



**EMOTIONAL INTELLIGENCE:  
A PSYCHOMETRIC STUDY**

**Janette Kay Warwick  
B. Social Science (Hons) Adelaide**

**Thesis submitted in fulfilment of the requirements  
for the Degree of Doctor of Philosophy**

**Department of Psychology  
The University of Adelaide**

**March 2006**

TABLE OF CONTENTS

LIST OF TABLES .....	vii
LIST OF FIGURES .....	ix
ABSTRACT.....	x
STATEMENT.....	xiv
ACKNOWLEDGEMENTS.....	xv
CHAPTER 1: EMOTIONAL INTELLIGENCE: A RELIABLE AND VALID CONSTRUCT	
1.1 Introduction.....	17
1.2 The Current Study.....	23
1.3 Historical Review.....	26
1.3.1 Social Intelligence.....	27
1.3.2 Multiple Intelligences .....	28
1.3.3 Events Leading to the Development of Emotional Intelligence .....	30
1.3.4 Emotional Intelligence Construct Coined.....	31
1.4 Evaluating Emotional Intelligence Models.....	35
1.4.1 Goleman (1995; 1998).....	36
1.4.2 Bar-On (1997).....	36
1.4.3 Cooper (1996/1997).....	37
1.4.4 Higgs and Dulewicz (1999).....	37
1.4.5 Petrides and Furnham (2001).....	37
1.4.6 Salovey and Mayer (1990); Mayer and Salovey (1997).....	38
1.5 Optimal Emotional Intelligence Model .....	40
1.5.1 Trait-Based Emotional Intelligence .....	40
1.5.2 Abilities-Based Emotional Intelligence .....	41
1.5.3 Intended Use of an Emotional Intelligence Model .....	41
1.6 Emotional Intelligence: Personality and Intelligence Theories .....	42
1.6.1 Trait-Based Emotional Intelligence and Personality Theories .....	42
1.6.2 Abilities-Based Emotional Intelligence and Intelligence Theories .....	43
1.7 Conclusion .....	45

## CHAPTER 2: A REVIEW OF TRAIT AND ABILITIES-BASED MEASURES OF EMOTIONAL INTELLIGENCE

2.1	Introduction.....	46
2.2	Psychometric Considerations.....	46
2.2.1	Reliability.....	47
2.2.2	Validity .....	48
2.3	A Review of Trait-Based Emotional Intelligence Measures .....	51
2.3.1	Trait Meta-Mood Scale (TMMS) Salovey et al. (1995) .....	52
2.3.2	Emotional Quotient Inventory (EQ-i) Bar-On (1997) .....	56
2.3.3	Assessing Emotions Scale (AES) Schutte et al. (1998).....	62
2.3.4	Trait EI Questionnaire (TEIQue) Petrides and Furnham (2001) .....	66
2.3.5	The Emotional Intelligence Questionnaire (TEIQ) Tsacosis (2003).....	67
2.3.6	Summary of Trait-Based EI Measures.....	69
2.4	A Review of Abilities-Based Emotional Intelligence Measures .....	72
2.4.1	Emotional Perception Questionnaire (EPQue) Mayer et al. (1990) .....	73
2.4.2	Emotional Accuracy Research Scale (EARS) Mayer and Geher (1996).....	74
2.4.3	Mayer Emotional Intelligence Scale (MEIS) Mayer et al. (1999).....	75
2.4.4	Mayer Salovey Caruso EI Test (MSCEIT) Mayer et al. (2000c) .....	82
2.4.5	Summary of Abilities-Based EI Measures.....	91
2.5	Conclusion .....	91

## CHAPTER 3: THE DEVELOPMENT OF A SELF-REPORT AND PEER-REPORT MEASURE OF EMOTIONAL INTELLIGENCE

3.1	Introduction.....	93
3.2	The Need for New Trait-Based Emotional Intelligence Measures .....	93
3.3	Pilot Study 1.....	94
3.4	The Validation of Two New Trait-Based Emotional Intelligence Measures .....	95
3.4.1	Convergent Validity.....	95
3.4.2	Gender Differences .....	96
3.5	Objectives .....	97
3.6	Method .....	98
3.6.1	Participants.....	98
3.6.2	Materials .....	98
3.6.3	Procedure .....	102

3.7	Results.....	102
3.7.1	Descriptive statistics .....	102
3.7.2	Factor Analyses.....	103
3.7.3	Descriptive Statistics Revisited.....	108
3.7.4	Intercorrelations .....	109
3.7.5	Gender Differences in Trait-Based Emotional Intelligence.....	112
3.7.6	Developmental Trends in Emotional Intelligence .....	112
3.8	Discussion .....	113
3.9	Pilot Study 2.....	118
3.10	Investigation of the Validity of the SRMEI and PRMEI.....	118
3.10.1	Convergent Validity .....	118
3.11	Objectives .....	119
3.12	Method .....	120
3.12.1	Participants.....	120
3.12.2	Measures .....	120
3.12.3	Procedure .....	122
3.13	Results.....	122
3.13.1	Descriptive Statistics.....	122
3.13.2	Internal Reliability Analysis .....	123
3.13.3	Test-Retest Reliability Analysis .....	124
3.13.4	Intercorrelations .....	124
3.14	Discussion .....	129
3.15	Conclusion .....	133
CHAPTER 4: AN ASSESSMENT OF THE VALIDITY OF A SELF-REPORT AND PERFORMANCE-BASED MEASURE OF EMOTIONAL INTELLIGENCE		
4.1	Introduction.....	135
4.2	Refinement of the New Trait-Based Emotional Intelligence Measure.....	135
4.3	The Need for New Abilities-Based Emotional Intelligence Measures.....	136
4.4	The Current Study.....	139
4.5.1	Convergent Validity.....	140
4.5.2	Discriminant Validity.....	140
4.5.3	Incremental Validity .....	141



4.5.4	Social Desirability.....	142
4.5.5	A Comparison of Trait and Ability EI .....	142
4.5.6	Gender Differences .....	143
4.6	Objectives .....	143
4.7	Method .....	144
4.7.1	Participants.....	144
4.7.2	Materials .....	144
4.7.3	Procedure .....	152
4.8	Results.....	152
4.8.1	Descriptive Statistics.....	152
4.8.2	Factor Analyses.....	153
4.8.3	Descriptive Statistics Revisited.....	160
4.8.4	Intercorrelations .....	161
4.8.5	Multiple Regression Analyses .....	166
4.8.6	Gender Differences in Emotional Intelligence .....	172
4.9	Discussion .....	173
4.10	SRMEI-R Results.....	173
4.10.1	SRMEI-R Factor Structure and Internal Reliability Levels.....	173
4.10.2	SRMEI-R Convergent Validity.....	174
4.10.3	SRMEI-R Discriminant Validity .....	174
4.10.4	SRMEI-R Incremental Validity .....	175
4.11	AMEI-CS and AMEI-CF Results .....	178
4.11.1	AMEI-CS and AMEI-CF Factor Structure .....	178
4.11.2	AMEI-CS and AMEI-CF Internal Reliability Levels.....	180
4.11.3	AMEI-CS and AMEI-CF Interrelated Abilities.....	181
4.11.4	AMEI-CS and AMEI-CF Convergent Validity .....	182
4.11.5	AMEI-CS and AMEI-CF Discriminant Validity .....	183
4.11.6	AMEI-CS Incremental Validity .....	184
4.11.7	AMEI-CF Incremental Validity .....	186
4.11.8	A Comparison of Trait and Ability EI .....	188
4.11.9	Gender Differences in Emotional Intelligence .....	188
4.12	Conclusion .....	189
CHAPTER 5: GENERAL DISCUSSION AND CONCLUSIONS		
5.1	Introduction.....	191
5.2	The Context for this Research.....	191

5.3	The contributions of this thesis to the field of Emotional Intelligence.....	194
5.3.1	Trait Emotional Intelligence .....	198
5.3.2	Ability Emotional Intelligence.....	199
5.3.3	Discussion of Trait and Ability EI Incremental Validity Results .....	203
5.3.4	A Comparison of Trait and Ability EI .....	204
5.4	Limitations of this Research .....	204
5.5	Directions for Future Research .....	205
5.5.1	Replication of the Foregoing Analyses.....	205
5.5.2	Expansion of the Foregoing Analyses .....	206
5.5.3	Refinement of the New Abilities-Based EI Method of Scoring .....	206
5.5.4	Investigation of EI via an experimental research design .....	207
5.5.5	Investigation of EI Abilities via Different Types of Emotions.....	208
5.5.6	Location of EI within Carroll's (1993) Three Stratum Theory.....	208
5.5.7	Developmental trends in Emotional Intelligence.....	209
5.6	Conclusion .....	210
	LIST OF APPENDICES.....	212
	REFERENCES .....	276

LIST OF TABLES

Table 1.1. Summary of Trait and Ability EI Definitions .....	32
Table 2.1. Summary of Trait-Based Measures of Emotional Intelligence .....	52
Table 2.2. Trait Meta-Mood Scale (TMMS) .....	54
Table 2.3. Emotional Quotient Inventory (EQ-i).....	58
Table 2.4. Assessing Emotions Scale (AES) .....	63
Table 2.5. Trait Emotional Intelligence Questionnaire (TEIQue) .....	68
Table 2.6. The Emotional Intelligence Questionnaire (TEIQ) .....	70
Table 2.7. Summary of Abilities-Based Measures of Emotional Intelligence .....	72
Table 2.8. Mayer Emotional Intelligence Scale (MEIS).....	78
Table 2.9. Mayer Salovey Caruso Emotional Intelligence Test (MSCEIT) .....	84
Table 3.1. Variable Names for Two New EI Tests.....	100
Table 3.2. Descriptive Terms for Two New EI Tests.....	100
Table 3.3. Descriptive Statistics for SRMEI, PRMEI, and QMET .....	103
Table 3.4. Factor Analysis for the SRMEI .....	105
Table 3.5. Factor Analysis for the PRMEI .....	107
Table 3.6. Revised Descriptives for the SRMEI, PRMEI and QMET .....	108
Table 3.7. Intercorrelations for the SRMEI, PRMEI and QMET .....	110
Table 3.8. A Comparison of SRMEI and PRMEI Mean Scores.....	111
Table 3.9. Developmental Trends for the SRMEI and PRMEI .....	113
Table 3.10. Descriptive Statistics for SRMEI, PRMEI, SRAES, and PRAES.....	122

Table 3.11. Mean Score Differences for Study 1 and 2.....	123
Table 3.12. Intercorrelations for the SRMEI, PRMEI, SRAES, and PRAES .....	127
Table 3.13. Paired Samples t-test Results for the SRMEI and PRMEI .....	128
Table 3.14. Paired Samples t-test Results for the SRAES and PRAES.....	128
Table 4.1. Example of Endorsement of Items for the MSCEIT 137	
Table 4.2. Descriptive Statistics for the SRMEI-R, AMEI-CS, AMEI-CF Cognitive Ability, Personality, and Criterion Variables.....	154
Table 4.3. Factor Analysis of the SRMEI-R.....	156
Table 4.4. Factor Analysis of the AMEI-CS.....	158
Table 4.5. Factor Analysis of the AMEI-CF.....	159
Table 4.6. Revised Descriptives for the SRMEI-R, AMEI-CS, AMEI-CF,.....	161
Fluid Ability, and General well-being .....	161
Table 4.7. Correlations for SRMEI-R, AMEI-CS, AMEI-CF, Cognitive Ability, Personality and Criterion Variables.....	163
Table 4.8. Multiple Regression Analyses for SRMEI-R .....	168
Table 4.9. Multiple Regression Analyses for AMEI-CS .....	169
Table 4.10. Multiple Regression Analyses for SRMEI-R Extreme Scores .....	170
Table 4.11. Multiple Regression Analyses for AMEI-CS Extreme Scores .....	171
Table 4.12. Multiple Regression Analyses for AMEI-CF Extreme Scores .....	172
Table 4.13. Gender Differences for SRMEI-R and AMEI-CS .....	173
Table 4.14. AMEI-CS Example of Endorsement of Items .....	181

LIST OF FIGURES

Figure 1. Investigation of a New Trait and Ability EI Measure .....	24
Figure 5.1. Convergent, Discriminant and Incremental Validity for SRMEI-R.....	196
Figure 5.2. Convergent, Discriminant and Incremental Validity for AMEI-CS .....	197
Figure 5.3. Convergent, Discriminant and Incremental Validity for AMEI-CF .....	197

## ABSTRACT

The purpose of this thesis has been to develop new trait-based and abilities-based measures of “emotional intelligence” (EI), and evaluate their psychometric properties. A popular construct, some have claimed that EI is more important than IQ in predicting life success (Goleman, 1995). But developments in the definition and measurement of EI have not kept pace with these assertions. A review of current conceptualisations of EI in chapter 1 indicated that there is no consensually agreed upon definition of the construct (Van Rooy & Viswesvaran, 2004). In addition, an examination of EI instruments in chapter 2 indicated a number of limitations with respect to their psychometric properties. In particular, self-report measures of EI typically lack discriminant validity in relation to existing personality domains, and comparatively few studies have examined the incremental validity of these measures. A comparison of outcomes both before and after personality is controlled for is also of interest to obtain a more complete picture of the total and unique variance that EI is able to account for. A further limitation of existent performance-based measures relates to scoring methods and ultimately reliability outcomes. Nevertheless, the construct has the potential to be able to account for additional variance in test scores, and has implications for the definition and diagnosis of mental health problems and, where relevant, for the treatment and prevention of such problems. But before such assertions can be made, self-report and performance-based measures of EI need to be developed that demonstrate appropriate psychometric properties.

As a result of limitations with existing EI measures, chapter 3 began by focusing on the development of a new self-report, and peer-report measure of EI. The two new

measures were developed based on the Mayer and Salovey (1997) definition of EI as the best definition at present on conceptual and empirical grounds. A “domain-referenced” approach to the development of affective test items was adopted to generate questions (Anderson, 1981). Following the development of the new self-report and peer-report instruments, the psychometric properties of both measures were evaluated. In the first pilot study, the reliability, factorial validity, and convergent validity of the two instruments were investigated. The results revealed that the internal reliability levels for both the self-report, and peer-report measure of EI were good. However, an evaluation of the construct validity revealed a factor structure for the two EI measures that was somewhat inconsistent with the theorized factor structure. For the convergent validity, both the self-report, and peer-report measures of EI were significantly correlated with the theoretically related construct of empathy. Both EI measures were only minimally intercorrelated, and the results of paired samples t-tests revealed that self-reported EI scores were (in the main) higher than peer-report estimates. There was also evidence of gender differences in EI in favour of both males, and females.

Chapter 3 continued with a second pilot study to investigate test-retest reliability levels, and the convergent validity of the two EI measures in relation to an alternative trait EI measure, the Assessing Emotions Scale (AES). Test-retest reliability levels were good, and there was higher correlation between the self-report, and peer-report measures. Paired samples t-tests again revealed that self-reported EI scores were markedly higher than peer-report estimates. Next, an analysis of the convergent validity of the new self-report and peer-report measure in relation to a self-report and peer-report AES indicated some support, with modest correlation between the new self-report measure and the self-

report AES. The modest correlation was attributed to the presence of response bias in the first instrument but not the latter. In contrast, there was good convergence between the new peer-report measure and the peer-report version of the AES.

One objective of chapter 4 was to refine the new self-report measure of EI. A second aim was to develop a new performance-based measure of EI scored according to consensus protocols but with improvements to response options and instructions to participants. As part of the development of the new performance-based measure of EI, a new scoring approach was devised termed confidence scoring. The final objective of chapter 4 was to conduct a third study that was designed to comprehensively evaluate the psychometric properties of both the self-report and performance-based measure of EI. The validation process included an assessment of: (1) internal reliability, (2) factorial validity, (3) convergent validity, (4) discriminant validity, and (5) incremental validity (before and after personality was controlled for). Individual differences in gender were also examined.

