele ke ya go dira kwa ntle. |

| #76. | My unit does not respect my responsibilities towards my extended family. |
| #76. | Umsebenzi wami awuzihloniphi izidingo zakunakekela abomndeni wami. |
| #76. | My eenheid respekteer nie my verantwoordelikheid teenoor my uitgebreide familie nie. |
| #76. | Kwa tiron ga ba thomphe maikarabelo a me go ba losika. |

| #77. | During deployments I do not have access to facilities to communicate with my family. |
| #77. | Kunzima ukuxhumana nabomndeni wami uma ngikude nasekhaya (deployed). |
| #77. | Gedurende ontplooiing het ek nie toegang tot fasiliteite om met my familie kontak te maak nie. |
| #77. | Ga go na tsela ya go golagana le ba lelapa fa ke dira kwa ntle. |

| #78. | I am unhappy with my job. |
| #78. | Umsebenzi wami awungijabulisi. |
| #78. | Ek is ongelukkig in my werk. |
| #78. | Tiro ya me ga e itumedisi. |

| #79. | My section head does not take my travelling time between work and home into account. |
| #79. | Umphathi wami akanandaba ngezikhathi engisisebenzisa ngohambo olusuka ekhaya liya emsebenzi. |
| #79. | My afdelingshoof neem nie my reistyd tussen die werk en huis in ag nie. |
| #79. | Moetapele wa me ga a na sepe le gore ke thloka nako e kae go tswa kwa gae go ya tirong. |

| #80. | There are racial conflicts at work. |
| #80. | Kunokuxabana okudawa ukucwasana ngokwebala emsebenzini. |
| #80. | Daar is rassekonflik by die werk. |
| #80. | Go na le mathata a thaoele kwa tiron ya me. |

| #81. | Deployments occur with little warning. |
| #81. | Asiwayiswa kusenethuba uma sizisebenza kude nasekhaya (deployed). |
| #81. | Ontplooiings vind plaas op kort kennisgewing. |
| #81. | Ga ke itsesiwe go le gale ka go tswa ka tiro. |

| #82. | We do not receive enough information before deployments. |
| #82. | Iminingwane engiyithola ngaphambili kokuba ngiyosebenza kude kayanele. |
| #82. | Ons ontvang nie voldoende inligting voor ontplooiings nie. |
| #82. | Tshedimosetso e re e newang pele re ya go dira kwa ntle ga ya lekana. |
| 1. No, did not happen          | 1. Cha, akwenzekanga                        | 1. Nee, dit nie gebeur nie                  | 1. Nyaa, ga go ise go diragale               |
| 2. Yes, no problem            | 2. Yebo, akunankinga                        | 2. Ja, geen probleem                        | 2. Ee, ga gona mathata                      |
| 5. Yes, big problem          | 5. Yebo, yinkinga enkulu                   | 5. Ja, groot probleem                       | 5. Ee, ke mathata a boitshegang/magologolo  |
| #83. There have been violent incidents at work. | #83. Kubekhona isikhathi lapho kunodlame emsebenzini. | #83. Daar was gewelddadige insidente by die werk. | #83. Kwa tirong go bile le ditiragalo tsa madubadube/dintwa. |
| #84. There are no health facilities available at my unit. | #84. Abekho abezempilo emsebenzini wami. | #84. Daar is geen gesondheidsfasiliteite by my eenheid beskikbaar nie. | #84. Ga go na thuso ya kalafi kwa tirong. |
| #85. There are no social workers available at my unit. | #85. Abekho abezentlalakahle emsebenzini wami. | #85. Daar is geen maatskaplike werkers by my eenheid beskikbaar nie. | #85. Ga go na badirediloago kwa tirong. |
| #86. I am not allowed to get medical attention. | #86. Angivunyelwe ukuthola usizo lwemzempilo. | #86. Ek word nie toegelaat om mediese versorging te kry nie. | #86. Ga ke letlelelwe go bona thuso ya kalafi. |
| #87. There are no opportunities for promotion. | #87. Awekho amathuba okukhushulwa emsebenzini. | #87. Daar is geen geleentheid vir bevordering nie. | #87. Ga go na menyetla ya go thathosiwa maemo mo tirong. |
| #88. I am not given the opportunity to go on military courses. | #88. Angikwazi ukuthola amathuba okufunda kwemzombutho emsebenzini. | #88. Ek word nie die geleentheid gegun om militêre kursusse te doen nie. | #88. Ga ke letlelelwe go ya dithutong tsa sesole. |
| #89. The merit system is unfair. | #89. Awekho amathuba okukhushulelwa (merits) esikhundleni esiphedzulu emsebenzini. | #89. Die merietestelsel is onregverdig. | #89. Tsela ya maduo (merits) go ya siama. |
| #90. The organisation has unrealistic expectations of me. | #90. Inhlango ilindele okukhulu okudula lokho engangakwazi ukukwenza. | #90. Die organisasie stel onrealistiese verwagtinge aan my. | #90. Kwa tirong ba lebeletse go feta bokgoni jwa me. |
The rest of the questions, to the end of this questionnaire, are about you and your family. Colour in one circle per question on the Answer Sheet. Answer each of the following questions on the following scale:

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>#91. My family is able to get help when they need it.</th>
<th>#91. My famille est en mesure d'obtenir de l'aide quand elle le nécessite.</th>
</tr>
</thead>
<tbody>
<tr>
<td>#92. My family is willing to accept help when they need it.</td>
<td>#92. Ma famille est disposée à accepter de l'aide lorsque cela est nécessaire.</td>
</tr>
<tr>
<td>#93. In my family we know that other people care about us.</td>
<td>#93. Ons familie weet dat ander mense omgee.</td>
</tr>
<tr>
<td>#94. In my family we know that other people love us.</td>
<td>#94. Ons familie weet dat ander mense lief is.</td>
</tr>
<tr>
<td>#95. My family is appreciated by others.</td>
<td>#95. Ons familie word door ander mense waardeer.</td>
</tr>
<tr>
<td>#96. We know that our family is important to others.</td>
<td>#96. Ons familie weet dat ons belangrik is vir ander.</td>
</tr>
<tr>
<td>#97. We know that our family is understood by others.</td>
<td>#97. Ons familie weet dat hulle verstaan word deur ander.</td>
</tr>
<tr>
<td>#98. Our family maintains good relationships with others.</td>
<td>#98. Ons familie handhaaf goeie verhoudinge met ander.</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td>---</td>
<td>---</td>
</tr>
</tbody>
</table>

<p>| | | | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>#100. Our family maintains regular contact with others.</td>
<td>#100. Umndeni wami uyakwazi ukuxhumana nabanye abantu.</td>
<td>#100. Ons familie het gereelde kontak met ander.</td>
<td>#100. Lapa lwame le kopana le batho ba bangwe nako le nako.</td>
<td></td>
</tr>
<tr>
<td>#101. Assistance from others adds value to family life.</td>
<td>#101. Usizo oluvela kwabanye abantu luyawakha umndeni wami.</td>
<td>#101. Ondersteuning van ander dra by tot 'n gesonde familielewe.</td>
<td>#101. Thuso ya batho e na le boleng jwa bothokwa mo lapeng lame.</td>
<td></td>
</tr>
<tr>
<td>#102. There are a variety of support systems available to my family.</td>
<td>#102. Kunezindlela eziningi umndeni wami othola ngazo usizo/uncendo.</td>
<td>#102. 'n Verskeidenheid ondersteuningstelsels is tot my familie se beskikking.</td>
<td>#102. Lapa lwame e na le metswedi e mentsi ya thuso.</td>
<td></td>
</tr>
<tr>
<td>#103. My family is satisfied with their support systems.</td>
<td>#103. Umndeni wami uyeneliswa usizo olutholayo.</td>
<td>#103. My familie is tevrede met hul ondersteuningstelsels.</td>
<td>#103. Lapa lwame lo kgotsofalela tshegetso e le e bonang.</td>
<td></td>
</tr>
<tr>
<td>#104. My family can rely on others for help.</td>
<td>#104. Umndeni wami uyakwazi ukuthembela kwabanye abantu.</td>
<td>#104. My familie kan op ander staatmaak vir hulp.</td>
<td>#104. Ba lapa lame ba ka ikanya batho ba bangwe go bona thuso.</td>
<td></td>
</tr>
<tr>
<td>#105. My family knows that others listen to them.</td>
<td>#105. Umndeni wami uyakwazi ukulalelwanga abanye abantu.</td>
<td>#105. My familie weet dat ander na hulle luister.</td>
<td>#105. Ba lapa lame ba its e gore batho ba bangwe ba a ba reetsa.</td>
<td></td>
</tr>
<tr>
<td>#106. My family provides assistance to others.</td>
<td>#106. Umndeni wami uyakwazi ukupha abanye abantu usizo.</td>
<td>#106. My familie verleen hulp aan ander.</td>
<td>#106. Ba lapa lwame ba tswa batho ba bangwe thuso.</td>
<td></td>
</tr>
<tr>
<td>#108. My family believes that they are protected.</td>
<td>#108. Umndeni wami uyazi ukuthi uvikelekle.</td>
<td>#108. My familie glo dat hulle beskerm word.</td>
<td>#108. Ba lapa lame ba dumela gore ba bolokesegile.</td>
<td></td>
</tr>
<tr>
<td>#</td>
<td>Statement</td>
<td>Zulu</td>
<td>Afrikaans</td>
<td>English</td>
</tr>
<tr>
<td>----</td>
<td>--------------------------------------------------------------------------</td>
<td>----------------------------------------------------------------------</td>
<td>---------------------------------------------------------------------------</td>
<td>------------------------------------------------------------------------</td>
</tr>
<tr>
<td>109</td>
<td>The children in my family know that they are safe in the community.</td>
<td>Abantwana emndenini wami baphephile emphakathini.</td>
<td>Die kinders in my familie weet dat hulle veilig in die gemeenskap is.</td>
<td>The children in my family know that they are safe in the community.</td>
</tr>
<tr>
<td>110</td>
<td>Members of my community will help in an emergency.</td>
<td>Amalunga omphakathi wami ayakwazi ukupha umndeni wami usizo oluphumayo.</td>
<td>Die mense in my gemeenskap sal help in geval van nood.</td>
<td>Members of my community will help in an emergency.</td>
</tr>
<tr>
<td>111</td>
<td>People help our family when we are in trouble.</td>
<td>Abantu bayakwazi ukusiza umndeni wami uma usosizini.</td>
<td>Ander mense help ons familie as ons in die moeilikheid is.</td>
<td>People help our family when we are in trouble.</td>
</tr>
<tr>
<td>112</td>
<td>My family is respected by others.</td>
<td>Umndeni wami uyahlionishwa ngabanye abantu.</td>
<td>Ons familie word deur ander gerespekteer.</td>
<td>My family is respected by others.</td>
</tr>
<tr>
<td>113</td>
<td>We know that we belong to the community.</td>
<td>Umndeni wami uyazi ukuthi unendawo ebalululekile emphakathi.</td>
<td>Ons weet dat ons deel is van die gemeenskap.</td>
<td>We know that we belong to the community.</td>
</tr>
<tr>
<td>114</td>
<td>When there are problems in our family, we can identify them.</td>
<td>Uma kunezinkinga emndenini wami siyakwazi ukuwibona.</td>
<td>Wanneer daar probleme in ons familie is, kan ons dit identifiseer.</td>
<td>When there are problems in our family, we can identify them.</td>
</tr>
<tr>
<td>115</td>
<td>We do not avoid the problems in our family.</td>
<td>Asizishayi indiva izinkinga emndenini wami.</td>
<td>Ons vermy nie probleme in ons familie nie.</td>
<td>We do not avoid the problems in our family.</td>
</tr>
<tr>
<td>116</td>
<td>In our family we confront our problems.</td>
<td>Uma kunezinkinga emndenini wami siyakwazi ukubhekana nqo nazo.</td>
<td>In ons familie konfronteer ons probleme.</td>
<td>In our family we confront our problems.</td>
</tr>
<tr>
<td>117</td>
<td>We resolve most of the problems in our family.</td>
<td>Umndeni wami uyakwazi ukuxazulula izinkinga.</td>
<td>Ons los meeste van die in ond familie op.</td>
<td>We resolve most of the problems in our family.</td>
</tr>
<tr>
<td>118</td>
<td>Problems in our family do not continue for ever.</td>
<td>Izinkinga azyekwa zingaxazulwanga emndenini wami.</td>
<td>Probleme in ons familie hou nie vir ewig aan nie.</td>
<td>Problems in our family do not continue for ever.</td>
</tr>
<tr>
<td>Number</td>
<td>Item Description</td>
<td>Translation</td>
<td></td>
<td></td>
</tr>
<tr>
<td>--------</td>
<td>----------------------------------------------------------------------------------</td>
<td>-----------------------------------------------------------------------------</td>
<td></td>
<td></td>
</tr>
<tr>
<td>#119.</td>
<td>We talk about the problems in our family.</td>
<td>Ons familie bespreek ons probleme.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>#120.</td>
<td>We find solutions to our problems.</td>
<td>Ons kry oplossings vir ons probleme.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>#121.</td>
<td>My family considers previous solutions as options.</td>
<td>My familie neem vorige oplossings in ag as moontlike opsies.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>#122.</td>
<td>We learn from our mistakes.</td>
<td>Ons leer uit ons foute.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>#123.</td>
<td>My family seeks advice from others.</td>
<td>My familie raadpleeg ander mense vir raad.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>#124.</td>
<td>We look for solutions that everyone agrees on.</td>
<td>Ons kyk na oplossings wat almal tevrede stel.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>#125.</td>
<td>Our family works together to solve problems.</td>
<td>Ons familie werk saam om probleme op te los.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>#126.</td>
<td>We implement the solutions to our problems.</td>
<td>Ons voer die oplossings vir ons probleme uit.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>#127.</td>
<td>We are confident that we can solve our problems.</td>
<td>Ons is seker dat ons ons probleme kan oplos.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>#128.</td>
<td>We resolve our problems step-by-step.</td>
<td>Probleme in ons familie word stapsgewys opgelos.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>#129.</td>
<td>Our family acts on our decisions.</td>
<td>#129.</td>
<td>In ons familie word besluite uitgevoer.</td>
<td>#129.</td>
</tr>
<tr>
<td>#130.</td>
<td>In our family we talk about whether solutions are working successfully.</td>
<td>#130.</td>
<td>Ons familie bespreek oplossings suksesvol werk.</td>
<td>#130.</td>
</tr>
<tr>
<td>#131.</td>
<td>In our family, we talk about solutions that did not work.</td>
<td>#131.</td>
<td>Ons familie bespreek probleme wat nie opgelos kon word nie.</td>
<td>#131.</td>
</tr>
<tr>
<td>#132.</td>
<td>When solutions do not work, our family consults with others.</td>
<td>#132.</td>
<td>Ons familie bespreek probleme wat nie werk nie met ander.</td>
<td>#132.</td>
</tr>
<tr>
<td>#133.</td>
<td>When solutions do not work, our family looks for other solutions.</td>
<td>#133.</td>
<td>Wanneer oplossings nie werk nie, soek ons na ander moontlikhede.</td>
<td>#133.</td>
</tr>
<tr>
<td>#134.</td>
<td>When solutions do not work, we try harder to find solutions.</td>
<td>#134.</td>
<td>Wanneer oplossings nie werk nie, probeer ons harder om oplossings te kry.</td>
<td>#134.</td>
</tr>
<tr>
<td>#135.</td>
<td>When solutions do not work, our family seeks professional help.</td>
<td>#135.</td>
<td>Wanneer oplossings nie werk nie, kry ons professionele hulp.</td>
<td>#135.</td>
</tr>
<tr>
<td>#136.</td>
<td>My family thinks that deployments create opportunities for me to grow/develop.</td>
<td>#136.</td>
<td>My familie voel dat ontplooiing ‘n geleenheid vir my is om te groei/ontwikkel.</td>
<td>#136.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>---</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td>---</td>
</tr>
</tbody>
</table>

<p>| | | | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>#137. My family understands the purpose for deployments.</td>
<td>#137. Umndeni wami uyasiqondisisa isidingo sokusebenzela kude nasekhaya (deployment).</td>
<td>#137. My familie verstaan die doel met ontplooiings.</td>
<td>#137. Lapa lwame le thaloganya lebaka la go dira kwa ntle.</td>
<td></td>
</tr>
<tr>
<td>#138. My family sees the value of deployments.</td>
<td>#138. Umndeni wami uyakubona ukubaluleka kokusebenzela kude nasekhaya (deployment).</td>
<td>#138. My familie het begrip vir die waarde van ontplooiings.</td>
<td>#138. Lapa lame le bona tiro ya kwa ntle e na le boleng.</td>
<td></td>
</tr>
<tr>
<td>#139. My family can handle the demands of deployments.</td>
<td>#139. Umndeni wami uyakwazi ukumelana nezidingo zokusebenzela kude kwami.</td>
<td>#139. My familie kan die eise wat ontplooiings stel, hanteer.</td>
<td>#139. Lapa lwame le kgona go lebana le ditlhokego tsa tiro ya kwa ntle.</td>
<td></td>
</tr>
<tr>
<td>#140. My family and I are committed to the military.</td>
<td>#140. Mina nomndeni wami sizibophezele kumbutho wezokuvikela.</td>
<td>#140. Ek en my gesin is toegewyd aan die weemag.</td>
<td>#140. Nna le ba lelapa lame re na le boitlamo mo sesoleng.</td>
<td></td>
</tr>
<tr>
<td>#141. My family and I are committed to our country.</td>
<td>#141. Mina nomndeni wami sizibophezele ezweni lakithi.</td>
<td>#141. Ek en my gesin is toegewy aan ons land.</td>
<td>#141. Nna le ba lapa lame re na le boitlamo mo nageng ya rona.</td>
<td></td>
</tr>
<tr>
<td>#142. The SANDF’s purpose is important.</td>
<td>#142. Izimiso zombutho wokuvikela (SANDF) zibalulekile.</td>
<td>#142. Die doel van die SANW is belangrik.</td>
<td>#142. Sesole sa naga ya rona se na le mosoleng ya rona.</td>
<td></td>
</tr>
<tr>
<td>#143. The SANDF protects our country.</td>
<td>#143. Umbutho wokuvikela (SANDF) uvikela izwe lethu</td>
<td>#143. Die SANW beskerm ons land.</td>
<td>#143. Sesole sa naga ya rona se sireletsa naga.</td>
<td></td>
</tr>
<tr>
<td>#144. Deployments prevent boredom.</td>
<td>#144. Ukusebenzela kude nasekhaya (deployment) kugwema isithukuthezi.</td>
<td>#144. Ontplooiings voorkom dat soldate verveeld raak.</td>
<td>#144. Tiro ya kwa ntle e thusa go tlosa bodutu.</td>
<td></td>
</tr>
<tr>
<td>#145. Deployments make life interesting.</td>
<td>#145. Ukusebenzela kude kwenza impilo ibemnandi.</td>
<td>#145. Ontplooiings maak die lewe interessant.</td>
<td>#145. Tiro ya kwa ntle e dira gore botshelo bo nne monate.</td>
<td></td>
</tr>
<tr>
<td>#146. There are only a few bad things about deployments.</td>
<td>#146. Zimbalwa izinto ezingemnandi ngokusebenzela kude nasekhaya.</td>
<td>#146. Die negatiewe aspekte van ontplooiings is in die minderheid.</td>
<td>#146. Dilo tse di seng monate ka tiro ya kwa ntle ga di dintsi.</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>---</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td>---</td>
</tr>
</tbody>
</table>

