Measurement invariance across gender and ethnicity on the Emotional Quotient Inventory 2.0

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Abstract

This study responds to the call for investigations of measurement invariance on tests of emotional intelligence. The aim of this study was to establish the measurement invariance of the Emotional Quotient Inventory 2.0 across gender and ethnic groups in South Africa. The sample consisted of 1144 working adults. Multiple group factor analysis was conducted to test for configural, metric, and scalar invariance. Results suggest that the assessment is largely invariant at configural and metric levels across gender and ethnic groups. At scalar level, full invariance were achieved for five of the fifteen scales across gender and three scales across ethnic groups. Partial scalar models were explored for all other scales. Overall, the evidence seems to suggest that the scales had similar meanings for men and women and also for Black and White respondents, although for a few scales across gender, and more so for ethnicity, it seems that responses might also be influenced by factors other the underlying latent construct.

Keywords: measurement invariance; emotional intelligence; ethnicity; gender; emotional quotient inventory 2.0; multiple group factor analysis

Introduction

Many models and measures of emotional intelligence (EI) have been developed since Salovey and Mayer (1990) first proposed the construct twenty five years ago. There are however, substantial differences between them. While Petrides and Furham (2001) suggested differentiating between ability and trait based models, Daus and Ashkanasy (2005) proposed three streams of EI research. The first stream is based on the ability model of Salovey and Mayer (1990), the second stream on self-report measures based on this model, with the third stream representing other mixed models of EI. The focus of this study is on the Emotional Quotient Inventory 2.0 (EQ-i 2.0; Multi Health Systems, 2012), which would be a trait-based or mixed model approach to EI. The aim of the study is to establish the measurement invariance of the assessment across gender and ethnic groups in South Africa.

The role of measurement invariance in EI research

Many studies have examined group differences in EI with mixed results. For example, Tsaousis and Kazi (2013) found considerable inconsistency in studies investigating differences across age and gender groups on many different measures of EI. They argue that the reason for this ambiguity in group differences is that most studies fail to test for measurement invariance across groups of interest prior to comparison (Tsaousis & Kazi, 2013). This means that most reported findings are based on observed differences in mean scores across the groups being examined. Observed mean score comparisons are based on the assumption of invariant or equivalent measurement across groups (Vanderberg & Lance, 2000). The problem is that this assumption is hardly ever tested explicitly, and according to Tsaousis and Kazi (2013) renders all such findings highly questionable.

Other than a requirement for group comparisons, measurement invariance also has important implications for test use in real world applications such as personnel selection

(Borsboom, 2006). This is nowhere more important than when test scores are used to make decisions about individuals in high stakes settings (Borsboom, 2006; Cheung & Rensvold, 2000). According to Whitman, Van Rooy, Viswesvaran and Kraus (2009), increasing use of EI measures for selection purposes by multinational organisations would require establishing measurement invariance to enable meaningful interpretations of multinational test scores. Of course, the same principle applies to diverse cultures present in a single country. Thus, measurement invariance of EI scales across gender and ethnic groups is an issue requiring attention to safeguard against the possibility of bias or so-called adverse impact due to non-invariance (Whitman et al. 2009).

This is vital as non-invariance can occur for many reasons (Libbrecht, De Beuckelaer, Lievens, & Rockstuhl, 2014). For example, items may not have the same meaning in different groups, or there may be response style differences across the groups (Harzing, 2006). Another source of non-invariance could stem from the unique norms present in different cultural, gender, age, and ethnic groups (Gregorich, 2006). Libbrecht et al. (2014) also note that there are differences in the value that certain cultures place on emotional expressiveness and in the way that they respond to motivationally oriented measures, which they consider to be characteristic elements of EI measures.

The present study

The present study was conducted in South Africa, a country with considerable demographic diversity, regarding culture in particular. The EQ-i2.0 is widely used in this context for selection purposes. This therefore necessitates a full understanding of how the assessment functions across groups. Of particular relevance is the degree to which the scales of the EQ-i2.0 have the same meaning across groups, and is free from influence unrelated to the latent construct of interest. Thus, there is a clear need to examine the measurement invariance of the EQ-i2.0. Only one study has investigated the measurement invariance of the EQ-i in a South

