

CONFIRMATORY FACTOR ANALYSIS OF THE CAREER DEVELOPMENT QUESTIONNAIRE AND THE CAREER DECISION-MAKING SELF-EFFICACY SCALE FOR SOUTH AFRICAN HIGH SCHOOL STUDENTS

GIDEON P DE BRUIN
*Department of Psychology
University of Stellenbosch*

MARTHA J BERNARD-PHERA
*Department of Psychology
Rand Afrikaans University*

ABSTRACT

This study investigated the construct validity of the Career Development Questionnaire and the Career Decision-Making Self-Efficacy Scale for Grade 12 students from a low socioeconomic area in South Africa. The results of confirmatory factor analyses provided support for the construct validity of the Career Development Questionnaire and the Career Decision-Making Self-Efficacy Scale as measures of career maturity and career decision-making self-efficacy respectively. In accordance with theoretical predictions, a moderate degree of overlap between the constructs measured by the two instruments was observed. It appears that a general factor, labelled General Career Decision-Making, underlies responses to the two questionnaires. In addition to the general factor, the Career Decision-Making Self-Efficacy Scale also measures self-efficacy expectations regarding decision-making.

OPSOMMING

Hierdie studie het ondersoek ingestel na die konstruegeldigheid van die Loopbaanontwikkelingsvraelys en die Loopbaanbesluitneming-selfdoeltreffendheidskaal vir Graad 12 leerlinge van 'n lae sosio-ekonomiese gebied. Die resultate van bevestigende faktorontledings het ondersteuning gebied vir die konstruegeldigheid van die twee vraelyste as meetinstrumente van onderskeidelik loopbaanvolwassenheid en loopbaanbesluitneming-selfdoeltreffendheid. In ooreenstemming met dit wat op grond van teorie voorspel kon word, is daar 'n redelike mate van ooreenstemming van die twee konstrue waargeneem. Dit blyk dat 'n algemene faktor, wat Algemene Loopbaanbesluitneming genoem word, response vir die twee vraelyste onderlê. Benewens die algemene faktor, meet die Loopbaanbesluitneming-selfdoeltreffendheidskaal ook selfdoeltreffendheidsverwagtings ten opsigte van besluitneming.

The theory of Bandura (1986) regarding self-efficacy expectations provides a useful explanation for the phenomenon that individuals who have the same abilities do not necessarily produce the same achievements (given that the circumstances of the individuals were the same). According to this theory, individuals who believe that they have the ability to complete a specific task successfully, will tend to perform better than individuals who do not believe that they have such an ability. Likewise, the former group will tend to persevere with the task for longer if they encounter obstacles. Individuals who believe that they have the ability to complete a given task successfully have positive self-efficacy expectations with regard to the task. On the other hand, individuals who do not believe that they have the ability to complete a task successfully have negative self-efficacy expectations with regard to the task.

This theory has already been used to explain, predict and change behaviour in many areas of life. These areas include, amongst others, anxiety and fear (Williams, 1992), pain tolerance and control (Kores, Murphy, Rosenthal, Elias & North, 1990), immune system functioning (Wiedenfeld, Bandura, Levine, O'Leary, Brown & Raska, 1990), parenting sensitivity (Teti, O'Connell & Reiner, 1997), coping with arthritis (Barlow, Williams & Wright, 1997) and sport achievements (Feltz, 1992). Hackett and Betz (1981) were the first researchers who applied self-efficacy theory to the terrain of career psychology. They found that men had more positive self-efficacy expectations with regard to their ability to be successful in careers that were traditionally regarded as female, than women with regard to their ability to succeed in traditionally male careers. The result

of this is that men can make decisions regarding their careers from a greater pool of potential careers, which include traditionally female careers. In contrast, women tend to make decisions regarding their career choices from a small pool of potential careers as a result of a lack of self-efficacy expectations. Correspondingly, Seane (1998) showed that black male youths in South Africa have more positive career-related self-efficacy expectations than their female counterparts. Seane (1998) further showed that the male youths considered a greater number of careers than the female youths.