For the self-report measure of EI, there was good evidence for internal reliability, and factorial validity. Likewise, the instrument converged with a measure of empathy, was distinguishable (in the main) from the Big Five personality domains, and was incrementally predictive of grade point average, stress, and loneliness but not general well-being. The incremental validity of the self-report measure of EI was further supported in relation to low and high scoring EI subgroups for stress, and loneliness. Additional variance accounted for ranged from 5% to 23% prior to the inclusion of personality in the regression equation but decreased to 3% to 12% after the Big Five were



controlled for. Results were also indicative of individual differences in EI in favour of males or females, depending upon the ability being tested.

With respect to the performance-based measure of EI, consensually scored results exhibited poor to good internal reliability levels, and a good factor structure but only once redundant test items were deleted. The results indicated that consensually derived answers converged with two measures of cognitive ability, was distinguishable from the Big Five, and incrementally predicted grade point average, stress, loneliness, and general well-being in the order of 29% prior to controlling for personality but decreased to between 2% and 7% of variance when the Big Five were entered into the analysis. Where the performance-based measure of EI was scored according to confidence levels, the results revealed an instrument that had excellent reliability, and reasonable factorial validity. Confidence scores were significantly correlated with empathy; both measures of cognitive ability; and exhibited discriminant validity in relation to the Big Five. In addition, confidence scores of low and high scoring individuals were incrementally predictive of loneliness and general well-being in the order of 14% before and 4% to 5% of variance after the Big Five were partialled out.

Chapter 5 concluded this thesis by first revisiting the initial aims and reviewing the findings in light of the aforementioned objectives. Based on the above outcomes it was concluded that measures of the EI construct were generally reliable and valid, but there is still a long way to go to evaluate the full utility of the construct. Additionally, contributions of this thesis to an understanding of the field of EI were discussed along with limitations relating to this research. Finally, a number of recommendations were made for future research.

## STATEMENT

This thesis contains no material which has been accepted for the award of any other degree or diploma in any University, and to the best of my knowledge and belief, it contains no material previously published or written by another person, except where due reference is made in the text of the thesis.

I consent to this thesis being made available for photocopying and loan if accepted for the award of the degree of Doctor of Philosophy.

---

Janette Kay Warwick  
March 2006

## ACKNOWLEDGEMENTS

First and foremost, I would like to thank my supervisors for their help throughout this thesis. For my principal supervisor, Professor Ted Nettelbeck who consistently supported, challenged, and encouraged me as I worked through the various stages of the thesis, thankyou. To my co-supervisor, Dr. Lynn Ward, a highly deserved thanks for your support, boundless enthusiasm, and guidance – your input has also been invaluable to me. It has been a delight, and a real joy to work with you both.

A very special thanks to Margaret, my mum. Throughout endless discussions and conversations about the thesis, you have listened patiently, challenged me to think outside the square, and laughed with me a lot. You have helped make the PhD experience a unique and wonderful experience, and a time in my life that I will look back on with fond memories.

I would like to thank each of my family members for your continual support and belief in me. To Geoff and Penny, Craig and Jem, Sam and Cathy. To John and Terri, Peter and Becky, and Lisa – I especially thankyou for your care. Thanks also to Graham and Bev who encouraged me to never give up on my dreams.

My thanks to the psychology students who participated in the three studies because without you there would be no thesis. Thanks also to Bob Willson, Nick Burns, Carmen Rayner, and the office staff for your insights and support.

I would also like to express my thanks to a few close friends who were an important part of my cheer squad. To Bev, thanks for your moral support and lots of shared cups of coffee. Thanks to Robyn for our regular D & M's, also over coffee. To my partners in thesis – Neta and Taryn – the end is in sight!

Thanks most of all to J.C.

**CHAPTER 1:**  
**EMOTIONAL INTELLIGENCE:**  
**A RELIABLE AND VALID CONSTRUCT?**

**1.1 Introduction**

The aim of this thesis was to develop new trait-based and abilities-based measures of “emotional intelligence” (EI) and evaluate the psychometric properties of these instruments. The potential of EI as a means for predicting a diverse range of real-life outcomes has received considerable support in media reports. Some authors have claimed that EI is more important than IQ in predicting life success (Goleman, 1995). Others have suggested that it is capable of being learned (Bar-On, 1997, Goleman, 1995; Mayer & Salovey, 1997; Salovey & Mayer, 1990). Essentially then, as pointed out by Roberts, Zeidner and Matthews (2001) some have seen EI as a panacea for many ills. But developments in the definition and measurement of EI have not kept pace with these assertions. Various difficulties with the field of EI are briefly explicated herein to provide a context for the current thesis.

There have been a number of difficulties associated with defining EI, including a lack of consensus among researchers as to the best definition of the construct. The literature reveals a somewhat ambiguous sense of what EI may be. There are a range of different names that have been applied to EI and similar constructs including “emotional literacy”, “emotional quotient”, “social intelligence” and so forth (Dulewicz & Higgs, 2000). Indeed, there is no current conceptualisation of EI that is accepted by all (Van Rooy & Viswesvaran, 2004). Over time, research has led to the separation of EI into two main models: “trait-based” or “abilities-based” (Petrides & Furnham, 2000; 2001). Trait-based models of EI are said to refer to a constellation of emotion-related dispositions, and self-

perceived abilities that are embedded within the personality framework and are therefore purportedly best assessed by self-report methods (Petrides & Furnham, 2001). In contrast, abilities-based EI models are conceived in terms of cognitive information processing abilities. Petrides and Furnham (2000) have maintained that, as an information-processing model, abilities-based EI is best operationalised by maximal performance measures.

The notion that the construct is best conceptualised in terms of trait and ability EI is generally well accepted in the literature but there has been some confusion surrounding the operationalisation of abilities-based definitions via self-report scales. A number of self-report measures of EI have been constructed based on ability definitions (Salovey, Mayer, Goldman, Turvey & Palfai, 1995; Schutte, Malouff, Hall, Haggerty, Cooper, Golden & Dornheim, 1998; Tsousis, 2003). Where the outcomes of self-report EI measures (irrespective of their definition) are interpreted as reflecting trait EI, then this is consistent with the distinction between trait and ability EI made by Petrides and Furnham (2000). But this has not always been the case. In particular, there have been attempts to operationalise Mayer and Salovey's (1997) ability EI definition via self-report and regard results as reflective of ability EI (Tsousis, 2003). It is presently unclear what impact this has for the field of EI because the relationship between trait and ability EI and the respective methods of measurement have not yet been the subject of empirical investigation. Therefore, it is recommended that self-report and maximal performance measures of EI be regarded as operationalisations of trait and ability EI, respectively, for continuity of the construct, until evidence to the contrary is presented.

On the one hand, the abilities-based definitions of EI, and Mayer and Salovey's (1997) model in particular show the most promise at present for research and ultimately intervention purposes. At a conceptual level, if EI is a form of

intelligence then an abilities-based definition is plausible whereas a personality-based definition is not. In addition, empirical research has demonstrated that abilities-based conceptualisations of EI converge with existing intelligence measures: trait-based models do not (Bar-On, 1997; Mayer, Caruso & Salovey, 1999). On the other hand, a number of trait-based conceptualizations of EI have demonstrated their usefulness for selection purposes insofar as operationalisations of a number of definitions have been effective in predicting important outcomes. However, the predictive validity of trait-based EI models is limited to the extent to which they have been able to demonstrate their independence from various personality domains (Bar-On, 1997; Newsome, Day & Catano, 2000). In contrast, abilities-based definitions of EI have consistently been distinguished from existing personality domains (Ciarrochi, Chan & Caputi, 2000; Mayer et al., 1999). Taken together, the notion of EI is still in its infancy and although abilities-based conceptualisations show early promise there is still much to be done to refine the definition of the construct. Definition issues are considered at a later stage in chapter 1.

Next, it is essential that EI measures demonstrate appropriate psychometric properties before claims about the utility of the construct can be made with confidence. Researchers need to demonstrate that definitions of EI are both reliable and valid. An estimate of a measure's reliability is said to reflect how consistently a test measures a particular construct (Anastasi & Urbina, 1997). In conjunction with this, an estimate of validity provides an assessment of the extent to which a measure assesses the construct that it intends to measure (Anastasi & Urbina, 1997). For instance, any measure needs to demonstrate that it converges with constructs of a similar nature and diverges from theoretically distinct constructs. A measure also needs to be able to account for additional variance

beyond the variance explained by existing tests to demonstrate that it has incremental validity. In the case of EI, the expectation is that the construct will account for additional variance in relation to adaptive and positive life outcomes (Matthews, Zeidner & Roberts, 2002). The degree to which an instrument is reliable and valid is critical insofar as it relates to the confidence with which inferences can be made about a measure and the proposed underlying construct. The topics of reliability and validity are discussed in depth in chapter 2.

A closer look at the psychometric properties of EI instruments overall indicates a number of limitations with respect to current measures. In reviewing trait-based EI measures it is apparent that there are a plethora of instruments in existence (Pérez, 2003). Results indicate that these measures are by and large reliable and exhibit good convergent and predictive validity (Bar-On, 1997; Salovey et al., 1995; Schutte, et al., 1998). The same cannot be said for other aspects of validity, with difficulties found in relation to factorial, discriminant and incremental validity (Newsome et al., 2000; Petrides & Furnham, 2000; Slaski & Cartwright, 2002; 2003). The current status of trait EI measures is discussed in depth in chapter 2.

With respect to the few abilities-based measures of EI in existence there are also difficulties in relation to some aspects of validity, and scoring methods. For the most part there is good evidence for the convergent, discriminant and predictive validity of these EI measures (Ciarrochi et al., 2000; Mayer et al., 1999; Roberts et al., 2001). There is also a modest degree of support for the incremental validity of abilities-based EI measures (Brackett & Mayer, 2003; Mayer et al., 1999). But the usefulness of the degree of incremental validity accounted for needs to be considered in light of the variables being investigated. For instance, in the case of incrementally predicting employment success rates, an additional explanation of



variance in the order of 10% would equate to a saving of \$10,000 to an employer where the cost of replacement of staff is in the order of \$100,000. A more significant limitation of abilities-based EI measures relates to scoring methods and ultimately reliability outcomes. Abilities-based EI measures are typically scored according to consensus, expert, and target scoring protocols. A crucial difficulty with consensual scoring is that some aspects of reliability are lower than desirable. Moreover, the veridical nature of supposed correct and incorrect answers is questionable (Roberts et al., 2001). A limitation of expert scoring is that theorists may draw on different domains of expertise, and this can lead to disagreement amongst judges as to which answer is correct (Roberts et al., 2001). Finally, a target person may lack insight, distort feelings, or be influenced by a social desirability bias (Mayer & Geher, 1996). The psychometric properties of existing ability EI measures is explored in greater depth in chapter 2.

Given the aforementioned, consideration is needed for the extent of psychometric analysis of new EI instruments. In the majority of instances, trait-based measures of EI have been subjected to limited psychometric analysis. Researchers have often focused on the predictive validity of EI measures to the exclusion of the discriminant and incremental validity of scales (Bar-On, 1997; Carmeli, 2003; Nikolaou & Tsaousis, 2002; Salovey, Stroud, Woolery & Epel, 2002). Thus, although results from trait-based measures have suggested a number of important relationships between EI and adaptive outcomes, the extent to which the outcomes are confounded by existing personality domains is unclear. In addition, further research is required to evaluate the extent to which trait and abilities-based measures of EI add incrementally to our understanding of psychological phenomena. In short, a comprehensive investigation of the psychometric properties of trait and ability EI is required including an analysis of

reliability levels as well as factorial, convergent, discriminant and incremental validity outcomes.

EI will be of interest if it is able to shed some light on the proportion of variance as yet unaccounted for in academic, workplace, and life success test scores. A number of studies have indicated that, although there is substantial evidence of moderate to strong correlations between IQ tests and school performance, the relationship between psychometric tests, and non-academic performance is less clear (Stankov, 1999; Sternberg, 1981; Vaillant & Davis, 2000). In addition, depending on the test used, traditional psychometric measures of intelligence typically account for around 25% of the variance in academic performance (Neisser, Boodoo, Bouchard, Boykin, Brody, Ceci, Halpern, Loehlin, Perloff, Sternberg, & Urbina, 1996). By this account, 75% of the variance in academic performance remains unexplained. The total and unique variance that the construct of EI is able to account for will be investigated herein.

Potentially, the EI construct has useful implications for the diagnosis, treatment, and prevention of mental health problems and one's quality of life. For example, individuals with low levels of socio-emotional ability are thought to be at increased risk of mental health problems (Mayer & Salovey, 1997; Petrides & Furnham, 2001; Salovey & Mayer, 1990; Schutte et al., 1998). Conversely, EI is said to be associated with several psychological well-being indices such as lower levels of depression (Petrides & Furnham, 2001; Schutte et al., 1998); improved satisfaction with life (Palmer, Donaldson & Stough, 2002); reduced stress levels (Slaski & Cartwright, 2002; 2003); and better social relations (Lopes, Salovey & Straus, 2003). But before statements about the utility of EI can be confidently made the construct must demonstrate that it is capable of being defined and measured in a reliable and valid manner.

## 1.2 The Current Study

As stated at the outset, the aim of this thesis has been to develop new trait-based and abilities-based measures of EI. Based on Mayer and Salovey's (1997) ability definition, the new instruments have been subjected to a comprehensive analysis of their psychometric properties over the course of three studies. The overall investigation of the new trait and ability EI measures is conceptualised in Figure 1. The investigation included an analysis of (1) the convergence of the construct with empathy, an alternative EI measure, and cognitive ability; (2) the divergence of EI from existing personality domains; and (3) the ability of EI to account for additional variance in relation to adaptive after controlling for the effects of personality, cognitive ability and social desirability.

In the first instance, two trait EI measures were devised to measure EI: a self-report and peer-report scale. Self-report and peer-report measures are easier to develop and administer than performance-based instruments. Arguably, many trait EI definitions consist of personality domains such as "optimism" and "happiness" and this has led to difficulties with the discriminant, and incremental validity of the construct. With this in mind, a principal objective was to develop self-report and peer-report questions that were distinguishable from existing personality domains. To facilitate this, a self-report and peer-report EI measure was devised in keeping with Mayer and Salovey's (1997) abilities-based definition. At the same time, a "domain-referenced" approach to the development of affective test items was adopted to generate questions (Anderson, 1981). The development of the two new measures and accompanying construction methodology are described in chapter 3.