African context, although this was done on the short form of the previous version of the assessment, and invariance was explored only across broad South-African and Australian samples (Ekermans, Saklofske, Austin, & Stough, 2011). Thus, the aim of the present study was to establish the measurement invariance of the EQ-i2.0 across gender and ethnic groups within the South African context. Specifically, invariance was investigated for each subscale of the assessment, and not for the composite scales or full model, as scores are typically used for making selection decisions about individuals at this level. Although subscale scores on the EQ-i2.0 are also summed to larger composite scores and an overall EI score, non-invariant items and subscales are likely to become obscured and meaningless at composite levels, without knowledge of the degree to which individual items and subscales are invariant/non-invariant lower down. In addition, previous confirmatory factor analytic investigations in South Africa did not find support for the full model consisting of 15 subscale factors loading on five composite factors, loading on a single EQ factor (van Zyl, 2014). Invariance at the subscale level was therefore the focus of this study.

Method

Participants

The sample contained 1144 participants of which 574 (50.2%) were men (age: *M*=39.49 years, SD=11.86) and 570 (49.8%) were women. Respondents ranged between 18 years and 74 years of age (*M*=39.4 years, SD=11.8) With regard to ethnicity, respondents self-identified as follows: Black=414 (36.2%); White=341 (29.8%); Coloured= 87 (7.6%); Indian/Asian=96 (8.4%). There were 206 (18%) respondents who did not provide any ethnic information. Ethnic invariance was examined only across Black and White respondents, as not enough data were available to include other ethnic groups.

Measure

EI was measured with the EQ-i2.0 (Multi Health Systems, 2012). The EQ-i2.0 is a revised version of the original Emotional Quotient Inventory (Bar-On 1997), in which EI is conceptualised as noncognitive abilities and skills thought to influence an individual's ability to cope with environmental demands and pressures (Bar-On, 1997). In the revised version, a number of changes were made on selected items, scales and the overall model, although the foundation and integrity of the original model was retained Multi Health Systems, 2012). The EQ-i2.0 consists of 133 items, measuring 15 constructs that are summed to five composite scales and one overall EI score. Participants could respond on a 5-point Likert scale with 1=Strongly Disagree and 5=Strongly Agree. An example item is 'I pay attention to how I am feeling'. The psychometric properties of the EQ-i2.0 has been extensively investigated in South Africa, with Cronbach alpha and McDonald's omega reliabilities for the subscales ranging between .72 and .90 (van Zyl, 2014).

Procedure

The data was collected as part of the standardisation process of the EQ-i2.0 in South Africa. Participants were working adults who completed the questionnaire on a secure online platform. Prior to assessment respondents were provided with information about the project, where it was explained what the data would be used for, that their data would be treated with complete confidentiality, and that participation is voluntary. Informed consent was required before respondents were allowed to complete the assessment.

Analysis

Multigroup confirmatory factor analysis (MGCFA) was conducted on each of the 15 scales of the EQ-i2.0 using the lavaan package (Rosseel, 2012) operated in the R-statistics freeware platform, version 3.1.2. Since maximum likelihood estimation assumes that observed data

follow a multivariate normal distribution, and by implication requires the data to be continuous, weighed least squares mean and variance corrected (WLSMV; Muthén, du Toit, & Spisic, 1997) estimation was used in this study as the data were ordinal. WLSMV estimation is a robust method developed specifically to deal with ordered categorical data that are not multivariate normal (Sass, 2011). There were no missing data.

Increasingly constrained CFA models were tested to examine the degree to which model parameters were invariant across groups (Chen, 2007; Vandenberg & Lance, 2000). Three models were tested, each with different substantive implications. Testing was conducted hierarchically, starting with configural invariance in which the same models are tested across groups without the requirement of equal parameters (Sass, 2011). Configural invariance shows that the constructs are conceptualised in a similar way across groups (Cheung & Rensvold, 2002). Metric invariance was tested next, in which factor loadings were constrained to be equal across groups (Cheung & Rensvold, 2002). Substantively, this suggests that the latent constructs have the same meaning in different groups (Gregorich, 2006). Non-invariance at metric level could imply that one or more of the items have a different meaning across the groups, or that one group (assuming two comparison groups) has an extreme response style (Gregorich, 2006). An example of an extreme response style would be when one group consistently endorses the extreme response options on a 5-point Likert scale, rather than the moderate middle options (Cheung & Rensvold, 2000). Strong or scalar invariance was examined next by constraining both factor loadings and intercepts to be equal (Vanderberg & Lance, 2000). Substantively, full scalar invariance allows for defensible comparisons of observed latent and observed group means (Gregorich, 2006; van der Schoot, Lugtig & Hox, 2012). Non-invariance at scalar level could be due to the influence from norms in different culture, age, gender or language groups, among others, on respondent's scores that cannot be accounted for by the underlying factor (Gregorich, 2006). Given the

descriptions of metric and scalar invariance, it should be clear that establishing scalar invariance is important for the purpose of this study. Strict or residual invariance was not tested as it is of little practical value (Gregorich, 2006).