<p>| | | | | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>#147. I am not concerned about the dangers of deployment.</td>
<td>#147. Angikhathazeki ngezingozi zokusebenzela kude nasekhaya.</td>
<td>#147. Ek is nie bekommend oor die gevare van ontplooiings nie.</td>
<td>#147. Ga ke tshwenyegele bokotsi jwa tiro ya kwa ntle.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>#149. There are benefits to being in the military.</td>
<td>#149. Kukhona izinzuzo ngokusebenzela umkhosi/umbutho.</td>
<td>#149. Die militère lewe bied voordele.</td>
<td>#149. Sesole se na le dipelo tse di itumedisang.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>#150. My family understands that deployment is part of my job.</td>
<td>#150. Umndeni wami uyaqonda ukuthi ukusebenza kude nasekhaya kuyinxenyomsebenzi wami.</td>
<td>#150. My familie verstaan dat ontplooiing deel van my werk is.</td>
<td>#150. Ba lapa lwame ba thilaganya gore tiro ya kwa ntle ke karolo ya tiro ya me.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>#151. My family thinks deployments are important.</td>
<td>#151. Umndeni wami ucabanga ukuthi ukusebenzela kude nasekhaya kubalulekile (kusemqoka).</td>
<td>#151. My familie dink dat ontplooiings belangrik is.</td>
<td>#151. Lapa lame le gopola gore tiro ya kwa ntle e bothokwa.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>#152. My family needs the extra money I get from deployments.</td>
<td>#152. Umndeni wami uyayidina imali eyongezwa ukusebenzela kude nasekhaya.</td>
<td>#152. My familie het die ekstra geld wat ek met ontplooiings verdien nodig.</td>
<td>#152. Lapa lame le thokha madi a ke a bonang fa ke dira kwa ntle.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>#153. My family is proud that I am a soldier.</td>
<td>#153. Umndeni wami uyaziqhene ngobusotsha bami.</td>
<td>#153. My familie is trots daarop dat ek ‘n soldaat is.</td>
<td>#153. Lapa lame le ipelafatsa ka go nna lesole ga me.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>#154. I am proud to be a soldier.</td>
<td>#154. Ngiyaziqhene ngokuba yisotsha.</td>
<td>#154. Ek is trots daarop om ‘n soldaat te wees.</td>
<td>#154. Ke a ipela ka go nna lesole.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>#156. I like to work for the military.</td>
<td>#156. Ngiyakuthokozela ukusebenzela umkhosi/umbutho.</td>
<td>#156. Ek hou daanvan om vir die weermag te werk.</td>
<td>#156. Ke a rata go dira mo sesoleng.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>#157.</td>
<td>#158.</td>
<td>#159.</td>
<td>#160.</td>
<td>#161.</td>
<td>#162.</td>
</tr>
<tr>
<td>-------</td>
<td>-------</td>
<td>-------</td>
<td>-------</td>
<td>-------</td>
<td>-------</td>
</tr>
<tr>
<td><strong>1. Strongly disagree</strong></td>
<td><strong>1. Cha, angivumi</strong></td>
<td><strong>1. Stem glad nie saam nie</strong></td>
<td><strong>1. Ke ganela thata</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>2. Disagree</strong></td>
<td><strong>2. Angivumi</strong></td>
<td><strong>2. Stem nie saam nie</strong></td>
<td><strong>2. Ke a gana</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>5. Strongly agree</strong></td>
<td><strong>5. Yebo, ngiyavuma</strong></td>
<td><strong>5. Stem beslis saam</strong></td>
<td><strong>5. Ke dumela thata</strong></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>#157.</th>
<th>#158.</th>
<th>#159.</th>
<th>#160.</th>
<th>#161.</th>
<th>#162.</th>
<th>#163.</th>
<th>#164.</th>
<th>#165.</th>
<th>#166.</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>I trust the people I deploy with.</strong></td>
<td><strong>In my family we focus on the positive aspects of deployments.</strong></td>
<td><strong>My family has money available in case of an emergency.</strong></td>
<td><strong>My family can handle money matters without my help.</strong></td>
<td><strong>My family knows how to get money from the bank when I am not available.</strong></td>
<td><strong>My family can get transport when they need it.</strong></td>
<td><strong>My family can get to a clinic/hospital when they need medical help.</strong></td>
<td><strong>My family has access to security (eg police, dogs, neighbours, etc).</strong></td>
<td><strong>My family has strong religious beliefs.</strong></td>
<td><strong>In our family we have a strong cultural identity.</strong></td>
</tr>
</tbody>
</table>

© 2003, Directorate Social Work & Military Health Research Centre – Military Social Health Index – v 2.0
<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Strongly disagree</td>
<td>1. Cha, angivumi</td>
</tr>
<tr>
<td>2.</td>
<td>Disagree</td>
<td>2. Angivumi</td>
</tr>
<tr>
<td>3.</td>
<td>Uncertain</td>
<td>3. Anginasiqiniseko</td>
</tr>
<tr>
<td>4.</td>
<td>Agree</td>
<td>4. Ngiyavuma</td>
</tr>
<tr>
<td>5.</td>
<td>Strongly agree</td>
<td>5. Yebo, ngiyavuma</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1.</td>
<td>Stem glad nie saam nie</td>
<td>1. Ke ganela thata</td>
</tr>
<tr>
<td>2.</td>
<td>Stem nie saam nie</td>
<td>2. Ke a gana</td>
</tr>
<tr>
<td>3.</td>
<td>Onseker</td>
<td>3. Ga ke na bonnete</td>
</tr>
<tr>
<td>4.</td>
<td>Stem saam</td>
<td>4. Ke a dumela</td>
</tr>
<tr>
<td>5.</td>
<td>Stem beslis saam</td>
<td>5. Ke dumela thata</td>
</tr>
</tbody>
</table>

<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>#167.</td>
<td>We are proud of our culture.</td>
<td>#167. Siyazihenya ngamasiko ethu.</td>
</tr>
<tr>
<td>#168.</td>
<td>Our family’s cultural roots are important.</td>
<td>#168. Imvelaphi yamasiko omndeni wami ibalulekile.</td>
</tr>
<tr>
<td>#169.</td>
<td>My family has interests/hobbies outside the family.</td>
<td>#169. Umndeni wami unayo eminye imisebenzi yokuzithokozisa (hobbies) ngaphandle komndeni.</td>
</tr>
<tr>
<td>#170.</td>
<td>My family believes that we can cope with life.</td>
<td>#170. Umndeni wami uyathemba ukuthi uyakwazi ukubhekana nempilo.</td>
</tr>
<tr>
<td>#171.</td>
<td>In our family we feel good about ourselves.</td>
<td>#171. Emndenini wami siyabujabulela ubuthina.</td>
</tr>
<tr>
<td>#172.</td>
<td>My family is able to bounce back after difficult times.</td>
<td>#172. Umndeni wami uyakwazi ukukuvuka uzithathe emva kokuhlangabezana nobunzima.</td>
</tr>
<tr>
<td>#173.</td>
<td>Problems are part of life.</td>
<td>#173. Izinkinga ziyinxene yokuphila.</td>
</tr>
<tr>
<td>#174.</td>
<td>Difficult times are an opportunity to learn.</td>
<td>#174. Izinkinga ziletha ithuba lokufunda.</td>
</tr>
<tr>
<td>#175.</td>
<td>I am in control of my life.</td>
<td>#175. Ngiyakwazi ukuyilawula impilo yami.</td>
</tr>
<tr>
<td>#176.</td>
<td>My family stands together.</td>
<td>#176. Umndeni wami ubambisene.</td>
</tr>
<tr>
<td>#177.</td>
<td>We have close family ties.</td>
<td>#177. Umndeni wami unobudlelwano obuhle.</td>
</tr>
<tr>
<td>#178.</td>
<td>In our family we talk about experiences we have shared.</td>
<td>#178. Emndenini wami siyakwazi ukuxo xa ngezinto ezisehlakalele empiweni.</td>
</tr>
</tbody>
</table>

© 2003, Directorate Social Work & Military Health Research Centre – Military Social Health Index – v 2.0
<p>| #179. We have our own way of celebrating family traditions. | #179. Emndeni wami sinendlela yokugubha imikhosi/yokuzithokozisa. | #179. In my family vier ons feesdae op ons eie manier. | #179. Mo lapeng re na le tsela e re ketekang mekete ya rona ka yona. |
| #180. We respect each other in our family. | #180. Emndenini wami siyahloniphana. | #180. In my family respekteer ons mekaar. | #180. Mo lapeng lame re a tlotlana. |
| #181. My family can adapt to change. | #181. Umndeni wami uuyakwazi ukumelana nezinguquko. | #181. My family kan by verandering aanpas. | #181. Lapa lame le kgona go fetoga jaaka go thokega. |
| #182. We talk openly with each other in our family. | #182. Emndenini wami sikhulumisana ngendlela ekhululekile. | #182. In my familie gesels ons openlik met mekaar. | #182. Mo lapeng re kgona go buisana ntle le mathata. |
| #183. My family has learned how to cope in difficult times. | #183. Umndeni wami uzifundisile ukumelana nezinkathi ezinzima. | #183. My familie het geleer hoe om moeilike situasies te hanteer. | #183. Lapa lame le ithutile go lepama le nako e thata. |
| #184. In our family we agree on important things. | #184. Umndeni wami uuyakwazi ukuvelo ngezinto ezibalulekile. | #184. In ons familie stem ons saam oor belangrike punte. | #184. Lapa lame le dumelana ka dilo tse di bothokwa. |
| #185. Our family likes spending time together. | #185. Umndeni wami uyathanda ukuchitha isikhathi ndawonye. | #185. Ons familie geniet dit om tyd saam deur te bring. | #185. Lapa lame le rata go itisa mmogo. |
| #186. Other members of my family are employed. | #186. Amanye amalunga omndeni wami ayasebenza. | #186. Meer as een van ons familieledes verdiens 'n inkomste. | #186. Bangwe mo lapeng ba a dira. |
| #188. We believe things in life will get better. | #188. Siyathemba ukuthi izinto zizobangcono emplweni. | #188. Ons glo aan 'n beter toekoms. | #188. Re dumela gore dilo mo botseleng di tla tokafala. |
| #189. We maintain a healthy lifestyle. | #189. Umndeni wami ugcina impilo ephilisayo. | #189. Ons handhaaf 'n gesonde leefwyse. | #189. Re tshela botselo jo bo edileng. |</p>
<table>
<thead>
<tr>
<th>#190. Leliphepha lohlelo lemibuzo lingezilimi ezine kulo. Yiluphi lwalezilimi olusebenzisa kakhu?</th>
<th>#190. Hierdie vraelys is in vier tale opgestel. Watter van die volgende tale het u die meeste gebruik om hierdie vraelys te voltooi?</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. IsiNgisí</td>
<td>1. Engels</td>
</tr>
<tr>
<td>2. IsiZulu</td>
<td>2. IsiZulu</td>
</tr>
<tr>
<td>3. IsiBhunu</td>
<td>3. Afrikaans</td>
</tr>
<tr>
<td>4. Setswana</td>
<td>4. Setswana</td>
</tr>
<tr>
<td>5. Anginasiqiniseko</td>
<td>5. Onseker</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>#190. This questionnaire has four languages in it. Which one of the languages did you use most often to complete this questionnaire?</th>
<th>#191. Did you have any difficulties in understanding this questionnaire?</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. English</td>
<td>1. Yes</td>
</tr>
<tr>
<td>2. Zulu</td>
<td>2. No</td>
</tr>
<tr>
<td>3. Afrikaans</td>
<td>3. Unsure</td>
</tr>
<tr>
<td>4. Setswana</td>
<td></td>
</tr>
<tr>
<td>5. Unsure</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>#190. Dipotso tse di ka dipuo/diteme tse nne. O dirisi tse puo/leleme efe/lefe mo nakong e ntsi?</th>
<th>#191. Het u enige probleme ondervind om die vraelys te verstaan?</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Sejatlhapi</td>
<td>1. Ja</td>
</tr>
<tr>
<td>2. Sezulu</td>
<td>2. Nee</td>
</tr>
<tr>
<td>3. Seafrikaans</td>
<td>3. Onseker</td>
</tr>
<tr>
<td>4. Setswana</td>
<td></td>
</tr>
<tr>
<td>5. Ga ke na bonnete</td>
<td></td>
</tr>
</tbody>
</table>

Please do not mark the last set of answers marked “For Office Use Only.”

Thank you for completing this questionnaire.

Ngiyabonga ngokugcwalisa leliphepha lemibuzo.

Dankie dat u die vraelys voltooi het.

Re lebogela tirisanommogo ya gago.
**Military Social Health Index – Answer Sheet – v2.0**

#1  How old are you?
1 2 3 4 5 6 7 8 9 10

#2  What is your rank?
1 2 3 4 5 6 7 8 9 10

#3  What is your home language (mother tongue)?
1 2 3 4 5 6 7 8 9

---

#4  

#5  

#6  

#7  

#8  

#9  

#10  

#11  

#12  

#13  

#14  

#15  

#16  

#17  

#18  

#19  

#20  

#21  

#22  

#23  

#24  

#25  

#26  

#27  

#28  

#29  

#30  

#31  

#32  

---

#33  

#34  

#35  

#36  

#37  

#38  

#39  

#40  

#41  

#42  

#43  

#44  

#45  

#46  

#47  

#48  

#49  

#50  

#51  

#52  

#53  

#54  

#55  

#56  

#57  

#58  

#59  

#60  

#61  

#62  

#63  

#64  

#65  

#66  

#67  

#68  

#69  

#70  

#71  

#72  

#73  

#74  

#75  

#76  

#77  

#78  

#79  

#80  

#81  

#82  

#83  

#84  

#85  

#86  

#87  

#88  

#89  

#90  

---

*Please turn this page over and continue*
Thank you for participating in this research project
APPENDIX D: RESEARCH PROTOCOL FOR VALIDATION STUDY

The research protocol that was provided to all social workers involved in data collection is included on the following pages.
Validation of the *Military Social Health Index*:

Research Protocol
For Social Workers

Social Work R&D
Military Health Research Centre
February 2003
VALIDATION OF THE MILITARY SOCIAL HEALTH INDEX: RESEARCH PROTOCOL FOR SOCIAL WORKERS

INTRODUCTION

1. The Director Social Work tasked the Social Work R&D department of the Military Psychological Institute to develop a new instrument for use by social work officers during Concurrent Health Assessments. A proposal for this project was negotiated and approved in April 2002 and the instrument was called the Military Social Health Index or MSHI.

2. The new instrument was developed by a team of social workers from MPI, 1 Military Hospital and Gauteng MHU. It was pilot tested in a number of Gauteng units and a linguistic equivalence study was conducted to ensure that the four translations were equivalent.

3. It is now time to collect completed MSHIs so that the instrument can be validated. Validation involves:
   a. Ensuring that the instrument is valid, that is, that it measures what it is supposed to measure.
   b. Ensuring that the instrument is reliable, that is, that it measures accurately and consistently.
   c. Ensuring that the instrument is not culturally biased, that is, that the instrument does not disadvantage any culture and/or language group. Six culture groups are being specifically targeted in the study:
      i. African Setswana-speaking people.
      ii. African Zulu-speaking people.
      iii. Asian (Indian) English-speaking people.
      iv. Coloured Afrikaans-speaking people.
      v. White Afrikaans-speaking people.
      vi. White English-speaking people.
   d. Determining the cut-off scores that enable us to know whether or not someone has a social problem.

AIM

4. The purpose of this manual is to explain what you, as a social worker in the Directorate Social Work, are required to do to assist the validation of the MSHI.

PROCEDURES

MATERIALS

5. You will receive three sets of documents from your staff officer or area manager in an envelope:
   a. This manual, which explains what you must do.
b. Two master copies of the MSHI question booklet. You should use this booklet over and over again. It is provided in four languages. If you need additional copies of the booklet, you will need to copy them yourself.

c. A pile of 70 MSHI answer sheets. Do not photocopy these forms – they were especially printed to be scanned at MPI. Photocopied forms cannot be scanned.

FINDING RESPONDENTS

6. **Number of Respondents.** You must obtain a total of 60 completed answer sheets.

7. **Case Work Respondents.** You must obtain at least 20 completed answer sheets from casework clients whom you have already assessed and who are uniformed members of the SANDF (not dependents or civilian employees). Case work clients from any culture group can participate in the study.

8. **Community/Group Work Respondents.** The remaining 40 answer sheets can be collected from people you have contact with in the line of your day-to-day work. Any uniformed members you see during the women's health project, life skills courses, deployment resilience training, etc can complete the instrument. If you work in a training unit, you have an ideal opportunity to get lots of questionnaires filled in easily. Ask the course leaders for 90 minutes to administer the questionnaire to small groups of people.

9. As far as possible, try to get a good cross-section of different Arms of Service, ranks, gender, marital status, etc.

10. The Tertiary and Area Formation staff officers have instructed that you obtain the non-casework participants from certain culture groups, depending on where you work:

   a. All social workers must target White and Asian English-speaking persons.


   c. Social workers in the North West must concentrate on Setswana-speaking persons.

   d. Social workers in Gauteng must each obtain at least 22 White Afrikaans-speaking persons, with the balance being made up of any other culture groups.

   e. Social workers in the Northern and Western Cape must obtain at least 25 Coloured Afrikaans-speaking persons, with the balance being made up of any other culture groups.

   f. Social workers in Mpumalanga and Limpopo may collect data from all culture groups.

   g. Social workers in the Free State must concentrate on White Afrikaans-speaking persons, and any other groups.

   h. Social workers in the Eastern Cape must concentrate on White English-speaking persons and all other groups.

11. Use the covering letter on the top of the question booklet if your Commanding Officer requires proof that this is an official SANDF study.
INVITING PARTICIPATION

12. Wherever you get your respondents, the next step is to invite the people to participate in the study.

13. Ask the person if they may be willing to participate in a social work research project. If they express willingness, hand them the question booklet.

14. On the front is a letter about the study from Brig Gen Motumi. Read this aloud to the respondent(s). Ask if they understand the study and if they have any questions. Reinforce the fact that the study is anonymous and that their force number is not required. Encourage them to participate by explaining that their participation will help the Directorate Social Work take better care of soldiers and families.

15. If the person is willing to participate, continue with the instructions in the following section.

16. If the person does not want to participate, thank them for their time and take back the question booklet. Do not pressure them to participate.

COMPLETING THE INSTRUMENT

17. If a person agreed to participate in the study, explain that everything in the questionnaire is provided in four languages: English, Zulu, Afrikaans and Setswana. They should pick one language to read, although they can compare across languages if they want.

18. Ask them to read through the first two pages (up to question 1, “How old are you?”). Ask if they have any questions about completing the instrument.

19. Ensure that they understand how to complete the instrument on the answer sheet. Remind them not to write on the question book.

20. Hand out the Answer Sheet and monitor their completion of the first few questions. Ensure that they are completing the Answer Sheet correctly. Once they are on question 10, do not look at their answers, as the questions are becoming more personal.

21. In our pilot studies, we found that about half the respondents complete the instrument in 40 minutes and that almost all will have completed within an hour. A handful of individuals may take a little more than one hour.

22. When they are done, scan over their answer sheet to make sure they have completed the answers correctly and that most or all items are completed. Do not force anyone to complete all the answers.

23. **This next section is very important:**

   a. **Case Work.** If the participant is your client, keep the answer sheet separate because there is a section you need to complete. Don’t let it get mixed up with other answer sheets. See the following section for details.

   b. **Community Work/Training.** If the participant is part of a group (eg in a community work project or at a training unit), place the completed Answer Sheets in a box or envelope.

24. Thank the respondent(s) for participating in the study and assure them that their Answer Sheets will remain anonymous. Reinforce the fact that their participation has contributed to the development of social work services in the SANDF.
CASE WORK

25. We can determine the reliability and validity of the MSHI with the completed Answer Sheets. But in order to determine the cut-off scores, we need clinical information about the respondents. The cut-off scores are very important because these are used during the CHA to determine who needs to be interviewed.

26. Look at the back of the Answer Sheet and notice a group of 10 or so items that are marked “For Office Use Only”. The questions that link with these items are listed in Appendix A to this manual.

27. Complete these questions on the Answer Sheet, using what you know about the client through your social work assessment of him/her. Think carefully about these questions – your answers to these questions are probably the most important part of this study.

SUBMITTING DOCUMENTS

28. At the end of each month (from May to July 2003), submit all completed Answer Sheets to your staff officer or area manager, as follows:

   a. You can mix casework and community work Answer Sheets.

   b. On the front of the envelope, write your name and how many casework forms and how many community work forms can be found in the envelope.

   c. You have until the end of July to collect this data. If you think you won't make the deadline, talk with your area manager or staff officer in advance – perhaps one of your colleagues can help complete your quota.

29. Your staff officer will send these documents to Maj Kleynhans at MPI. MPI will capture the data and track our progress towards obtaining sufficient data for the validation.

QUERIES

30. If you have queries about the study, please speak with your staff officer. If s/he cannot answer your question, s/he will contact MPI. Please do not contact MPI directly.

MANAGEMENT INFORMATION SYSTEM

31. Register your time working on this project on the DSW Interim MIS as research. Use the following information:

   a. Study Number:  804.0193

   b. Project Name:  Validation of the MSHI

   c. Project Type:  8 (research & development)

   d. End Result:  1 (operational support)

   e. ICD 10:  Z00.0

   f. Position:  5 (willing, allowed & able personnel)
APPENDIX A:
SOCIAL WORK ASSESSMENT AND THE MSHI

1. At the end of the Military Social Health Index you will see a section of 11 questions headed “For Office Use Only”.

2. Answer these questions if the respondent is a uniformed client of yours whom you have assessed.

3. Base the answers to these questions on your own professional assessment of the client’s functioning.

4. The assessment focuses on the entire family system of which the client is a part. Do not focus on the client in isolation from the system. The definition of a family is provided on the following page.

5. Be sure that you are familiar with the Resilience Model as described in Appendix B of this manual before you attempt to answer these questions. It is essential that you are thoroughly familiar with the definitions and descriptions of the various components of the Resilience Model as described in Appendix B. You will not be able to complete the last eleven questions accurately if you do not. If you complete the questions inaccurately, you will create unreliable cut-off scores. Unreliable cut-off scores will result in you and your social work colleagues having to conduct more interviews during CHA.

6. Answer all the questions using the following key:
   1 = Yes
   2 = Unsure
   3 = No

7. Complete the questions to the best of your ability.
   a. Only mark the “1=Yes” and “2=No” answers if you are definitely sure.
   b. If you unsure of the answer, mark “2 = Unsure”.