Taylor and Betz (1983) applied the theory of Bandura (1986) to the field of career decision-making. They were of the opinion that individuals who have more confidence in their ability to make applicable career decisions will have more positive attitudes with regard to career decision-making and that they will also be more capable to make successful career decisions. Taylor and Betz (1983) developed the Career Decision-Making Self-Efficacy Scale (CDMSES) to operationalise their views about self-efficacy expectations with regard to career decision-making. This instrument can be used to assess the self-efficacy expectations of individuals regarding the career decision-making process. The Career Decision-Making Self-Efficacy Scale has already been used in a number of studies on career decision-making. It appears that scores for the Career Decision-Making Self-Efficacy Scale are related to the individual's career decision-making status (Gianakos, 1999; Robbins, 1985; Taylor & Popma, 1990), career identity (Robbins, 1985), career decision-making difficulties (Osipow & Gati, 1998), self-worth (Robbins, 1985), trait-anxiety (Gloria & Hird, 1999), exploratory behaviour (Blustein, Ellis & Devenis, 1989; Brown, Glastetter-Fender & Shelton, 2000), locus of control (Brown et al, 2000; Taylor & Popma, 1990) and

willingness of women to consider non-traditional careers (Foss & Slaney, 1986). It would therefore appear that the Career Decision-Making Self-Efficacy Scale relates to a variety of career-related constructs in a meaningful manner.

The view of Taylor and Betz (1983) on self-efficacy expectations with regard to career decision-making is based on two theories, namely Crites' (1969) theory of career maturity and Bandura's (1986) theory of self-efficacy expectations. The items of the Career Decision-Making Self-Efficacy Scale represent career decision-making tasks that were derived from the Career Maturity Inventory of Crites (1978). The individual must continually indicate to which degree he or she has the self-observed ability to complete the tasks successfully. The Career Decision-Making Self-Efficacy Scale consists of five sub-scales, namely (a) accurate self-evaluation, (b) the gathering of career information, (c) goal selection, (d) formulation of future plans, and (e) problem solving. Each of the sub-scales of the Career Decision-Making Self-Efficacy Scale corresponds with an aspect of Crites' model of career maturity. The career maturity construct will consequently be discussed in greater detail.

Career maturity refers to the readiness of an individual to make a career decision. Each development phase through which an individual moves has specific career development tasks and career maturity can also be described as the degree to which an individual has succeeded in mastering the career development tasks that are relevant for his or her development phase. Individuals who have greater career maturity would have completed more of the relevant career development tasks successfully than individuals who have a lesser degree of career maturity. The concept of career maturity was introduced by Super (1957), who emphasised the developmental nature of the career decision-making process. His work served as a stimulus for the thinking and theorising of Crites (1969) on career maturity, which was operationalised in the widely-used Career Maturity Inventory (Crites, 1978). Crites (1978) distinguished between cognitive and affective aspects of career maturity. The former pertains to specific skills that are related to career decision-making and the latter pertains to the attitude of an individual with regard to the career decision-making process. High scores on the Career Maturity Inventory are accompanied by career decision-making skills that are better developed and attitudes with regard to the career decision-making process that are more positive. The Career Maturity Inventory has been used in a number of South African studies to assess the career maturity of South African groups during the 1980s (e.g. Morris, 1985; Newman, 1982; Reid-van Niekerk & Van Niekerk, 1990; Watson & Van Aarde, 1986). However, Langley (1989) recognised the need for an indigenous measuring instrument to assess career maturity and developed the Career Development Questionnaire (Langley, du Toit & Herbst, 1992). The Career Development Questionnaire is based on the career maturity models of Super (1983), Crites (1978) and Westbrook (1983) and therefore is heavily influenced by the thinking of American theorists. The questionnaire consists of five sub-scales, namely Self Knowledge, Decision-making, Career Information, Integration of Self Knowledge and Career Information, and Career Planning.

The Career Development Questionnaire has been standardised for high school and college students with English, Afrikaans or an African language as first language. However, little research has been done to demonstrate the validity of the questionnaire for the different ethnic and cultural groups in South Africa. Several studies during the 1980s and early 1990s indicated that black and coloured South Africans generally achieved lower scores than their white counterparts on measuring instruments such as the Career Maturity Inventory and the Career Development Questionnaire (Alexander, 1990; Beekman, 1989; Hickson & White, 1989; Reid-van Niekerk & Van Niekerk, 1990; Watson & Van Aarde, 1986). A recent study by Baloyi (1996) indicates that these differences can be ascribed to socio-economic factors. Baloyi (1996) found in this regard that there

were no differences in the levels of career maturity of black and white high school pupils at private schools.

Since the Career Decision-Making Self-Efficacy Scale, as mentioned earlier, is to a great extent based on the career maturity construct, one can accept that there should be a significantly positive correlation between scores for the Career Decision-Making Self-Efficacy Scale and scores for career maturity questionnaires such as the Career Maturity Inventory and the Career Development Questionnaire. In this regard, Luzzo (1993) emphasises that the more positive an individual is about her or his ability to take successful career decisions, the greater the chance that the individual will display positive attitudes towards career decision-making in general. In correspondence with this hypothesis, Luzzo (1993) indicated that scores for the Career Decision-Making Self-Efficacy Scale correlated positively with scores for the attitude component of Crites' (1978) Career Maturity Inventory ($r = .41$). This finding supports the theoretical connection between the individual's confidence in her or his ability to make a career decision and the feelings and subjective reactions of an individual regarding the career decision-making process (Luzzo, 1993). However, Luzzo (1993) could not succeed in indicating a significant relationship between the Career Decision-Making Self-Efficacy Scale and career decision-making skills such as measured by the Career Decision-making sub-scale of the Career Development Inventory (Super, Thompson, Lindeman, Jordaan & Myers, 1981). From this it can be deduced that the Career Decision-Making Self-Efficacy Scale primarily has a bearing on the affective, rather than the cognitive, aspects of the career decision-making process.