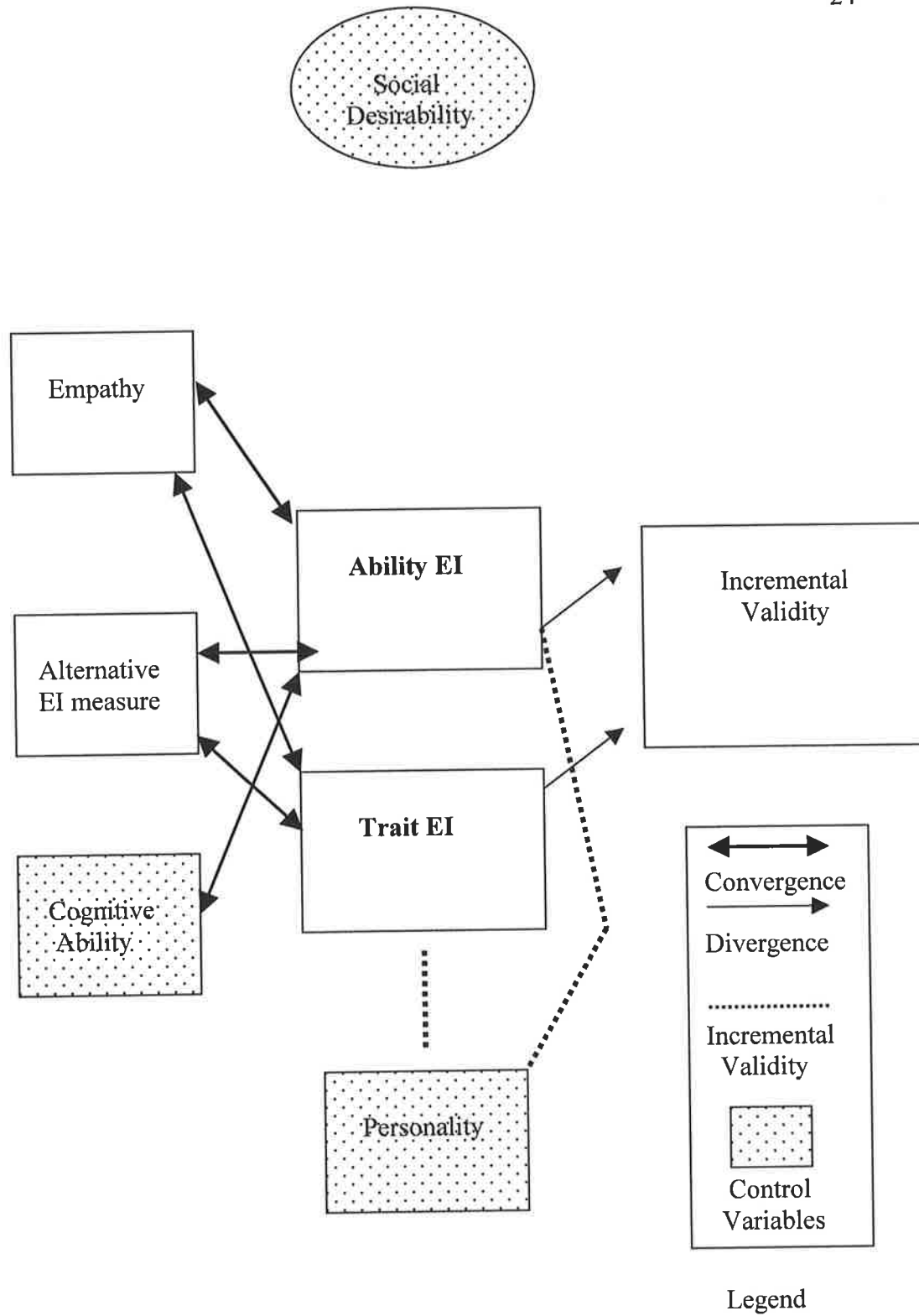


Figure 1. Investigation of a New Trait and Ability EI Measure

Following on from this, the focus of the first pilot study was to evaluate the internal reliability levels as well as the factorial, and convergent validity of the two measures in relation to empathy. Gender differences in trait EI were also explored as outlined in chapter 3. Subsequently, the second pilot study sought to evaluate test-retest reliability levels as well as the convergent validity of trait EI in relation to an alternative trait EI measure. Chapter 3 considered the outcomes.

The focus of study 3 was to refine the wording of several self-report test items to improve its psychometric properties. In addition, the self-report EI measure was subjected to a comprehensive psychometric analysis. (Refer to chapter 4).

In terms of current measures of ability EI, limitations are thought to relate to problems with response options, instructions to participants, and scoring methods. In response to these difficulties it was apparent that the field would benefit from the development of a new performance-based instrument that seeks to address these difficulties. Moreover, there are comparatively few measures of ability EI and therefore developing a new instrument will facilitate the investigation of the construct. The construction of a new performance-based EI measure was outlined with improved response options, clearer instructions to participants and two methods of scoring responses based on consensus and confidence protocols. The new abilities-based EI scale was also subjected to a comprehensive analysis of its psychometric properties as outlined in chapter 4.

Chapter 5 provided a brief summary of the findings from this thesis and the contribution that this series of studies have made to the field of EI. The concluding chapter sought to answer the question of whether the EI measures devised herein are reliable and valid. The implications of the findings for the field of EI are also

discussed. Finally, limitations of this thesis have been considered and recommendations for future research have been made.

This thesis has addressed four main issues:

- (i) Developed a new trait-based measure of EI that can be differentiated from existing personality domains.
- (ii) Developed a new consensually scored performance-based measure of EI with changes to response options and instructions to participants to improve internal reliability levels.
- (iii) Developed an alternative method of scoring the new performance-based measure of EI termed confidence scoring.
- (iv) Investigated the psychometric properties of the new trait and abilities-based measures of EI via a comprehensive research design. Specifically, the research design includes an analysis of the reliability as well as the factorial, convergent, discriminant and incremental validity of both measures.

An historical review and evaluation of existing EI definitions to provide the context for the subsequent development and validation of new trait and ability instruments follows.

### **1.3 Historical Review**

The formulation of EI emerged as a consequence of several theorists maintaining that the construct of intelligence involves socio-emotional abilities in addition to cognitive abilities (Gardner, 1983; Greenspan, 1981; Mayer & Salovey, 1997; Salovey & Mayer, 1990; Wechsler, 1943). Salovey and Mayer (1990) formally proposed the first theoretical model of EI. Thereafter, a range of EI definitions and measures were put forward (Bar-On, 1997, Goleman, 1995; Mayer & Salovey, 1997; Petrides & Furnham, 2001; 2003).

EI needs to demonstrate appropriate psychometric characteristics, particularly in light of previous attempts at defining and measuring socio-emotional abilities. An examination of some of the definitions, and measurement difficulties associated with “social intelligence” (SI) (Cantor & Kihlstrom, 1987; Ford & Tisak, 1983) and Gardner’s (1983) “multiple intelligences” (MI) follows because these relate to the construct of EI.

### **1.3.1 Social Intelligence**

The construct of SI (Cantor & Kihlstrom, 1987; Ford & Tisak, 1983) is one of two socio-emotional variables to be considered here. Thorndike (1920) published his tripartite theory of intelligence, proposing that intelligence should be measured in different ways, and suggested three possible ways in which intelligence could be manifest: abstract, social and mechanical intelligence. Thorndike (1920) defined SI as “... the ability to understand and manage men and women, boys and girls – to act wisely in human relations” (p. 228).

Subsequent investigations identified a number of difficulties with SI, the most notable being marked variations in how the construct was defined by different researchers. Some theorists claimed that SI should be defined in terms of a single entity, such as social perception (Walker & Foley, 1973), whereas others asserted that the construct was multi-dimensional (Ford & Tisak, 1983). The effect of these problems has been that it is difficult to determine what SI is. That said, the difficulties in defining a construct are not limited to socio-emotional abilities. Rather, researchers in the fields of intelligence, stress and personality have likewise experienced ongoing difficulties in defining their respective constructs (Van Rooy & Viswesvaran, 2004).

Many early studies of SI experienced measurement problems in differentiating social from academic intelligence, but later research met with some

success in this regard. Guilford's (1956) Structure-of-Intellect model of intelligence included a range of social abilities. Unlike earlier research, Guilford's (1956) model met with a degree of success in isolating SI from verbal intelligence, thereby supporting the uniqueness, and validity of the construct. Ford and Tisak (1983) were also able to demonstrate a moderate degree of distinctiveness of SI from verbal intelligence. Results from their research indicated the presence of a factor structure that was consistent with the definition of SI, as well as evidence for the convergent, discriminant and predictive validity of their new SI measure (Ford & Tisak, 1983). They argued that SI could be differentiated from verbal intelligence because their new measure assessed the capacity of an individual to influence specific outcomes in a variety of social contexts. Legree (1995) provided further evidence of the relative independence of SI from verbal intelligence by identifying a separate first-order social factor that loaded on a general intelligence factor. Nevertheless, a principal criticism of SI research has been that the potential influence of personality and intelligence has not been controlled for in the majority of analyses (Landy, 2005).

To summarize, there is still considerable debate around the best way to define and measure SI. Moreover, there is some evidence for the uniqueness and convergent, discriminant and predictive validity of the construct but that evidence remains modest. As a consequence of this, several researchers have attempted to define, and measure socio-emotional intellectual factors in other ways (Bar-On, 1997; Gardner, 1983; Mayer & Salovey, 1997; Salovey & Mayer, 1990).

### **1.3.2 Multiple Intelligences**

Gardner (1983) suggested that a high level of competence in *any* given field of endeavour should be viewed as exhibiting intelligent behaviour. He was interested in encouraging researchers to reformulate their views about what counted



as intelligent behaviour, thereby facilitating more appropriate ways for assessing intelligence. Gardner's (1983) theory defined intelligence as a complex system comprising linguistic, logical-mathematical, spatial, musical, bodily-kinesthetic, intrapersonal and interpersonal abilities. The ability to compose music with the aid of a computer, for example, would meet Gardner's criteria for intelligent behaviour.

Of relevance to the EI construct are intrapersonal and interpersonal intelligences. Intrapersonal intelligence was defined as the capacity to have "access to one's own feeling life – one's range of affects or emotions: the capacity instantly to effect discriminations among these feelings and, eventually, to label them, to enmesh them in symbolic codes, to draw upon them as a means of understanding and guiding one's behaviour" (Gardner, 1983, p. 239). Interpersonal intelligence, on the other hand, was defined as "...the ability to notice and make distinctions among other individuals, and in particular, among their moods, temperaments, motivations, and intentions" (Gardner, 1983, p. 239).

However, the notion of MI is not without its difficulties in terms of how the theory has been conceptualised. Two key aspects of Gardner's (1983) MI theory are that each type of intelligence is purportedly relatively independent of the others, and can be combined with others to facilitate adaptive behaviours. Gardner, Kornhaber, and Wake (1996) have provided various examples to support the autonomy of intrapersonal and interpersonal intelligences. Gardner et al. (1996) asserted that many elements of interpersonal intelligence appear to be lacking among individuals with autism. In a similar vein, they maintained that some individuals with psychopathological illnesses are aware of other people's feelings and motivations, but not their own feelings. Notwithstanding such examples, thus far there has been little empirical support for the theory of MI (Sternberg, 1994). Moreover, decades of psychometric research have indicated that a diverse number

of measures of putatively different cognitive abilities are not independent in the general population; rather they are positively correlated.

Second, there appears to be some ambiguity about the independence of intrapersonal and interpersonal intelligences, and this adversely impacts on researchers' attempts to measure these constructs. Gardner (1983) proposed that the two personal intelligences are independent but also suggested that they could be treated as one entity because knowledge concerning both abilities are intimately intermingled, and "one cannot develop without the other" (p. 241). The result of this ambiguity, however, is that attempts to operationalise the personal intelligences have been problematic.

### **1.3.3 Events Leading to the Development of Emotional Intelligence**

Several events led to the emergence of EI as a psychological construct, including some of the results related to prior socio-emotional research, and a shift in how the relationship between emotional and cognitive processes was viewed. Although researchers had experienced a variety of difficulties in defining and operationalising other socio-emotional abilities, there was nevertheless evidence that these types of abilities had a role to play in intelligent behaviour. It was argued that EI offered theoretical advantages over SI because the construct concentrates on emotion and should be more distinct from verbal ability (Mayer, Salovey & Caruso, 2000a). But this is yet to be consistently established.

Second, a more traditional perspective in Western thought has viewed emotion as "disorganised interruptions of mental activity" (Salovey & Mayer, 1990, p. 185). In contrast, more contemporary theories of emotion have viewed affective

processes as serving adaptive as well as maladaptive functions. Emotions may serve to direct attention, to motivate, and to facilitate the evaluation of information (Mayer & Salovey, 1993). In addition, research has suggested that emotional and cognitive systems in the brain are more closely integrated than was first thought (Mayer, Salovey & Caruso, 2000b). The emotion system manages a broad range of stimuli from a variety of sources (Smith, 1999), including physiological, perceptual, experiential and cognitive information, to provide an individual with a coherent experience of mood, and emotion (Mayer, Salovey et al., 2000b). Taken together, several events have prompted researchers to attempt to integrate emotional and cognitive processes into a single theoretical model and the construct of EI is the resultant outcome.

#### **1.3.4 Emotional Intelligence Construct Coined**

The construct of EI is a new approach to defining socio-emotional abilities. Salovey and Mayer (1990) proposed the first theoretical model of EI. They defined the construct as involving the ability to: (1) appraise one's own and others' emotions, (2) utilise emotions, and (3) regulate one's own and others' emotions. Mayer and Salovey (1997) subsequently revised this definition of EI to include the ability to: (1) appraise one's own and others' emotions, (2) utilise emotions, (3) understand emotions, and (4) regulate one's own and others' emotions. Essentially, Salovey and colleagues distinguished EI from SI on the basis that EI is

Table 1.1. Summary of Trait and Ability EI Definitions

	<b>Ability EI</b>	<b>Ability EI</b>	<b>Trait EI</b>	<b>Trait EI</b>	<b>Trait EI</b>	<b>Trait EI</b>	<b>Trait EI</b>
<b>General Characteristics</b>	<b>Salovey &amp; Mayer (1990)</b>	<b>Mayer &amp; Salovey (1997)</b>	<b>Bar-On (1997)</b>	<b>Cooper (1996/1997)</b>	<b>Goleman (1995; 1998)</b>	<b>Dulewicz &amp; Higgs (1999)</b>	<b>Petrides &amp; Furnham (2001)</b>
1 Perception and express of emotion in oneself and others	Appraisal and expression of emotion in oneself/others	Perception, appraisal, and expression of emotion in oneself/others identify own identify others express discriminate	Intrapersonal emotional self-awareness assertiveness self-regard self-actual. independence Interpersonal Empathy interpersonal relationships Social responsibility	Current environment Emotional literacy EQ values and attitudes	Self-awareness emotional self-awareness accurate self-assessment self-confidence Empathy empathy organizational awareness service orient develop others leveraging diversity	Enablers self-awareness interpersonal sensitivity influence	Emotion appraisal (self and others) Emotion expression Trait empathy Assertiveness
2 Utilization of emotion	Utilization of Emotion	Emotional facilitation of thinking prioritize generate perspectives	Adaptation Problem Solving reality testing flexibility		Self-motivation achievement orientation commitment initiative optimism		Self-motivation Adaptability

	Ability EI	Ability EI	Trait EI	Trait EI	Trait EI	Trait EI	Trait EI
General Characteristics	Salovey & Mayer (1990)	Mayer & Salovey (1997)	Bar-On (1997)	Cooper (1996/1997)	Goleman (1995; 1998)	Dulewicz & Higgs (1999)	Petrides & Furnham (2001)
3 Understanding of emotion		Understanding and analysing emotions, employing emotional knowledge label interpret complexities transitions					
4 Regulation of emotion in oneself and others	Regulation of emotion in oneself/others	Reflective regulation of emotions to promote emotional and intellectual growth in oneself/others openness reflect monitor manage self/others	Stress Manage stress tolerance Impulse control General Mood happiness Optimism	EQ competencies Outcomes	Self-regulation self-control trust worthy conscientious adaptability innovation Social skills leadership comm. influence change catalyst conflict manage building bonds collab & co-op team capability	Drivers motivation intuitiveness Constrainers conscientious emotional resilience	Emotion regulation Emotion management (others) Stress management Impulse (low) Relat. skills Social competence Self-esteem Trait happiness Trait optimism

primarily about emotions, although they have acknowledged that emotions play a significant role in social relations (Ashkanasy & Daus, 2005).

The emergence of EI has led to numerous conceptualisations of the construct, each with its respective strengths and limitations. To facilitate a comparison amongst the various EI definitions, each of the theories has been loosely grouped into general categories, as shown in Table 1.1. Consistent with Mayer and Salovey's (1997) definition, the general categories have tended to coalesce to comprise: (1) perception of one's own, and others emotions, (2) utilization of emotions, (3) understanding of emotions, and (4) regulation of one's own, and others emotions.