© 2003, Social Work Research & Development, MPI
The term 'family', as used in the questions below, is defined as the network of significant and meaningful relationships between a group of individuals who experience a sense of emotional affiliation and mutual obligation. Although family is not defined according to blood or legal relations, most families comprise individuals who have a kin or romantic connection. Family refers to the group of individuals one cares for or who care for one. The family is "the ecological system that nourishes the individual". Family may include one or more spouses or partners, children (biological, adopted, or otherwise), parents, siblings, extended family relatives, etc. *Family includes any individuals that consider themselves to be a family.*

Answer all the questions using the following key:

1 = Yes  
2 = Unsure  
3 = No

### VULNERABILITY (Note: ‘Yes’ means there is a problem)

**Question 192.** In your professional opinion, does this client/family have social problems that require social work intervention? (Note: ‘Yes’ means there is a problem)

**Question 193.** In your professional opinion, does this client/family experience pile-up that requires social work intervention? (Note: ‘Yes’ means there is a problem)

**Question 194.** In your professional opinion, does this client/family experience problems in the family life cycle that require social work intervention? (Note: ‘Yes’ means there is a problem)

**Question 195.** In your professional opinion, does this client/family experience work-to-family interference that requires social work intervention? (Note: ‘Yes’ means there is a problem)

### RESILIENCE (Note: ‘No’ means there is a problem)

**Question 196.** In your professional opinion, does this client/family have access to high quality and sufficient social support? (Note: ‘No’ means there is a problem)

**Question 197.** In your professional opinion, does this client/family demonstrate good problem solving ability? (Note: ‘No’ means there is a problem)

**Question 198.** In your professional opinion, does this client/family demonstrate positive stressor appraisal? (Remember that stressor appraisal is with regard to deployments only.) (Note: ‘No’ means there is a problem)

**Question 199.** In your professional opinion, does this client/family demonstrate a variety of generalised resistance resources? (Note: ‘No’ means there is a problem)

### SOCIAL HEALTH (Note: ‘No’ means there is a problem)

**Question 200.** In your professional opinion, could this client deploy next week to another country for a period of three months? (Note: ‘No’ means there is a problem)

**Question 201.** In your professional opinion, is this client/family socially healthy? (Note: ‘No’ means there is a problem)

**Question 202.** Write your three-digit social work code (from the DSW Interim MIS system) in the open blocks.
APPENDIX B:
DEFINITIONS OF RESILIENCE MODEL COMPONENTS

1. The paragraphs below provide a definition of each of the nine components of the Resilience Model (underlined), followed by a brief description of the component.

2. On the pages that follow you find a set of eight ‘facet maps’ that were used in the scale development process to generate the scale items (questions). If you review these maps you will get a good sense of what we mean by and are measuring for each of the eight components.

3. **Social problems** (See Figure 1) is the presence of persistent (non-crisis) social pathology in the family system over the previous six months, which combines to create vulnerability and social unhealth.

4. Social problems can be located within any individual within the family or in the family system itself or in the system of relationships that family members are connected to. Social problems do not refer to problems in macro environment, unless these problems impinge directly and consciously on the family. Social problems are defined according to the perceptions of one member of the family system – the member that is assessed. Social problems are persistent and enduring over a period of time, rather than crises or short-term events.

5. **Pile-up** (See Figure 2) is the accumulation, over a six-month period, of multiple life stressors, crises or events, originating from outside the family system, which require complex and multiple role changes in the family system, which contributes to increased vulnerability and social unhealth.

6. Pile-up refers to non-normative life events (such as the death of a colleague), rather than normative family life cycle events (such as the death of a parent). Although pile-up can occur within the family system (eg the injury of a family member), the stressors do not originate from within the family system itself.

7. **Family life cycle** (See Figure 3) refers to the difficulties related to transitional events in the family life cycle, which contribute to increased vulnerability and social unhealth.

8. The focus is on significant and stressful events originating from within the family system – in contrast to pile-up, which refers to events originating from without the family system. No normative family life cycle process is required – any event in the life of a family constitutes family life cycle.

9. **Work-to-family interference** (See Figure 4) is the presence of stressors in the workplace that may spill over into the family system, which combines to create vulnerability and social unhealth.

10. The focus is exclusively on events and processes within the soldier’s workplace (ie the military) that may impact negatively on family resilience and well-being. This may include the lack of military support for families or the poor management of military deployments.

11. **Social support** (See Figure 5) is the ability of the family system to access quality and sufficient support systems in times of need, which contributes to increased resilience and social health.

12. The source of social support is not of interest here – families can obtain support from any source. The quality and adequacy of social support is, however, important. The quality of social support comprises emotional support (feeling cared for and loved), esteem support
(feeling valued), network support (feeling of belonging) and instrumental support (practical help).

13. **Problem solving** (See Figure 6) is the ability of the family system to identify problems, generate alternatives, implement solutions and evaluate solutions, which contributes to increased resilience and social health.

14. The focus here is on the family’s ability to follow a systematic process of solving problems, rather that on the family’s ability to communicate in a constructive manner about problems or the belief of family members in their ability to solve or overcome problems. Problem solving addresses the process of solving problems, not the resolution of problems as such.

15. **Stressor appraisal** (See Figure 7) is the way in which the stress of deployments is perceived (seen), appraised (evaluated) and interpreted (given meaning) by family systems, which contributes to increased resilience and social health.

16. The ‘stressor’ is defined as a military deployment – the appraisal of the stressor thus focuses specifically on deployments (stressor appraisal – C) or more broadly on the military (situation appraisal – CC). Stressor appraisal focuses on the cognitive processes concerning deployments, rather that on the deployments itself – it is not a measure of the stressfulness of the deployment, but rather of the thinking about the stressor.

17. **Generalised resistance resources** (See Figure 8) is the presence of a variety of creative and dynamic resources in family members and the family system, that enable families to resist life stress, which contributes to increased resilience and social health.

18. Social supports and problem solving processes, although also resistance resources, are excluded here as they constitute specific rather than generalized resistance resources. The focus here, unlike with stressor appraisal, is on life stress in general, rather than on the stress of deployments in particular.

19. **Social health** (See Figure 9) is the relatively low vulnerability and high resilience of people that enables them to deal effectively with life stress, notably the stress of a military operation (Directorate Social Work, 2001, p. 5).

20. Social health is thus the result of a stressor such as a military deployment impacting on a family system, mediated by the relative absence of social problems, pile-up, family life cycle difficulties and work-to-family interference and the relative presence of social support, problem solving abilities, positive stressor appraisal and generalized resistance resources.
Figure 1: Facet Map for Social Problems

Social Problems

Conflict with family members - Community conflicts - In trouble with law/MDC - Care of extended family - Fragmentation of nuclear family - Food/subsistence - Physical fights while drinking - Done things you regret because drinking - Friends say you drink too much - Children are neglected - Use of drugs - Excessive drinking - Difficulty paying bills - Difficulty supporting family financially - Assets taken by sheriff of court - Concerns around care of children - Conflict with work supervisors - AWOL - In trouble with law/MDC - Conflict with members of community - Feeling worried/anxious - Feeling out of control - Feeling helpless - Feeling depressed - Feeling helpless - Ongoing violence - Psychological problems - Illness - Suicidal
Figure 2: Facet Map for Pile-Up

- Increase in petrol price
- Natural disaster
- Community crisis
- Experience of violent assault
- Loss of job
- Buying a home
- Major financial crisis
- Change of address
- Change of work
- Significant cultural event
- Death of friend/colleague
- Promotion
- Arrest

Pile-up
Figure 3: Facet Map for Family Life Cycle

- Moving in with partner
- Lobola/marriage
- Death of spouse/partner
- Wedding ceremony
- Separation/divorce
- Death of elderly family member
- Unplanned pregnancy
- Child fails/drops out of school
- Planned pregnancy
- Child leaves home
- Child born out of wedlock
- Kin child enters family
- Child changes school
- Child born in wedlock
Figure 4: Facet Map for Work-to-Family Interference
Figure 5: Facet Map for Social Support

Social Support

- Feeling of belonging
- Feel cared for by others
- Feeling loved by others
- Feel respected by others
- Feel important to others
- Feel understood by others
- Support when upset/distressed
- People will help in an emergency
- Supports make constructive contribution to family life
- Feel secure-safe/protected
- Often spend time with others
- Provide support to others
- Feel listened to by others
- Able to make use of supports when needed
- Willing to make use of supports when needed
- Pratical support from others
- Good relationships with others
- Regular/frequent contact with others
- Satisfaction with available supports
- Large number of supports available
- Can rely on others
- Children feel safe in community
- Feel important to others
- Feel valued or appreciated by others
- Feel respected by others
- Feel cared for by others
- Feel loved by others
Problems are identified
Family learns from mistakes
Family consults with others for help
Family avoids blaming people
Think of different ways to solve problems
Family collaborates in solving problems
Family puts into practice the solutions
Family acts on decisions
When solutions don’t work, family mobilises
When solutions don’t work, family doesn’t ignore problem
When solutions don’t work, family consults with others
When solutions don’t work, family talks
When solutions don’t work, family looks for another solution
When solutions don’t work, family looks for solutions everyone agrees on
When solutions don’t work, family looks for solutions to problems
When solutions don’t work, family looks to past for solutions
When solutions don’t work, family talks
When solutions don’t work, family consults with others
When solutions don’t work, family talks about problems
When solutions don’t work, family gets more determined to succeed
When solutions don’t work, family looks for solutions
When solutions don’t work, family works together to find solutions
When solutions don’t work, family looks for solutions to problems
When solutions don’t work, family talks
When solutions don’t work, family consults with others
When solutions don’t work, family looks for solutions to problems
Family is confident when solving problems
Family solves problems step-by-step
Family talks about whether solutions worked
When solutions don’t work, family does something about it
When solutions don’t work, family seeks professional help
Family works together to find solutions
Family looks for solutions to problems
Family talks
Family is confident when solving problems
Family faces problems directly
Problems do not persist indefinitely
Family solves problems
Family is confident when solving problems
Family’s confidence when solving problems
Family looks for solutions
to problems
Family talks
Family is confident when solving problems
Family looks for solutions
to problems
Family talks
Family is confident when solving problems
Figure 6: Facet Map for Problem Solving
Figure 7: Facet Map for Stressor Appraisal

- Family can get help during deployments if needed
- Deployments are an opportunity to grow
- Deployments are an opportunity to learn new things
- Deployments have purpose
- Deployments are meaningful
- Deployments are not very stressful
- Problems resulting from deployments are manageable
- Deployment stress is manageable
- Commitment to military
- Commitment to South Africa
- SANDF’s mission is important
- SANDF contributes to stability in RSA
- Deployments make life interesting
- Deployments prevent boredom
- Negative aspects are in minority
- Happy to deploy with colleagues
- Enjoy military life
- Enjoy deployments
- Proud of being a soldier
- Deployments provide additional income
- Deployments are necessary part of job
- Family sees deployments as being important
- Family sees deployments as necessary part of job
- Problems resulting from deployments aren’t overwhelming
- Military life is rewarding
- Can handle stress of deployments
- Danger not a concern
**Figure 8: Facet Map for Generalised Resistance Resources**

- **Generalised Resistance Resources**

**Believe things will work out okay**
- **Enjoy eating meals together**
- **Family involved in community care**
- **Family has more than one income**
- **Family enjoys spending time together**
- **Family agrees on most important things**
- **Family sees difficulties as a challenge/opportunity**

**Sharing family stories**
- **Caring family relationships**
- **Close family relationships**
- **Strong family relationships**
- **Family stands closely together**
- **Cultural roots are important**

**Practice family traditions**
- **Mutual respect in family**

**Family adjusts to change**
- **Family can function independently**

**Family has learned to cope in difficult times**
- **Family has access to security/police**
- **Family has access to health care**
- **Family has access to shops**
- **Family has access to health care**
- **Family has access to transport**
- **Family has access to security/police**

**Family has access to shops**
- **Family has access to transport**
- **Family has access to health care**

**Are healthy**
- **Family members have interests/hobbies**
- **Family has strong cultural identity**
- **Family has strong religious/spiritual beliefs**

**Family is happy in life**
- **Family is happy in life**
- **Family members are healthy**
- **Children in family are cared for**

**Family has access to health care**
- **See self as coping with life**
- **Feel good about self**
- **Family has enough food**

**Living healthily**
- **Family has adequate shelter**
- **Family knows how to deal with life stress**
- **Bounce back quickly after difficulties**
- **Problems don't get them down**

**Believe in own abilities**
- **Difficulties in life have purpose**
- **Have control over life experiences**
- **Practice family traditions**
- **Open communication in family**

**Family has learned to cope in difficult times**
- **Family has learned to cope in difficult times**
- **Open communication in family**
- **Mutual respect in family**
- **Family can function independently**

**Family can access money independently**
- **Family can access money independently**
- **Family can access money independently**
- **Family can access money independently**
- **Family can access money independently**

© 2003, Social Work Research & Development, MPI

RESTRICTED
The text below is an extract from the data analysis log kept by the candidate during the process of data analysis. Each step in the process is numbered down the left side of the log. Each time data is changed in some way (eg after recoding) the file is renamed. The log indicates syntax procedures, output files, etc.

<table>
<thead>
<tr>
<th>Step</th>
<th>Description</th>
</tr>
</thead>
</table>
| 035  | Doctorate 03b – copy of Doctorate 03a  
Create item labels with syntax 1f  
Item Analysis: Syntax 2d  
Output: Item Analysis 035 |
| 036  | Create Doctorate 03b in Statistica  
New Macro Reliability 036  
Output: Reliability Out 036 |
| 037  | Doctorate 03b  
Syntax 6c – scale validation  
Output: Scale Valid 037  
Syntax: Doctoral Tables 7c |
|      | Data from 035-037 into Item Analysis 2a.xls |
| 038  | Doctorate 03b  
Syntax 5a – mean correlations  
Into SPSS as Mean Correlations 038  
SPSS output as Mean Correlations 038b  
Export into Item Analysis 2a.xls |
| 039  | Create Doctorate 05c from Doctorate 03b using Syntax 1e  
Delete scale scores of 0 or 100 on new variables  
Syntax 4d  
Output: Cultural Bias 039 |
| 040  | Copy Doctorate 06 to 06a  
Create new variables with IF  
Recode Clinical Unsure with 1  
Shuffle variable order  
Syntax: Known 040  
Output: Known 040  
Export and summarise in Excel known group |
| 041  | Doctorate 06a  
Cutting scores  
Syntax 041  
Output: 041  
Summarise in excel known group |
| 042  | Doctorate 06a  
Cutting score ranges  
Syntax: Cutting 042  
Output: Cutting 042  
Summarise in Excel known group |
## Table 34: Original Factor Matrix: White Afrikaans Culture