The objective of the present study is to investigate the construct validity of the Career Decision-Making Self-Efficacy Scale and the Career Development Questionnaire for Grade 12 students from a community that was discriminated against under apartheid. The validity of the two instruments will be investigated on the basis of a series of confirmatory factor analyses. Various South African researchers, among whom de Bruin and Nel (1996) and Stead and Watson (1998), have emphasised that constructs that were developed in the United States of America, such as career maturity and career decision-making self-efficacy, will not necessarily be valid for the South African context. Similarly, research findings in the United States of America cannot necessarily be generalised to contexts that differ radically from the context in which the research was originally done. In this regard it is important to empirically evaluate the validity of measuring instruments and the relationships between constructs in the new context.

METHOD

Participants

The participants were 202 Grade 12 students from Eldorado Park, Johannesburg. This area is characterised by poverty, unemployment and a high crime rate and can be described as a so-called historically disadvantaged community. The residents of the area and the participants in the study can predominantly be described as coloured, although there are also black and asian residents in the area. Eighty of the participants were males and 122 were females. The average age of the men was 18.05 and of the women was 17.60. The participants were predominantly Afrikaans speaking (72.50% of the males and 79.50% of the females) and to a lesser degree English speaking (17.5% of the men and 10.66% of the women). The remaining participants reported an African language as their mother tongue.

Procedure

All the data was collected by the second author in school time during the guidance period. The participants took part in the study voluntarily.

Measuring instruments

Career Development Questionnaire

As explained in the preceding paragraphs, the questionnaire consists of five sub-scales, namely Self Knowledge, Decision-making, Career Information, Integration of Self Knowledge and Career Information, and Career Planning. The internal consistency reliability coefficients reported in the manual for the five 20-item sub-scales range between .66 and .83 (Langley et al, 1992). These coefficients can be regarded as satisfactory for research purposes. The manual does not contain much information on the validity of the Career Development Questionnaire. Langley et al (1992) report that the intercorrelations of the five sub-scales are moderately high, suggesting that they have a general factor in common. Watson and Stead (1997) demonstrated that the total score of the Career Development Questionnaire is positively related to vocational planning and exploration as measured by the Commitment to Career Choices Scale (Blustein, Ellis & Devenis, 1989). The Career Development Questionnaire is available in Afrikaans and English. Participants completed the questionnaire in their language of choice.

Career Decision-Making Self-Efficacy Scale

The Career Decision-Making Self-Efficacy Scale was developed by Taylor and Betz (1983). The purpose of the instrument is to assess the self-efficacy expectations of individuals with regard to their ability to make effective career decisions. The sub-scales of the Career Decision-Making Self-Efficacy Scale are derived from Crites' (1978) theory of career maturity. The five sub-scales are the following: Goal Selection, Occupational Information, Problem Solving, Planning, and Self-Appraisal. Each sub-scale consists of 10 items, giving a total of 50 items. Although the measuring model of the Career Decision-Making Self-Efficacy Scale specifies that five separate dimensions underlie the items, factor-analytical and other evidence indicates that it is more appropriate to focus on the total scores of the Career Decision-Making Self-Efficacy Scale than on the scores for the sub-scales (Taylor & Popma, 1990). In this regard it is appropriate to use the five sub-scales as indicators of general self-efficacy expectations with regard to career decision-making. However, it does not appear to be appropriate to regard the five sub-scales as representative of independent dimensions of self-efficacy expectations (Robbins, 1985). In the present study, the five sub-scales are used only as indicators of a general self-efficacy factor. Betz and Taylor (1983) reported a very satisfactory internal consistency reliability coefficient for the total scale (= .97). The internal consistency reliability coefficients of the five sub-scales range between .86 and .89 and can also be described as satisfactory. All the participants completed the CDMSES in English.

Data analysis

The data was analysed by means of a series of maximum likelihood confirmatory factor analyses. This technique requires of the researcher to specify a theoretical model that will explain the covariances between observable and latent variables in advance. The observable variables in the present case are the sub-scale scores of the Career Development Questionnaire and the Career Decision-Making Self-Efficacy Scale. The latent variables in a confirmatory factor analysis are the postulated constructs or factors that underlie the scores for the observable variables.