#### **1.4 Evaluating Emotional Intelligence Models**

In what follows, key definitions of trait EI are reviewed to evaluate the strengths and weaknesses of each model. An important advantage of trait EI is that it is more readily operationalised (by self-report methods) compared to ability EI (measured by performance-based methods). However, a key difficulty with trait-based definitions is that some aspects of the construct echo problems with previous conceptualizations of socio-emotional abilities, such as SI. Specifically, various researchers have defined the construct in a range of different ways. The result of this variation in defining trait EI is that it is difficult to determine the nature of the construct that researchers are attempting to capture with any precision. Each of the trait EI definitions are analysed in turn.

Overall, the strengths of trait EI include a clear target audience (Goleman, 1995; 1998) and arguably a comprehensive account of the construct (Petrides & Furnham, 2001). Problems associated with trait-based EI definitions include conceptual overlap between factors (Goleman, 1995; 1998), atheoretical models (Bar-On, 1997; Goleman, 1995; 1998; Higgs & Dulewicz, 1999; Petrides & Furnham,

2001) and definitions that include existing well-known constructs (Higgs & Dulewicz, 1999; Petrides & Furnham, 2001).

#### **1.4.1 Goleman (1995; 1998)**

Goleman's (1995; 1998) two definitions are for the most part the same, with the later version providing additional depth in describing the model (Table 1.1). Both definitions will therefore be examined at the same time. One possible advantage of Goleman's definition is a clear target audience in that this model focuses on organizational behaviour. For example, empathy includes organizational awareness, and service orientation. Where a model has a clear focus, there is greater opportunity for precision in defining and measuring a construct.

There are, however, several weaknesses in the theoretical background of Goleman's (1995; 1998) conceptualisation of EI. It is not readily apparent how the theory underlying the model was derived. Moreover, this definition of EI is broader than the construct as originally conceived and it includes personality aspects, general ability and social competence (Ashkanasy & Daus, 2005).

#### **1.4.2 Bar-On (1997)**

Bar-On (1997) considered that high levels of EI serve adaptive purposes and result in successful emotional functioning as well as positive psychological well-being (Table 1.1). However, there are three main conceptual concerns with Bar-On's (1997) definition of EI. Critically, it is unclear how various aspects of the model were selected to define EI (Conte, 2005). Moreover, Bar-On's (1997) conceptualisation of EI is somewhat broader than other models, and comprises an array of personal, emotional and social abilities, and skills. Second, it is not immediately apparent how some subscales such as problem solving, and reality testing relate to EI (Pérez, Petrides & Furnham, 2005; Wong & Law, 2002). Third, there are some key elements of EI that appear to be missing from the definition. For example, intuitively, one

would expect that the self-perceived trait of being able to identify, and manage emotional stressors would also be of relevance to EI.

#### **1.4.3 Cooper (1996/1997)**

A review of Cooper's (1996/1997) definition of EI reveals a model that on the one hand is not so broad as to be considered outside the bounds of EI, but on the other is ambiguous with respect to some of the terms used (Table 1.1). The model is parsimonious by virtue of comprising only five factors. That said, the labels used for this definition of EI are markedly different than those describing other models of the construct, and it is unclear what terms such as "emotional literacy" mean. It is uncertain if this is intended to refer to the perception of emotion, or some other aspect of trait EI behaviour.

#### **1.4.4 Higgs and Dulewicz (1999)**

There are two potential disadvantages that were observed in relation to the EI definition proposed by Higgs and Dulewicz (1999) (Table 1.1). The labels used to define the construct are inconsistent with other definitions of EI and it is not readily apparent on what basis various elements of the model were chosen to define EI. In addition, the definition includes conscientiousness and emotional resilience but this replicates existing well-known constructs. Ultimately, this raises the question of whether this conceptualisation of trait EI is redundant.

#### **1.4.5 Petrides and Furnham (2001)**

Petrides' and Furnham's (2001) trait EI definition is based on an extensive review of existing trait-based definitions. As a result, this definition of EI provides a comprehensive account of the construct (Table 1.1). But Petrides' and Furnham's definition includes "trait empathy", "trait happiness", and "trait optimism", which are well-established personality constructs in their own right. A further consideration for this definition of EI is that it needs to distinguish adequately between what constitutes



a dependent variable and what represents an independent variable. For instance, Petrides and Furnham (2001) have included happiness as an independent variable; but arguably happiness is an outcome variable.

In summary, amongst the advantages of the individual trait-based EI definitions are a clear target audience (Goleman, 1995; 1998) and a comprehensive account of the construct (Petrides & Furnham, 2001). Conversely, some of the disadvantages include problems with conceptual overlap between factors (Goleman, 1995; 1998), a lack of theoretical explanation in the formulation of models and relationships amongst variables (Bar-On, 1997; Goleman, 1995; 1998; Higgs & Dulewicz, 1999; Petrides & Furnham, 2001), and definitions that include existing well-known constructs (Higgs & Dulewicz, 1999; Petrides & Furnham, 2001).

#### **1.4.6 Salovey and Mayer (1990); Mayer and Salovey (1997)**

The two abilities-based models of EI first conceptualised by Salovey and Mayer (1990) and subsequently revised by Mayer and Salovey (1997) have provided the only “ability” models evident in the literature to date (Table 1.1). Essentially, the two definitions are the same with the exception that understanding of emotions has been added in the latter. Both definitions are examined simultaneously.

There are two apparent strengths related to abilities-based EI definitions. First, conceptually if EI is a form of intelligence then an abilities-based definition is a prerequisite if the construct is to be considered a true form of intelligence. Second, an important premise of ability EI is that the construct is based on a range of studies on cognition and affect that had previously remained scattered across various subfields in psychology (Salovey & Mayer, 1990). A singular advantage of this integration is that a theoretical framework has emerged to examine socio-emotional abilities in a holistic manner rather than in a piecemeal fashion.

Despite the aforementioned strengths, ability-based definitions of EI are not without their problems. Mayer and Salovey (1997) theorized that EI comprises four branches, including a further four abilities that develop as an individual matures. The model is arranged so that the first branch reflects basic psychological processes, and then as EI develops, more complex, integrated information processing is said to be occurring. One of the difficulties with the hierarchical model is that there is no empirical evidence to support the proposed development of EI. Ultimately, there is a need to conduct longitudinal research to evaluate the hierarchical model more closely (Van Rooy & Viswesvaran, 2004).

In addition, some ability EI branches conceptually overlap. The branch relating to the utilization of one's emotions, whilst comprising important abilities (such as the ability to prioritise, and solve problems), more nearly relates to the regulation of one's own and others' emotions. In a similar vein, the branch relating to understanding of one's emotions conceptually overlaps with the perception of one's own emotions. The ability to express one's emotions is currently subsumed within the perception of emotions branch but the ability to inhibit the inappropriate expression of emotion could also readily form part of the regulation of emotions branch.

Finally, there are some concerns about the use of different terms to refer to what appears to be the same branch labels and this leads to a lack of clarity about what constitutes EI. For example, the term "perception" of emotion is sometimes used interchangeably with "appraisal" of emotion. In the case of trait EI a further perceptual term used is "self awareness". The "utilization" of emotions is referred to as the "facilitation" of emotions; "understanding" of emotions is also labelled "knowledge" of emotions; and the "regulation" of emotions factor is simultaneously

termed “management” of emotions. The result of this lack of clarity in definitional terms is that it is difficult to determine precisely what the construct of EI represents.

## **1.5 Optimal Emotional Intelligence Model and Measurement Issues**

Next, an examination of the relative strengths, weaknesses, and intended use of trait-based, and abilities-based models is undertaken. Such an assessment is inextricably linked to measurement related issues that are discussed, in depth, in chapter 2.

### **1.5.1 Trait-Based Emotional Intelligence**

Trait-based EI has several strengths relative to the method of measurement, and results to date. One advantage of trait EI is that it is typically assessed by self-report or observer rating and these types of measures are relatively easy to construct, and characteristically reliable. Moreover, Petrides and Furnham (2001) assert that trait EI has greater empirical support compared to ability EI, and has demonstrated a degree of convergent, and predictive validity (Ciarrochi, Deane & Anderson, 2002; Saklofske, Austin & Minski, 2003; Schutte et al., 1998).

With respect to trait EI, the principal limitations relate to potential inaccuracies in the measurement of self-reported data as well as difficulties associated with the validity of the construct. Trait EI theories characteristically adopt a self-report method of assessing self-perceived abilities, and consequently rely on an individual having insight into his/her characteristic way of behaving (Mayer et al., 1999; Petrides & Furnham, 2000). But where a person lacks insight, self-reported ability may be correspondingly inaccurate. Conceivably, affective phenomena would be particularly vulnerable to this type of error. Additional limitations include that there have been difficulties in recovering theorized factor structures, and that outcomes relating to the discriminant and incremental validity of the construct remain unclear (Bar-On, 1997; Charbonneau & Nicol, 2002; Petrides & Furnham, 2000;

Schutte et al., 1998). Some of these difficulties have important implications for trait EI. For example, if discriminant validity for trait EI is not demonstrable in relation to existing personality dimensions then this raises the question of whether the construct is redundant.

### **1.5.2 Abilities-Based Emotional Intelligence**

One of the strengths of abilities-based EI is that the construct is designed to capture actual ability and it has thus far demonstrated a degree of validity. The notion of abilities-based EI is of interest insofar as it reflects an individual's actual ability (rather than self-perceived ability) and is therefore better able to predict behaviour. In addition, abilities-based EI measures have demonstrated a degree of convergent, discriminant, predictive, and incremental validity (Ciarrochi et al., 2000; Mayer et al., 1999; Roberts et al., 2001).

Current problems associated with ability EI relate to scoring methods, reliability levels, and factor structures. Of particular concern are difficulties associated with determining what constitutes correct or incorrect solutions to a problem (Roberts et al., 2001). Currently, abilities-based EI measures are most often consensually scored, and to date it is still unclear whether test results are an artefact of the scoring method, or reflect genuine mental abilities. Further difficulties include lower than desirable reliability levels for various subtests within existing measures, and variations in the factor structure of maximal performance EI measures (Ciarrochi et al., 2000; Mayer et al., 1999; Roberts et al., 2001). That said, internal reliability levels for the two main abilities-based measures, the MEIS and MSCEIT, are satisfactory in terms of the total score and at the branch level.

### **1.5.3 Intended Use of an Emotional Intelligence Model**

The best EI model to adopt is also, in part, dependent on the intended use of the model. Arguably, both trait-based and abilities-based conceptualisations of EI are

able to contribute to an understanding of emotional behaviour in any given context and both may be useful indicators of performance. That said, trait EI (as a range of self-perceived abilities, and emotion-related dispositions) is better suited to individuals who are interested in a self-appraisal of their abilities for the purpose of understanding oneself (Schutte et al., 1998). In contrast, ability EI (as an actual mental ability) is best suited to the diagnosis and treatment of EI deficits, provided that some of the early psychometric limitations can be overcome.

## **1.6 Emotional Intelligence: Personality and Intelligence Theories**

On the basis that trait EI and ability EI are located within a personality and intelligence framework, respectively, it is important that the two conceptualisations of the construct demonstrate appropriate relationships with existing theories.

### **1.6.1 Trait-Based Emotional Intelligence and Personality Theories**

Trait EI needs to be validated by demonstrating an appropriate relationship with existing well-known personality theories. In particular, discriminant validity will be demonstrated by low or negative correlations with personality domains. The notion of a personality trait refers to “consistent attributes that characterize what a person is like” (Sternberg, 1994, p. 622). Personality trait theories are typically either nomothetic or idiographic. Nomothetic theories presume that all individuals have the same personality traits but to varying degrees. Conversely, idiographic theories maintain that an individual’s personality is characterised by traits that are essentially unique to each individual (Sternberg, 1994). The construct of trait EI is best validated against nomothetic personality theories because of difficulties associated with attempting to measure a vast range of unique traits as required by idiographic theories.

There are three main nomothetic personality theories that trait EI would best be validated against and that conceptually overlap with each other. The first, and

most widely accepted personality theory is commonly referred to as the “Big Five”. This term refers to five personality traits that have frequently been identified across a number of studies. The traits are agreeableness, conscientiousness, openness, neuroticism, and extraversion (Costa & McCrae, 1992). The second predominant personality theory is Eysenck’s Personality Dimensions. This theory defines personality in terms of three characteristic traits: extraversion, neuroticism, and psychoticism (Eysenck, 1981). The third personality theory is that of Cattell’s Factor-Analytic theory (Cattell, 1982). In particular, Cattell identified 16 personality traits based on factor analysis. These include extraversion and neuroticism but also include self-assuredness, tough mindedness, timidity, and so forth. In summary, a key aspect of the validation process for trait EI will be to investigate the nature of the relationships between the construct, and mainstream personality theories like the Big Five, Eysenck’s Personality Dimensions, and Cattell’s factor-analytic theory.

### **1.6.2 Abilities-Based Emotional Intelligence and Intelligence Theories**

To be regarded as a valid construct, it is also essential that abilities-based EI demonstrate an appropriate relationship by converging with traditional intelligence theories (amongst other things). The construct of “g” or general ability is one such traditional intelligence theory with which many would expect ability EI to be demonstrably related (Spearman, 1927). The “g” construct emerged following Spearman’s observations that, although different tests were supposedly measuring different abilities, they nonetheless tended to be positively correlated, exhibiting a “positive manifold”. Spearman (1927) conceived of “g” as a general ability that underlies all intellectual functioning.

However, there is evidence to suggest that not all tests of mental ability need to correlate as evidence of their validity. The existence of a positive manifold among different ability tests supports the notion of “g”, but not all psychological tests are

related. Indeed, the best psychometric evidence points to several relatively different kinds of abilities. Moreover, although the importance of Spearman's "g" has gained wide acceptance (Jensen, 1998), it is still unclear today what "g" actually represents, and the idea that a general ability exists as an entity based in neurological quality is still open to question.

Validation studies will also need to establish a relationship between abilities-based EI and other traditional intelligence conceptualisations, including the primary mental abilities, and fluid and crystallised abilities. Thurstone (1938) proposed that the construct of intelligence could best be represented by a small number of relatively independent primary mental abilities. Later, two clusters of cognitive abilities were identified that were subsequently named fluid intelligence or problem solving ability (Gf) and crystallised intelligence or learned abilities (Gc) (Horn & Cattell, 1966; Horn & Noll, 1997). More recently, Carroll's (1993) Three-Stratum theory is the most widely accepted conceptualisation of intelligence, and incorporates both a general factor and Gf/Gc, together with an extended range of other broad, relatively independent ability factors. The Three-Stratum Theory provides a factor analytic description of mental abilities in terms of some 69 primary mental abilities at the first and lowest stratum, followed by eight or nine second-order factors, including fluid and crystallized ability, and a broad general intelligence factor at the third and highest level (Carroll, 1993).

Several relationships between EI and this comprehensive model of intelligence are plausible. One possibility is that ability EI may be subsumed within one or more of the level factors associated with the first and lowest stratum of Carroll's (1993) theory. For example, two socio-emotional factors that are represented at the first and lowest stratum of verbal intelligence include communication ability, and listening ability.

A further possibility is that ability EI may be subsumed within one or more of the level factors associated with the second stratum of the Three Stratum theory, like verbal intelligence, performance intelligence, or broad cognitive speediness. In support of this idea, ability EI is defined, in part, in terms of one's capacity to solve emotional problems. Therefore, ability EI would appear to relate to performance intelligence to some extent. Research has also indicated the presence of an ability EI speediness factor, with high EI individuals being faster at processing emotion recognition tasks compared to low EI individuals (Petrides & Furnham, 2003).