Invariance decisions were made by considering by changes in CFI (ΔCFI) and RMSEA (ΔRMSEA). A change in the CFI index ≤ -.01 and the RMSEA index ≥ .010 or .015 were generally considered indicative of non-invariance (Chen, 2007; Cheung & Rensvold, 2002). Slight violations were tolerated if the change in fit of one index (i.e., ΔRMSEA) was satisfactory while the other slightly exceeded ideal cut-off value (i.e., ΔCFI), and vice versa. Thus, invariance was considered using suggested change in fit values in conjunction with substantive judgement (Chen, 2007). Less emphasis was placed on the chi-square difference test given its sensitivity to nonnormality and large sample sizes (Tsaousis & Kazi, 2013).

Results

Tables 1 and 2 show the MGCFA results for all the subscales of the EQ-i2.0 across gender and ethnicity respectively. For cases where the goodness-of-fit indices did not support invariance, partial invariance was explored (Byrne, Shavelson, & Muthen, 1989). Partial invariance is achieved by identifying the constrained parameter that most contributed to the lack of fit, and is allowed it to vary freely across groups. The model is re-examined and the process is repeated as necessary (Gregorich, 2006).

Starting with configural invariance (model 1 of each scale), results show that there is reasonable support for configural invariance on all the models with the possible exception of Flexibility, both for gender and ethnicity. Although, the fit of a congeneric CFA model for Flexibility was previously found to be somewhat weaker in general, good fit was reported for a re-specified model based on modification indices (van Zyl, 2014). For the present purpose of examining scale invariance, the congeneric Flexibility model was used and not a re-specified model, as model fit to a confirmatory model was not the objective here, and has

been found to be acceptable elsewhere (van Zyl, 2014). Metric invariance (model 2 of each scale) was examined next. Full metric invariance was achieved on all the scales, except for Independence and Optimism across ethnicity for which partial invariance (indicated with an 'a' after the model number) was achieved by feeing factor loadings on one item in each scale. This was followed by tests for strong or scalar invariance (model 3 of each scale). Full scalar invariance was achieved across gender for Self-Regard, Self-Actualisation, Emotional Self-Awareness, Emotional Expression, Assertiveness, Empathy, Reality Testing, Flexibility, Problem Solving, and Optimism. Partial scalar invariance across gender was achieved for the remaining scales by having to free intercepts on one, two or three items per scale. Full scalar invariance across ethnicity was achieved only for Social Responsibility. For the remaining scales partial scalar invariance was similarly achieved by freeing intercepts on one or several items in each scale. The non-invariant items (metric or scalar), across gender or ethnicity for each scale are presented in the appendix.

<Table 1 approximately here>

<Table 2 approximately here>

Discussion

This study sought to contribute to the call for measurement invariance studies in EI (Whitman et al., 2009; Librecht et al., 2014). Results showed that full configural and metric invariance was achieved for all the scales of the EQ-i2.0 across gender and ethnicity with two exceptions for metric invariance. Partial metric models were supported for Independence and Optimism across ethnicity. Thus, the constructs measured on the EQ-i2.0 appear to have largely similar meanings for men and women as well as black and white respondents.

With regards to scalar invariance across gender groups, partial models were supported for five scales, while full scalar invariance was achieved for the remaining ten scales. For

ethnicity, full scalar invariance could only be achieved for Social Responsibility. Partial scalar models were supported for the remaining fourteen scales across ethnicity, although in some cases three (Emotional Self-Awareness, Optimism) or four (Reality Testing) item intercepts had to be unconstrained. This suggests that responses to these items are influenced to some degree by the gender and cultural norms present in these groups within the South African population.