Confirmatory factor analysis allows the researcher to evaluate the fit between the postulated model and the observed data. In this regard the researcher relies on a series of fit indexes. The following indexes were used in the study in question: the chi-square statistic, the Root Mean Square Error of Approximation (RMSEA; Steiger & Lind, 1980), the Goodness of Fit Index (GFI; Jöreskog & Sörbom, 1989), the Normed Fit Index (NFI; Bentler & Bonnet, 1980) and the Comparative Fit Index (CFI; Bentler, 1990). With regard to the chi-square statistic, a non-significant chi-square indicates that the model shows a good fit with the

data and that the difference between the original covariance matrix and the covariance matrix that is reconstructed on the basis of the postulated model, is insignificantly small. However, Browne and Cudeck (1993) have pointed out that the chi-square is often too strict a test, as it is unreasonable to expect that any reconstructed covariance matrix will display a perfect fit with the original covariance matrix. In addition to this, a further undesirable characteristic of the chi-square is that it is influenced to a great extent by the size of the sample. The RMSEA is influenced by the size of the test sample to a lesser extent. This index also takes into consideration the complexity of a postulated model and generally gives preference to simpler models that make use of fewer parameters to explain the covariances between the variables. Browne and Cudeck (1993) have formulated the general guideline that RMSEA values of .05 and smaller indicate a close fit between the postulated model and the observed data. Values of .08 and smaller indicate a reasonable fit and values of greater than .08 indicate an unsatisfactory fit. One of the strongest points of the RMSEA is that confidence intervals can be constructed around the point estimations.

A general guideline for the interpretation of the GFI, NFI and CFI is that values of .90 and higher indicate a satisfactory fit between the postulated model and the observed data. There are no tests for statistical significance of these indexes and it is also not possible to construct confidence intervals around the point estimations.

Confirmatory factor analysis allows the researcher to estimate the factor pattern coefficients that link the observed variables and the latent variables. The correlations between the latent variables can also be estimated. All analyses were carried out with the SE-Path programme of the Statistical data analysis package. Each of the postulated models that were tested in the study in question will consequently be set out.

Model 1 specifies that a single factor underlies the five sub-scales of the Career Development Questionnaire. In correspondence with the theory on which the Career Development Questionnaire is based, this factor is called Career Maturity. Model 1 specifies further that there is also only one factor underlying the five sub-scales of the Career Decision-Making Self-Efficacy Scale. In correspondence with the theory on which the Career Decision-Making Self-Efficacy Scale is based, this factor is called Self-Efficacy. In accordance with theoretical expectations, the model specifies that the two factors are correlated with one another. The variances of the two factors are fixed to unity in order to identify the model. The factor pattern coefficients of the two factors on the Career Development Questionnaire and the Career Decision-Making Self-Efficacy Scale sub-scales are estimated freely from the observed data.

Model 2 specifies that a General Career Decision-Making factor underlies the sub-scales of the Career Development Questionnaire and the Career Decision-Making Self-Efficacy Scale. This factor represents that which the sub-scales of the Career Development Questionnaire and the Career Decision-Making Self-Efficacy Scale have in common. The model specifies further that a Career Decision-making factor can be abstracted from the shared residual variance of the Career Development Questionnaire sub-scales and that a Self-Efficacy factor can be abstracted from the shared residual variance of the Career Decision-Making Self-Efficacy Scale sub-scales. As in Models 1 and 2, the variances of the three factors are fixed to unity and all factor pattern coefficients are freely estimated from the observed data.

RESULTS

The fit indexes of the two models are given in Table 1. It should be noted that not one of the models displays a good fit with the observed data from a statistical point of view, since the chi-square

statistic for each of the models is statistically significant. However, closer inspection of the table indicates that the two models display reasonably satisfactory to very satisfactory fits with the observed data in practical terms. Comparison of the fit indexes further indicates that, relatively speaking, Model 2 displays the best fit.

TABLE 1
FIT INDEXES FOR THREE POSTULATED MEASURING MODELS (N=202)

Model	χ^2	df	<i>p</i>	RMSEA	GFI	NFI	CFI
Model 1	76.03	34	.000	.08 (.06 - .10)	.93	.91	.95
Model 2	45.46	25	.007	.06 (.03 - .09)	.96	.94	.97

Note. The 90% confidence intervals for the RMSEA are given in brackets after the point estimation.