A final possibility is that a general ability EI factor previously identified may correlate with the general factor located at the third stratum of Carroll's (1993) theory. Mayer et al. (1999) reported the presence of a general factor on the basis that all of the tasks loaded on the first unrotated factor without exception. Taken together, the evidence suggests that something akin to ability EI is evident in all three strata described in the Three Stratum theory. The critical question is whether ability EI can add to our understanding of the nature of intelligence.

## **1.7 Conclusion**

The EI construct emerged, in part, following limitations identified with the construct of SI (Ford & Tisak, 1983; Guilford, 1956; Thorndike, 1920) and Gardner's (1983) notion of MI. As with its predecessors, it is essential that EI address difficulties associated with the definition, and measurement of socio-emotional abilities. Thus, a crucial question for proponents of EI is whether it is a reliable and valid construct as evidenced by factorial, convergent, discriminant, predictive and incremental validity outcomes (in relation to positive life outcomes).



## CHAPTER 2

### A REVIEW OF TRAIT AND ABILITIES-BASED EMOTIONAL INTELLIGENCE MEASURES

#### 2.1 Introduction

The focus of chapter 2 was to review measures of EI. Key psychometric terms are outlined including a description of reliability and validity criteria. Research investigating EI has consistently demonstrated that trait EI measures are reliable, and exhibit convergent and predictive validity. However, other aspects of trait EI validity such as the factorial, discriminant, and incremental validity are problematical. For abilities-based measures of EI there are concerns about scoring methods as a consequence of low reliability outcomes at the subtest level but not at the branch level or with respect to total scores. With these limitations in mind, abilities-based measures have nevertheless generally exhibited convergent, discriminant and predictive validity, with weak support for incremental validity. However, the factor structure of ability EI measures has been inconsistent in relating to underlying theoretical models. The implication of these anomalies is that there is a need for further refinement of EI measures; and this is essential to evaluate the validity of EI adequately.

#### 2.2 Psychometric Considerations

A review of key psychometric terms is presented to provide a context for the subsequent evaluation of EI measures. The aim of psychometric analysis is to determine the extent to which a measure is reliable and valid, and therefore the confidence with which inferences can be made about a measure, and the proposed underlying construct. Thus, together reliability and validity estimates enable

researchers to evaluate construct validity. The objective of a scale will determine the type and amount of construct validity that is needed (Anastasi & Urbina, 1997).

### 2.2.1 Reliability

A measure of a scale's reliability relates to how consistently a test measures a particular construct (Anastasi & Urbina, 1997). The four main types of reliability are: (1) internal reliability, (2) inter-rater reliability, (3) parallel forms of reliability, and (4) test-retest reliability. A measure of internal reliability estimates the degree of variance that items have in common within a scale. Inter-rater reliability is a measure of variance between scorers, and is obtained by two or more examiners scoring a sample of items. A measure of parallel forms of reliability provides an estimate of common variance between two versions of a test purportedly measuring the same thing. Test-retest reliability is a measure of common variance on a single test taken by the same sample at different times (Anastasi & Urbina, 1997).

With the aforementioned in mind, guidelines are required to facilitate an interpretation of reliability results. Ideally, a reliability coefficient of .90 is considered appropriate for clinical decision-making, whereas a reliability estimate of around .70 is deemed suitable for research purposes (Groth-Marnat, 1997). In addition, the degree to which a measure is reliable depends on the type of analysis being conducted, with internal testing involving fewer sources of variance (Sternberg, 1994). Thus, inter-rater, parallel forms, and test-retest reliability typically return lower coefficients than internal reliability estimates.

### 2.2.2 Validity

The validity of a scale refers to the extent to which an instrument measures what it purports to measure (Anastasi & Urbina, 1997). The issue of validity is crucial in test construction because a test may be reliable even if it is not valid. In contrast, where a test is not reliable it cannot be regarded as valid (Groth-Marnat, 1997). There are various types of validity, each serving different functions in relation to scale development and evaluation. Types of validity include: (1) face validity, (2) content validity, (3) convergent validity, (4) discriminant validity, (5) criterion validity and (6) incremental validity (Groth-Marnat, 1997).

Face validity refers to the extent to which test items are at face value representative of the construct being measured (Groth-Marnat, 1997). Content validity reflects the extent to which the actual content of a test assesses what is intended (Groth-Marnat, 1997). Convergent validity provides an assessment of the degree to which an instrument converges with existing scales purportedly assessing the same construct (Anastasi & Urbina, 1997). A measure of discriminant validity assesses the degree to which an instrument is independent of theoretically distinct variables (Anastasi & Urbina, 1997). Criterion validity refers to the extent to which test scores relate to performance on an outside measure. This type of validity is frequently subdivided into two types: concurrent validity, and predictive validity. Concurrent validity relates to outside measures that are taken at the same time as a test score, whereas predictive validity refers to outside measures taken some time after test scores have been obtained (Groth-Marnat, 1997). Finally, an estimate of incremental validity

assesses the extent to which a scale can account for additional variance in test scores, above and beyond existing measures of the same construct (Groth-Marnat, 1997).

As with reliability analyses, guidelines are required to interpret the strength of validity coefficients. For a measure to demonstrate convergent validity it should be moderately to highly positively correlated with theoretically related variables (Anastasi & Urbina, 1997). In the case of abilities-based EI, convergent validity would be demonstrated by correlation with theoretically related cognitive ability type variables, as discussed in chapter 1. Trait-based EI is required to converge with constructs such as empathy but not so highly as to suggest that EI is redundant. The discriminant validity of a test would be demonstrated by zero or negative correlations with theoretically distinct constructs (Anastasi & Urbina, 1997). EI is expected to diverge from theoretically distinct well-known personality traits.

An evaluation of the incremental validity of a measure requires consideration of the proportion of variance explained and variables that are being investigated. Groth-Marnat (1997) contended that (in theory at least) a measure might demonstrate incremental validity by accounting for around 2% of additional variance in test scores. But the higher the proportion of variance accounted for in test scores, the greater the justification for spending time and money on investigating a particular construct. For example, where EI abilities were incrementally predictive of reduced stress levels, then the construct would be of proportionate interest for its potential to improve mental health and quality of life outcomes. Arguably, an additional explanation of 2% of stress variance would not be trivial in the majority of contexts. Studies of EI to date have yielded incremental validity outcomes ranging from 1% to 10% (Bastian, Burns

& Nettelbeck, 2005; Lopes et al., 2003; Saklofske et al., 2003). Future studies need to replicate and improve upon the upper limits of these outcomes. That said, there is no definitive answer to the question of how much additional variance EI needs to demonstrate to be regarded as incrementally valid. Rather, each case must be evaluated on its own merit.

In evaluating the incremental validity of an instrument it is essential that intercorrelated variables be taken into account because the interpretation of results can be problematic (Tabachnick & Fidell, 2001). Some researchers have recommended that the effects of personality and cognitive ability be controlled for when attempting to explain variance in criterion variables (Brackett & Mayer, 2003; Mayer & Salovey, 1997; Petrides & Furnham, 2000; 2001; Saklofske et al., 2003), although in practice this has not always occurred. The recommendation is based on the notion that personality and intelligence conceptually overlap EI but that the former are well-established constructs that have already been able to reliably account for variance in relation to a number of psychological domains. Thus, by controlling for the effects of personality and cognitive ability, the unique contribution of EI to various criterion variables is able to be distinguished. But it is contended that controlling for the effects of personality may mask the potential usefulness of EI in certain contexts.

Arguably, the potential of EI rests more with its capacity to predict say stress outcomes rather than explain stress variance and the distinction between these two functions has important implications with respect to control variables such as personality. By way of example, an individual with a high level of conscientiousness would be expected to be organised, well-prepared and efficient. From a treatment

perspective, it is unlikely that an employer/employee would attempt to change an individual's personality type. Rather, it is more likely that a treatment program would be aimed at changing specific behaviours. For example, an individual with a low score in relation to the ability to regulate one's own emotions might be expected to be impatient, anxious and socially isolated. In the latter case, a treatment program aimed at improving the ability to regulate one's own emotions (assuming EI skills are capable of being learned) would plausibly be successful in reducing anxiety and loneliness. Implicit in the above example is the notion that including personality variables in a regression analysis may mask the usefulness of EI. One approach to distinguishing between the predictive versus explanatory capacity of EI would be to conduct two analyses: one with EI entered into a regression model without personality and a second analysis with personality entered into a regression equation first following by the respective EI subscales.

With the aforementioned psychometric guidelines in mind, what follows is a review of trait-based and abilities-based measures of EI.

### **2.3 A Review of Trait-Based Emotional Intelligence Measures**

According to Pérez (2003) there are in excess of 50 trait-based measures of EI in existence. A review of each of these measures is beyond the scope of this thesis and the following section will therefore focus on an evaluation of five trait EI measures that have been most frequently investigated in the literature. Overall, there is good support for the reliability of trait-based EI measures, and for the convergent and predictive validity of instruments. Results for other aspects of trait-based EI validity are less convincing, in particular, factorial, discriminant, and incremental validity outcomes are

problematic. A summary of the psychometric properties of trait-based measures of EI is presented in Table 2.1. The theoretical framework underlying various trait EI measures is briefly revisited followed by an evaluation of the psychometric properties of the instruments.

**Table 2.1. Summary of Trait-Based Measures of Emotional Intelligence**

<b>Trait-based EI measures</b>	<b>D</b>	<b>R</b>	<b>FV</b>	<b>CV</b>	<b>DV</b>	<b>PV</b>	<b>IV</b>
TMMS - Trait Meta-Mood Scale Salovey et. al., (1995)		√		√		√	
EQ-i - Emotional Quotient Inventory Bar-On (1997)		√		√		√	
AES - Assessing Emotions Scale Schutte & Malouff (1998)	√	√		√		√	
TEIQue - Trait EI Questionnaire Petrides & Furnham (2001)						√	
TEIQ - Trait EI Questionnaire Tsaousis (2003)	√					√	

D = definition; R = reliability; FV = factorial validity; CV = convergent validity; DV = discriminant validity; PV = predictive validity; and IV = incremental validity.

### **2.3.1 Trait Meta-Mood Scale (TMMS) Salovey et al. (1995)**

The Trait Meta-Mood Scale (TMMS) is a self-report scale that provides a measure of one element of EI: the ability to regulate one's own emotions. A key limitation of the TMMS is that there is some ambiguity with respect to what the instrument is attempting to measure. On the one hand, the TMMS is described as a measure of one's ability to reflect on, and manage one's emotions and it includes three subscales: (1) attention to one's feelings, (2) clarity of one's feelings, and (3) repair of one's feelings (Salovey et al., 1995). On the other hand, the authors contended that the TMMS is able to function as a measure of "monitoring moods, discriminating among moods, and regulating them" (Salovey et al., 1995, p. 129). Moreover, some researchers have adopted the TMMS as a measure of the regulation of emotions

(Palmer et al., 2002). In other instances, researchers have construed the TMMS as providing a measure of Salovey and Mayer's (1990) definition of the construct (Davies, Stankov & Roberts, 1998). The impact of the ambiguity underlying the definition of the TMMS is that the measure may be used inappropriately, and subsequent inferences concerning the scale and the construct of EI may be inaccurate. A further noteworthy point is that the TMMS was devised on an abilities-based EI definition; but as a self-report measure the scale is best regarded as a trait-based instrument by virtue of its method of operationalisation (Petrides & Furnham, 2000).

Results relating to the TMMS indicate that the scale is, in the main, a reliable measure of the regulation of one's emotions, and there is good evidence for the convergent and predictive validity of the instrument (Table 2.1). The TMMS has demonstrated reasonable reliability levels ranging from .75 for the attention to emotions subscale (Palmer et al., 2002) to .88 for the clarity of emotions subscale (Salovey et al., 2002). As evidence for its convergent validity the TMMS repair subscale was moderately positively correlated with optimism .57 (Salovey et al., 1995). The predictive validity of the TMMS was evidenced by weak to moderate correlations with depression, and distress (Salovey et al., 1995); self-esteem and interpersonal satisfaction (Salovey et al., 2002).

One of the disadvantages of the TMMS are problems associated with factorial, discriminant, and incremental validity (Table 2.1). Salovey et al. (1995) recovered a



Table 2.2. Summary of Results for the Trait Meta-Mood Scale (TMMS)

Authors	Factor structure	Variance	Reliability	Results	Results
TMMS Self-report Salovey et al. (1995)	Attention to one's emotions Clarity of one's Emotions Repair of one's Emotions	n/a	0.86 0.87 0.82	Attention subscale and priv self-consc <sup>a</sup> $r=.42^{**}$ pub self-consc <sup>b</sup> $r=.36^{**}$ Clarity subscale and emotion express $r=-.25^*$ depression $r=-.27^*$ Repair subscale and depression $r=-.37^{**}$ optimism $r=.57^{**}$ change mood $r=.53^{**}$	Attention subscale and depression $r=-.25^*$ neuroticism $r=.22^*$ repress defense <sup>c</sup> $r=-.22^*$ Clarity subscale and depression $r=-.26^*$ neuroticism $r=-.40^{**}$ distress $r=-.44^{**}$ Repair subscale and distress $r=-.44^{**}$
TMMS Self-report Palmer et al. (2002)	Definition only Total TMMS Attention Clarity Repair	n/a	0.82 0.75 0.75 0.51	Total TMMS life satisfaction $r=.26^{**}$ positive affect $r=.32^{**}$ total TAS-20 $r=-.42^{***}$	
TMMS Self-report Salovey et al. (2002)	Definition only Attention Clarity Repair		0.82 0.88 0.85	TMMS attention empathy $r=.44^{***}$ self-esteem $r=.22^*$ TMMS clarity symptom report $r=.30^{**}$ social anxiety $r=-.30^{**}$ depression $r=-.32^{**}$ self-esteem $r=.34^{***}$ interper. satis <sup>d</sup> . $r=.39^{***}$	TMMS clarity negative mood $r=.32^*$ TMMS repair cognitive apprais $r=.35^{**}$ trait passive cope $r=-.31^*$ state passive cope $r=.34^*$ TMMS clarity day 2 cortisol $r=-.40^{**}$ average cortisol $r=-.31^*$

Authors	Factor structure	Variance	Reliability	Results	Results
				TMMS repair symptom report $r = -.35^{**}$ social anxiety $r = -.37^{**}$ depression $r = -.47^{***}$ self-esteem $r = .65^{***}$ interper. satisfac $r = .31^{**}$	TMMS attention cortisol reactivity $r = -.30^*$ systolic bp <sup>e</sup> $r = -.36^{**}$ TMMS repair trait active coping $r = .44^{**}$ rumination $r = -.56^{***}$ distraction $r = .55^{***}$
TMMS Self-report Coffey, Berenbaum & Kerns (2003)	Definition only Attention Clarity Repair			TMMS attention mood labelling $r = .26^{**}$ mood monitoring $r = .22^{**}$ TMMS clarity mood labelling $r = .57^{***}$ mood monitoring $r = .19^{**}$ TMMS repair mood labelling $r = .16^*$	Factor Analysis Outcome attention to emotions unclear about emotions TMMS attention extraversion $r = .35^{**}$ openness $r = .51^{**}$ TMMS unclear neuroticism $r = .34^{**}$ openness $r = -.19^*$
TMMS Self-report Donaldson-Feilder & Bond (2004)				TMMS total acceptance $r = .40^{**}$ job control $r = .29^{**}$	physical wellbeing $r = .16^{**}$ mental ill-health $r = -.16^{**}$

\*  $p < .05$ ; \*\*  $p < .01$ ; \*\*\*  $p < .001$ . <sup>a</sup> private self-consciousness; <sup>b</sup> public self-consciousness; <sup>c</sup> repressive defenses;  
<sup>d</sup> interpersonal satisfaction; <sup>e</sup> systolic blood pressure.

three-factor solution consistent with the underlying theoretical model, as did Palmer et al. (2002). Conversely, Coffey et al. (2003) reported a two-factor solution that they labelled (1) attention to emotions; and (2) unclear about emotions. In terms of the discriminant validity of the TMMS, two outcomes were higher than desirable. Salovey et al. (1995) reported a moderate negative correlation between the clarity of emotions subscale and neuroticism ( $r=-.40$ ). A moderate positive correlation ( $r=.51$ ) was exhibited between the attention subscale and openness (Coffey et al., 2003). To date the incremental validity of the TMMS has not been evaluated and this negatively impacts on the veracity of outcomes. For instance, there are weak negative correlations between the TMMS attention to emotions subscale and measures of stress such as cortisol secretions and systolic blood pressure (Salovey et al., 2002). But the proportion of stress variance that the TMMS accounts for before and after controlling for the effects of personality have not been evaluated.