While evidence of non-invariance was observed on a number of items on multiple scales of the EQ-i2.0, especially at scalar level, the practical implications of these results are less clear. From a group difference perspective, the results of this study suggest that items flagged as non-invariant should be excluded from analyses before comparisons of latent or observed mean scores are made across gender or ethnic (Black and White) groups. Stated differently, making group comparisons on observed scores that include the non-invariant items are likely to be inaccurate and misleading. For selection purposes, it becomes necessary to determine whether or not the presence of non-invariance has a meaningful impact at the scale score level. While the evidence of non-invariance found in this study certainly presents a cause for concern, more evidence is required to show that non-invariance on these items have practical implications at scale level.

This is because measurement invariance analysis has several limitations. For example, Chen (2007) noted that the magnitude of change in fit statistics is susceptible to differences in sample size, patterns of invariance, and model complexity. It has further been argued that the criteria used as part of the measurement invariance process are too strict, as it requires the difference between parameters to be exactly zero (Borsboom, 2006; Muthen & Asparouhov, 2013; Van de Schoot, Kluytmans, Tummers, Lugtig, Hox & Muthen, 2013). According to Borsboom (2006) this necessitates making a categorical evaluation, in the sense of difference vs no-difference, on something that is essentially is a matter of degree.

To this end, future studies might investigate measurement invariance on the EQ-i2.0 with Bayesian alternatives, which have less stringent requirements (Muthen & Asparouhov, 2013). Known as approximate measurement invariance, it makes use of approximate zero, rather than exact zero constraints which allows for slightly more wiggle room (Van de Schoot et al., 2013). In addition, future research might also employ item response theory (IRT) methods to investigate differential item functioning (DIF), the IRT equivalent to non-invariance. These methods can further be used to examine differential test functioning (DTF), which allows for better evaluations of the practical impact that non-invariance might have at scale level.

References

Bar-On, R. (1997). *Emotional Quotient Inventory: Technical manual.* Toronto, Canada: Multi-Health Systems

Borsboom, D. (2006). When does measurement invariance matter? *Medical Care, 44*(3), 176-181. doi:10.1097/01.mlr.0000245143.08679.cc

Byrne, B. M., Shavelson, R.J., & Muthén, B. (1989). Testing for the equivalence of factor covariance and mean structures: the issue of partial measurement invariance. *Psychological Bulletin, 105*, 456-466

Chen, F. F. (2007). Sensitivity of goodness of fit indexes to lack of measurement invariance. *Structural Equation modelling, 14*(3), 464–504

Cheung, G.W., & Rensvold, R. B. (2002). Evaluating goodness-of-fit indexes for testing measurement invariance. *Structural Equation Modeling, 9*(2), 233-255

Daus, C. S., & Ashkanasy, N. M. (2005). The case for the ability-based model of emotional intelligence in organizational behavior. *Journal of Organizational Behavior, 26*, 453–466. doi.org/10.1002/job.321

Ekermans, G., Saklofske, D. H., Austin, E., & Stough, C. (2011). Measurement invariance and differential item functioning of the Bar-On EQ-i:S measure over Canadian, Scottish, South African and Australian samples. *Personality and Individual Differences, 50,* 286-290

Gregorich, S. E. (2006). Do Self-Report Instruments Allow Meaningful Comparisons Across Diverse Population Groups? Testing Measurement Invariance Using the Confirmatory Factor Analysis Framework, *Medical Care, 44*(11), 78-94

Harzing, A. W. (2006). Response styles in cross-national survey research: A 26-country study. *International Journal of Cross-Cultural Management, 6*, 243–266

Libbrecht, N., De Beuckelaer, A., & Lievens, F. (2012). Measurement Invariance of the Wong and Law Emotional Intelligence Scale Scores: Does the Measurement Structure Hold across Far Eastern and European Countries? *Applied Psychology,* 63(2), 223-237

Multi Health Systems (2012). *Emotional Quotient Inventory 2.0: Users handbook.* Retrieved November 07, 2013, from http://ei.mhs.com/eq20_manual/part5

Muthén, B., & Asparouhov, T. (2013). *BSEM Measurement Invariance Analysis.* Mplus Web Notes: No. 17. Available online at: www.statmodel.com

Petrides, K. V., & Furnham, A. (2000). Sex differences in measured and self-estimated trait emotional intelligence. *Sex Roles, 42,* 449–461

Petrides, K. V., & Furnham, A. (2001). Trait emotional intelligence: Psychometric investigation with reference to established trait taxonomies. *European Journal of Personality, 15,* 425–448. doi.org/10.1002/per.416

Rosseel, Y. (2012). lavaan: An R package for structural equation modeling. *Journal of Statistical Software, 48*(2), 1–36