<table>
<thead>
<tr>
<th>Item</th>
<th>Scale</th>
<th>Missing</th>
<th>Support</th>
<th>Psolve</th>
<th>Appraise</th>
<th>Grrs</th>
</tr>
</thead>
<tbody>
<tr>
<td>F91</td>
<td>0.0</td>
<td>0.565</td>
<td>0.286</td>
<td>0.199</td>
<td>0.298</td>
<td></td>
</tr>
<tr>
<td>F92</td>
<td>0.0</td>
<td>0.660</td>
<td>0.363</td>
<td>0.209</td>
<td>0.341</td>
<td></td>
</tr>
<tr>
<td>F93</td>
<td>0.2</td>
<td>0.761</td>
<td>0.337</td>
<td>0.194</td>
<td>0.356</td>
<td></td>
</tr>
<tr>
<td>F94</td>
<td>0.0</td>
<td>0.743</td>
<td>0.361</td>
<td>0.203</td>
<td>0.373</td>
<td></td>
</tr>
<tr>
<td>F95</td>
<td>0.2</td>
<td>0.790</td>
<td>0.396</td>
<td>0.207</td>
<td>0.437</td>
<td></td>
</tr>
<tr>
<td>F96</td>
<td>0.0</td>
<td>0.783</td>
<td>0.429</td>
<td>0.224</td>
<td>0.446</td>
<td></td>
</tr>
<tr>
<td>F97</td>
<td>0.0</td>
<td>0.770</td>
<td>0.479</td>
<td>0.229</td>
<td>0.478</td>
<td></td>
</tr>
<tr>
<td>F98</td>
<td>0.4</td>
<td>0.676</td>
<td>0.485</td>
<td>0.187</td>
<td>0.460</td>
<td></td>
</tr>
<tr>
<td>F99</td>
<td>1.0</td>
<td>0.306</td>
<td>0.139</td>
<td>0.124</td>
<td>0.033</td>
<td></td>
</tr>
<tr>
<td>F100</td>
<td>0.0</td>
<td>0.697</td>
<td>0.482</td>
<td>0.221</td>
<td>0.415</td>
<td></td>
</tr>
<tr>
<td>F101</td>
<td>0.2</td>
<td>0.622</td>
<td>0.494</td>
<td>0.211</td>
<td>0.393</td>
<td></td>
</tr>
<tr>
<td>F102</td>
<td>0.8</td>
<td>0.734</td>
<td>0.411</td>
<td>0.253</td>
<td>0.366</td>
<td></td>
</tr>
<tr>
<td>F103</td>
<td>0.4</td>
<td>0.728</td>
<td>0.456</td>
<td>0.242</td>
<td>0.393</td>
<td></td>
</tr>
<tr>
<td>F104</td>
<td>0.2</td>
<td>0.785</td>
<td>0.447</td>
<td>0.213</td>
<td>0.403</td>
<td></td>
</tr>
<tr>
<td>F105</td>
<td>0.0</td>
<td>0.818</td>
<td>0.480</td>
<td>0.263</td>
<td>0.464</td>
<td></td>
</tr>
<tr>
<td>F106</td>
<td>0.2</td>
<td>0.627</td>
<td>0.523</td>
<td>0.311</td>
<td>0.484</td>
<td></td>
</tr>
<tr>
<td>F107</td>
<td>0.2</td>
<td>0.707</td>
<td>0.493</td>
<td>0.288</td>
<td>0.475</td>
<td></td>
</tr>
<tr>
<td>F108</td>
<td>0.4</td>
<td>0.702</td>
<td>0.383</td>
<td>0.273</td>
<td>0.395</td>
<td></td>
</tr>
<tr>
<td>F109</td>
<td>0.4</td>
<td>0.537</td>
<td>0.259</td>
<td>0.309</td>
<td>0.257</td>
<td></td>
</tr>
<tr>
<td>F110</td>
<td>0.2</td>
<td>0.631</td>
<td>0.404</td>
<td>0.304</td>
<td>0.387</td>
<td></td>
</tr>
<tr>
<td>F111</td>
<td>0.2</td>
<td>0.671</td>
<td>0.389</td>
<td>0.313</td>
<td>0.378</td>
<td></td>
</tr>
<tr>
<td>F112</td>
<td>0.2</td>
<td>0.697</td>
<td>0.569</td>
<td>0.248</td>
<td>0.539</td>
<td></td>
</tr>
<tr>
<td>F113</td>
<td>0.0</td>
<td>0.681</td>
<td>0.483</td>
<td>0.371</td>
<td>0.504</td>
<td></td>
</tr>
<tr>
<td>G114</td>
<td>0.2</td>
<td>0.626</td>
<td>0.685</td>
<td>0.262</td>
<td>0.608</td>
<td></td>
</tr>
<tr>
<td>G115</td>
<td>0.0</td>
<td>0.469</td>
<td>0.680</td>
<td>0.217</td>
<td>0.497</td>
<td></td>
</tr>
<tr>
<td>G116</td>
<td>0.0</td>
<td>0.528</td>
<td>0.768</td>
<td>0.268</td>
<td>0.583</td>
<td></td>
</tr>
<tr>
<td>G117</td>
<td>0.4</td>
<td>0.522</td>
<td>0.777</td>
<td>0.258</td>
<td>0.579</td>
<td></td>
</tr>
<tr>
<td>G118</td>
<td>0.0</td>
<td>0.495</td>
<td>0.740</td>
<td>0.205</td>
<td>0.560</td>
<td></td>
</tr>
<tr>
<td>G119</td>
<td>0.2</td>
<td>0.428</td>
<td>0.775</td>
<td>0.213</td>
<td>0.569</td>
<td></td>
</tr>
<tr>
<td>G120</td>
<td>0.0</td>
<td>0.447</td>
<td>0.855</td>
<td>0.263</td>
<td>0.621</td>
<td></td>
</tr>
<tr>
<td>G121</td>
<td>0.0</td>
<td>0.467</td>
<td>0.830</td>
<td>0.273</td>
<td>0.616</td>
<td></td>
</tr>
<tr>
<td>G122</td>
<td>0.2</td>
<td>0.413</td>
<td>0.774</td>
<td>0.271</td>
<td>0.599</td>
<td></td>
</tr>
<tr>
<td>G123</td>
<td>0.2</td>
<td>0.476</td>
<td>0.523</td>
<td>0.296</td>
<td>0.348</td>
<td></td>
</tr>
<tr>
<td>G124</td>
<td>0.0</td>
<td>0.455</td>
<td>0.832</td>
<td>0.316</td>
<td>0.566</td>
<td></td>
</tr>
<tr>
<td>G125</td>
<td>0.0</td>
<td>0.468</td>
<td>0.882</td>
<td>0.266</td>
<td>0.630</td>
<td></td>
</tr>
<tr>
<td>G126</td>
<td>0.2</td>
<td>0.440</td>
<td>0.871</td>
<td>0.272</td>
<td>0.620</td>
<td></td>
</tr>
<tr>
<td>G127</td>
<td>0.0</td>
<td>0.411</td>
<td>0.808</td>
<td>0.321</td>
<td>0.632</td>
<td></td>
</tr>
<tr>
<td>G128</td>
<td>0.4</td>
<td>0.414</td>
<td>0.830</td>
<td>0.355</td>
<td>0.599</td>
<td></td>
</tr>
<tr>
<td>G129</td>
<td>0.4</td>
<td>0.427</td>
<td>0.789</td>
<td>0.310</td>
<td>0.577</td>
<td></td>
</tr>
<tr>
<td>G130</td>
<td>0.2</td>
<td>0.422</td>
<td>0.813</td>
<td>0.313</td>
<td>0.631</td>
<td></td>
</tr>
<tr>
<td>G131</td>
<td>0.2</td>
<td>0.383</td>
<td>0.755</td>
<td>0.265</td>
<td>0.573</td>
<td></td>
</tr>
<tr>
<td>G132</td>
<td>0.4</td>
<td>0.311</td>
<td>0.583</td>
<td>0.301</td>
<td>0.398</td>
<td></td>
</tr>
<tr>
<td>G133</td>
<td>0.6</td>
<td>0.385</td>
<td>0.795</td>
<td>0.274</td>
<td>0.558</td>
<td></td>
</tr>
<tr>
<td>ITEM</td>
<td>SCALE</td>
<td>MISSING</td>
<td>SUPPORT</td>
<td>PSOLVE</td>
<td>APPRAISE</td>
<td>GRRS</td>
</tr>
<tr>
<td>------</td>
<td>-------</td>
<td>---------</td>
<td>---------</td>
<td>--------</td>
<td>----------</td>
<td>------</td>
</tr>
<tr>
<td>G134</td>
<td></td>
<td>0.8</td>
<td>.432</td>
<td>.771</td>
<td>.316</td>
<td>.584</td>
</tr>
<tr>
<td>G135</td>
<td></td>
<td>0.2</td>
<td>.293</td>
<td>.468</td>
<td>.333</td>
<td>.339</td>
</tr>
<tr>
<td>H136</td>
<td></td>
<td>0.8</td>
<td>.274</td>
<td>.263</td>
<td>.693</td>
<td>.287</td>
</tr>
<tr>
<td>H137</td>
<td></td>
<td>0.4</td>
<td>.329</td>
<td>.265</td>
<td>.701</td>
<td>.324</td>
</tr>
<tr>
<td>H138</td>
<td></td>
<td>0.6</td>
<td>.277</td>
<td>.235</td>
<td>.710</td>
<td>.280</td>
</tr>
<tr>
<td>H139</td>
<td></td>
<td>0.4</td>
<td>.309</td>
<td>.302</td>
<td>.682</td>
<td>.352</td>
</tr>
<tr>
<td>H140</td>
<td></td>
<td>0.2</td>
<td>.263</td>
<td>.309</td>
<td>.614</td>
<td>.335</td>
</tr>
<tr>
<td>H141</td>
<td></td>
<td>0.0</td>
<td>.373</td>
<td>.418</td>
<td>.529</td>
<td>.413</td>
</tr>
<tr>
<td>H142</td>
<td></td>
<td>0.0</td>
<td>.338</td>
<td>.373</td>
<td>.582</td>
<td>.375</td>
</tr>
<tr>
<td>H143</td>
<td></td>
<td>0.2</td>
<td>.278</td>
<td>.323</td>
<td>.583</td>
<td>.302</td>
</tr>
<tr>
<td>H144</td>
<td></td>
<td>1.0</td>
<td>.061</td>
<td>.084</td>
<td>.480</td>
<td>.065</td>
</tr>
<tr>
<td>H145</td>
<td></td>
<td>0.2</td>
<td>.125</td>
<td>.177</td>
<td>.622</td>
<td>.213</td>
</tr>
<tr>
<td>H146</td>
<td></td>
<td>0.6</td>
<td>.191</td>
<td>.198</td>
<td>.654</td>
<td>.218</td>
</tr>
<tr>
<td>H147</td>
<td></td>
<td>0.8</td>
<td>.103</td>
<td>.133</td>
<td>.564</td>
<td>.121</td>
</tr>
<tr>
<td>H148</td>
<td></td>
<td>0.6</td>
<td>.226</td>
<td>.241</td>
<td>.609</td>
<td>.252</td>
</tr>
<tr>
<td>H149</td>
<td></td>
<td>0.6</td>
<td>.313</td>
<td>.382</td>
<td>.500</td>
<td>.374</td>
</tr>
<tr>
<td>H150</td>
<td></td>
<td>0.6</td>
<td>.324</td>
<td>.309</td>
<td>.795</td>
<td>.304</td>
</tr>
<tr>
<td>H151</td>
<td></td>
<td>0.6</td>
<td>.217</td>
<td>.229</td>
<td>.807</td>
<td>.240</td>
</tr>
<tr>
<td>H152</td>
<td></td>
<td>1.2</td>
<td>.043</td>
<td>.027</td>
<td>.338</td>
<td>-.011</td>
</tr>
<tr>
<td>H153</td>
<td></td>
<td>0.2</td>
<td>.241</td>
<td>.327</td>
<td>.647</td>
<td>.367</td>
</tr>
<tr>
<td>H154</td>
<td></td>
<td>0.4</td>
<td>.239</td>
<td>.313</td>
<td>.594</td>
<td>.355</td>
</tr>
<tr>
<td>H155</td>
<td></td>
<td>0.6</td>
<td>.100</td>
<td>.089</td>
<td>.690</td>
<td>.139</td>
</tr>
<tr>
<td>H156</td>
<td></td>
<td>0.0</td>
<td>.223</td>
<td>.282</td>
<td>.599</td>
<td>.338</td>
</tr>
<tr>
<td>H157</td>
<td></td>
<td>0.8</td>
<td>.229</td>
<td>.251</td>
<td>.753</td>
<td>.312</td>
</tr>
<tr>
<td>H158</td>
<td></td>
<td>0.6</td>
<td>.274</td>
<td>.251</td>
<td>.753</td>
<td>.312</td>
</tr>
<tr>
<td>J159</td>
<td></td>
<td>0.4</td>
<td>.374</td>
<td>.323</td>
<td>.388</td>
<td>.420</td>
</tr>
<tr>
<td>J160</td>
<td></td>
<td>0.0</td>
<td>.346</td>
<td>.395</td>
<td>.393</td>
<td>.539</td>
</tr>
<tr>
<td>J161</td>
<td></td>
<td>0.2</td>
<td>.410</td>
<td>.377</td>
<td>.320</td>
<td>.573</td>
</tr>
<tr>
<td>J162</td>
<td></td>
<td>0.0</td>
<td>.442</td>
<td>.403</td>
<td>.317</td>
<td>.636</td>
</tr>
<tr>
<td>J163</td>
<td></td>
<td>0.0</td>
<td>.393</td>
<td>.361</td>
<td>.272</td>
<td>.660</td>
</tr>
<tr>
<td>J164</td>
<td></td>
<td>0.2</td>
<td>.544</td>
<td>.374</td>
<td>.321</td>
<td>.626</td>
</tr>
<tr>
<td>J165</td>
<td></td>
<td>0.0</td>
<td>.402</td>
<td>.487</td>
<td>.223</td>
<td>.644</td>
</tr>
<tr>
<td>J166</td>
<td></td>
<td>0.2</td>
<td>.378</td>
<td>.474</td>
<td>.244</td>
<td>.616</td>
</tr>
<tr>
<td>J167</td>
<td></td>
<td>0.8</td>
<td>.353</td>
<td>.437</td>
<td>.263</td>
<td>.594</td>
</tr>
<tr>
<td>J168</td>
<td></td>
<td>0.8</td>
<td>.316</td>
<td>.398</td>
<td>.230</td>
<td>.582</td>
</tr>
<tr>
<td>J169</td>
<td></td>
<td>0.6</td>
<td>.388</td>
<td>.465</td>
<td>.247</td>
<td>.579</td>
</tr>
<tr>
<td>J170</td>
<td></td>
<td>0.2</td>
<td>.404</td>
<td>.495</td>
<td>.298</td>
<td>.773</td>
</tr>
<tr>
<td>J171</td>
<td></td>
<td>0.4</td>
<td>.399</td>
<td>.555</td>
<td>.250</td>
<td>.787</td>
</tr>
<tr>
<td>J172</td>
<td></td>
<td>0.4</td>
<td>.374</td>
<td>.592</td>
<td>.312</td>
<td>.768</td>
</tr>
<tr>
<td>J173</td>
<td></td>
<td>0.2</td>
<td>.305</td>
<td>.398</td>
<td>.248</td>
<td>.581</td>
</tr>
<tr>
<td>J174</td>
<td></td>
<td>0.2</td>
<td>.308</td>
<td>.462</td>
<td>.321</td>
<td>.616</td>
</tr>
<tr>
<td>J175</td>
<td></td>
<td>0.4</td>
<td>.310</td>
<td>.494</td>
<td>.301</td>
<td>.632</td>
</tr>
<tr>
<td>J176</td>
<td></td>
<td>0.2</td>
<td>.369</td>
<td>.642</td>
<td>.224</td>
<td>.798</td>
</tr>
<tr>
<td>J177</td>
<td></td>
<td>0.2</td>
<td>.372</td>
<td>.603</td>
<td>.189</td>
<td>.720</td>
</tr>
<tr>
<td>J178</td>
<td></td>
<td>0.2</td>
<td>.358</td>
<td>.571</td>
<td>.209</td>
<td>.694</td>
</tr>
<tr>
<td>J179</td>
<td></td>
<td>0.2</td>
<td>.212</td>
<td>.367</td>
<td>.124</td>
<td>.560</td>
</tr>
<tr>
<td>ITEM</td>
<td>SCALE</td>
<td>MISSING</td>
<td>SUPPORT</td>
<td>PSOLVE</td>
<td>APPRAISE</td>
<td>GRRS</td>
</tr>
<tr>
<td>------</td>
<td>-------</td>
<td>---------</td>
<td>---------</td>
<td>--------</td>
<td>----------</td>
<td>------</td>
</tr>
<tr>
<td>J180</td>
<td>0.2</td>
<td>.407</td>
<td>.644</td>
<td>.187</td>
<td>.790</td>
<td></td>
</tr>
<tr>
<td>J181</td>
<td>0.2</td>
<td>.385</td>
<td>.561</td>
<td>.325</td>
<td>.745</td>
<td></td>
</tr>
<tr>
<td>J182</td>
<td>0.0</td>
<td>.389</td>
<td>.690</td>
<td>.242</td>
<td>.770</td>
<td></td>
</tr>
<tr>
<td>J183</td>
<td>0.2</td>
<td>.348</td>
<td>.566</td>
<td>.316</td>
<td>.754</td>
<td></td>
</tr>
<tr>
<td>J184</td>
<td>0.2</td>
<td>.369</td>
<td>.657</td>
<td>.303</td>
<td>.749</td>
<td></td>
</tr>
<tr>
<td>J185</td>
<td>0.4</td>
<td>.360</td>
<td>.614</td>
<td>.192</td>
<td>.743</td>
<td></td>
</tr>
<tr>
<td>J186</td>
<td>0.4</td>
<td>.248</td>
<td>.295</td>
<td>.141</td>
<td>.429</td>
<td></td>
</tr>
<tr>
<td>J187</td>
<td>0.4</td>
<td>.377</td>
<td>.577</td>
<td>.177</td>
<td>.703</td>
<td></td>
</tr>
<tr>
<td>J188</td>
<td>0.4</td>
<td>.333</td>
<td>.456</td>
<td>.274</td>
<td>.646</td>
<td></td>
</tr>
<tr>
<td>J189</td>
<td>0.4</td>
<td>.356</td>
<td>.558</td>
<td>.293</td>
<td>.744</td>
<td></td>
</tr>
<tr>
<td>ITEM</td>
<td>SCALE</td>
<td>MISSING</td>
<td>SUPPORT</td>
<td>PSOLVE</td>
<td>APPRAISE</td>
<td>GRRS</td>
</tr>
<tr>
<td>------</td>
<td>-------</td>
<td>---------</td>
<td>---------</td>
<td>--------</td>
<td>----------</td>
<td>------</td>
</tr>
<tr>
<td>F91</td>
<td>Social Supports</td>
<td>0.4</td>
<td>.473</td>
<td>.294</td>
<td>.187</td>
<td>.330</td>
</tr>
<tr>
<td>F92</td>
<td>0.6</td>
<td>.571</td>
<td>.407</td>
<td>.226</td>
<td>.331</td>
<td></td>
</tr>
<tr>
<td>F93</td>
<td>0.4</td>
<td>.696</td>
<td>.461</td>
<td>.295</td>
<td>.393</td>
<td></td>
</tr>
<tr>
<td>F94</td>
<td>0.0</td>
<td>.743</td>
<td>.466</td>
<td>.327</td>
<td>.387</td>
<td></td>
</tr>
<tr>
<td>F95</td>
<td>0.2</td>
<td>.762</td>
<td>.525</td>
<td>.369</td>
<td>.430</td>
<td></td>
</tr>
<tr>
<td>F96</td>
<td>0.2</td>
<td>.722</td>
<td>.475</td>
<td>.293</td>
<td>.354</td>
<td></td>
</tr>
<tr>
<td>F97</td>
<td>0.8</td>
<td>.782</td>
<td>.583</td>
<td>.363</td>
<td>.447</td>
<td></td>
</tr>
<tr>
<td>F98</td>
<td>0.6</td>
<td>.726</td>
<td>.596</td>
<td>.294</td>
<td>.424</td>
<td></td>
</tr>
<tr>
<td>F99</td>
<td>0.4</td>
<td>.503</td>
<td>.345</td>
<td>.196</td>
<td>.263</td>
<td></td>
</tr>
<tr>
<td>F100</td>
<td>0.4</td>
<td>.708</td>
<td>.534</td>
<td>.287</td>
<td>.378</td>
<td></td>
</tr>
<tr>
<td>F101</td>
<td>0.4</td>
<td>.662</td>
<td>.503</td>
<td>.315</td>
<td>.397</td>
<td></td>
</tr>
<tr>
<td>F102</td>
<td>0.4</td>
<td>.697</td>
<td>.462</td>
<td>.299</td>
<td>.368</td>
<td></td>
</tr>
<tr>
<td>F103</td>
<td>0.4</td>
<td>.699</td>
<td>.527</td>
<td>.342</td>
<td>.417</td>
<td></td>
</tr>
<tr>
<td>F104</td>
<td>0.4</td>
<td>.691</td>
<td>.514</td>
<td>.337</td>
<td>.435</td>
<td></td>
</tr>
<tr>
<td>F105</td>
<td>0.2</td>
<td>.776</td>
<td>.589</td>
<td>.373</td>
<td>.466</td>
<td></td>
</tr>
<tr>
<td>F106</td>
<td>0.4</td>
<td>.697</td>
<td>.623</td>
<td>.401</td>
<td>.507</td>
<td></td>
</tr>
<tr>
<td>F107</td>
<td>0.6</td>
<td>.697</td>
<td>.611</td>
<td>.390</td>
<td>.487</td>
<td></td>
</tr>
<tr>
<td>F108</td>
<td>0.2</td>
<td>.717</td>
<td>.523</td>
<td>.415</td>
<td>.432</td>
<td></td>
</tr>
<tr>
<td>F109</td>
<td>1.2</td>
<td>.530</td>
<td>.434</td>
<td>.357</td>
<td>.311</td>
<td></td>
</tr>
<tr>
<td>F110</td>
<td>0.4</td>
<td>.647</td>
<td>.516</td>
<td>.372</td>
<td>.413</td>
<td></td>
</tr>
<tr>
<td>F111</td>
<td>0.6</td>
<td>.665</td>
<td>.455</td>
<td>.331</td>
<td>.352</td>
<td></td>
</tr>
<tr>
<td>F112</td>
<td>0.2</td>
<td>.690</td>
<td>.581</td>
<td>.364</td>
<td>.464</td>
<td></td>
</tr>
<tr>
<td>F113</td>
<td>0.0</td>
<td>.699</td>
<td>.584</td>
<td>.442</td>
<td>.473</td>
<td></td>
</tr>
<tr>
<td>G114</td>
<td>0.4</td>
<td>.653</td>
<td>.746</td>
<td>.461</td>
<td>.548</td>
<td></td>
</tr>
<tr>
<td>G115</td>
<td>0.6</td>
<td>.494</td>
<td>.627</td>
<td>.291</td>
<td>.424</td>
<td></td>
</tr>
<tr>
<td>G116</td>
<td>1.0</td>
<td>.514</td>
<td>.725</td>
<td>.388</td>
<td>.495</td>
<td></td>
</tr>
<tr>
<td>G117</td>
<td>0.2</td>
<td>.583</td>
<td>.811</td>
<td>.433</td>
<td>.556</td>
<td></td>
</tr>
<tr>
<td>G118</td>
<td>0.4</td>
<td>.549</td>
<td>.752</td>
<td>.385</td>
<td>.535</td>
<td></td>
</tr>
<tr>
<td>G119</td>
<td>0.2</td>
<td>.531</td>
<td>.781</td>
<td>.360</td>
<td>.555</td>
<td></td>
</tr>
<tr>
<td>G120</td>
<td>0.2</td>
<td>.553</td>
<td>.823</td>
<td>.371</td>
<td>.562</td>
<td></td>
</tr>
<tr>
<td>G121</td>
<td>0.0</td>
<td>.576</td>
<td>.805</td>
<td>.435</td>
<td>.566</td>
<td></td>
</tr>
<tr>
<td>G122</td>
<td>0.4</td>
<td>.546</td>
<td>.761</td>
<td>.359</td>
<td>.566</td>
<td></td>
</tr>
<tr>
<td>G123</td>
<td>0.0</td>
<td>.541</td>
<td>.612</td>
<td>.358</td>
<td>.424</td>
<td></td>
</tr>
<tr>
<td>G124</td>
<td>0.6</td>
<td>.549</td>
<td>.803</td>
<td>.480</td>
<td>.576</td>
<td></td>
</tr>
<tr>
<td>G125</td>
<td>0.4</td>
<td>.568</td>
<td>.850</td>
<td>.417</td>
<td>.585</td>
<td></td>
</tr>
<tr>
<td>G126</td>
<td>0.2</td>
<td>.566</td>
<td>.869</td>
<td>.441</td>
<td>.601</td>
<td></td>
</tr>
<tr>
<td>G127</td>
<td>0.4</td>
<td>.579</td>
<td>.801</td>
<td>.382</td>
<td>.555</td>
<td></td>
</tr>
<tr>
<td>G128</td>
<td>1.0</td>
<td>.536</td>
<td>.805</td>
<td>.422</td>
<td>.565</td>
<td></td>
</tr>
<tr>
<td>G129</td>
<td>1.2</td>
<td>.545</td>
<td>.788</td>
<td>.483</td>
<td>.575</td>
<td></td>
</tr>
<tr>
<td>G130</td>
<td>1.0</td>
<td>.537</td>
<td>.813</td>
<td>.434</td>
<td>.588</td>
<td></td>
</tr>
<tr>
<td>G131</td>
<td>0.0</td>
<td>.487</td>
<td>.719</td>
<td>.423</td>
<td>.510</td>
<td></td>
</tr>
<tr>
<td>G132</td>
<td>0.4</td>
<td>.413</td>
<td>.540</td>
<td>.287</td>
<td>.390</td>
<td></td>
</tr>
<tr>
<td>G133</td>
<td>0.4</td>
<td>.558</td>
<td>.813</td>
<td>.459</td>
<td>.587</td>
<td></td>
</tr>
<tr>
<td>G134</td>
<td>0.2</td>
<td>.510</td>
<td>.780</td>
<td>.412</td>
<td>.585</td>
<td></td>
</tr>
<tr>
<td>G135</td>
<td>0.2</td>
<td>.380</td>
<td>.519</td>
<td>.378</td>
<td>.403</td>
<td></td>
</tr>
<tr>
<td>ITEM</td>
<td>SCALE</td>
<td>MISSING</td>
<td>SUPPORT</td>
<td>PSOLVE</td>
<td>APPRAISE</td>
<td>GRRS</td>
</tr>
<tr>
<td>------</td>
<td>-------</td>
<td>---------</td>
<td>---------</td>
<td>--------</td>
<td>----------</td>
<td>------</td>
</tr>
<tr>
<td>H136</td>
<td>Stressor Appraisal</td>
<td>0.6</td>
<td>.398</td>
<td>.426</td>
<td>.604</td>
<td>.449</td>
</tr>
<tr>
<td>H137</td>
<td>0.0</td>
<td>.393</td>
<td>.432</td>
<td>.731</td>
<td>.480</td>
<td></td>
</tr>
<tr>
<td>H138</td>
<td>0.0</td>
<td>.365</td>
<td>.388</td>
<td>.746</td>
<td>.438</td>
<td></td>
</tr>
<tr>
<td>H139</td>
<td>0.2</td>
<td>.367</td>
<td>.446</td>
<td>.706</td>
<td>.486</td>
<td></td>
</tr>
<tr>
<td>H140</td>
<td>0.0</td>
<td>.381</td>
<td>.454</td>
<td>.647</td>
<td>.488</td>
<td></td>
</tr>
<tr>
<td>H141</td>
<td>0.0</td>
<td>.435</td>
<td>.529</td>
<td>.631</td>
<td>.531</td>
<td></td>
</tr>
<tr>
<td>H142</td>
<td>0.0</td>
<td>.432</td>
<td>.455</td>
<td>.612</td>
<td>.555</td>
<td></td>
</tr>
<tr>
<td>H143</td>
<td>0.4</td>
<td>.378</td>
<td>.402</td>
<td>.582</td>
<td>.492</td>
<td></td>
</tr>
<tr>
<td>H144</td>
<td>0.4</td>
<td>.221</td>
<td>.298</td>
<td>.561</td>
<td>.277</td>
<td></td>
</tr>
<tr>
<td>H145</td>
<td>0.6</td>
<td>.254</td>
<td>.329</td>
<td>.720</td>
<td>.393</td>
<td></td>
</tr>
<tr>
<td>H146</td>
<td>0.6</td>
<td>.250</td>
<td>.328</td>
<td>.626</td>
<td>.385</td>
<td></td>
</tr>
<tr>
<td>H147</td>
<td>0.6</td>
<td>.133</td>
<td>.172</td>
<td>.509</td>
<td>.225</td>
<td></td>
</tr>
<tr>
<td>H148</td>
<td>0.4</td>
<td>.147</td>
<td>.197</td>
<td>.492</td>
<td>.241</td>
<td></td>
</tr>
<tr>
<td>H149</td>
<td>0.6</td>
<td>.336</td>
<td>.351</td>
<td>.626</td>
<td>.441</td>
<td></td>
</tr>
<tr>
<td>H150</td>
<td>0.0</td>
<td>.341</td>
<td>.419</td>
<td>.728</td>
<td>.508</td>
<td></td>
</tr>
<tr>
<td>H151</td>
<td>0.2</td>
<td>.329</td>
<td>.317</td>
<td>.723</td>
<td>.409</td>
<td></td>
</tr>
<tr>
<td>H152</td>
<td>0.4</td>
<td>.139</td>
<td>.190</td>
<td>.481</td>
<td>.255</td>
<td></td>
</tr>
<tr>
<td>H153</td>
<td>0.4</td>
<td>.403</td>
<td>.401</td>
<td>.652</td>
<td>.593</td>
<td></td>
</tr>
<tr>
<td>H154</td>
<td>0.2</td>
<td>.320</td>
<td>.341</td>
<td>.591</td>
<td>.552</td>
<td></td>
</tr>
<tr>
<td>H155</td>
<td>0.0</td>
<td>.248</td>
<td>.240</td>
<td>.676</td>
<td>.418</td>
<td></td>
</tr>
<tr>
<td>H156</td>
<td>0.2</td>
<td>.357</td>
<td>.392</td>
<td>.636</td>
<td>.551</td>
<td></td>
</tr>
<tr>
<td>H157</td>
<td>0.4</td>
<td>.254</td>
<td>.345</td>
<td>.643</td>
<td>.499</td>
<td></td>
</tr>
<tr>
<td>H158</td>
<td>0.6</td>
<td>.304</td>
<td>.379</td>
<td>.681</td>
<td>.506</td>
<td></td>
</tr>
<tr>
<td>J159</td>
<td>Generalised Resistance Resources</td>
<td>0.2</td>
<td>.284</td>
<td>.336</td>
<td>.473</td>
<td>.427</td>
</tr>
<tr>
<td>J160</td>
<td>0.4</td>
<td>.282</td>
<td>.388</td>
<td>.465</td>
<td>.475</td>
<td></td>
</tr>
<tr>
<td>J161</td>
<td>0.0</td>
<td>.344</td>
<td>.427</td>
<td>.473</td>
<td>.598</td>
<td></td>
</tr>
<tr>
<td>J162</td>
<td>0.0</td>
<td>.357</td>
<td>.363</td>
<td>.415</td>
<td>.564</td>
<td></td>
</tr>
<tr>
<td>J163</td>
<td>0.0</td>
<td>.442</td>
<td>.395</td>
<td>.473</td>
<td>.571</td>
<td></td>
</tr>
<tr>
<td>J164</td>
<td>0.2</td>
<td>.458</td>
<td>.493</td>
<td>.464</td>
<td>.636</td>
<td></td>
</tr>
<tr>
<td>J165</td>
<td>0.2</td>
<td>.376</td>
<td>.442</td>
<td>.415</td>
<td>.626</td>
<td></td>
</tr>
<tr>
<td>J166</td>
<td>0.2</td>
<td>.307</td>
<td>.415</td>
<td>.472</td>
<td>.522</td>
<td></td>
</tr>
<tr>
<td>J167</td>
<td>0.4</td>
<td>.396</td>
<td>.453</td>
<td>.470</td>
<td>.640</td>
<td></td>
</tr>
<tr>
<td>J168</td>
<td>0.8</td>
<td>.388</td>
<td>.492</td>
<td>.455</td>
<td>.607</td>
<td></td>
</tr>
<tr>
<td>J169</td>
<td>0.6</td>
<td>.357</td>
<td>.460</td>
<td>.437</td>
<td>.536</td>
<td></td>
</tr>
<tr>
<td>J170</td>
<td>0.4</td>
<td>.418</td>
<td>.577</td>
<td>.459</td>
<td>.742</td>
<td></td>
</tr>
<tr>
<td>J171</td>
<td>0.2</td>
<td>.408</td>
<td>.527</td>
<td>.464</td>
<td>.784</td>
<td></td>
</tr>
<tr>
<td>J172</td>
<td>0.2</td>
<td>.388</td>
<td>.519</td>
<td>.411</td>
<td>.685</td>
<td></td>
</tr>
<tr>
<td>J173</td>
<td>0.0</td>
<td>.330</td>
<td>.371</td>
<td>.407</td>
<td>.621</td>
<td></td>
</tr>
<tr>
<td>J174</td>
<td>0.2</td>
<td>.349</td>
<td>.396</td>
<td>.482</td>
<td>.659</td>
<td></td>
</tr>
<tr>
<td>J175</td>
<td>0.2</td>
<td>.297</td>
<td>.414</td>
<td>.426</td>
<td>.570</td>
<td></td>
</tr>
<tr>
<td>J176</td>
<td>0.0</td>
<td>.451</td>
<td>.582</td>
<td>.459</td>
<td>.805</td>
<td></td>
</tr>
<tr>
<td>J177</td>
<td>0.2</td>
<td>.434</td>
<td>.575</td>
<td>.470</td>
<td>.799</td>
<td></td>
</tr>
<tr>
<td>J178</td>
<td>0.0</td>
<td>.419</td>
<td>.565</td>
<td>.418</td>
<td>.693</td>
<td></td>
</tr>
<tr>
<td>J179</td>
<td>0.0</td>
<td>.355</td>
<td>.373</td>
<td>.341</td>
<td>.574</td>
<td></td>
</tr>
<tr>
<td>J180</td>
<td>0.2</td>
<td>.427</td>
<td>.574</td>
<td>.440</td>
<td>.763</td>
<td></td>
</tr>
<tr>
<td>J181</td>
<td>0.2</td>
<td>.413</td>
<td>.540</td>
<td>.493</td>
<td>.786</td>
<td></td>
</tr>
<tr>
<td>ITEM</td>
<td>SCALE</td>
<td>MISSING</td>
<td>SUPPORT</td>
<td>PSOLVE</td>
<td>APPRAISE</td>
<td>GRRS</td>
</tr>
<tr>
<td>------</td>
<td>-------</td>
<td>---------</td>
<td>---------</td>
<td>--------</td>
<td>----------</td>
<td>------</td>
</tr>
<tr>
<td>J182</td>
<td>0.4</td>
<td>0.410</td>
<td>0.579</td>
<td>0.420</td>
<td>0.724</td>
<td></td>
</tr>
<tr>
<td>J183</td>
<td>0.2</td>
<td>0.437</td>
<td>0.534</td>
<td>0.439</td>
<td>0.763</td>
<td></td>
</tr>
<tr>
<td>J184</td>
<td>0.4</td>
<td>0.424</td>
<td>0.592</td>
<td>0.444</td>
<td>0.773</td>
<td></td>
</tr>
<tr>
<td>J185</td>
<td>0.0</td>
<td>0.411</td>
<td>0.557</td>
<td>0.433</td>
<td>0.758</td>
<td></td>
</tr>
<tr>
<td>J186</td>
<td>0.2</td>
<td>0.300</td>
<td>0.355</td>
<td>0.247</td>
<td>0.509</td>
<td></td>
</tr>
<tr>
<td>J187</td>
<td>0.2</td>
<td>0.446</td>
<td>0.595</td>
<td>0.463</td>
<td>0.768</td>
<td></td>
</tr>
<tr>
<td>J188</td>
<td>0.0</td>
<td>0.403</td>
<td>0.502</td>
<td>0.468</td>
<td>0.745</td>
<td></td>
</tr>
<tr>
<td>J189</td>
<td>1.0</td>
<td>0.387</td>
<td>0.536</td>
<td>0.414</td>
<td>0.750</td>
<td></td>
</tr>
<tr>
<td>ITEM</td>
<td>SCALE</td>
<td>MISSING</td>
<td>SUPPORT</td>
<td>PSOLVE</td>
<td>APPRAISE</td>
<td>GRRS</td>
</tr>
<tr>
<td>-------</td>
<td>-------</td>
<td>---------</td>
<td>---------</td>
<td>--------</td>
<td>----------</td>
<td>-------</td>
</tr>
<tr>
<td>F91</td>
<td></td>
<td>0.8</td>
<td>.347</td>
<td>.228</td>
<td>.247</td>
<td>.211</td>
</tr>
<tr>
<td>F92</td>
<td></td>
<td>0.0</td>
<td>.481</td>
<td>.358</td>
<td>.286</td>
<td>.257</td>
</tr>
<tr>
<td>F93</td>
<td></td>
<td>0.8</td>
<td>.603</td>
<td>.380</td>
<td>.357</td>
<td>.349</td>
</tr>
<tr>
<td>F94</td>
<td></td>
<td>0.2</td>
<td>.699</td>
<td>.467</td>
<td>.386</td>
<td>.430</td>
</tr>
<tr>
<td>F95</td>
<td></td>
<td>0.2</td>
<td>.701</td>
<td>.511</td>
<td>.389</td>
<td>.451</td>
</tr>
<tr>
<td>F96</td>
<td></td>
<td>0.8</td>
<td>.673</td>
<td>.525</td>
<td>.354</td>
<td>.459</td>
</tr>
<tr>
<td>F97</td>
<td></td>
<td>0.2</td>
<td>.721</td>
<td>.554</td>
<td>.387</td>
<td>.471</td>
</tr>
<tr>
<td>F98</td>
<td></td>
<td>0.2</td>
<td>.735</td>
<td>.601</td>
<td>.410</td>
<td>.541</td>
</tr>
<tr>
<td>F99</td>
<td></td>
<td>0.0</td>
<td>.619</td>
<td>.447</td>
<td>.365</td>
<td>.403</td>
</tr>
<tr>
<td>F100</td>
<td></td>
<td>0.4</td>
<td>.714</td>
<td>.567</td>
<td>.382</td>
<td>.444</td>
</tr>
<tr>
<td>F101</td>
<td></td>
<td>0.4</td>
<td>.719</td>
<td>.610</td>
<td>.443</td>
<td>.501</td>
</tr>
<tr>
<td>F102</td>
<td></td>
<td>0.8</td>
<td>.630</td>
<td>.505</td>
<td>.468</td>
<td>.483</td>
</tr>
<tr>
<td>F103</td>
<td></td>
<td>0.8</td>
<td>.676</td>
<td>.538</td>
<td>.443</td>
<td>.475</td>
</tr>
<tr>
<td>F104</td>
<td></td>
<td>1.2</td>
<td>.496</td>
<td>.348</td>
<td>.289</td>
<td>.278</td>
</tr>
<tr>
<td>F105</td>
<td></td>
<td>0.0</td>
<td>.703</td>
<td>.559</td>
<td>.413</td>
<td>.464</td>
</tr>
<tr>
<td>F106</td>
<td></td>
<td>0.4</td>
<td>.728</td>
<td>.654</td>
<td>.487</td>
<td>.556</td>
</tr>
<tr>
<td>F107</td>
<td></td>
<td>0.2</td>
<td>.706</td>
<td>.629</td>
<td>.476</td>
<td>.546</td>
</tr>
<tr>
<td>F108</td>
<td></td>
<td>1.0</td>
<td>.642</td>
<td>.543</td>
<td>.430</td>
<td>.471</td>
</tr>
<tr>
<td>F109</td>
<td></td>
<td>0.2</td>
<td>.543</td>
<td>.443</td>
<td>.461</td>
<td>.411</td>
</tr>
<tr>
<td>F110</td>
<td></td>
<td>0.2</td>
<td>.690</td>
<td>.575</td>
<td>.470</td>
<td>.517</td>
</tr>
<tr>
<td>F111</td>
<td></td>
<td>0.0</td>
<td>.681</td>
<td>.600</td>
<td>.455</td>
<td>.522</td>
</tr>
<tr>
<td>F112</td>
<td></td>
<td>0.2</td>
<td>.717</td>
<td>.624</td>
<td>.487</td>
<td>.541</td>
</tr>
<tr>
<td>F113</td>
<td></td>
<td>0.2</td>
<td>.690</td>
<td>.655</td>
<td>.505</td>
<td>.598</td>
</tr>
<tr>
<td>G114</td>
<td></td>
<td>0.4</td>
<td>.619</td>
<td>.623</td>
<td>.499</td>
<td>.597</td>
</tr>
<tr>
<td>G115</td>
<td></td>
<td>0.6</td>
<td>.429</td>
<td>.480</td>
<td>.304</td>
<td>.418</td>
</tr>
<tr>
<td>G116</td>
<td></td>
<td>0.2</td>
<td>.629</td>
<td>.738</td>
<td>.440</td>
<td>.585</td>
</tr>
<tr>
<td>G117</td>
<td></td>
<td>0.2</td>
<td>.602</td>
<td>.721</td>
<td>.438</td>
<td>.585</td>
</tr>
<tr>
<td>G118</td>
<td></td>
<td>0.2</td>
<td>.560</td>
<td>.718</td>
<td>.426</td>
<td>.564</td>
</tr>
<tr>
<td>G119</td>
<td></td>
<td>0.0</td>
<td>.605</td>
<td>.809</td>
<td>.501</td>
<td>.637</td>
</tr>
<tr>
<td>G120</td>
<td></td>
<td>0.6</td>
<td>.623</td>
<td>.802</td>
<td>.486</td>
<td>.637</td>
</tr>
<tr>
<td>G121</td>
<td></td>
<td>0.4</td>
<td>.465</td>
<td>.619</td>
<td>.374</td>
<td>.475</td>
</tr>
<tr>
<td>G122</td>
<td></td>
<td>0.4</td>
<td>.588</td>
<td>.782</td>
<td>.485</td>
<td>.628</td>
</tr>
<tr>
<td>G123</td>
<td></td>
<td>0.2</td>
<td>.615</td>
<td>.658</td>
<td>.441</td>
<td>.498</td>
</tr>
<tr>
<td>G124</td>
<td></td>
<td>0.4</td>
<td>.613</td>
<td>.781</td>
<td>.519</td>
<td>.583</td>
</tr>
<tr>
<td>G125</td>
<td></td>
<td>0.0</td>
<td>.574</td>
<td>.811</td>
<td>.467</td>
<td>.626</td>
</tr>
<tr>
<td>G126</td>
<td></td>
<td>0.4</td>
<td>.628</td>
<td>.862</td>
<td>.504</td>
<td>.672</td>
</tr>
<tr>
<td>G127</td>
<td></td>
<td>1.0</td>
<td>.613</td>
<td>.814</td>
<td>.475</td>
<td>.636</td>
</tr>
<tr>
<td>G128</td>
<td></td>
<td>1.0</td>
<td>.590</td>
<td>.805</td>
<td>.489</td>
<td>.666</td>
</tr>
<tr>
<td>G129</td>
<td></td>
<td>0.2</td>
<td>.553</td>
<td>.782</td>
<td>.496</td>
<td>.606</td>
</tr>
<tr>
<td>G130</td>
<td></td>
<td>0.2</td>
<td>.552</td>
<td>.802</td>
<td>.484</td>
<td>.577</td>
</tr>
<tr>
<td>G131</td>
<td></td>
<td>0.2</td>
<td>.384</td>
<td>.478</td>
<td>.335</td>
<td>.359</td>
</tr>
<tr>
<td>G132</td>
<td></td>
<td>0.6</td>
<td>.570</td>
<td>.647</td>
<td>.491</td>
<td>.481</td>
</tr>
<tr>
<td>G133</td>
<td></td>
<td>0.2</td>
<td>.561</td>
<td>.761</td>
<td>.460</td>
<td>.603</td>
</tr>
<tr>
<td>G134</td>
<td></td>
<td>0.4</td>
<td>.596</td>
<td>.781</td>
<td>.540</td>
<td>.669</td>
</tr>
<tr>
<td>G135</td>
<td></td>
<td>0.6</td>
<td>.437</td>
<td>.555</td>
<td>.463</td>
<td>.435</td>
</tr>
<tr>
<td>ITEM</td>
<td>SCALE</td>
<td>MISSING</td>
<td>SUPPORT</td>
<td>PSOLVE</td>
<td>APPRAISE</td>
<td>GRRS</td>
</tr>
<tr>
<td>--------</td>
<td>---------------------------</td>
<td>---------</td>
<td>---------</td>
<td>--------</td>
<td>----------</td>
<td>------</td>
</tr>
<tr>
<td>H136</td>
<td>Stressor Appraisal</td>
<td>0.6</td>
<td>0.378</td>
<td>0.420</td>
<td>0.632</td>
<td>0.357</td>
</tr>
<tr>
<td>H137</td>
<td></td>
<td>0.6</td>
<td>0.454</td>
<td>0.500</td>
<td>0.693</td>
<td>0.454</td>
</tr>
<tr>
<td>H138</td>
<td></td>
<td>0.4</td>
<td>0.382</td>
<td>0.426</td>
<td>0.689</td>
<td>0.384</td>
</tr>
<tr>
<td>H139</td>
<td></td>
<td>0.2</td>
<td>0.477</td>
<td>0.488</td>
<td>0.698</td>
<td>0.425</td>
</tr>
<tr>
<td>H140</td>
<td></td>
<td>0.6</td>
<td>0.487</td>
<td>0.518</td>
<td>0.698</td>
<td>0.436</td>
</tr>
<tr>
<td>H141</td>
<td></td>
<td>0.4</td>
<td>0.543</td>
<td>0.633</td>
<td>0.652</td>
<td>0.592</td>
</tr>
<tr>
<td>H142</td>
<td></td>
<td>0.4</td>
<td>0.547</td>
<td>0.606</td>
<td>0.652</td>
<td>0.608</td>
</tr>
<tr>
<td>H143</td>
<td></td>
<td>1.2</td>
<td>0.532</td>
<td>0.605</td>
<td>0.604</td>
<td>0.604</td>
</tr>
<tr>
<td>H144</td>
<td></td>
<td>1.8</td>
<td>0.243</td>
<td>0.211</td>
<td>0.470</td>
<td>0.257</td>
</tr>
<tr>
<td>H145</td>
<td></td>
<td>0.4</td>
<td>0.324</td>
<td>0.253</td>
<td>0.622</td>
<td>0.255</td>
</tr>
<tr>
<td>H146</td>
<td></td>
<td>0.2</td>
<td>0.222</td>
<td>0.220</td>
<td>0.393</td>
<td>0.231</td>
</tr>
<tr>
<td>H147</td>
<td></td>
<td>0.8</td>
<td>0.122</td>
<td>0.100</td>
<td>0.312</td>
<td>0.115</td>
</tr>
<tr>
<td>H148</td>
<td></td>
<td>0.8</td>
<td>0.189</td>
<td>0.213</td>
<td>0.426</td>
<td>0.262</td>
</tr>
<tr>
<td>H149</td>
<td></td>
<td>0.2</td>
<td>0.312</td>
<td>0.270</td>
<td>0.432</td>
<td>0.359</td>
</tr>
<tr>
<td>H150</td>
<td></td>
<td>0.4</td>
<td>0.474</td>
<td>0.497</td>
<td>0.716</td>
<td>0.620</td>
</tr>
<tr>
<td>H151</td>
<td></td>
<td>1.2</td>
<td>0.350</td>
<td>0.337</td>
<td>0.704</td>
<td>0.421</td>
</tr>
<tr>
<td>H152</td>
<td></td>
<td>0.6</td>
<td>0.284</td>
<td>0.305</td>
<td>0.499</td>
<td>0.367</td>
</tr>
<tr>
<td>H153</td>
<td></td>
<td>0.6</td>
<td>0.461</td>
<td>0.455</td>
<td>0.656</td>
<td>0.542</td>
</tr>
<tr>
<td>H154</td>
<td></td>
<td>0.2</td>
<td>0.448</td>
<td>0.498</td>
<td>0.632</td>
<td>0.583</td>
</tr>
<tr>
<td>H155</td>
<td></td>
<td>0.6</td>
<td>0.333</td>
<td>0.327</td>
<td>0.695</td>
<td>0.425</td>
</tr>
<tr>
<td>H156</td>
<td></td>
<td>0.4</td>
<td>0.472</td>
<td>0.509</td>
<td>0.640</td>
<td>0.616</td>
</tr>
<tr>
<td>H157</td>
<td></td>
<td>0.8</td>
<td>0.369</td>
<td>0.331</td>
<td>0.549</td>
<td>0.410</td>
</tr>
<tr>
<td>H158</td>
<td></td>
<td>1.2</td>
<td>0.403</td>
<td>0.403</td>
<td>0.670</td>
<td>0.468</td>
</tr>
<tr>
<td>J159</td>
<td>Generalised Resistance Resources</td>
<td>0.8</td>
<td>0.301</td>
<td>0.277</td>
<td>0.350</td>
<td>0.385</td>
</tr>
<tr>
<td>J160</td>
<td></td>
<td>0.4</td>
<td>0.381</td>
<td>0.378</td>
<td>0.447</td>
<td>0.531</td>
</tr>
<tr>
<td>J161</td>
<td></td>
<td>1.0</td>
<td>0.393</td>
<td>0.377</td>
<td>0.471</td>
<td>0.530</td>
</tr>
<tr>
<td>J162</td>
<td></td>
<td>1.0</td>
<td>0.453</td>
<td>0.404</td>
<td>0.466</td>
<td>0.527</td>
</tr>
<tr>
<td>J163</td>
<td></td>
<td>0.8</td>
<td>0.415</td>
<td>0.402</td>
<td>0.443</td>
<td>0.551</td>
</tr>
<tr>
<td>J164</td>
<td></td>
<td>1.2</td>
<td>0.420</td>
<td>0.388</td>
<td>0.477</td>
<td>0.522</td>
</tr>
<tr>
<td>J165</td>
<td></td>
<td>0.8</td>
<td>0.488</td>
<td>0.605</td>
<td>0.490</td>
<td>0.692</td>
</tr>
<tr>
<td>J166</td>
<td></td>
<td>0.8</td>
<td>0.370</td>
<td>0.502</td>
<td>0.373</td>
<td>0.594</td>
</tr>
<tr>
<td>J167</td>
<td></td>
<td>0.8</td>
<td>0.454</td>
<td>0.561</td>
<td>0.425</td>
<td>0.668</td>
</tr>
<tr>
<td>J168</td>
<td></td>
<td>1.4</td>
<td>0.440</td>
<td>0.556</td>
<td>0.425</td>
<td>0.679</td>
</tr>
<tr>
<td>J169</td>
<td></td>
<td>1.0</td>
<td>0.403</td>
<td>0.445</td>
<td>0.431</td>
<td>0.548</td>
</tr>
<tr>
<td>J170</td>
<td></td>
<td>0.6</td>
<td>0.530</td>
<td>0.638</td>
<td>0.504</td>
<td>0.769</td>
</tr>
<tr>
<td>J171</td>
<td></td>
<td>0.2</td>
<td>0.532</td>
<td>0.628</td>
<td>0.464</td>
<td>0.802</td>
</tr>
<tr>
<td>J172</td>
<td></td>
<td>0.6</td>
<td>0.498</td>
<td>0.561</td>
<td>0.421</td>
<td>0.666</td>
</tr>
<tr>
<td>J173</td>
<td></td>
<td>0.4</td>
<td>0.474</td>
<td>0.580</td>
<td>0.475</td>
<td>0.720</td>
</tr>
<tr>
<td>J174</td>
<td></td>
<td>0.0</td>
<td>0.481</td>
<td>0.573</td>
<td>0.494</td>
<td>0.726</td>
</tr>
<tr>
<td>J175</td>
<td></td>
<td>0.2</td>
<td>0.490</td>
<td>0.575</td>
<td>0.490</td>
<td>0.743</td>
</tr>
<tr>
<td>J176</td>
<td></td>
<td>0.2</td>
<td>0.507</td>
<td>0.634</td>
<td>0.528</td>
<td>0.803</td>
</tr>
<tr>
<td>J177</td>
<td></td>
<td>0.2</td>
<td>0.510</td>
<td>0.628</td>
<td>0.496</td>
<td>0.810</td>
</tr>
<tr>
<td>J178</td>
<td></td>
<td>0.2</td>
<td>0.501</td>
<td>0.609</td>
<td>0.501</td>
<td>0.759</td>
</tr>
<tr>
<td>J179</td>
<td></td>
<td>0.4</td>
<td>0.411</td>
<td>0.501</td>
<td>0.383</td>
<td>0.704</td>
</tr>
<tr>
<td>J180</td>
<td></td>
<td>0.2</td>
<td>0.514</td>
<td>0.642</td>
<td>0.508</td>
<td>0.821</td>
</tr>
<tr>
<td>J181</td>
<td></td>
<td>0.2</td>
<td>0.500</td>
<td>0.594</td>
<td>0.489</td>
<td>0.763</td>
</tr>
<tr>
<td>ITEM</td>
<td>SCALE</td>
<td>MISSING</td>
<td>SUPPORT</td>
<td>PSOLVE</td>
<td>APPRAISE</td>
<td>GRRS</td>
</tr>
<tr>
<td>------</td>
<td>-------</td>
<td>---------</td>
<td>---------</td>
<td>--------</td>
<td>----------</td>
<td>------</td>
</tr>
<tr>
<td>J182</td>
<td>0.2</td>
<td>.493</td>
<td>.627</td>
<td>.504</td>
<td>.786</td>
<td></td>
</tr>
<tr>
<td>J183</td>
<td>0.4</td>
<td>.508</td>
<td>.635</td>
<td>.489</td>
<td>.787</td>
<td></td>
</tr>
<tr>
<td>J184</td>
<td>0.4</td>
<td>.494</td>
<td>.635</td>
<td>.494</td>
<td>.786</td>
<td></td>
</tr>
<tr>
<td>J185</td>
<td>0.4</td>
<td>.460</td>
<td>.589</td>
<td>.482</td>
<td>.736</td>
<td></td>
</tr>
<tr>
<td>J186</td>
<td>1.0</td>
<td>.200</td>
<td>.218</td>
<td>.222</td>
<td>.376</td>
<td></td>
</tr>
<tr>
<td>J187</td>
<td>1.0</td>
<td>.495</td>
<td>.599</td>
<td>.464</td>
<td>.737</td>
<td></td>
</tr>
<tr>
<td>J188</td>
<td>0.6</td>
<td>.487</td>
<td>.602</td>
<td>.467</td>
<td>.749</td>
<td></td>
</tr>
<tr>
<td>J189</td>
<td>0.2</td>
<td>.490</td>
<td>.544</td>
<td>.462</td>
<td>.724</td>
<td></td>
</tr>
</tbody>
</table>
### Table 37: Original Factor Matrix: African Xhosa Culture