### **2.3.2 Emotional Quotient Inventory (EQ-i) Bar-On (1997)**

The Emotional Quotient Inventory (EQ-i) is a self-report measure that was developed to operationalize Bar-On's (1997) definition of EI. Notably, the EQ-i started out as a measure of well-being and was subsequently adapted to become a measure of EI. The EQ-i provides a total score, a measure of five second-order factors, and 15 scales. The first factor assesses intrapersonal EI, and includes the scales of: (1) emotional self-awareness, (2) assertiveness, (3) self-regard, (4) self-actualization, and (5) independence. The second factor relates to interpersonal EI and it provides a measure of: (6) empathy, (7) interpersonal relationships, and (8) social responsibility. Factor 3 assesses EI adaptation and includes: (9) problem solving, (10) reality testing,

and (11) flexibility, whereas factor 4 assesses stress management and relates to (12) stress tolerance, and (13) impulse control. The fifth factor, general mood, provides a measure of (14) happiness, and (15) optimism.

In terms of the psychometric properties of the EQ-i, the measure is regarded as largely reliable, and it exhibits convergent, and predictive validity (Table 2.3). Internal reliability levels range from a low of .53 to a high of .97. The convergent validity of the EQ-i is indicated by moderate correlations with the trait EI measure, the Assessing Emotions Scale (AES) ( $r=.67, p<.001$ ), and the theoretically related construct of alexithymia ( $r=-.64, p<.001$ ) (Austin, Saklofske & Egan, 2005). Support for the predictive validity of the EQ-i has been indicated by weak to moderate correlations with a range of criterion variables. These correlations include interpersonal variables such as social introversion, and alienation, and mood variables such as depression and stress (Austin et al., 2005; Slaski & Cartwright, 2002).

In contrast, there are problems associated with the factorial, discriminant, and incremental validity of the EQ-i (Table 2.3). In particular, factor analysis of the EI measure has produced outcomes that are on occasion consistent with the five-factor theory underlying the measure (Bar-On, 1997). However, in other instances, factor analysis has recovered either a three-factor (Van Der Zee & Wabeke, 2004), or six-factor outcome (Palmer, Manocha, Gignac & Stough, 2003). There is a lack of evidence for the discriminant validity of the EQ-i, with consistent correlations between the EI measure, and the Big Five personality domains. This has especially been the

Table 2.3. Summary of Results for the Emotional Quotient Inventory (EQ-i)

Authors	Factor structure	Variance	Reliability	Results	Results
EQ-i Self-report Bar-On (1997)	EQ-i total score Intrapersonal Interpersonal Adaptability Stress management General mood			EQ-i total score emotional stability $r=.72$ life satisfaction $r=.41$ acculturation $r=.34$	job perform and satis <sup>a</sup> . $r=.51$ poor emotional health $r=-.85$ depression $r=-.56$
EQ-i Self-report Newsome et al. (2000)				EQ-i total extraversion $r=.46^{***}$ anxiety $r=-.77^{***}$ independence $r=.44^{***}$ self-control $r=.36^{***}$ Intrapersonal EI extraversion $r=.38^{***}$ anxiety $r=-.64^{***}$ tough-mindedness $r=-.16^*$ independence $r=.56^{***}$ self-control $r=.26^{***}$ Interpersonal EI extraversion $r=.52^{***}$ anxiety $r=-.34^{***}$ independence $r=.26^{**}$ self-control $r=.39^{***}$	Adaptability extraversion $r=.30^{***}$ anxiety $r=-.68^{***}$ independence $r=.33^{***}$ self-control $r=.35^{***}$ Stress management extraversion $r=.23^{**}$ anxiety $r=-.71^{***}$ self-control $r=.23^{**}$ General mood extraversion $r=.42^{***}$ anxiety $r=-.68^{***}$ independence $r=.32^{***}$ self-control $r=.16^*$

Authors	Factor structure	Variance	Reliability	Results	Results
EQ-i Self-report Petrides & Furnham (2001)	EQ-i & EPQ  EQ-i & Big Five	53.90% Total 64.50% Total		EQ-i factor analysis & EPQ Trait EI factor neuroticism $r=-.31$ extraversion $r=.29$ psychoticism $r=-.14$	EQ-i factor analysis & Big Five Trait EI factor conscientiousness $r=.35$ neuroticism $r=-.29$ extraversion $r=.29$
EQ-i Self-report Kobe, Reiter-Palmon Rickers (2001)				EQ-i total score social intelligence $r=.57^{**}$ leadership $R^2=ns - p:1$	Social intelligence leadership $R^2=29\%^{***}$
EQ-i Self-report Slaski & Cartwright '(2002)				EQ-i. total score poor general health $r=-.50^{**}$ morale $r=.54^{**}$ distress $r=-.56^{**}$	quality of life $r=.40^{**}$ stress $r=-.40^{**}$ performance $r=.21^{**}$
EQ-i Self-report Palmer et al. (2003)	EQ-i total score Emotional disposition Interpersonal Impulse control Problem solving Emotional self- awareness Character	40.30% 22.80% 5.00% 4.30% 3.10% 2.80% 2.30%	0.97 0.63 0.53 0.95 0.74 0.84	CFA six factor=good fit EQ-i total score mental health $r=-.50^*$	
EQ-i Self-report Mandell & Pherwani (2003)				EQ-i total score females < males* leadership $R^2=24\%^*$	
EQ-i Self-report Hemmati, Mills & Kroner (2004)				EQ-i total score hypochondria $r=-.50^{**}$ depression $r=-.67^{**}$ denial $r=.44^{**}$	self-depreciation $r=-.57^{**}$ deviation $r=-.64^{**}$ hopelessness $r=-.47^{**}$ depression $r=-.59^{**}$

Authors	Factor structure	Variance	Reliability	Results	Results
				interpersonal probs $r = -.64^{**}$ alienation $r = -.54^{**}$ persecutory ideation $r = -.44^{**}$ anxiety $r = -.50^{**}$ thinking disorder $r = -.26^{**}$ impulsivity $r = -.65^{**}$ impression manage $r = .50^{**}$ social introversion $r = -.56^{**}$	self-deception $r = .43^{**}$ IQ verbal $r = .21^*$ EQ-i total score inmate < norm $t(122.47) = 2.97^{**}$
EQ-i Self-report Van Der Zee & Wabeke (2004)	Sense of accomplish Empathy Planfulness			Extraversion & EQ-i subscales self-awareness $r = .46^{***}$ assertiveness $r = .47^{***}$ interpersonal relations $r = .58^{***}$ Agreeable & EQ-i subscales empathy $r = .51^{***}$ social responsibility $r = .49^{***}$ impulse control $r = .42^{***}$ happiness $r = .13^{***}$ Conscientious & EQ-i scales problem-solving $r = .37^{***}$ happiness $r = .10^{***}$ Neuroticism & EQ-i subscales self-regard $r = .60^{***}$ self-actualization $r = .44^{***}$ reality testing $r = .49^{***}$ flexibility $r = .39^{***}$ happiness $r = .57^{***}$ optimism $r = .57^{***}$	Openness & EQ-i subscales independence $r = .60^{***}$ Competent support & EQ-i self-actualization $r = .21^{**}$ happiness $r = .18^*$ Competent L/ship & EQ-i assertiveness $r = .18^*$ self-regard $r = .17^*$ self-actualization $r = .24^{**}$ independence $r = .22^{**}$ reality testing $r = .21^{**}$ flexibility $r = .29^{**}$ stress tolerance $r = .18^*$ happiness $r = .19^*$ Top managers < reference N all subscales except empathy and impulse control

Authors	Factor structure	Variance	Reliability	Results	Results
sEQ-i Self-report Austin et al. (2005)	EQ-i total Interpersonal Intrapersonal Adaptability Stress manage General mood Positive impression	44.40% 5.60% 4.30% 5.60% 7.20% 17.40% 4.20%	0.87 0.78 0.79 0.79 0.83 0.61	AES $r=.67^{***}$ EQ-i total score alexithymia $r=-.64^{***}$ personality (mini markers) neuroticism $r=-.55^{***}$ extraversion $r=.30^{***}$ openness $r=.25^{**}$ Agreeableness $r=.55^{***}$ conscientiousness $r=.33^{**}$ personality (big five) neuroticism $r=-.62^{***}$ extraversion $r=.53^{***}$ Agreeableness $r=.46^{***}$	conscientiousness $r=.59^{***}$ AES social network size $r=.36^{***}$ social network satis <sup>b</sup> . $r=.17^{**}$ satis. with life <sup>c</sup> $r=.30^{***}$ alcohol consumption $r=-.19^*$ EQ-i total score social network size $r=.27^{***}$ social network satis <sup>b</sup> . $r=.25^{***}$ satis. with life <sup>c</sup> $r=.33^{***}$ AES social network size $r=.30^*$ - p:2

\*  $p < .05$ ; \*\*  $p < .01$ ; \*\*\*  $p < .001$ . p:1 – partialled social intelligence; p:2 = partialled personality. <sup>a</sup> job performance and satisfaction; <sup>b</sup> social network satisfaction; <sup>c</sup> satisfaction with life.



case in relation to the personality domain of neuroticism with correlations in the order of  $-.77$  (Newsome et al., 2000). There are few studies that have investigated the incremental validity of the EQ-i and of these there was a lack of evidence for this aspect of validity. Austin et al. (2005) reported that correlations between the EI measure and (1) social network satisfaction and (2) life satisfaction were non-significant once personality was partialled out. Kobe et al. (2001) reported that the EQ-i was no longer a significant predictor of leadership when social intelligence was partialled out. However, a notable limitation of the latter finding is that the incremental validity of any trait EI measure also needs to be evaluated after controlling for the effects of personality. This was not controlled for in the Kobe (2001) study.

### **2.3.3 Assessing Emotions Scale (AES) Schutte et al. (1998)**

Schutte et al., (1998) developed the Assessing Emotions Scale (AES) based on Salovey and Mayer's (1990) ability EI definition. The AES assesses three factors: "(1) appraising and expressing emotions in the self and others, (2) regulating emotion in the self and others, and (3) using emotions in adaptive ways" (p. 190). As a self-report instrument the AES is interpreted as a trait-based EI measure.

The AES is a reliable instrument. Research indicates good evidence for the convergent and predictive validity of the AES (Table 2.4). The AES has yielded satisfactory to good internal reliability levels generally in the range of  $.70$  and above (Saklofske et al., 2003; Schutte et al., 1998). For convergent validity outcomes, the AES has exhibited a strong positive correlation with the repair subscale of the Trait Meta-Mood Scale of  $r=.68$  (Schutte et al., 1998). The AES has demonstrated good

Table 2.4. Summary of Results for the Assessing Emotions Scale (AES)

Authors	Factor structure	Variance	Reliability	Results	Results
AES Self-report Schutte et al. (1998)	General EI	17.40%	0.90 initial 0.87 replicated  0.78 test-retest	General EI alexithymia total $r=-.65^{***}$ optimism $r=.52^{**}$ pessimism $r=-.43^*$ depression $r=-.37^*$ impulsiveness $r=-.39^{**}$ openness $r=.54^{**}$	Trait Meta-Mood Scale attention $r=.63^{***}$ clarity $r=.52^{***}$ repair $r=.68^{***}$ grade point average $r=.32^{**}$ SAT scores -
AES Self-report Petrides & Furnham (2000)	Optimism/mood Regulation Appraisal of Emotions Social skills Utilisation of Emotions	40.40% Total	n/a	n/a	
AES Self-report Ciarrochi, Chan & Bajgar (2001)				General EI self-esteem $r=.41^{**}$ trait anxiety $r=-.43^{**}$ social support friends $r=.26^{**}$ parents $r=.23^{**}$	social support extended family $r=.36^{**}$ satisfaction $r=.44^{**}$ parental warmth $r=.19^*$ face recognition $r=.18^*$
AES Self-report Ciarrochi et al. (2002)	Perception (self) Managing (self) Managing (others) Utilization		0.80 0.78 0.66 0.58	General EI hassles scale $r=-.15^*$ suicidal ideation $r=-.41^{**}$ depression $r=-.41^{**}$	hopelessness $r=-.57^{**}$

Authors	Factor structure	Variance	Reliability	Results	Results
AES Self-report Charbonneau & Nicol (2002)			0.90 0.78 test-retest	General EI empathy total $r=.22^*$ empathic perspective $r=.38^{***}$ empathic fantasy $r=.45^{***}$	empathic concern $r=.38^{***}$ personality $r=.49^{***}$ interpers EI (self) <sup>a</sup> $r=.58^{***}$
AES Self-report Saklofske et al. (2003)	Optim/mood reg Appraisal Utilization Social skills General EI		0.80 0.79 0.57 0.75 0.89	General EI neuroticism $r=-.37^{***}$ extraversion $r=.51^{***}$ openness $r=-.27^{***}$ agreeableness $r=.18^{**}$ conscientious $r=.38^{***}$ happiness $r=.13^* - p:1$	life satis <sup>b</sup> $r=.19^{**} - p:1$ lonely (family) $r=-.14^* - p:1$ lonely (social) $r=-.13^* - p:1$ lonely (roman) $r=-.12^* - p:1$ depress prone <sup>c</sup> $r=-.14^* - p:1$ social desire <sup>d</sup> $r=.12^*$
AES Self-report Carmeli (2003)				General EI Work outcomes job performance $r=.32^{***}$ withdrawal intent $r=-.20^*$ Work behaviour altruistic behav. $r=.38^{***}$	Work attitudes career commit $r=.38^{***}$ affective commit $r=.24^*$ job satisfaction $r=.27^{**}$ work-fam conflict <sup>e</sup> $r=-.27^{**}$
mAES 12-item scale Chan (2004)	Total EI Empathic sensitivity Positive regulation Positive utilization Emotional appraisal		0.75 0.71 0.61 0.64 0.60	General EI General self-efficacy non-guidance $R^2=.11^{**}$ total $R^2=.10^{**}$	Self-ffic <sup>f</sup> toward helping guidance $R^2=.41^{**}$ total $R^2=.11^{**}$
AES Self-report Spence, Oades & Caputi (2004)				General EI Goal self-integration external $r=-.40^{**}$ introjected $r=-.29^{**}$ identified $r=.38^{**}$	intrinsic $r=.22^*$ Emotional wellbeing negative affect $r=-.21^*$ positive affect $r=.28^{**}$

Authors	Factor structure	Variance	Reliability	Results	Results
AES Self-report Van Rooy, Alonso & Viswesvaran (2005)				General EI extraversion r=.34** emotional stability r=.32**	openness r=.36** conscientiousness r=.36** agreeableness r=.34**

\*  $p < .05$ ; \*\*  $p < .01$ ; \*\*\*  $p < .001$ .  $p:1$  = partialled personality. <sup>a</sup> interpersonal EI (self); <sup>b</sup> life satisfaction; <sup>c</sup> depression proneness; <sup>d</sup> social desirability; <sup>e</sup> work-family conflict; <sup>f</sup> self-efficacy toward helping.

predictive validity with weak to moderate correlations between depression and grade point average (Schutte et al., 1998); and self-esteem, anxiety and social support (Ciarrochi et al., 2001).