Saklofske, D. H., Austin, E. J., Galloway, J., & Davidson, K. (2007). Individual difference correlates of health-related behaviours: Preliminary evidence for links between emotional intelligence and coping. *Personality and Individual Differences, 42*, 491–502

Salovey, P., & Mayer, J. D. (1990). Emotional intelligence. *Imagination, Cognition and Personality, 9,* 185–211. doi.org/10.2190/DUGG-P24E-52WK-6CDG

Sass, D. A. (2011). Testing measurement invariance and comparing latent factor means within a confirmatory factor analysis framework. *Journal of Psychoeducational Assessment, 29*(4), 347–363

Tsaousis, I., & Kazi, S. (2013). Factorial invariance and latent mean differences of scores on trait emotional intelligence across gender and age. *Personality and Individual Differences, 54,* 169–173

Vandenberg, R. J., & Lance, C. E. (2000). A review and synthesis of the measurement invariance literature: Suggestions, practices, and recommendations for organizational research. *Organizational Research Methods, 3*, 4–70

Van de Schoot, R., Kluytmans, A., Tummers, T., Lugtig, P., Hox, J., & Muthén, B. (2013). Facing off with Scylla and Charybdis: a comparison of scalar, partial, and the novel possibility of approximate measurement invariance, *Frontiers in Psychology, 4,* 1-12

Van de Schoot, R., Lugtig, P., & Hox. J. (2012). A checklist for testing measurement invariance. *European Journal of Developmental Psychology, 9,* 486-492. doi: 10.1080/17405629.2012.686740

Van Zyl, C. J. J. (2014). The psychometric properties of the Emotional Quotient Inventory 2.0 in South Africa. *SA Journal of Industrial Psychology, 40*(1), doi.org/10.4102/sajip.v40i1.1192

Whitman, D. S., Van Rooy, D. L., Viswesvaran, C., & Kraus, E. (2009). *Educational and Psychological Measurement, 69*(6), 1059-1074

Appendix

Non-invariant items on the EQ-i2.0 across gender and ethnicity

Scale	Non-invariant factor loadings (metric)	Non-invariant intercepts (scalar)
Gender		
Independence		114, 54, 4
Interpersonal Relations		41, 102
Social Responsibility		20, 115
Problem Solving		
Impulse Control		5
Stress-Tolerance		88
Ethnicity		
Self-Regard		130, 64
Self-Actualisation		104, 118
Emotional Self-Awareness		62, 27, 16
Emotional Expression		103
Assertiveness		23
Independence	114	15
Interpersonal Relationships		74, 66
Empathy		13
Problem Solving		75

Reality Testing		14, 36, 111, 43
Impulse Control		5, 34
Flexibility		42, 96
Stress-Tolerance		1
Optimism	32	80, 83, 90

Table 1

Tests of measurement invariance across gender for the scales of the EQ-i2.0

Gender								
Model	Model comparison	χ^2	Df	CFI	RMSEA	(90% CI)	Δ CFI	Δ RMSEA
Self-Regard								
1		78.234	40	.942	.050	.034 - .067		
2	2 vs 1	84.338	47	.943	.046	.030 - .062	0.001	-0.004
3	3 vs 2	95.867	54	.936	.045	.030 - .060	-0.007	-0.001
Self-Actualization								
1		84.168	54	.965	.039	.021 - .054		
2	2 vs 1	104.290	62	.951	.043	.028 - .056	-0.014	0.004
3	3 vs 2	121.967	70	.939	.044	.031 - .057	-0.012	0.001
Emotional Self-Awareness								
1		36.005	28	.990	.028	.000 - .051		
2	2 vs 1	34.643	34	.999	.007	.000 - .038	0.009	-0.021
3	3 vs 2	43.179	40	.996	.015	.000 - .039	-0.003	0.008
Emotional Expression								
1		98.661	40	.955	.062	.047 - .078		
2	2 vs 1	79.692	47	.975	.043	.026 - .059	0.020	-0.019
3	3 vs 2	101.608	54	.963	.048	.034 - .063	-0.012	0.005
Assertiveness								
1		26.786	28	1.000	0.000	.000 - .038		
2	2 vs 1	31.533	34	1.000	0.000	.000 - .034	0.000	0.000
3	3 vs 2	40.253	40	1.000	0.000	.000 - .036	0.000	0.000