The point estimate of the RMSEA for Model 1 is .08 with 90% confidence intervals of .06 and .10. The point estimate indicates that the postulated model displays a reasonable fit with the observed data according to the guidelines of Browne and Cudeck (1992). The GFI (.93), NFI (.91) and the CFI (.95) indicate that the model displays a satisfactory fit with the observed data in practical terms. The standardised factor pattern coefficients for Model 1 are reflected in Table 2. Inspection of the factor pattern coefficients indicates that the five sub-scales of the Career Development Questionnaire and the five sub-scales of the Career Decision-Making Self-Efficacy Scale are good indicators of the Career Maturity and Self-Efficacy factors respectively. All ten standardised factor pattern coefficients are statistically significant ($p < .05$). The factor pattern coefficients for the Career Maturity factor vary between .50 (Self Knowledge) and .83 (Planning). The factor pattern coefficients for the Self-Efficacy factor vary between .69 (Self-Appraisal) and .79 (Occupational Information). All the sub-scales of the Career Decision-Making Self-Efficacy Scale therefore appear to be satisfactory indicators of the Self-Efficacy factor.

TABLE 2
STANDARDISED ESTIMATED FACTOR PATTERN
COEFFICIENTS FOR MODEL 1

Sub-scale	Factor	
	I	II
CDM 1 (Self Knowledge)	.50	
CDM 2 (Decision-Making)	.65	
CDM 3 (Career Information)	.75	
CDM 4 (Integration of Self Knowledge and Career Information)	.62	
CDM 5 (Planning)	.83	
CDMSES 1 (Self-Appraisal)		.69
CDMSES 2 (Occupational Information)		.79
CDMSES 3 (Goal Selection)		.71
CDMSES 4 (Planning)		.77
CDMSES 5 (Problem Solving)		.72

Note. The correlation between the two factors is .49.

The correlation between the Career Maturity and Self-Efficacy factors is .49 ($p < .05$). From this it appears that there is an overlap of approximately 24% of the variance of the two constructs. Such an overlap is expected on theoretical grounds, since both constructs have a bearing on career decision-making and the Career Decision-Making Self-Efficacy Scale is based on a model of career maturity, namely that of Crites (1978). The degree of overlap, however, is not so large that the conclusion

can be drawn that the two instruments largely provide the same information. In this regard it should be noted that approximately 76% of the variance of the constructs does not overlap (this estimate also includes that variance that can be ascribed to measurement error).

The point estimate of the RMSEA for Model 2 is .06 with 90% confidence intervals of .03 and .09. According to the guidelines of Browne and Cudeck (1992), the point estimate can be regarded as indicative of a satisfactory fit. The GFI (.96), NFI (.94) and CFI (.97) also indicate that the fit between the model and the observed data can be regarded as satisfactory. The standardised estimated factor pattern coefficients of Model 2 are given in Table 3. Closer inspection of this table indicates that all five sub-scales of the Career Development Questionnaire are strong indicators of the general factor that underlies the sub-scales of the Career Development Questionnaire and the Career Decision-Making Self-Efficacy Scale. The standardised factor pattern coefficients of the Career Development Questionnaire sub-scales with regard to the general factor vary between .56 (Integration of Self Knowledge and Career Information) and .79 (Decision-making). All these factor pattern coefficients are statistically significant ($p < .05$).

It appears that all five sub-scales of the Career Decision-Making Self-Efficacy Scale also are satisfactory indicators of the general factor, but the relationship of the Career Decision-Making Self-Efficacy Scale sub-scales to the general factor is weaker than that of the Career Development Questionnaire sub-scales. With regard to the general factor, the factor pattern coefficients of the Career Decision-Making Self-Efficacy Scale sub-scales vary between .32 (Goal Selection) and .45 (Self-Appraisal). All these factor pattern coefficients are statistically significant ($p < .05$).

The factor pattern coefficients of the Career Development Questionnaire sub-scales on the group factor that underlies them (after the influence of the general factor has been partialled out) varies between -.14 and .59 and can be described as reasonably low. Three of these coefficients, namely those for Self Knowledge, Decision-making and Integration of Self Knowledge and Career Information, are not statistically significant ($p > 0.05$). From this it appears that the shared variance of the Career Development Questionnaire sub-scales is largely explained by the general factor. The three sub-scales that did not display statistically significant factor pattern coefficients on the Career Development Questionnaire group factor primarily have bearing on aspects relating to the self. On the other hand, the two sub-scales that did display statistically significant factor pattern coefficients, namely Career Information and Planning, primarily have bearing on knowledge about the career world. From this it can possibly be deduced that the Career Development Questionnaire taps a dimension of knowledge that is not covered by the sub-scales of the Career Decision-Making Self-Efficacy Scale. However, further research with regard to the correlates of this factor is required before one could confidently say anything about the nature and meaning thereof.