In contrast to the aforementioned results, some problems are noted with respect to the factorial, discriminant and incremental validity of the AES (Table 2.4). Factorial outcomes have been inconsistent with the three-factor theory purportedly underlying the AES. Schutte et al. (1998) reported that the AES captures a homogeneous or general EI factor on the basis of the strength and parsimony of the first factor recovered. However, subsequently, Petrides and Furnham (2000) recovered four factors that they labelled: (1) optimism/ mood regulation, (2) appraisal of emotions, (3) social skills, and (4) utilisation of emotions. Other researchers have obtained similar outcomes (Ciarrochi et al., 2002; Saklofske et al., 2003). In addition, the discriminant validity of the AES is equivocal, with moderate correlations with several personality domains. Saklofske et al. (2003) reported weak to moderate correlations ranging from .18 (agreeableness) to .51 (extraversion) and Schutte et al. (1998) reported a moderate positive correlation with openness of .54. Finally, Saklofske et al. (2003) investigated the incremental validity of the AES and found minimal support for this aspect of validity. The AES predicted additional variance in the order of: (1) happiness - 1.3%, (2) life satisfaction - 2.8%, (3) loneliness (family) - 1.4%, (4) loneliness (social) - 1.3%, (5) loneliness (romantic) - 1.2%, and (6) depression - 1.0%.

#### **2.3.4 Trait EI Questionnaire (TEIQue) Petrides and Furnham (2001)**

In keeping with their (2001) definition of EI, Petrides and Furnham

constructed the Trait Emotional Intelligence Questionnaire (TEIQue). The measure provides a total EI score as well as scores on four factors, and 15 subscales. The subscales are: (1) emotion appraisal, (2) emotion expression, (3) trait empathy, (4) assertiveness, (5) self-motivation, (6) adaptability, (7) emotion regulation, (8) emotion management (others), (9) stress management, (10) impulsiveness (low), (11) relationship skills, (12) social competence, (13) self-esteem, (14) trait happiness, and (15) trait optimism.

Investigations of the TEIQue have indicated that the measure is reliable, and there is some support for predictive validity. The internal reliability outcome published to date reports that the TEIQue total score has an alpha coefficient of .86 and initial studies have indicated that the TEIQue is predictive of happiness, and exam performance. Conversely, there is a lack of support for the factorial, convergent, discriminant, and incremental validity (Table 2.5). The TEIQue has purportedly exhibited discriminant validity by virtue of being independently located in Eysenckian factor space, but not in relation to the Big Five. Results relating to the factorial, convergent, and incremental validity of the TEIQue have not yet appeared in the literature.

### **2.3.5 The Emotional Intelligence Questionnaire (TEIQ) Tsaousis (2003)**

A self-report measure of EI, the Emotional Intelligence Questionnaire (TEIQ) provides an overall EI score as well as an assessment of four dimensions of EI in

Table 2.5. Summary of Results for the Trait Emotional Intelligence Questionnaire (TEIQue)

Authors	Factor structure	Variance	Reliability	Results	Results
TEIQue Self-Report Petrides & Furnham (2003)	n/a		0.86 Total score	TEIQue total score neuroticism $r=-.70^{**}$ extraversion $r=.68^{**}$ Openness $r=.44^{**}$ conscientiousness $r=.34^{**}$ TEIQue total score neuroticism $r=-.73^{**}$	extraversion $r=.69^{**}$ openness $r=.47^{**}$ Negative mood induction high v low EI - ns Positive mood improvement high EI $M=-34.06^{**}$ low EI $M=-23.13^{**}$
sTEIQue Self-Report Furnham & Petrides (2003)				Happiness WAIS <sup>a</sup> $r=.26^*$ STEIQue $r=.70^{**}$ neuroticism $r=-.37^{**}$	extraversion $r=.33^{**}$ openness $r=.38^{**}$ Happiness sTEIQue $R^2=.54$ ( $t=5.19^*$ )
TEIQue Self-Report Petrides et al. (2004)				TEIQue total & exam performance English exam TEIQue $F(3,656)=421.56^{**}$ Low IQ/EI v high IQ/low EI maths exam $F=236.97^{**}$ science exam $F=198.03^{**}$ english exam $F=157.76^{**}$ general cert <sup>b</sup> . $F=120.14^{**}$	Low IQ/high EI v high IQ/EI maths exam $F=194.68^{**}$ science exam $F=146.24^{**}$ english exam $F=178.39^{**}$ general cert <sup>b</sup> . $F=147.49^{**}$ Low EI > high EI unauthor. Absent <sup>c</sup> $t=3.20^{**}$ Low EI > high EI suspended x2 =3.05* suspended x2 =5.73*

\*  $p < .05$ ; \*\*  $p < .01$ ; \*\*\*  $p < .001$ . <sup>a</sup> Wechsler Adult Intelligence Scale; <sup>b</sup> general certificate; <sup>c</sup> unauthorized absenteeism.

accordance with Mayer and Salovey (1997). The four dimensions are: (1) perception and appraisal of emotions, (2) control of emotions, (3) understanding and reasoning of emotions, and (4) use of emotion for problem solving (Tsaousis, 2003).

There is good evidence for the reliability and for the predictive validity of the TEIQ. However, there are concerns regarding its factorial, convergent, discriminant and incremental validity (Table 2.6). Internal reliability levels have ranged from .77 to .95. The TEIQ has demonstrated good predictive validity in relation to stress, general health, and well-being variables. To date, outcomes relating to the factor structure, and convergent validity of the TEIQ are unpublished, and remain inaccessible for evaluation. The discriminant validity of the TEIQ is problematical in terms of the Big Five personality domains, with correlations in the order of  $r = -.66, p < .01$  for neuroticism. Investigation of the incremental validity of the TEIQ has largely been overlooked. For instance, the TEIQ was identified as a significant predictor of stress and well-being. But the proportion of stress and well-being variance accounted for by the TEIQ before and after personality were controlled for has not investigated.

### **2.3.6 Summary of Trait-Based EI Measures**

From an overall analysis of trait-based EI instruments, there is good support for the reliability, convergent and predictive validity of the measures. Results of other aspects of trait-based EI validity are less convincing. In particular, factorial,



Table 2.6. Summary of Results for The Emotional Intelligence Questionnaire (TEIQ)

Authors	Factor structure	Variance	Reliability	Results	Results
TEIQ Self-Report Tsaousis (2003)	Definition only TEIQ total Perception Control Understanding Use			TEIQ total Empathy Alexithymia Mood	
TEIQ Self-Report Nikolaou & Tsaousis (2002)	Definition only TEIQ total Perception Control Understanding Use		0.95 0.81 0.94 0.90 0.95	TEIQ total and stress work relations $r = -.52^{**}$ overload $r = -.50^{**}$ control $r = -.55^{**}$ resources $r = -.43^{**}$ pay & benefit $r = -.29^{**}$ your job $r = -.37^{**}$ job stress $r = -.59^{**}$ commit of e/ee <sup>a</sup> $r = .53^{**}$ commit or org <sup>b</sup> $r = .46^{**}$ Low EI < High EI and stress work relations $t = 5.68^{**}$	overload $t = 5.44^*$ control $t = 6.15^{**}$ resources $t = 4.21^{**}$ pay & benefit $t = 4.14^{**}$ your job $t = 4.31^{**}$ job stress $t = 6.86^{**}$ EI subscales and job stress perception $\beta = -.22^{**}$ control $\beta = -.20^{**}$ use $\beta = -.16^*$
TEIQ Self-Report Vakola, Tsaousis & Nikolaou (2004)	Definition only TEIQ total Perception Control Understanding Use		0.94 0.81 0.93 0.89 0.91	TEIQ total Big Five extraversion $r = .53^{**}$ Neuroticism $r = -.65^{**}$ openness $r = .20^*$ agreeableness $r = .41^{**}$ conscientiousness $r = .39^{**}$	Understanding extraversion $r = .41^{**}$ openness $r = .31^{**}$ agreeableness $r = .41^{**}$ conscientiousness $r = .39^{**}$ Use extraversion $r = .59^{**}$

Authors	Factor structure	Variance	Reliability	Results	Results
				Perception extraversion $r=.39^{**}$ openness $r=.23^{**}$ agreeableness $r=.32^{**}$ conscientiousness $r=.38^{**}$ Control extraversion $r=.21^*$ neuroticism $r=-.78^{**}$ conscientiousness $r=.43^{**}$	neuroticism $r=-.66^{**}$ agreeableness $r=.29^{**}$ conscientiousness $r=.49^{**}$ TEIQ total change attitude $r=.53^{**}$ job satisfaction $r=.18^*$ turnover $r=-.23^{**}$ EI subscales & change attitude use $\beta=.49$ sig. na
TEIQ Self-Report Tsaousis & Nikolaou (2005)	Definition only TEIQ total Perception Control Understanding Use		0.92 0.77 0.87 0.85 0.91	TEIQ total poor health $r=-.32^{**}$ anxiety $r=-.42^{**}$ social dissatisfaction $r=-.38^{**}$ depression $r=-.48^{**}$ health (GHQ) $r=-.49^{**}$ physical health $r=-.44^{**}$ psychological health $r=-.65^{**}$ health (ASSET) $r=-.63^{**}$ smoking $r=-.16^*$	exercise $r=.33^{**}$ relaxation time $r=.43^{**}$ EI subscales & poor health perception $\beta=-.19^{**}$ control $\beta=-.25^{**}$ use $\beta=-.17^{**}$ understanding $\beta=-.12^{**}$ EI subscales & health (GHQ) control $\beta=-.45^{**}$ use $\beta=-.21^{**}$

\*  $p < .05$ ; \*\*  $p < .01$ ; \*\*\*  $p < .001$ . <sup>a</sup> commitment of employee; <sup>b</sup> commitment of organization.

discriminant validity are problematic. Likewise, incremental validity outcomes are less than convincing with between 1% to 2.8% of additional variance being accounted for in relation to well-being indices. Research to assess the impact of personality domains such as the Big Five on trait EI measures is vital to facilitate an evaluation of incremental validity and hence the extent to which the construct is, or is not, redundant.

#### 2.4 A Review of Abilities-Based Emotional Intelligence Measures

The following review focuses on evaluating abilities-based EI measures. In the main there is good evidence for convergent, discriminant, and predictive validity with incremental validity outcomes ranging from 3% to 10%. However, there are questions surrounding the best method of scoring performance-based EI measures. The questions are related to low internal reliability results at the subtest level and recovered factor structures that have been inconsistent with underlying theoretical models. A summary of the psychometric properties of abilities-based measures of EI is presented in Table 2.7.

**Table 2.7. Summary of Abilities-Based Measures of Emotional Intelligence**

<b>Abilities-based EI measures</b>	<b>D</b>	<b>R</b>	<b>FV</b>	<b>CV</b>	<b>DV</b>	<b>PV</b>	<b>IV</b>
EPQue - Emotional Perception Questionnaire Mayer, DiPaolo & Salovey (1990)				√	√		
EARS - Emotional Accuracy Research Scale Mayer & Geher (1996)				√		√	
MEIS - Mayer Emotional Intelligence Scale Mayer et al. (1999)	√			√	√	√	
MSCEIT - Mayer, Salovey, Caruso EI Test Mayer, Salovey et al. (2000c)	√			√	√	√	√

D=definition; R=reliability; FV=factorial validity; CV=convergent validity; DV=discriminant validity; PV=predictive validity; and IV=incremental validity

#### **2.4.1 Emotional Perception Questionnaire (EPQue) Mayer et al. (1990)**

The EPQue is a performance based measure of EI based on Salovey and Mayer's (1990) definition of the construct, and it assesses one aspect of the model: the perception of other people's emotions (Mayer et al., 1990). This measure of EI thus provides a limited operationalisation of the construct. A consensus method of scoring participants' responses has been adopted whereby an individual receives 1 point for each response that is within 1 scale-point of the modal response. For example, if the modal response to an item is 3, then any response from 2 – 4 is considered consensual. This particular type of consensual scoring has been questioned, however, because the scoring of a respondent's answers may be artificially inflated because more than one "correct" answer to a problem is possible. Moreover, the notion of consensual scoring overall has been the subject of debate. Roberts et al. (2001) questioned the veracity of consensually scored responses. They contended that what might be a consensus response for one group may not be so for another group. Further criticisms of consensus scoring include that participants' responses may be influenced by cultural beliefs and that the approach assumes large numbers of observations can be pooled (Roberts et. al., 2001).

At a psychometric level, analysis of the EPQue has revealed that the reliability levels of the instrument are suboptimal and the factor analytical outcome is less than convincing. The internal reliability of the EPQue is lower than desirable at .63 (Mayer et al., 1990). Therefore confidence in the consistency of participants' responses is diminished, and this is an ongoing issue for performance-based consensually scored

measures of EI. According to the test developers, factor analysis provided evidence of a single unifactorial solution representing emotion perception. But a key limitation of this finding is that a minimal proportion of variance (2.5%) was accounted for. By this account, 97.5% of the variance in test scores remains unexplained.

Against this, there is tentative evidence for the convergent, and discriminant validity of the measure. Mayer et al. (1990) maintained that the EPQue exhibits convergent validity in relation to empathy  $r=.33, p<.01$ , and discriminant validity in relation to the Big Five by virtue of a weak positive correlation with extraversion of  $r=.15, p<.05$ . But the difficulties associated with the reliability, and factor structure of the EPQue raise doubts about these claims. The incremental validity of the EPQue before and after controlling for the effects of personality and cognitive ability has not been reported.

#### **2.4.2 Emotional Accuracy Research Scale (EARS) Mayer and Geher (1996)**

Mayer and Geher (1996) developed the Emotional Accuracy Research Scale (EARS) as a paper and pencil performance measure of EI. The scale assesses the perception of other people's emotions in accordance with Salovey and Mayer's (1990) model of EI. This is also a limited operationalisation of EI because the EARS assesses only one aspect of the construct. There are two approaches adopted in the scoring of participants' responses. The first of these is referred to as "target agreement" where a target person's self-reported emotion forms the basis of a correct answer. However, there are potential problems with target scoring. Specifically, the target person may lack insight into their emotions, or distort their responses so that they are perceived

positively (Mayer & Geher, 1996). A second method of scoring is termed “consensus agreement”. In this instance, the modal score for each item is calculated and then the number of instances that participants choose the modal score is summed. As with the EPQue, the veracity of consensually scored questions is problematic.

Two studies that have investigated the EARS have indicated that there are difficulties associated with the reliability of the measure, but some support for convergent and predictive validity. No other elements of validity have been assessed. Internal reliability levels are equivocal, being .24 for target scores, and .53 for consensus scores (Mayer & Geher, 1996). In contrast, Geher, Warner and Brown (2001) recorded a consensual reliability level of .80. The convergent validity outcomes revealed that consensually scored responses were negatively correlated with state empathy  $r = -.18, p < .01$ ; and positively with trait empathy  $r = .24, p < .001$  (Mayer & Geher, 1996). But it is questionable whether correlations of this magnitude are able to demonstrate that the EARS converges with the measure of empathy. With respect to predictive validity outcomes, Mayer and Geher (1996) reported that the EARS was positively correlated with SAT scores  $r = .26, p < .01$ . In addition, Geher et al. (2001) reported that the EARS accounted for unique variance in a real-life perception of emotion situation.

#### **2.4.3 Mayer Emotional Intelligence Scale (MEIS) Mayer et al. (1999)**

The Mayer Emotional Intelligence Scale (MEIS) was the first performance-based measure of EI that was devised to assess the four-branch definition of EI described by Mayer and Salovey (1997). The MEIS provides an overall EI score, four

branch scores, and 12 subtest scores. Branch 1 assesses the perception of emotions on four subtests including (1) faces, (2) music, (3) designs, and (4) stories. Branch 2 provides a measure of the utilization of emotions in relation to a (5) synesthesia task, and (6) feeling biases task. Branch 3 examines the understanding of emotions factor in four tasks labelled (7) blends, (8) progressions, (9) transitions, and (10) relativity. Branch 4 measures the regulation of emotions via two tasks labelled emotion management in (11) the self and (12) others.