Independence								
1		91.967	40	.913	.059	.000 - .050		
2	2 vs 1	107.290	47	.899	.058	.044 - .073	-0.014	-0.001
3	3 vs 2	161.097	54	.821	.073	.060 - .086	-0.078	0.015
3a	3a vs 2	118.742	51	.887	.059	.046 - .073	-0.012	0.001
Interpersonal Relationships								
1		91.477	40	.943	.058	.043 - .074		
2	2 vs 1	79.726	47	.964	.043	.026 - .059	0.021	-0.015
3	3 vs 2	120.442	54	.927	.057	.043 - .071	-0.037	0.014
3a	3a vs 2	93.243	52	.955	.046	.030 - .061	-0.009	0.003
Empathy								
1		154.457	54	.905	.070	.057 - .083		
2	2 vs 1	119.168	62	.946	.049	.036 - .063	0.041	-0.021
3	3 vs 2	127.257	70	.946	.047	.033 - .059	0.000	-0.002
Social Responsibility								
1		29.678	18	.973	.042	.009 - .067		
2	2 vs 1	36.000	23	.970	.039	.008 - .062	-0.003	-0.003
3	3 vs 2	78.399	28	.885	.069	.051 - .088	-0.085	0.030
3a	3a vs 2	41.660	26	.964	.040	.014 - .062	-0.006	0.001
Problem Solving								
1		52.650	40	.986	.029	.000 - .049		
2	2 vs 1	61.366	47	.984	.028	.000 - .047	-0.002	-0.001
3	3 vs 2	78.993	54	.972	.035	.016 - .051	-0.012	0.007

Reality Testing								
1		68.346	40	.972	.043	.025 - .061		
2	2 vs 1	62.191	47	.985	.029	.000 - .047	0.013	-0.014
3	3 vs 2	77.740	54	.977	.034	.014 - .050	-0.008	0.005
Impulse Control								
1		57.835	40	.981	.034	.010 - .053		
2	2 vs 1	68.576	47	.977	.035	.014 - .052	-0.004	0.001
3	3 vs 2	96.054	54	.956	.045	.030 - .060	-0.021	0.010
3a	3a vs 2	85.160	53	.966	.040	.023 - .055	-0.011	0.005
Flexibility								
1		147.949	40	.875	.085	.070 - .099		
2	2 vs 1	127.229	47	.907	.067	.053 - .082	0.032	-0.018
3	3 vs 2	142.847	54	.897	.066	.053 - .079	-0.010	-0.001
Stress Tolerance								
1		65.319	40	.978	.041	.022 - .058		
2	2 vs 1	79.191	47	.972	.043	.025 - .059	-0.006	0.002
3	3 vs 2	109.330	54	.951	.052	.038 - .066	-0.021	0.009
3a	3a vs 2	98.113	53	.960	.048	.033 - .062	-0.012	0.005
Optimism								
1		91.084	40	.923	.058	.042 - .074		
2	2 vs 1	81.063	47	.948	.044	.027 - .060	0.025	-0.014
3	3 vs 2	96.583	54	.935	.046	.031 - .060	-0.013	0.002

Table 2

Tests of measurement invariance across ethnicity for the scales of the EQ-i2.0

Ethnicity								
Model	Model comparison	χ^2	Df	CFI	RMSEA	(90% CI)	Δ CFI	Δ RMSEA
Self-Regard								
1		86.035	40	.929	.055	.039 - .071		
2	2 vs 1	95.414	47	.925	.052	.037 - .067	-0.004	-0.003
3	3 vs 2	136.013	54	.874	.064	.050 - .077	-0.051	0.012
3a	3a vs 2	109.014	52	.912	.054	.040 - .068	-0.013	0.002
Self-Actualization								
1		74.819	54	.976	.032	.010 - .048		
2	2 vs 1	88.601	62	.969	.034	.015 - .049	-0.007	0.002
3	3 vs 2	144.623	70	.914	.053	.041 - .065	-0.055	0.019
3a	3a vs 2	108.448	68	.954	.040	.025 - .053	-0.015	0.006
Emotional Self-Awareness								
1		44.212	28	.980	.039	.014 - .060		
2	2 vs 1	54.878	34	.974	.040	.019 - .059	-0.006	0.001
3	3 vs 2	100.505	40	.926	.063	.048 - .079	-0.048	0.023
3a	3a vs 2	59.310	37	.973	.040	.019 - .058	-0.001	0.000
Emotional Expression								
1		118.902	40	.940	.072	.058 - .088		
2	2 vs 1	100.247	47	.959	.055	.040 - .070	0.019	-0.017
3	3 vs 2	147.297	54	.929	.068	.055 - .081	-0.030	0.013
3a	3a vs 2	117.516	53	.951	.057	.043 - .071	-0.008	0.002