In contrast with the Career Development Questionnaire sub-scales, all the factor pattern coefficients of the Career Decision-Making Self-Efficacy Scale sub-scales on the group factor that underlies them are reasonably high and statistically significant ($p < 0.05$). These factor pattern coefficients vary between .53 (Self-Appraisal) and .71 (Occupational Information). It therefore appears that if the variance that the Career Development Questionnaire and the Career Decision-Making Self-Efficacy Scale sub-scales have in common is partialled out, there is still a relatively well-defined group factor that can be abstracted from the residual correlations of the Career Decision-Making Self-Efficacy Scale sub-scales. From this it can be concluded that the Career Decision-Making Self-Efficacy Scale has reliable variance that cannot be measured by the Career Development Questionnaire.

TABLE 3
STANDARDISED ESTIMATED FACTOR PATTERN
COEFFICIENTS FOR MODEL 2

Sub-scale	I	II	III
CDM 1 (Self Knowledge)	.61	-.14	
CDM 2 (Decision-Making)	.79	-.12	
CDM 3 (Career Information)	.63	.36	
CDM 4 (Integration of Self Knowledge and Career Information)	.56	.21	
CDM 5 (Planning)	.72	.59	
CDMSES 1 (Self-Appraisal)	.45		.53
CDMSES 2 (Occupational Information)	.35		.71
CDMSES 3 (Goal Selection)	.32		.64
CDMSES 4 (Planning)	.37		.67
CDMSES 5 (Problem Solving)	.35		.62

DISCUSSION

From the preceding paragraphs it appears that the two constructs that underlie the Career Development Questionnaire and the Career Decision-Making Self-Efficacy Scale, namely Career Maturity and Self-Efficacy with regard to Career Decision-making, are measured effectively by the two instruments. Furthermore, it appears that there is a moderate degree of overlap between the two constructs, but that each instrument also provides unique information. Interestingly, Luzzo (1993) reported a correlation of .41 between the Career Maturity Inventory – Attitude Scale and the Career Decision-Making Self-Efficacy Scale. This correlation is similar to the correlation obtained in the present study between the Career Development Questionnaire and the Career Decision-Making Self-Efficacy Scale ($r = .49$). The latter correlation provides strong support for the hypothesised positive relationship between career maturity and career decision-making self-efficacy because, unlike the Career Maturity Inventory – Attitude Scale, the Career Development Questionnaire does not share content with the Career Decision-Making Self-Efficacy Scale. The overlapping variance of the two constructs can possibly be described as a General Career Decision-making factor. The results suggest that the Career Development Questionnaire sub-scales are pure and strong indicators of this broad construct. The Career Decision-Making Self-Efficacy Scale sub-scales appear to be reasonably effective indicators of the General Career Decision-making factor, but they also provide unique information that is not provided by the Career Development Questionnaire. This information probably has a bearing on self-confidence relating to general decision-making, since it can be accepted that the general factor that underlies the two instruments will absorb variance that relates to decision-making about careers.

The significance of the findings of the study are, firstly, that the construct validity of both the Career Development Questionnaire and the Career Decision-Making Self-Efficacy Scale for coloured Grade 12 students from a socio-economically disadvantaged area received support. This suggests that the theoretical constructs of career maturity and career decision-making self-efficacy, which were developed in the United States of America, retain their meaning for coloured South African youths who come from a socio-political, economical and cultural context very different from the United States of America. The findings also suggest that the Career Development Questionnaire and the Career Decision-Making Self-Efficacy Scale hold promise as indicators of the two theoretical constructs with coloured South African adolescents and youths.

In the second place, it appears that each of the instruments can potentially make a useful contribution to the career counselling situation. The Career Development Questionnaire appears to be an effective and pure indicator of the individual's readiness to make career decisions. On the other hand, the value of the Career Decision-Making Self-Efficacy Scale lies therein that it offers information about an individual's self-efficacy expectations regarding decision-making. According to Bandura's (1986) theory, individuals with higher self-efficacy expectations would tackle and complete the career development tasks that are measured by the Career Development Questionnaire more efficiently than individuals with low self-efficacy expectations would. In this regard it could therefore be expected that individuals with high scores for the Career Decision-Making Self-Efficacy Scale will also obtain high scores for the Career Development Questionnaire. As mentioned earlier, the correlation between the two constructs that underlie the Career Development Questionnaire and the Career Decision-Making Self-Efficacy Scale respectively is only .49. The situation could therefore arise in which an individual with a high score for the Career Decision-Making Self-Efficacy Scale could obtain an average or low score for the Career Development Questionnaire. In such a case it probably indicates that the individual has the necessary self-confidence to complete the development tasks that are related to career decision-making, but that he or she is not motivated to finish off the tasks or that there are one or more stumbling blocks that prevent the individual from completing the tasks. The target of the career counselling intervention in such a case could be to raise the motivation of the individual with regard to career decision-making and/or the removal of stumbling blocks in the path of the career decision-making of the individual.