<table>
<thead>
<tr>
<th>Item</th>
<th>Social Supports</th>
<th>Problem Solving</th>
</tr>
</thead>
<tbody>
<tr>
<td>F91</td>
<td>0.4</td>
<td>.395</td>
</tr>
<tr>
<td>F92</td>
<td>1.0</td>
<td>.520</td>
</tr>
<tr>
<td>F93</td>
<td>2.0</td>
<td>.653</td>
</tr>
<tr>
<td>F94</td>
<td>0.8</td>
<td>.707</td>
</tr>
<tr>
<td>F95</td>
<td>0.6</td>
<td>.653</td>
</tr>
<tr>
<td>F96</td>
<td>1.0</td>
<td>.689</td>
</tr>
<tr>
<td>F97</td>
<td>0.6</td>
<td>.704</td>
</tr>
<tr>
<td>F98</td>
<td>1.8</td>
<td>.720</td>
</tr>
<tr>
<td>F99</td>
<td>0.4</td>
<td>.602</td>
</tr>
<tr>
<td>F100</td>
<td>0.6</td>
<td>.689</td>
</tr>
<tr>
<td>F101</td>
<td>1.6</td>
<td>.690</td>
</tr>
<tr>
<td>F102</td>
<td>0.0</td>
<td>.583</td>
</tr>
<tr>
<td>F103</td>
<td>0.6</td>
<td>.660</td>
</tr>
<tr>
<td>F104</td>
<td>1.2</td>
<td>.401</td>
</tr>
<tr>
<td>F105</td>
<td>1.4</td>
<td>.699</td>
</tr>
<tr>
<td>F106</td>
<td>0.4</td>
<td>.730</td>
</tr>
<tr>
<td>F107</td>
<td>0.4</td>
<td>.645</td>
</tr>
<tr>
<td>F108</td>
<td>0.8</td>
<td>.559</td>
</tr>
<tr>
<td>F109</td>
<td>0.4</td>
<td>.432</td>
</tr>
<tr>
<td>F110</td>
<td>0.8</td>
<td>.534</td>
</tr>
<tr>
<td>F111</td>
<td>0.4</td>
<td>.591</td>
</tr>
<tr>
<td>F112</td>
<td>0.6</td>
<td>.640</td>
</tr>
<tr>
<td>F113</td>
<td>0.4</td>
<td>.531</td>
</tr>
<tr>
<td>G114</td>
<td>0.4</td>
<td>.524</td>
</tr>
<tr>
<td>G115</td>
<td>1.2</td>
<td>.148</td>
</tr>
<tr>
<td>G116</td>
<td>1.0</td>
<td>.381</td>
</tr>
<tr>
<td>G117</td>
<td>0.8</td>
<td>.518</td>
</tr>
<tr>
<td>G118</td>
<td>0.6</td>
<td>.451</td>
</tr>
<tr>
<td>G119</td>
<td>0.0</td>
<td>.528</td>
</tr>
<tr>
<td>G120</td>
<td>1.6</td>
<td>.550</td>
</tr>
<tr>
<td>G121</td>
<td>0.4</td>
<td>.397</td>
</tr>
<tr>
<td>G122</td>
<td>0.6</td>
<td>.527</td>
</tr>
<tr>
<td>G123</td>
<td>0.6</td>
<td>.497</td>
</tr>
<tr>
<td>G124</td>
<td>0.4</td>
<td>.460</td>
</tr>
<tr>
<td>G125</td>
<td>0.0</td>
<td>.494</td>
</tr>
<tr>
<td>G126</td>
<td>0.2</td>
<td>.500</td>
</tr>
<tr>
<td>G127</td>
<td>0.8</td>
<td>.494</td>
</tr>
<tr>
<td>G128</td>
<td>1.2</td>
<td>.489</td>
</tr>
<tr>
<td>G129</td>
<td>1.2</td>
<td>.516</td>
</tr>
<tr>
<td>G130</td>
<td>0.6</td>
<td>.487</td>
</tr>
<tr>
<td>G131</td>
<td>0.6</td>
<td>.378</td>
</tr>
<tr>
<td>G132</td>
<td>0.8</td>
<td>.494</td>
</tr>
<tr>
<td>G133</td>
<td>0.6</td>
<td>.491</td>
</tr>
<tr>
<td>G134</td>
<td>0.6</td>
<td>.472</td>
</tr>
<tr>
<td>G135</td>
<td>0.4</td>
<td>.370</td>
</tr>
<tr>
<td>ITEM</td>
<td>SCALE</td>
<td>MISSING</td>
</tr>
<tr>
<td>------</td>
<td>-------</td>
<td>---------</td>
</tr>
<tr>
<td>H136</td>
<td></td>
<td>0.8</td>
</tr>
<tr>
<td>H137</td>
<td>Stressor Appraisal</td>
<td>0.6</td>
</tr>
<tr>
<td>H138</td>
<td></td>
<td>0.4</td>
</tr>
<tr>
<td>H139</td>
<td></td>
<td>0.4</td>
</tr>
<tr>
<td>H140</td>
<td></td>
<td>1.2</td>
</tr>
<tr>
<td>H141</td>
<td></td>
<td>0.4</td>
</tr>
<tr>
<td>H142</td>
<td></td>
<td>0.6</td>
</tr>
<tr>
<td>H143</td>
<td></td>
<td>0.4</td>
</tr>
<tr>
<td>H144</td>
<td></td>
<td>1.0</td>
</tr>
<tr>
<td>H145</td>
<td></td>
<td>1.0</td>
</tr>
<tr>
<td>H146</td>
<td></td>
<td>1.2</td>
</tr>
<tr>
<td>H147</td>
<td></td>
<td>0.2</td>
</tr>
<tr>
<td>H148</td>
<td></td>
<td>1.0</td>
</tr>
<tr>
<td>H149</td>
<td></td>
<td>1.0</td>
</tr>
<tr>
<td>H150</td>
<td></td>
<td>0.0</td>
</tr>
<tr>
<td>H151</td>
<td></td>
<td>0.2</td>
</tr>
<tr>
<td>H152</td>
<td></td>
<td>0.6</td>
</tr>
<tr>
<td>H153</td>
<td></td>
<td>0.8</td>
</tr>
<tr>
<td>H154</td>
<td></td>
<td>0.4</td>
</tr>
<tr>
<td>H155</td>
<td></td>
<td>0.4</td>
</tr>
<tr>
<td>H156</td>
<td></td>
<td>0.2</td>
</tr>
<tr>
<td>H157</td>
<td></td>
<td>1.4</td>
</tr>
<tr>
<td>H158</td>
<td></td>
<td>1.2</td>
</tr>
<tr>
<td>J159</td>
<td>Generalised Resistance Resources</td>
<td>0.6</td>
</tr>
<tr>
<td>J160</td>
<td></td>
<td>1.0</td>
</tr>
<tr>
<td>J161</td>
<td></td>
<td>1.6</td>
</tr>
<tr>
<td>J162</td>
<td></td>
<td>0.6</td>
</tr>
<tr>
<td>J163</td>
<td></td>
<td>0.6</td>
</tr>
<tr>
<td>J164</td>
<td></td>
<td>0.8</td>
</tr>
<tr>
<td>J165</td>
<td></td>
<td>0.0</td>
</tr>
<tr>
<td>J166</td>
<td></td>
<td>0.4</td>
</tr>
<tr>
<td>J167</td>
<td></td>
<td>1.0</td>
</tr>
<tr>
<td>J168</td>
<td></td>
<td>1.0</td>
</tr>
<tr>
<td>J169</td>
<td></td>
<td>1.0</td>
</tr>
<tr>
<td>J170</td>
<td></td>
<td>0.4</td>
</tr>
<tr>
<td>J171</td>
<td></td>
<td>0.6</td>
</tr>
<tr>
<td>J172</td>
<td></td>
<td>0.2</td>
</tr>
<tr>
<td>J173</td>
<td></td>
<td>1.0</td>
</tr>
<tr>
<td>J174</td>
<td></td>
<td>0.4</td>
</tr>
<tr>
<td>J175</td>
<td></td>
<td>0.4</td>
</tr>
<tr>
<td>J176</td>
<td></td>
<td>0.0</td>
</tr>
<tr>
<td>J177</td>
<td></td>
<td>0.4</td>
</tr>
<tr>
<td>J178</td>
<td></td>
<td>0.4</td>
</tr>
<tr>
<td>J179</td>
<td></td>
<td>0.2</td>
</tr>
<tr>
<td>J180</td>
<td></td>
<td>0.0</td>
</tr>
<tr>
<td>J181</td>
<td></td>
<td>0.6</td>
</tr>
<tr>
<td>ITEM</td>
<td>SCALE</td>
<td>MISSING</td>
</tr>
<tr>
<td>------</td>
<td>-------</td>
<td>---------</td>
</tr>
<tr>
<td>J182</td>
<td></td>
<td>0.2</td>
</tr>
<tr>
<td>J183</td>
<td></td>
<td>0.8</td>
</tr>
<tr>
<td>J184</td>
<td></td>
<td>0.6</td>
</tr>
<tr>
<td>J185</td>
<td></td>
<td>0.6</td>
</tr>
<tr>
<td>J186</td>
<td></td>
<td>0.0</td>
</tr>
<tr>
<td>J187</td>
<td></td>
<td>0.6</td>
</tr>
<tr>
<td>J188</td>
<td></td>
<td>0.2</td>
</tr>
<tr>
<td>J189</td>
<td></td>
<td>1.2</td>
</tr>
<tr>
<td>ITEM</td>
<td>SCALE</td>
<td>MISSING</td>
</tr>
<tr>
<td>------</td>
<td>-------</td>
<td>---------</td>
</tr>
<tr>
<td>F94</td>
<td>Social Supports</td>
<td>0.0</td>
</tr>
<tr>
<td>F95</td>
<td></td>
<td>0.2</td>
</tr>
<tr>
<td>F96</td>
<td></td>
<td>0.0</td>
</tr>
<tr>
<td>F97</td>
<td></td>
<td>0.0</td>
</tr>
<tr>
<td>F100</td>
<td></td>
<td>0.0</td>
</tr>
<tr>
<td>F101</td>
<td></td>
<td>0.2</td>
</tr>
<tr>
<td>F102</td>
<td></td>
<td>0.8</td>
</tr>
<tr>
<td>F103</td>
<td></td>
<td>0.4</td>
</tr>
<tr>
<td>F105</td>
<td></td>
<td>0.0</td>
</tr>
<tr>
<td>F106</td>
<td></td>
<td>0.2</td>
</tr>
<tr>
<td>F107</td>
<td></td>
<td>0.2</td>
</tr>
<tr>
<td>F108</td>
<td></td>
<td>0.4</td>
</tr>
<tr>
<td>F110</td>
<td></td>
<td>0.2</td>
</tr>
<tr>
<td>F111</td>
<td></td>
<td>0.2</td>
</tr>
<tr>
<td>G117</td>
<td>Problem Solving</td>
<td>0.4</td>
</tr>
<tr>
<td>G119</td>
<td></td>
<td>0.2</td>
</tr>
<tr>
<td>G120</td>
<td></td>
<td>0.0</td>
</tr>
<tr>
<td>G121</td>
<td></td>
<td>0.0</td>
</tr>
<tr>
<td>G122</td>
<td></td>
<td>0.2</td>
</tr>
<tr>
<td>G124</td>
<td></td>
<td>0.0</td>
</tr>
<tr>
<td>G125</td>
<td></td>
<td>0.0</td>
</tr>
<tr>
<td>G126</td>
<td></td>
<td>0.2</td>
</tr>
<tr>
<td>G127</td>
<td></td>
<td>0.0</td>
</tr>
<tr>
<td>G128</td>
<td></td>
<td>0.4</td>
</tr>
<tr>
<td>G129</td>
<td></td>
<td>0.4</td>
</tr>
<tr>
<td>G130</td>
<td></td>
<td>0.2</td>
</tr>
<tr>
<td>G133</td>
<td></td>
<td>0.6</td>
</tr>
<tr>
<td>G134</td>
<td></td>
<td>0.8</td>
</tr>
<tr>
<td>H136</td>
<td>Stressor Appraisal</td>
<td>0.8</td>
</tr>
<tr>
<td>H137</td>
<td></td>
<td>0.4</td>
</tr>
<tr>
<td>H138</td>
<td></td>
<td>0.6</td>
</tr>
<tr>
<td>H139</td>
<td></td>
<td>0.4</td>
</tr>
<tr>
<td>H140</td>
<td></td>
<td>0.2</td>
</tr>
<tr>
<td>H145</td>
<td></td>
<td>0.2</td>
</tr>
<tr>
<td>H150</td>
<td></td>
<td>0.6</td>
</tr>
<tr>
<td>H151</td>
<td></td>
<td>0.6</td>
</tr>
<tr>
<td>H153</td>
<td></td>
<td>0.2</td>
</tr>
<tr>
<td>H154</td>
<td></td>
<td>0.4</td>
</tr>
<tr>
<td>H155</td>
<td></td>
<td>0.6</td>
</tr>
<tr>
<td>H156</td>
<td></td>
<td>0.0</td>
</tr>
<tr>
<td>H157</td>
<td></td>
<td>0.8</td>
</tr>
<tr>
<td>H158</td>
<td></td>
<td>0.6</td>
</tr>
<tr>
<td>J171</td>
<td>GRRs</td>
<td>0.4</td>
</tr>
<tr>
<td>J175</td>
<td></td>
<td>0.4</td>
</tr>
<tr>
<td>J176</td>
<td></td>
<td>0.2</td>
</tr>
<tr>
<td>ITEM</td>
<td>SCALE</td>
<td>MISSING</td>
</tr>
<tr>
<td>------</td>
<td>-------</td>
<td>---------</td>
</tr>
<tr>
<td>J177</td>
<td>0.2</td>
<td>.391</td>
</tr>
<tr>
<td>J178</td>
<td>0.2</td>
<td>.379</td>
</tr>
<tr>
<td>J180</td>
<td>0.2</td>
<td>.420</td>
</tr>
<tr>
<td>J181</td>
<td>0.2</td>
<td>.405</td>
</tr>
<tr>
<td>J182</td>
<td>0.0</td>
<td>.411</td>
</tr>
<tr>
<td>J183</td>
<td>0.2</td>
<td>.359</td>
</tr>
<tr>
<td>J184</td>
<td>0.2</td>
<td>.378</td>
</tr>
<tr>
<td>J185</td>
<td>0.4</td>
<td>.376</td>
</tr>
<tr>
<td>J187</td>
<td>0.4</td>
<td>.386</td>
</tr>
<tr>
<td>J188</td>
<td>0.4</td>
<td>.338</td>
</tr>
<tr>
<td>J189</td>
<td>0.4</td>
<td>.363</td>
</tr>
</tbody>
</table>
### TABLE 39: FINAL FACTOR MATRIX: COLOURED AFRIKAANS CULTURE