Assertiveness								
1		38.234	28	.984	.031	.000 - .054		
2	2 vs 1	43.670	34	.984	.027	.000 - .049	0.000	-0.004
3	3 vs 2	61.969	40	.965	.038	.017 - .056	-0.019	0.011
3a	3a vs 2	51.435	39	.980	.029	.000 - .049	-0.004	0.002
Independence								
1		78.359	40	.935	.050	.034 - .067		
2	2 vs 1	96.975	47	.916	.053	.038 - .068	-0.019	0.003
2a	2a vs 1	87.931	46	.929	.049	.033 - .065	-0.006	-0.001
3	3 vs 2a	119.869	54	.889	.057	.040 - .068	-0.027	0.004
3a	3a vs 2a	95.162	52	.927	.047	.032 - .062	-0.002	-0.002
Interpersonal Relationships								
1		86.428	40	.948	.056	.039 - .072		
2	2 vs 1	100.478	47	.940	.055	.040 - .070	-0.008	-0.001
3	3 vs 2	179.481	54	.860	.079	.066 - .091	-0.080	0.024
3a	3a vs 2	117.012	52	.928	.058	.044 - .072	-0.012	0.003
Empathy								
1		166.332	54	.908	.074	.062 - .087		
2	2 vs 1	149.884	62	.928	.061	.049 - .074	0.020	-0.013
3	3 vs 2	186.144	70	.905	.066	.055 - .078	-0.023	0.005
3a	3a vs 2	170.414	69	.917	.062	.051 - .074	-0.011	0.001
Social Responsibility								
1		28.648	18	.976	.040	.000 - .066		
2	2 vs 1	33.497	23	.976	.035	.000 - .059	0.000	-0.005
3	3 vs 2	42.833	28	.966	.038	.010 - .059	-0.010	0.003

Problem Solving								
1		66.670	40	.971	.042	.023 - .059		
2	2 vs 1	58.137	47	.988	.025	.000 - .044	0.017	-0.017
3	3 vs 2	142.272	54	.905	.066	.053 - .079	-0.083	0.041
3a	3a vs 2	71.932	53	.980	.031	.006 - .048	-0.008	0.006
Reality Testing								
1		64.978	40	.976	.041	.021 - .058		
2	2 vs 1	67.413	47	.980	.034	.012 - .051	0.004	-0.007
3	3 vs 2	160.099	54	.898	.072	.059 - .085	-0.082	0.038
3a	3a vs 2	77.412	50	.974	.038	.020 - .054	-0.006	0.004
Impulse Control								
1		56.757	40	.983	.033	.007 - .052		
2	2 vs 1	57.835	47	.989	.025	.000 - .044	0.006	-0.008
3	3 vs 2	105.187	54	.949	.050	.036 - .064	-0.040	0.025
3a	3a vs 2	72.374	52	.980	.032	.010 - .049	-0.009	0.007
Flexibility								
1		133.472	40	.895	.079	.064 - .094		
2	2 vs 1	135.593	47	.900	.071	.057 - .085	0.005	-0.008
3	3 vs 2	205.258	54	.830	.086	.074 - .099	-0.070	0.015
3a	3a vs 2	149.885	52	.890	.071	.058 - .084	-0.010	0.000
Stress Tolerance								
1		74.597	40	.970	.048	.031 - .065		
2	2 vs 1	84.809	47	.967	.046	.030 - .062	-0.003	-0.002
3	3 vs 2	126.458	54	.936	.060	.046 - .073	-0.031	0.014
3a	3a vs 2	105.337	53	.954	.051	.037 - .065	-0.013	0.005

				Optimism				
1		75.108	40	.947	.048	.031 - .065		
2	2 vs 1	96.674	47	.926	.053	.038 - .068	-0.021	0.005
2a	2a vs 1	70.778	46	.963	.038	.018 - .055	0.016	-0.010
3	3 vs 2a	169.715	53	.825	.076	.064 - .090	-0.138	0.038
3a	3a vs 2a	84.011	50	.949	.043	.026 - .058	-0.014	0.005