It is also possible that it could be found – against all theoretical expectations – that an individual might obtain a high score for the Career Development Questionnaire and a low score for the Career Decision-Making Self-Efficacy Scale. This would suggest that the individual has all the necessary information and is ready to make a career decision, but he or she lacks the confidence to make decisions. In such cases the aim of career counselling interventions should probably be to build up the self-efficacy exceptions and self-confidence of the individual with regard to decision-making.

Note

1. The "racial" categories used in this paper are in accordance with the use of these categories by the present and previous South African governments. Our use of these categories does not imply that we accept that they have status as any more than legal labels in South Africa.

REFERENCES

- Alexander, D.I.M. (1990). *Die ontwikkeling van beroepsvolwassenheid by minderheidsgroepleerlinge*. (The development of vocational maturity among minority group students). Unpublished Master's dissertation, Rand Afrikaans University, Johannesburg.
- Baloyi, D.K. (1996). *Career development in high schools: A systematic cross-cultural perspective*. Unpublished Masters dissertation, University of Pretoria, Pretoria.
- Bandura, A. (1986). *Social foundations of thought and behavior: A social-cognitive theory*. Englewood-Cliffs, NJ: Prentice-Hall.
- Barlow, J.H., Williams, B., & Wright, C.C. (1997). The reliability and validity of the Arthritis Self-Efficacy Scale in a UK context. *Psychology, Health and Medicine*, 2, 3-17.
- Beekman, A.W. (1989). *Beroepsrypheid by 'n groep universiteitstudente in S.W.A./Namibië*. (Vocational maturity among a group of university students in S.W.A./ Namibia). Unpublished Masters dissertation, Rand Afrikaans University, Johannesburg.