<table>
<thead>
<tr>
<th>ITEM</th>
<th>SCALE</th>
<th>MISSING</th>
<th>SUPPORT</th>
<th>PSOLVE</th>
<th>APPRAIS</th>
<th>GRRS</th>
</tr>
</thead>
<tbody>
<tr>
<td>F94</td>
<td></td>
<td>0.0</td>
<td>.707</td>
<td>.450</td>
<td>.341</td>
<td>.355</td>
</tr>
<tr>
<td>F95</td>
<td></td>
<td>0.2</td>
<td>.766</td>
<td>.516</td>
<td>.370</td>
<td>.401</td>
</tr>
<tr>
<td>F96</td>
<td></td>
<td>0.2</td>
<td>.738</td>
<td>.459</td>
<td>.297</td>
<td>.311</td>
</tr>
<tr>
<td>F97</td>
<td></td>
<td>0.8</td>
<td>.787</td>
<td>.571</td>
<td>.364</td>
<td>.416</td>
</tr>
<tr>
<td>F100</td>
<td></td>
<td>0.4</td>
<td>.701</td>
<td>.514</td>
<td>.292</td>
<td>.359</td>
</tr>
<tr>
<td>F101</td>
<td></td>
<td>0.4</td>
<td>.674</td>
<td>.490</td>
<td>.310</td>
<td>.376</td>
</tr>
<tr>
<td>F102</td>
<td></td>
<td>0.4</td>
<td>.706</td>
<td>.429</td>
<td>.312</td>
<td>.321</td>
</tr>
<tr>
<td>F103</td>
<td></td>
<td>0.4</td>
<td>.699</td>
<td>.486</td>
<td>.355</td>
<td>.376</td>
</tr>
<tr>
<td>F105</td>
<td></td>
<td>0.2</td>
<td>.783</td>
<td>.558</td>
<td>.384</td>
<td>.435</td>
</tr>
<tr>
<td>F106</td>
<td></td>
<td>0.4</td>
<td>.692</td>
<td>.608</td>
<td>.402</td>
<td>.469</td>
</tr>
<tr>
<td>F107</td>
<td></td>
<td>0.4</td>
<td>.703</td>
<td>.599</td>
<td>.380</td>
<td>.468</td>
</tr>
<tr>
<td>F108</td>
<td></td>
<td>0.2</td>
<td>.732</td>
<td>.503</td>
<td>.410</td>
<td>.392</td>
</tr>
<tr>
<td>F110</td>
<td></td>
<td>0.4</td>
<td>.637</td>
<td>.483</td>
<td>.377</td>
<td>.374</td>
</tr>
<tr>
<td>F111</td>
<td></td>
<td>0.6</td>
<td>.657</td>
<td>.417</td>
<td>.339</td>
<td>.307</td>
</tr>
<tr>
<td>G117</td>
<td></td>
<td>0.2</td>
<td>.581</td>
<td>.795</td>
<td>.432</td>
<td>.562</td>
</tr>
<tr>
<td>G119</td>
<td></td>
<td>0.2</td>
<td>.526</td>
<td>.789</td>
<td>.355</td>
<td>.543</td>
</tr>
<tr>
<td>G120</td>
<td></td>
<td>0.2</td>
<td>.554</td>
<td>.852</td>
<td>.369</td>
<td>.549</td>
</tr>
<tr>
<td>G121</td>
<td></td>
<td>0.0</td>
<td>.580</td>
<td>.818</td>
<td>.434</td>
<td>.551</td>
</tr>
<tr>
<td>G122</td>
<td></td>
<td>0.4</td>
<td>.542</td>
<td>.782</td>
<td>.362</td>
<td>.571</td>
</tr>
<tr>
<td>G124</td>
<td></td>
<td>0.6</td>
<td>.547</td>
<td>.808</td>
<td>.494</td>
<td>.554</td>
</tr>
<tr>
<td>G125</td>
<td></td>
<td>0.4</td>
<td>.562</td>
<td>.867</td>
<td>.428</td>
<td>.585</td>
</tr>
<tr>
<td>G126</td>
<td></td>
<td>0.2</td>
<td>.563</td>
<td>.893</td>
<td>.447</td>
<td>.598</td>
</tr>
<tr>
<td>G127</td>
<td></td>
<td>0.4</td>
<td>.573</td>
<td>.827</td>
<td>.387</td>
<td>.543</td>
</tr>
<tr>
<td>G128</td>
<td></td>
<td>1.0</td>
<td>.532</td>
<td>.821</td>
<td>.427</td>
<td>.540</td>
</tr>
<tr>
<td>G129</td>
<td></td>
<td>1.2</td>
<td>.551</td>
<td>.807</td>
<td>.489</td>
<td>.543</td>
</tr>
<tr>
<td>G130</td>
<td></td>
<td>1.0</td>
<td>.540</td>
<td>.817</td>
<td>.441</td>
<td>.566</td>
</tr>
<tr>
<td>G133</td>
<td></td>
<td>0.2</td>
<td>.550</td>
<td>.789</td>
<td>.456</td>
<td>.559</td>
</tr>
<tr>
<td>G134</td>
<td></td>
<td>0.2</td>
<td>.506</td>
<td>.786</td>
<td>.417</td>
<td>.580</td>
</tr>
<tr>
<td>H136</td>
<td></td>
<td>0.6</td>
<td>.395</td>
<td>.426</td>
<td>.642</td>
<td>.402</td>
</tr>
<tr>
<td>H137</td>
<td></td>
<td>0.0</td>
<td>.399</td>
<td>.425</td>
<td>.770</td>
<td>.412</td>
</tr>
<tr>
<td>H138</td>
<td></td>
<td>0.0</td>
<td>.377</td>
<td>.379</td>
<td>.771</td>
<td>.374</td>
</tr>
<tr>
<td>H139</td>
<td></td>
<td>0.2</td>
<td>.364</td>
<td>.442</td>
<td>.705</td>
<td>.444</td>
</tr>
<tr>
<td>H140</td>
<td></td>
<td>0.0</td>
<td>.379</td>
<td>.459</td>
<td>.645</td>
<td>.440</td>
</tr>
<tr>
<td>H145</td>
<td></td>
<td>0.4</td>
<td>.256</td>
<td>.317</td>
<td>.671</td>
<td>.330</td>
</tr>
<tr>
<td>H150</td>
<td></td>
<td>0.0</td>
<td>.337</td>
<td>.409</td>
<td>.722</td>
<td>.441</td>
</tr>
<tr>
<td>H151</td>
<td></td>
<td>0.2</td>
<td>.327</td>
<td>.304</td>
<td>.720</td>
<td>.345</td>
</tr>
<tr>
<td>H153</td>
<td></td>
<td>0.4</td>
<td>.400</td>
<td>.399</td>
<td>.641</td>
<td>.571</td>
</tr>
<tr>
<td>H154</td>
<td></td>
<td>0.2</td>
<td>.313</td>
<td>.348</td>
<td>.595</td>
<td>.481</td>
</tr>
<tr>
<td>H155</td>
<td></td>
<td>0.0</td>
<td>.257</td>
<td>.239</td>
<td>.653</td>
<td>.368</td>
</tr>
<tr>
<td>H156</td>
<td></td>
<td>0.2</td>
<td>.365</td>
<td>.395</td>
<td>.646</td>
<td>.505</td>
</tr>
<tr>
<td>H157</td>
<td></td>
<td>0.4</td>
<td>.255</td>
<td>.335</td>
<td>.663</td>
<td>.433</td>
</tr>
<tr>
<td>H158</td>
<td></td>
<td>0.6</td>
<td>.308</td>
<td>.373</td>
<td>.698</td>
<td>.435</td>
</tr>
<tr>
<td>J171</td>
<td></td>
<td>0.2</td>
<td>.416</td>
<td>.533</td>
<td>.472</td>
<td>.776</td>
</tr>
<tr>
<td>J175</td>
<td></td>
<td>0.2</td>
<td>.302</td>
<td>.398</td>
<td>.434</td>
<td>.540</td>
</tr>
<tr>
<td>J176</td>
<td></td>
<td>0.0</td>
<td>.440</td>
<td>.578</td>
<td>.464</td>
<td>.830</td>
</tr>
<tr>
<td>ITEM</td>
<td>SCALE</td>
<td>MISSING</td>
<td>SUPPORT</td>
<td>PSOLVE</td>
<td>APPRAIS</td>
<td>GRRS</td>
</tr>
<tr>
<td>------</td>
<td>-------</td>
<td>---------</td>
<td>---------</td>
<td>--------</td>
<td>---------</td>
<td>------</td>
</tr>
<tr>
<td>J177</td>
<td></td>
<td>0.2</td>
<td>.420</td>
<td>.563</td>
<td>.493</td>
<td>.820</td>
</tr>
<tr>
<td>J178</td>
<td></td>
<td>0.0</td>
<td>.400</td>
<td>.540</td>
<td>.426</td>
<td>.716</td>
</tr>
<tr>
<td>J180</td>
<td></td>
<td>0.2</td>
<td>.412</td>
<td>.570</td>
<td>.456</td>
<td>.804</td>
</tr>
<tr>
<td>J181</td>
<td></td>
<td>0.2</td>
<td>.401</td>
<td>.534</td>
<td>.519</td>
<td>.818</td>
</tr>
<tr>
<td>J182</td>
<td></td>
<td>0.4</td>
<td>.400</td>
<td>.575</td>
<td>.432</td>
<td>.783</td>
</tr>
<tr>
<td>J183</td>
<td></td>
<td>0.2</td>
<td>.423</td>
<td>.532</td>
<td>.476</td>
<td>.783</td>
</tr>
<tr>
<td>J184</td>
<td></td>
<td>0.4</td>
<td>.409</td>
<td>.592</td>
<td>.468</td>
<td>.822</td>
</tr>
<tr>
<td>J185</td>
<td></td>
<td>0.0</td>
<td>.400</td>
<td>.552</td>
<td>.461</td>
<td>.790</td>
</tr>
<tr>
<td>J187</td>
<td></td>
<td>0.2</td>
<td>.438</td>
<td>.596</td>
<td>.484</td>
<td>.790</td>
</tr>
<tr>
<td>J188</td>
<td></td>
<td>0.0</td>
<td>.396</td>
<td>.498</td>
<td>.485</td>
<td>.759</td>
</tr>
<tr>
<td>J189</td>
<td></td>
<td>1.0</td>
<td>.380</td>
<td>.537</td>
<td>.442</td>
<td>.748</td>
</tr>
</tbody>
</table>
### TABLE 40: FINAL FACTOR MATRIX: AFRICAN SETSWANA CULTURE

<table>
<thead>
<tr>
<th>ITEM</th>
<th>SCALE</th>
<th>MISSING</th>
<th>SUPPORT</th>
<th>PSOLVE</th>
<th>APPRAIS</th>
<th>GRRS</th>
</tr>
</thead>
<tbody>
<tr>
<td>F94</td>
<td></td>
<td>0.2</td>
<td>.677</td>
<td>.442</td>
<td>.355</td>
<td>.418</td>
</tr>
<tr>
<td>F95</td>
<td></td>
<td>0.2</td>
<td>.686</td>
<td>.496</td>
<td>.362</td>
<td>.440</td>
</tr>
<tr>
<td>F96</td>
<td></td>
<td>0.8</td>
<td>.667</td>
<td>.502</td>
<td>.324</td>
<td>.436</td>
</tr>
<tr>
<td>F97</td>
<td></td>
<td>0.2</td>
<td>.728</td>
<td>.545</td>
<td>.352</td>
<td>.456</td>
</tr>
<tr>
<td>F100</td>
<td></td>
<td>0.4</td>
<td>.698</td>
<td>.533</td>
<td>.367</td>
<td>.412</td>
</tr>
<tr>
<td>F101</td>
<td></td>
<td>0.4</td>
<td>.706</td>
<td>.586</td>
<td>.435</td>
<td>.446</td>
</tr>
<tr>
<td>F102</td>
<td></td>
<td>0.8</td>
<td>.626</td>
<td>.470</td>
<td>.450</td>
<td>.425</td>
</tr>
<tr>
<td>F103</td>
<td></td>
<td>0.8</td>
<td>.662</td>
<td>.515</td>
<td>.431</td>
<td>.435</td>
</tr>
<tr>
<td>F105</td>
<td></td>
<td>0.0</td>
<td>.683</td>
<td>.531</td>
<td>.392</td>
<td>.411</td>
</tr>
<tr>
<td>F106</td>
<td></td>
<td>0.4</td>
<td>.724</td>
<td>.624</td>
<td>.475</td>
<td>.527</td>
</tr>
<tr>
<td>F107</td>
<td></td>
<td>0.2</td>
<td>.697</td>
<td>.608</td>
<td>.458</td>
<td>.506</td>
</tr>
<tr>
<td>F108</td>
<td></td>
<td>1.0</td>
<td>.640</td>
<td>.516</td>
<td>.420</td>
<td>.422</td>
</tr>
<tr>
<td>F110</td>
<td></td>
<td>0.2</td>
<td>.664</td>
<td>.529</td>
<td>.454</td>
<td>.474</td>
</tr>
<tr>
<td>F111</td>
<td></td>
<td>0.0</td>
<td>.655</td>
<td>.573</td>
<td>.445</td>
<td>.482</td>
</tr>
<tr>
<td>G117</td>
<td></td>
<td>0.2</td>
<td>.603</td>
<td>.709</td>
<td>.419</td>
<td>.538</td>
</tr>
<tr>
<td>G119</td>
<td></td>
<td>0.0</td>
<td>.622</td>
<td>.805</td>
<td>.467</td>
<td>.629</td>
</tr>
<tr>
<td>G120</td>
<td></td>
<td>0.6</td>
<td>.631</td>
<td>.814</td>
<td>.464</td>
<td>.620</td>
</tr>
<tr>
<td>G121</td>
<td></td>
<td>0.4</td>
<td>.479</td>
<td>.618</td>
<td>.348</td>
<td>.454</td>
</tr>
<tr>
<td>G122</td>
<td></td>
<td>0.2</td>
<td>.592</td>
<td>.794</td>
<td>.457</td>
<td>.621</td>
</tr>
<tr>
<td>G124</td>
<td></td>
<td>0.4</td>
<td>.619</td>
<td>.779</td>
<td>.496</td>
<td>.578</td>
</tr>
<tr>
<td>G125</td>
<td></td>
<td>0.0</td>
<td>.585</td>
<td>.826</td>
<td>.460</td>
<td>.640</td>
</tr>
<tr>
<td>G126</td>
<td></td>
<td>0.4</td>
<td>.637</td>
<td>.875</td>
<td>.488</td>
<td>.651</td>
</tr>
<tr>
<td>G127</td>
<td></td>
<td>1.0</td>
<td>.630</td>
<td>.819</td>
<td>.456</td>
<td>.638</td>
</tr>
<tr>
<td>G128</td>
<td></td>
<td>1.0</td>
<td>.593</td>
<td>.809</td>
<td>.464</td>
<td>.648</td>
</tr>
<tr>
<td>G129</td>
<td></td>
<td>0.2</td>
<td>.561</td>
<td>.759</td>
<td>.470</td>
<td>.598</td>
</tr>
<tr>
<td>G130</td>
<td></td>
<td>0.2</td>
<td>.551</td>
<td>.792</td>
<td>.467</td>
<td>.582</td>
</tr>
<tr>
<td>G133</td>
<td></td>
<td>0.2</td>
<td>.567</td>
<td>.737</td>
<td>.426</td>
<td>.604</td>
</tr>
<tr>
<td>G134</td>
<td></td>
<td>0.4</td>
<td>.601</td>
<td>.768</td>
<td>.516</td>
<td>.686</td>
</tr>
<tr>
<td>H136</td>
<td></td>
<td>0.4</td>
<td>.353</td>
<td>.389</td>
<td>.642</td>
<td>.343</td>
</tr>
<tr>
<td>H137</td>
<td></td>
<td>0.6</td>
<td>.441</td>
<td>.489</td>
<td>.702</td>
<td>.420</td>
</tr>
<tr>
<td>H138</td>
<td></td>
<td>0.4</td>
<td>.364</td>
<td>.400</td>
<td>.714</td>
<td>.343</td>
</tr>
<tr>
<td>H139</td>
<td></td>
<td>0.2</td>
<td>.458</td>
<td>.457</td>
<td>.723</td>
<td>.389</td>
</tr>
<tr>
<td>H140</td>
<td></td>
<td>0.4</td>
<td>.480</td>
<td>.491</td>
<td>.670</td>
<td>.401</td>
</tr>
<tr>
<td>H145</td>
<td></td>
<td>0.4</td>
<td>.301</td>
<td>.230</td>
<td>.572</td>
<td>.205</td>
</tr>
<tr>
<td>H150</td>
<td></td>
<td>0.4</td>
<td>.459</td>
<td>.473</td>
<td>.687</td>
<td>.571</td>
</tr>
<tr>
<td>H151</td>
<td></td>
<td>1.0</td>
<td>.333</td>
<td>.313</td>
<td>.697</td>
<td>.386</td>
</tr>
<tr>
<td>H153</td>
<td></td>
<td>0.6</td>
<td>.468</td>
<td>.440</td>
<td>.635</td>
<td>.507</td>
</tr>
<tr>
<td>H154</td>
<td></td>
<td>0.2</td>
<td>.448</td>
<td>.486</td>
<td>.622</td>
<td>.535</td>
</tr>
<tr>
<td>H155</td>
<td></td>
<td>0.6</td>
<td>.313</td>
<td>.312</td>
<td>.695</td>
<td>.362</td>
</tr>
<tr>
<td>H156</td>
<td></td>
<td>0.4</td>
<td>.468</td>
<td>.498</td>
<td>.624</td>
<td>.567</td>
</tr>
<tr>
<td>H157</td>
<td></td>
<td>0.8</td>
<td>.351</td>
<td>.320</td>
<td>.542</td>
<td>.323</td>
</tr>
<tr>
<td>H158</td>
<td></td>
<td>1.2</td>
<td>.386</td>
<td>.377</td>
<td>.676</td>
<td>.374</td>
</tr>
<tr>
<td>J171</td>
<td></td>
<td>0.2</td>
<td>.538</td>
<td>.627</td>
<td>.430</td>
<td>.785</td>
</tr>
<tr>
<td>J175</td>
<td></td>
<td>0.2</td>
<td>.490</td>
<td>.568</td>
<td>.479</td>
<td>.717</td>
</tr>
<tr>
<td>J176</td>
<td></td>
<td>0.2</td>
<td>.514</td>
<td>.636</td>
<td>.515</td>
<td>.838</td>
</tr>
<tr>
<td>ITEM</td>
<td>SCALE</td>
<td>MISSING</td>
<td>SUPPORT</td>
<td>PSOLVE</td>
<td>APPRAIS</td>
<td>GRRS</td>
</tr>
<tr>
<td>------</td>
<td>-------</td>
<td>---------</td>
<td>---------</td>
<td>--------</td>
<td>---------</td>
<td>------</td>
</tr>
<tr>
<td>J177</td>
<td>0.2</td>
<td>.516</td>
<td>.629</td>
<td>.472</td>
<td>.839</td>
<td></td>
</tr>
<tr>
<td>J178</td>
<td>0.2</td>
<td>.507</td>
<td>.610</td>
<td>.479</td>
<td>.753</td>
<td></td>
</tr>
<tr>
<td>J180</td>
<td>0.2</td>
<td>.520</td>
<td>.646</td>
<td>.490</td>
<td>.838</td>
<td></td>
</tr>
<tr>
<td>J181</td>
<td>0.2</td>
<td>.507</td>
<td>.590</td>
<td>.472</td>
<td>.770</td>
<td></td>
</tr>
<tr>
<td>J182</td>
<td>0.2</td>
<td>.497</td>
<td>.640</td>
<td>.474</td>
<td>.840</td>
<td></td>
</tr>
<tr>
<td>J183</td>
<td>0.4</td>
<td>.526</td>
<td>.645</td>
<td>.469</td>
<td>.819</td>
<td></td>
</tr>
<tr>
<td>J184</td>
<td>0.4</td>
<td>.505</td>
<td>.642</td>
<td>.468</td>
<td>.810</td>
<td></td>
</tr>
<tr>
<td>J185</td>
<td>0.4</td>
<td>.458</td>
<td>.599</td>
<td>.455</td>
<td>.760</td>
<td></td>
</tr>
<tr>
<td>J187</td>
<td>1.0</td>
<td>.495</td>
<td>.609</td>
<td>.434</td>
<td>.763</td>
<td></td>
</tr>
<tr>
<td>J188</td>
<td>0.6</td>
<td>.483</td>
<td>.609</td>
<td>.437</td>
<td>.770</td>
<td></td>
</tr>
<tr>
<td>J189</td>
<td>0.2</td>
<td>.491</td>
<td>.553</td>
<td>.433</td>
<td>.725</td>
<td></td>
</tr>
</tbody>
</table>
TABLE 41: FINAL FACTOR MATRIX: AFRICAN XHOSA CULTURE