- Bentler, P.M. (1990). Comparative fit indexes in structural models. *Psychological Bulletin*, *107*, 238-246.
- Bentler, P.M., & Bonnet, D.G. (1980). Significance tests and goodness of fit in the analysis of covariance structures. *Psychological Bulletin*, *88*, 588-606.
- Betz, N.E. (2000). Evaluation of an intervention to increase realistic self-efficacy and interests in college women. *Journal of Vocational Behavior*, *56*, 35-52.
- Blustein, D.L., Ellis, M.V., & Devenis, L.E. (1989). The development and validation of a two-dimensional model of commitment to the career choice process. *Journal of Vocational Behavior*, *35*, 342-378.
- Brown, C., Glastetter-Fender, C., & Shelton, M. (2000). Psychosocial identity and career control in college student-athletes. *Journal of Vocational Behavior*, *56*, 53-62.
- Browne, M.W., & Cudeck, R. (1993). Alternative ways of assessing model fit. In K.A. Bollen & J.S. Long (Eds.), *Testing structural equation models* (pp. 136-162). Thousand Oaks, CA: Sage.
- Crites, J.O. (1969). *Vocational psychology: The study of vocational behavior and development*. New York: McGraw-Hill.
- Crites, J.O. (1978). *The Career Maturity Inventory*. Monterey, CA: McGraw-Hill.
- De Bruin, G.P., & Nel, Z.J. (1996). 'n Geïntegreerde oorsig van die navorsing oor loopbaanvoorligting in Suid-Afrika, 1980-1990. (An integrated overview of empirical research on career counselling in South Africa, 1980-1990). *South African Journal of Psychology*, *26*, 248-252.
- Feltz, D.E. (1992). Understanding motivation in sport: A self-efficacy perspective. In G.C. Roberts (Ed.), *Motivation in sport and exercise* (pp. 93-105). Champaign IL: Human Kinetics.
- Foss, C.J. & Slaney, R.B. (1986). Increasing non-traditional career choices in women: Relations of attitudes toward women and responses to a career intervention. *Journal of Vocational Behavior*, *28*, 191-202.
- Gianakos, I. (1999). Patterns of career choice and career decision-making self-efficacy. *Journal of Vocational Behavior*, *54*, 244-258.
- Gloria, A.M., & Hird, J.S. (1999). Influences of ethnic and non-ethnic variables on the career decision-making self-efficacy of college students. *Career Development Quarterly*, *48*, 157-174.
- Hackett, G., & Betz, N.E. (1981). A self-efficacy approach to the career development of women. *Journal of Vocational Behavior*, *18*, 326-339.
- Hickson, J., & White, E. (1989). Career maturity in black South African adolescents: implications for vocational counselling. *South African Journal of Education*, *9*, 77-81.
- Jöreskog, K.G. & Sörbom, D. (1989). *LISREL 7: A guide to the program and applications* (2nd ed.). Chicago, IL: SPSS.
- Kores, R.C., Murphy, W.D., Rosenthal, T.L., Elias, D.B., & North, W.C. (1990). Predicting outcome of chronic pain treatment via a modified self-efficacy scale. *Behavior Research and Therapy*, *28*, 165-169.
- Langley, P.R. (1989). *Gerekenariseerde loopbaanvoorligting: 'n Evaluering van die DISCOVER-stelsel*. (Computerized career counselling: An evaluation of the DISCOVER-system). Unpublished Doctoral dissertation, Rand Afrikaans University, Johannesburg.
- Langley, P.R., du Toit, R., & Herbst, D.L. (1992). *Manual for the Career Development Questionnaire*. Pretoria: Human Sciences Research Council.
- Luzzo, D.A. (1993). Value of career decision-making self-efficacy in predicting career decision making attitudes and skills. *Journal of Counselling Psychology*, *40*, 194-199.
- Morris, L.F. (1985). *Investigation of variables related to career maturity in a high achieving school*. Unpublished Masters dissertation, University of the Witwatersrand, Johannesburg.
- Newman, A.D. (1982). *An investigation into the influence of a group careers counselling programme on the career maturity of adolescents*. Unpublished Masters dissertation, University of Natal, Pietermaritzburg.
- Osipow, S.H., & Gati, I. (1998). Construct and concurrent validity of the career decision-making difficulties questionnaire. *Journal of Career Assessment*, *6*, 347-364.
- Reid-van Niekerk, H.H., & van Niekerk, E.C. (1990). Career maturity of black, coloured and white university students. *Journal of Industrial Psychology*, *16*, 1-4.
- Robbins, S.B. (1985). Validity estimates for the career decision-making self-efficacy scale. *Measurement and Evaluation in Counselling and Development*, *18*, 64-71.
- Seane, E.R. (1998). *Career self-efficacy expectations among black secondary school pupils*. Unpublished Masters dissertation. University of the Orange Free State, Bloemfontein.
- Stead, G.B., & Watson, M.B. (1998). The appropriateness of Super's career theory among black South Africans. *South African Journal of Psychology*, *28*, 40-43.
- Steiger, J.H. & Lind, J.C. (1980, June). *Statistically based tests for the number of common factors*. Paper presented at the annual meeting of the Psychonomic Society, Iowa City, IA.
- Super, D.E. (1957). *The psychology of careers: An introduction to vocational development*. New York: Harper & Row.
- Super, D.E. (1983). Assessment in career guidance: toward truly developmental counselling. *Personnel and Guidance Journal*, *61*, 555-562.
- Super, D.E., Thompson, A.S., Lindeman, R.H., Jordaan, J.P., & Myers, R.A. (1981). *Career Development Inventory College and University Form*. Palo Alto, CA: Consulting Psychologists Press.
- Taylor, K.M., & Betz, N.E. (1983). Applications of self-efficacy theory to the understanding and treatment of career indecision. *Journal of Vocational Behavior*, *22*, 63-81.
- Taylor, K.M., & Popma, J. (1990). An examination of the relationships among career decision-making self-efficacy, career salience, locus of control, and vocational indecision. *Journal of Vocational Behavior*, *37*, 17-31.
- Teti, D.M., O'Connell, M.A., & Reiner, C.D. (1997). Parenting sensitivity, parental depression and child health: The mediational role of parental self-efficacy. *Early Development and Parenting*, *5*, 237-250.
- Watson, M.B., & van Aarde, J.A. (1986). Attitudinal career maturity of South African coloured high school pupils. *Journal of Vocational Behavior*, *29*, 7-16.
- Watson, M.B., & Stead, G.B. (1997). Are career mature students more committed to the career choice process? *Journal of Industrial Psychology*, *23* (3), 20-21.
- Westbrook, B.W. (1983). Career maturity: The concept, the instruments, and the research. In W.B. Walsh & S.H. Osipow (Eds.), *Handbook of vocational psychology* (pp. 263-296). Hillsdale, NJ: Erlbaum.
- Wiedenfeld, S.A., Bandura, A., Levine, S., O'Leary, A., Brown, S., & Raska, K. (1990). Impact of perceived self-efficacy in coping with stressors in components of the immune system. *Journal of Personality and Social Psychology*, *59*, 1082-1094.
- Williams, S.L. (1992). Perceived self-efficacy and phobic disability. In R. Schwarzer (Ed.), *Self-efficacy: Thought control of action*. Washington, DC: Hemisphere.