<table>
<thead>
<tr>
<th>ITEM</th>
<th>SCALE</th>
<th>MISSING</th>
<th>SUPPORT</th>
<th>PSOLVE</th>
<th>APPRAIS</th>
<th>GRRS</th>
</tr>
</thead>
<tbody>
<tr>
<td>F94</td>
<td>0.8</td>
<td>.662</td>
<td>.433</td>
<td>.323</td>
<td>.397</td>
<td></td>
</tr>
<tr>
<td>F95</td>
<td>0.6</td>
<td>.636</td>
<td>.357</td>
<td>.317</td>
<td>.323</td>
<td></td>
</tr>
<tr>
<td>F96</td>
<td>1.0</td>
<td>.685</td>
<td>.354</td>
<td>.319</td>
<td>.345</td>
<td></td>
</tr>
<tr>
<td>F97</td>
<td>0.6</td>
<td>.688</td>
<td>.401</td>
<td>.327</td>
<td>.327</td>
<td></td>
</tr>
<tr>
<td>F100</td>
<td>0.6</td>
<td>.684</td>
<td>.375</td>
<td>.281</td>
<td>.396</td>
<td></td>
</tr>
<tr>
<td>F101</td>
<td>1.6</td>
<td>.679</td>
<td>.425</td>
<td>.310</td>
<td>.383</td>
<td></td>
</tr>
<tr>
<td>F102</td>
<td>0.0</td>
<td>.571</td>
<td>.414</td>
<td>.338</td>
<td>.336</td>
<td></td>
</tr>
<tr>
<td>F103</td>
<td>0.6</td>
<td>.637</td>
<td>.446</td>
<td>.388</td>
<td>.442</td>
<td></td>
</tr>
<tr>
<td>F105</td>
<td>1.4</td>
<td>.665</td>
<td>.496</td>
<td>.359</td>
<td>.406</td>
<td></td>
</tr>
<tr>
<td>F106</td>
<td>0.4</td>
<td>.743</td>
<td>.622</td>
<td>.404</td>
<td>.492</td>
<td></td>
</tr>
<tr>
<td>F107</td>
<td>0.6</td>
<td>.641</td>
<td>.508</td>
<td>.373</td>
<td>.400</td>
<td></td>
</tr>
<tr>
<td>F108</td>
<td>0.8</td>
<td>.537</td>
<td>.450</td>
<td>.359</td>
<td>.449</td>
<td></td>
</tr>
<tr>
<td>F109</td>
<td>0.8</td>
<td>.486</td>
<td>.491</td>
<td>.390</td>
<td>.423</td>
<td></td>
</tr>
<tr>
<td>F110</td>
<td>0.8</td>
<td>.579</td>
<td>.497</td>
<td>.380</td>
<td>.485</td>
<td></td>
</tr>
<tr>
<td>G117</td>
<td>0.8</td>
<td>.517</td>
<td>.696</td>
<td>.379</td>
<td>.557</td>
<td></td>
</tr>
<tr>
<td>G119</td>
<td>0.0</td>
<td>.530</td>
<td>.746</td>
<td>.392</td>
<td>.545</td>
<td></td>
</tr>
<tr>
<td>G120</td>
<td>1.4</td>
<td>.550</td>
<td>.818</td>
<td>.416</td>
<td>.603</td>
<td></td>
</tr>
<tr>
<td>G121</td>
<td>0.4</td>
<td>.397</td>
<td>.633</td>
<td>.317</td>
<td>.425</td>
<td></td>
</tr>
<tr>
<td>G122</td>
<td>0.6</td>
<td>.512</td>
<td>.810</td>
<td>.452</td>
<td>.569</td>
<td></td>
</tr>
<tr>
<td>G124</td>
<td>0.4</td>
<td>.461</td>
<td>.691</td>
<td>.422</td>
<td>.490</td>
<td></td>
</tr>
<tr>
<td>G125</td>
<td>0.0</td>
<td>.488</td>
<td>.812</td>
<td>.411</td>
<td>.560</td>
<td></td>
</tr>
<tr>
<td>G126</td>
<td>0.2</td>
<td>.512</td>
<td>.841</td>
<td>.476</td>
<td>.613</td>
<td></td>
</tr>
<tr>
<td>G127</td>
<td>0.8</td>
<td>.504</td>
<td>.803</td>
<td>.421</td>
<td>.544</td>
<td></td>
</tr>
<tr>
<td>G128</td>
<td>1.2</td>
<td>.497</td>
<td>.797</td>
<td>.450</td>
<td>.547</td>
<td></td>
</tr>
<tr>
<td>G129</td>
<td>1.2</td>
<td>.507</td>
<td>.712</td>
<td>.430</td>
<td>.538</td>
<td></td>
</tr>
<tr>
<td>G130</td>
<td>0.6</td>
<td>.473</td>
<td>.722</td>
<td>.469</td>
<td>.543</td>
<td></td>
</tr>
<tr>
<td>G133</td>
<td>0.8</td>
<td>.478</td>
<td>.656</td>
<td>.443</td>
<td>.594</td>
<td></td>
</tr>
<tr>
<td>G134</td>
<td>0.6</td>
<td>.477</td>
<td>.730</td>
<td>.427</td>
<td>.613</td>
<td></td>
</tr>
<tr>
<td>H136</td>
<td>0.6</td>
<td>.323</td>
<td>.341</td>
<td>.641</td>
<td>.273</td>
<td></td>
</tr>
<tr>
<td>H137</td>
<td>0.6</td>
<td>.352</td>
<td>.405</td>
<td>.664</td>
<td>.326</td>
<td></td>
</tr>
<tr>
<td>H138</td>
<td>0.4</td>
<td>.392</td>
<td>.395</td>
<td>.720</td>
<td>.365</td>
<td></td>
</tr>
<tr>
<td>H139</td>
<td>0.4</td>
<td>.347</td>
<td>.370</td>
<td>.723</td>
<td>.370</td>
<td></td>
</tr>
<tr>
<td>H140</td>
<td>1.2</td>
<td>.420</td>
<td>.457</td>
<td>.647</td>
<td>.393</td>
<td></td>
</tr>
<tr>
<td>H145</td>
<td>1.2</td>
<td>.251</td>
<td>.262</td>
<td>.575</td>
<td>.259</td>
<td></td>
</tr>
<tr>
<td>H150</td>
<td>0.0</td>
<td>.439</td>
<td>.509</td>
<td>.696</td>
<td>.511</td>
<td></td>
</tr>
<tr>
<td>H151</td>
<td>0.2</td>
<td>.398</td>
<td>.440</td>
<td>.734</td>
<td>.399</td>
<td></td>
</tr>
<tr>
<td>H153</td>
<td>0.8</td>
<td>.394</td>
<td>.434</td>
<td>.644</td>
<td>.488</td>
<td></td>
</tr>
<tr>
<td>H154</td>
<td>0.4</td>
<td>.371</td>
<td>.409</td>
<td>.567</td>
<td>.466</td>
<td></td>
</tr>
<tr>
<td>H155</td>
<td>0.4</td>
<td>.344</td>
<td>.369</td>
<td>.722</td>
<td>.367</td>
<td></td>
</tr>
<tr>
<td>H156</td>
<td>0.2</td>
<td>.378</td>
<td>.414</td>
<td>.615</td>
<td>.463</td>
<td></td>
</tr>
<tr>
<td>H157</td>
<td>1.4</td>
<td>.286</td>
<td>.311</td>
<td>.623</td>
<td>.304</td>
<td></td>
</tr>
<tr>
<td>H158</td>
<td>1.2</td>
<td>.317</td>
<td>.378</td>
<td>.644</td>
<td>.406</td>
<td></td>
</tr>
<tr>
<td>J171</td>
<td>0.6</td>
<td>.449</td>
<td>.536</td>
<td>.394</td>
<td>.684</td>
<td></td>
</tr>
<tr>
<td>J175</td>
<td>0.4</td>
<td>.414</td>
<td>.509</td>
<td>.408</td>
<td>.677</td>
<td></td>
</tr>
<tr>
<td>J176</td>
<td>0.0</td>
<td>.453</td>
<td>.535</td>
<td>.385</td>
<td>.755</td>
<td></td>
</tr>
<tr>
<td>ITEM</td>
<td>SCALE</td>
<td>MISSING</td>
<td>SUPPORT</td>
<td>PSOLVE</td>
<td>APPRAIS</td>
<td>GRRS</td>
</tr>
<tr>
<td>------</td>
<td>-------</td>
<td>---------</td>
<td>---------</td>
<td>--------</td>
<td>---------</td>
<td>------</td>
</tr>
<tr>
<td>J177</td>
<td></td>
<td>0.4</td>
<td>.452</td>
<td>.530</td>
<td>.360</td>
<td>.752</td>
</tr>
<tr>
<td>J178</td>
<td></td>
<td>0.4</td>
<td>.481</td>
<td>.575</td>
<td>.421</td>
<td>.792</td>
</tr>
<tr>
<td>J180</td>
<td></td>
<td>0.0</td>
<td>.500</td>
<td>.555</td>
<td>.444</td>
<td>.789</td>
</tr>
<tr>
<td>J181</td>
<td></td>
<td>0.6</td>
<td>.500</td>
<td>.592</td>
<td>.465</td>
<td>.783</td>
</tr>
<tr>
<td>J182</td>
<td></td>
<td>0.2</td>
<td>.404</td>
<td>.606</td>
<td>.440</td>
<td>.784</td>
</tr>
<tr>
<td>J183</td>
<td></td>
<td>0.8</td>
<td>.488</td>
<td>.578</td>
<td>.468</td>
<td>.798</td>
</tr>
<tr>
<td>J184</td>
<td></td>
<td>0.6</td>
<td>.484</td>
<td>.611</td>
<td>.446</td>
<td>.832</td>
</tr>
<tr>
<td>J185</td>
<td></td>
<td>0.6</td>
<td>.409</td>
<td>.570</td>
<td>.366</td>
<td>.700</td>
</tr>
<tr>
<td>J187</td>
<td></td>
<td>0.6</td>
<td>.431</td>
<td>.621</td>
<td>.404</td>
<td>.752</td>
</tr>
<tr>
<td>J188</td>
<td></td>
<td>0.2</td>
<td>.422</td>
<td>.547</td>
<td>.454</td>
<td>.720</td>
</tr>
<tr>
<td>J189</td>
<td></td>
<td>1.2</td>
<td>.426</td>
<td>.515</td>
<td>.405</td>
<td>.673</td>
</tr>
</tbody>
</table>
APPENDIX G: INTEGRATION OF ITEM ANALYSIS

The table below provides an integration of the item analysis of the four resilience scales conducted during Main Moment I. The analyses are based on the first iteration – prior to removal of any items. Items that were subsequently deleted are shaded – unshaded items comprise the final version of the Military Social Health Index.

The following key will assist in interpreting the table:

- **Mean:** The highest means – about 20% of items in each scale.
- **Var:** The lowest variance – about 20% of items in each scale.
- **Miss:** Missing values of 1% or more.
- **Rel:** Highest alpha coefficients – about 20% of the items in each scale.
- **ITC:** Item-Total Correlations – all corrected item-total correlations below .45.
- **Con:** Construct Validity – all items that correlated more highly with another scale than their own scale.
- **Bias:** Items that evidenced cultural bias.
- **W:** White Afrikaans respondents.
- **C:** Coloured Afrikaans respondents.
- **S:** African Setswana respondents.
- **X:** African Xhosa respondents.
- **Y:** Yes, item is culturally biased.

**TABLE 42: INTEGRATED ITEM ANALYSIS FOR RESILIENCE SCALES**

<table>
<thead>
<tr>
<th>ITEM</th>
<th>MEAN</th>
<th>VAR</th>
<th>MISS</th>
<th>REL</th>
<th>ITC</th>
<th>CON</th>
<th>BIAS</th>
</tr>
</thead>
<tbody>
<tr>
<td>#91. My family is able to get help when they need it.</td>
<td>SX</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Y</td>
</tr>
<tr>
<td>#92. My family is willing to accept help when they need it.</td>
<td>X</td>
<td>S</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>#93. In my family we know that other people care about us.</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Y</td>
</tr>
<tr>
<td>#94. In my family we know that other people love us.</td>
<td>S</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>#95. My family is appreciated by others.</td>
<td>WC</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Y</td>
</tr>
<tr>
<td>#96. We know that our family is important to others.</td>
<td>S</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ITEM</td>
<td>MEAN</td>
<td>VAR</td>
<td>MISS</td>
<td>REL</td>
<td>ITC</td>
<td>CON</td>
<td>BIAS</td>
</tr>
<tr>
<td>------</td>
<td>------</td>
<td>-----</td>
<td>------</td>
<td>-----</td>
<td>-----</td>
<td>-----</td>
<td>------</td>
</tr>
<tr>
<td>#97. We know that our family is understood by others.</td>
<td>SX</td>
<td>X</td>
<td>Y</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>#98. Our family maintains good relationships with others.</td>
<td>WCSX</td>
<td>WC</td>
<td>X</td>
<td>Y</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>#99. Our family receives practical help from others.</td>
<td>W</td>
<td>W</td>
<td>Y</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>#100. Our family maintains regular contact with others.</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>#101. Assistance from others adds value to family life.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>#102. There are a variety of support systems available to my family.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>#103. My family is satisfied with their support systems.</td>
<td>S</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>#104. My family can rely on others for help.</td>
<td>SX</td>
<td>X</td>
<td>Y</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>#105. My family knows that others listen to them.</td>
<td>X</td>
<td>Y</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>#106. My family provides assistance to others.</td>
<td>WCSX</td>
<td>WCSX</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>#107. My family often spends time with others.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>#108. My family believes that they are protected.</td>
<td>S</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>#109. The children in my family know that they are safe in the community.</td>
<td>C</td>
<td>X</td>
<td>Y</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>#110. Members of my community will help in an emergency.</td>
<td>X</td>
<td>Y</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>#111. People help our family when we are in trouble.</td>
<td>SX</td>
<td>Y</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>#112. My family is respected by others.</td>
<td>WX</td>
<td>WCSX</td>
<td>Y</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>#113. We know that we belong to the community.</td>
<td>CX</td>
<td>WC</td>
<td>X</td>
<td>Y</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>#114. When there are problems in our family, we can identify them.</td>
<td>WC</td>
<td>WC</td>
<td>Y</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>#115. We do not avoid the problems in our family.</td>
<td>X</td>
<td>X</td>
<td>Y</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>#116. In our family we confront our problems.</td>
<td>W</td>
<td>CX</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>#117. We resolve most of the problems in our family.</td>
<td>Y</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>#118. Problems in our family do not continue forever.</td>
<td>C</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>#119. We talk about the problems in our family.</td>
<td>CS</td>
<td>S</td>
<td>Y</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>#120. We find solutions to our problems.</td>
<td>W</td>
<td>W</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>#121. My family considers previous solutions as options.</td>
<td>WC</td>
<td>Y</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>#122. We learn from our mistakes.</td>
<td>WCSX</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>#123. My family seeks advice from others.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>#124. We look for solutions that everyone agrees on.</td>
<td>SX</td>
<td>X</td>
<td>Y</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>#125. Our family works together to solve problems.</td>
<td>SX</td>
<td>X</td>
<td>Y</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>#126. We implement the solutions to our problems.</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>#127. We are confident that we can solve our problems.</td>
<td>SX</td>
<td>C</td>
<td>S</td>
<td>Y</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>#128. We resolve our problems step-by-step.</td>
<td>S</td>
<td>SX</td>
<td>CSX</td>
<td>Y</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>#129. Our family acts on our decisions.</td>
<td>WS</td>
<td>CX</td>
<td>Y</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>#130. In our family we talk about whether solutions are working successfully.</td>
<td>CSX</td>
<td>C</td>
<td>Y</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>#131. In our family, we talk about solutions that did not work.</td>
<td>C</td>
<td>X</td>
<td>Y</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>#132. When solutions do not work, our family consults with others.</td>
<td></td>
<td>Y</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ITEM</td>
<td>MEAN</td>
<td>VAR</td>
<td>MISS</td>
<td>REL</td>
<td>ITC</td>
<td>CON</td>
<td>BIAS</td>
</tr>
<tr>
<td>------</td>
<td>------</td>
<td>-----</td>
<td>------</td>
<td>-----</td>
<td>-----</td>
<td>-----</td>
<td>------</td>
</tr>
<tr>
<td>#133. When solutions do not work, our family looks for other solutions.</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>#134. When solutions do not work, we try harder to find solutions.</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>#135. When solutions do not work, our family seeks professional help.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Y</td>
</tr>
<tr>
<td>#136. My family thinks that deployments create opportunities for me to grow/develop.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>#137. My family understands the purpose for deployments.</td>
<td>Y</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>#138. My family sees the value of deployments.</td>
<td>Y</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>#139. My family can handle the demands of deployments.</td>
<td>Y</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>#140. My family and I are committed to the military.</td>
<td>X</td>
<td>Y</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>#141. My family and I are committed to our country.</td>
<td>WX</td>
<td>WCSX</td>
<td>X</td>
<td>Y</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>#142. The SANDF’s purpose is important.</td>
<td>WCSX</td>
<td>WCSX</td>
<td>Y</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>#143. The SANDF protects our country.</td>
<td>CSX</td>
<td>S</td>
<td>S</td>
<td>SX</td>
<td>Y</td>
<td></td>
<td></td>
</tr>
<tr>
<td>#144. Deployments prevent boredom.</td>
<td>WSX</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Y</td>
</tr>
<tr>
<td>#145. Deployments make life interesting.</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Y</td>
</tr>
<tr>
<td>#146. There are only a few bad things about deployments.</td>
<td>X</td>
<td>S</td>
<td>Y</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>#147. I am not concerned about the dangers of deployment.</td>
<td></td>
<td>SX</td>
<td>Y</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>#148. My family is not overwhelmed by problems during deployments.</td>
<td>X</td>
<td>SX</td>
<td>Y</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>#149. There are benefits to being in the military.</td>
<td>WC</td>
<td>X</td>
<td>SX</td>
<td>Y</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>#150. My family understands that deployment is part of my job.</td>
<td>SX</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>#151. My family thinks deployments are important.</td>
<td>S</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Y</td>
</tr>
<tr>
<td>#152. My family needs the extra money I get from deployments.</td>
<td>W</td>
<td>W</td>
<td>Y</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>#153. My family is proud that I am a soldier.</td>
<td>C</td>
<td>WC</td>
<td>Y</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>#154. I am proud to be a soldier.</td>
<td>WCSX</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>#155. I like to deploy.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Y</td>
</tr>
<tr>
<td>#156. I like to work for the military.</td>
<td>WSX</td>
<td>SX</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>#157. I trust the people I deploy with.</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Y</td>
</tr>
<tr>
<td>#158. In my family we focus on the positive aspects of deployments.</td>
<td>SX</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>#159. My family has money available in case of an emergency.</td>
<td>X</td>
<td></td>
<td>WCX</td>
<td>C</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>#160. My family can handle money matters without my help.</td>
<td>X</td>
<td>X</td>
<td>Y</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>#161. My family knows how to get money from the bank when I am not available.</td>
<td>SX</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Y</td>
</tr>
<tr>
<td>#162. My family can get transport when they need it.</td>
<td>W</td>
<td>S</td>
<td>X</td>
<td>Y</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>#163. My family can get to a clinic/ hospital when they need medical help.</td>
<td>W</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Y</td>
</tr>
<tr>
<td>#164. My family has access to security (eg police, dogs, neighbours, etc).</td>
<td>S</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Y</td>
</tr>
<tr>
<td>#165. My family has strong religious beliefs.</td>
<td>W</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Y</td>
</tr>
<tr>
<td>#166. In our family we have a strong cultural identity.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Y</td>
</tr>
<tr>
<td>#167. We are proud of our culture.</td>
<td>X</td>
<td>X</td>
<td>Y</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>#168. Our family’s cultural roots are important.</td>
<td>X</td>
<td>SX</td>
<td>Y</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ITEM</td>
<td>MEAN</td>
<td>VAR</td>
<td>MISS</td>
<td>REL</td>
<td>ITC</td>
<td>CON</td>
<td>BIAS</td>
</tr>
<tr>
<td>------</td>
<td>------</td>
<td>-----</td>
<td>------</td>
<td>-----</td>
<td>-----</td>
<td>-----</td>
<td>------</td>
</tr>
<tr>
<td>#169. My family has interests/hobbies outside the family.</td>
<td>W</td>
<td></td>
<td>SX</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>#170. My family believes that we can cope with life.</td>
<td>W</td>
<td>WCS</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Y</td>
</tr>
<tr>
<td>#171. In our family we feel good about ourselves.</td>
<td>CS</td>
<td>WC</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>#172. My family is able to bounce back after difficult times.</td>
<td>W</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>#173. Problems are part of life.</td>
<td>CSX</td>
<td>WX</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Y</td>
</tr>
<tr>
<td>#174. Difficult times are an opportunity to learn.</td>
<td>C</td>
<td>WC</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Y</td>
</tr>
<tr>
<td>#175. I am in control of my life.</td>
<td>S</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Y</td>
</tr>
<tr>
<td>#176. My family stands together.</td>
<td>CSX</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Y</td>
</tr>
<tr>
<td>#177. We have close family ties.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Y</td>
</tr>
<tr>
<td>#178. In our family we talk about experiences we have shared.</td>
<td>SX</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Y</td>
</tr>
<tr>
<td>#179. We have our own way of celebrating family traditions.</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>#180. We respect each other in our family.</td>
<td>WSX</td>
<td>W</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>#181. My family can adapt to change.</td>
<td>WX</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Y</td>
</tr>
<tr>
<td>#182. We talk openly with each other in our family.</td>
<td>S</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Y</td>
</tr>
<tr>
<td>#183. My family has learned how to cope in difficult times.</td>
<td>WCSX</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>#184. In our family we agree on important things.</td>
<td>CSX</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Y</td>
</tr>
<tr>
<td>#185. Our family likes spending time together.</td>
<td>S</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>#186. Other members of my family are employed.</td>
<td>S</td>
<td>WSX</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Y</td>
</tr>
<tr>
<td>#187. Our family likes doing things together.</td>
<td>W</td>
<td>SX</td>
<td>S</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>#188. We believe things in life will get better.</td>
<td>C</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>#189. We maintain a healthy lifestyle.</td>
<td>X</td>
<td>CX</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**MULTICULTURAL SCALE DEVELOPMENT IN SOCIAL WORK**

**Page 486**