The MEIS is scored according to consensus, expert, and target scoring protocols. An updated method of consensus scoring deems an item to be correct to the extent that the majority of a standardization sample endorses that item (Mayer et al., 1999). By way of example, if 25% of the sample group selects “5” (5-point Likert scale) to indicate that they strongly agree that happiness is evident in a facial expression, then respondents receive a score of .25 for that item. The second approach to scoring abilities-based measures of EI is called “expert” scoring, whereby experts in the field of EI judge an answer to an item to be correct or incorrect (Mayer et al., 1999). In the case of the MEIS, two experts, namely the test developers, determined correct and incorrect answers. But a notable limitation of expert scoring is that theorists may draw on different domains of expertise, and this can lead to disagreement amongst judges as to which answer is correct (Roberts et al., 2001). The third method of scoring the MEIS is termed “target” scoring where a target person’s self-reported emotions are taken as the correct answer to a problem (Mayer et al., 1999). Mayer and colleagues have contended that, although the three methods of scoring are related, the

consensus method has most consistently exhibited the highest criterion validity, and is therefore the basis of their reported results.

On a positive note, the MEIS has demonstrated good convergent, discriminant, and predictive validity, although only weak incremental validity (Table 2.8). The MEIS was moderately positively correlated with empathy (Ciarrochi et al., 2000; Mayer et al., 1999) and IQ (Mayer et al., 1999; Roberts et al., 2001). However, Ciarrochi et al. (2000) recorded a nonsignificant correlation between the MEIS and a measure of “g”, and this represents a problem for any measure of mental ability. The MEIS was distinguishable from the Big Five (Ciarrochi et al., 2000; Roberts et al., 2001) and 16PF personality domains (Caruso, Mayer & Salovey, 2002). Somewhat surprisingly, however, the MEIS was weakly *negatively* related to extraversion (Roberts et al., 2001). Predictive validity was indicated by weak positive correlations with self-esteem (Ciarrochi et al., 2000) and interpersonal relationships (Caruso et al., 2002). In terms of incremental validity, Ciarrochi et al. (2000) reported that the MEIS was significantly correlated with life satisfaction and relationship quality after intelligence and personality were partialled out. However, the effect was weak being  $r=.19$  and  $r=.22$ ,  $p<.05$  respectively. Of the remaining study that examined the incremental validity of the MEIS, the effects of intelligence and empathy were controlled for but not personality (Mayer et al., 1999).

The most notable limitations of the MEIS relate to the reliability of various subtests, a lack of convergence between consensus and expert scores, and



Table 2.8. Summary of Results for the Mayer Emotional Intelligence Scale (MEIS)

Authors	Factor structure	Variance	Reliability	Results	Results
MEIS Performance Mayer et al. (1999)	Definition only Branch 1 - perception Faces Music designs Stories Branch 2 - facilitation synesthesia feeling biases Branch 3 - understand Blends progressions transitions relativity Branch 4 - regulation Others Self Factor Structure General EI Understand/Facilitate Perception Regulation		Consensus scores 0.89 0.94 0.90 0.85  0.86 0.70  0.49 0.51 0.94 0.78  0.72 0.70  0.96 0.96 0.92 0.81	Scoring - consensus & expert branch 1 $r=.70^{***}$ branch 2 $r=.64^{***}$ branch 3 $r=.61^{***}$ branch 4 $r=.80^{***}$ Scoring - consensus & target perception faces $r=.61^{***}$ perception designs $r=.70^{***}$ perception stories $r=.80^{***}$ Internal reliability expert .35 to .86 target .61 to .88 Gender differences females > males all 12 tasks Positive manifold consensus .07 to .68 expert .00 to .54 Total EI - adults self improvement $r=-.10^*$ - p:1 culture seeking $r=-.09^*$ - p:1	Adults > Adolescents overall $F=25.6^{**}$ perception faces $F=5.2^*$ facilitation synesthesia $F=.78^{**}$ understanding blends $F=52.2^{**}$ Total EI - adolescents verbal IQ $r=.45^{***}$ empathy $r=.37^{***}$
MEIS Performance Ciarrochi et al. (2000)	Definition only Branch 1 - perception Faces Music/designs		0.82 0.88	Total EI empathy $r=.43^{**}$ extraversion $r=.26^{**}$ open to feelings $r=.24^{**}$	High EI > positive mood recall in positive mood $t(104)=3.45^{**}$ High EI > positive mood recall in negative mood $t(104)=2.34^*$

Authors	Factor structure	Variance	Reliability	Results	Results
	Stories Branch 2 - facilitation synesthesia Feeling biases Branch 3 - understand Blends progressions transitions relativity Branch 4 - regulation Others Self Factor Structure General EI Perception Fac/Under/Reg		0.76  0.59 0.67  0.35 0.46 0.52 0.66  0.55 0.43	self-esteem $r=.31^{**}$ life satisfaction $r=.28^{**}$ relationship quality $r=.19^*$ Total EI life satisfaction $r=.19^*$ - p:2 relationship quality $r=.22^*$ - p:2 Perception parental warmth $r=.22^*$ - p:2 Gender differences Females > Males overall EI $F(1,132)=14.87^{**}$ perception $F(1,132)=6.69^*$ Fac/Und/Reg <sup>a</sup> $F(1,132)=9.43^{**}$ EI and Mood - Low v High EI Low EI > positive judgements in negative mood $t(108)=3.7^{**}$	Perception moderate mood $F(2,104)=7.78^{**}$ Mood x EI interaction - p:3 $F(2,87)=7.90^{**}$ Mood Induct <sup>b</sup> . - Low v High EI High EI > mood variation positive v neutral $t(108)=.25^{**}$ High EI > mood variation positive v negative $t=2.86^{**}$ Fac/Und/Reg moderate induct <sup>c</sup> . $F(2,108)=4.24^*$ Mood x EI interaction - p:4 $F(2,85)=3.40^*$
MEIS Performance Roberts et al. (2001)	Branch 1 - perception Faces Music designs Stories Branch 2 - facilitation synesthesia Feeling biases Branch 3 - understand Blends progressions		.81/.68 .85/.68 .84/.72 .72/.70  .84/.76 .66/.63  .38/.26 .37/.45	EI subtasks - EFA Consensus scores Perception 28% Regulation 12% Understanding 4% Expert scores Perception 21% Understanding 6% Regulation 5% EI subtasks - CFA Four-factor model	Consensus scores neuroticism $r=-.18^*$ conscientiousness $r=.16^*$ agreeableness $r=.24^*$ extraversion $r=-.13^*$ openness $r=.13^*$ Expert scores openness $r=.15^*$ Consensus scores Perception IQ $\beta=-.08^*$

Authors	Factor structure	Variance	Reliability	Results	Results
	transitions relativity Branch 4 - regulation Others Self		.57/.47 .68/.69 .66/.55 .68/.52 Cons/expert	Consensus scores x <sup>2</sup> (48,656)=171.19*** Expert scores x <sup>2</sup> (48,656)=158.98*** Total EI & subscales Consensus & expert scores range r=.02 - .80 EI subtasks Consensus & expert scores range r=-.22 to .96 EI subtasks - EFA Consensus & expert scores factor 1 - consensus 27% factor 2 - expert 20% Total EI & gender differences Consensus scores females > males t(691)=-2.10* Expert scores males > females t(691)=2.01* Total EI & cultural differences Expert scores white > ethnic t(688)=7.39*** Total EI & IQ Consensus scores ASVAB r=.32* Expert scores ASVAB r=.43*	agreeableness β=.15** extraversion β=.09* Utilization IQ β=.10* Understanding - IQ β=.39** agreeableness β=-.10* openness β=.19** Regulation agreeableness β=.29** conscientiousness β=.21** extraversion β=.14** Expert scores - Perception IQ β=.10* neuroticism β=.13** agreeableness β=-.12** conscientiousness β=-.10* extraversion β=-.16** Utilization IQ β=.10* neuroticism β=-.09* Understanding IQ β=.30** agreeableness β=-.08* conscientiousness β=.14** openness β=.20** Regulation IQ β=.09*; extraversion β=.10*

Authors	Factor structure	Variance	Reliability	Results	Results
MEIS Performance Caruso et al. (2002)	Definition only General EI Branch 1 - perception Faces Music designs Stories Branch 2 - facilitation synesthesia feeling biases Branch 3 - understand Blends progressions transitions relativity Branch 4 - regulation Others Self Combined FA Sociability EI Interest Neuroticism Rationality	55%	.95/.96 .94/.96 .85/.88 .87/.89 .85/.92 .78/.85 .84/.85 .85/.85 .60/.71 .74/.80 .34/.52 .31/.40 .58/.57 .69/.76 .76/.78 .72/.64 .61/.68	Total EI & 16PF extraversion $r=.16^*$ tough mindedness $r=-.21^{**}$ reasoning $r=.21^{**}$ sensitivity $r=.22^{**}$ vigilance $r=-.17^*$ self-reliance $r=-.16^*$ Total EI & career interests social $r=.15^*$ enterprising $r=-.17^*$ Total EI & interpers relate <sup>d</sup> inclusion $r=.26^{**}$ expressed inclusion $r=.19^*$ wanted inclusion $r=.26^{**}$ affection $r=.16^*$ wanted affection $r=.20^{**}$  16PF extrav; tough minded; MEIS 4 branches Career interests 16PF anxiety; 16PF self control; tough minded	

\*  $p < .05$ ; \*\*  $p < .01$ ; \*\*\*  $p < .001$ . p:1 = partialled intelligence and empathy; p:2 = partialled intelligence and personality; p:3 = partialled self-esteem; p:4 = partialled extraversion and neuroticism. <sup>a</sup> facilitation/understanding/regulation; <sup>b</sup> mood induction; <sup>c</sup> facilitation/understanding/regulation moderate induction; <sup>d</sup> Total EI & interpersonal relationships.

difficulties with factorial validity outcomes (Table 2.8). Internal reliability levels have been reported as satisfactory for overall scores, and for the four theorized factors but this has not been the case for several subtests. Results of internal reliability outcomes for MEIS consensus scores have ranged from a low of .31 for the progressions subtest (understanding of emotions) to a high of .87 for the perception of emotions (music subtest) (Caruso et al., 2002). Outcomes for expert scoring have been lower still ranging from .26 for the blends subtest (understanding of emotions) to .76 for the synesthesia subtest (utilization of emotions) (Roberts et al., 2001). The interpretation of reliability outcomes for the MEIS is further confounded by a lack of convergence between consensus and expert scores. Roberts et al. (2001) recorded that correlations between the two scoring methods ranged from  $-.16$  to  $.95$  with only half of them exceeding  $r = .52$ . In addition, results pertaining to the factorial validity of the MEIS have been equivocal. Researchers have been unable to recover a factor structure that is consistent with the theorized four-factor model. Mayer et al. (1999) and Roberts et al. (2001) identified a three-factor outcome, whereas Ciarrochi et al. (2000) recovered a two-factor outcome.

#### **2.4.4 Mayer Salovey Caruso EI Test (MSCEIT) Mayer et al. (2000c)**

The performance measure of ability EI, the Mayer, Salovey, Caruso Emotional Intelligence Test (MSCEIT) was developed by Mayer and colleagues in 2000. The MSCEIT, like the MEIS, is based on Mayer and Salovey's (1997) definition of EI, and provides an overall EI measure, four branch scores, and eight subtest scores. The first branch assesses the perception of emotions in (1) faces, and (2) designs; branch two

measures the utilization of emotions via a (3) synesthesia task, and (4) facilitation task. Branch three assesses the understanding of emotions in a (5) relativity subtest, and (6) blended emotions task. Branch four provides a measure of the regulation of emotions in (7) oneself, and (8) in other people.

Three approaches are adopted for the scoring of participants' responses, and each has their respective advantages and disadvantages as outlined in the review of the MEIS. The first method of scoring is in accordance with consensus protocols. The second method, termed expert scoring, is where a panel of 21 experts determined the correct answers to problems. Although an increase in the number of expert scorers' from two on the MEIS to 21 in the MSCEIT is an improvement, there are nonetheless concerns that 21 scorers reflect a pooled response, and in that sense expert scoring is conceptually no different than consensus scoring. The third method is termed target scoring.

Like its predecessor, the MSCEIT has exhibited reasonable convergent, discriminant, predictive and incremental validity (Table 2.9). The MSCEIT has demonstrated weak to moderate degrees of convergence with IQ (Lopes et al., 2003; Mayer et al., 2000c) and weak correlations with two trait-based measures of EI, the TMMS and EQ-i (Brackett & Mayer, 2003; Lopes et al., 2003). There is also good evidence for the discriminant validity of the MSCEIT with weak correlations with the Big Five personality domains (Brackett & Mayer, 2003; Lopes et al., 2003; Schulte et al., 2004). The predictive validity of the MSCEIT was indicated by a moderate positive correlation with life satisfaction (Mayer et al., 2000c).

Table 2.9. Summary of Results for the Mayer Salovey Caruso Emotional Intelligence Test (MSCEIT)

Authors	Factor structure	Variance	Reliability	Results	Results
MSCEIT Perform. Mayer et al. (2000)	General EI Perception faces pictures Utilization synesthesia facilitation Understanding changes blends Regulation self others	n/a	0.90 0.87 0.82 0.85 0.76 0.62 0.67 0.73 0.65 0.52 0.82 0.78 0.64	Total EI - age differences 17-21 M=100.10 22-29 M=97.79 30-39 M=100.60 40-49 M=102.10 50+ M=101.65 Total EI - culture differences white M=101.56 black M=99.90 asian M=101.44 Positive manifold range .17 to .53	Total EI & IQ army alpha vocab $r=.36^{**}$ wonderlic $r=.59^{**}$ grade point average $r=.53^{**}$ self-reported intelligence $r=.38^*$ Total EI AES $r=.35^{**}$ Total EI life satisfaction $r=.61^{**}$
MSCEIT Perform. Brackett & Mayer (2003)	General EI		0.86 test-retest	Total EI females > males $t(200)=-5.69^{***}$ Total EI AES $r=.18^{**}$ EQ-i $r=.21^{**}$ openness $r=.25^{***}$ agreeableness $r=.28^{***}$ Psyche wellbeing $r=.28^{***}$ SAT verbal $r=.32^{***}$ Total EI EQ-i interpersonal $r=.28^{***}$ EQ-i adaptability $r=.16^*$ EQ-i stress manage $r=.15^*$	Total EI EQ-i interpersonal $r=.19^*$ - p:1 Total EI agreeableness and openness $R^2=.38^{***}$ psyche wellbeing (personal growth) $R^2=.37^{***}$ Combined factor analysis EQ-i; neuro; consc; wellbeing <sup>a</sup> MSCEIT; SAT; agreeable <sup>b</sup> AES; wellbeing; open; extra <sup>c</sup> Total EI social deviance $r=-.20^{**}$ - p:1

Authors	Factor structure	Variance	Reliability	Results	Results
MSCEIT Perform. Mayer, Salovey, Caruso & Sitarenios (2003)	General EI Perception faces pictures Utilization synesthesia facilitation Understanding changes blends Regulation self others		.93/.91 .91/.90 .80/.82 .88/.87 .79/.76 .64/.63 .65/.55 .80/.77 .70/.68 .66/.62 .83/.81 .69/.64 .67/.64 cons/expert	Confirmatory factor analysis $\chi^2(15)=94.28$ Consensus v expert scoring $r=.90$ $z(703)=.99^{**}$ Expert interrater agreement 2 subgroups $k(110)=.84$ 2 match.controls $k(110)=.71/.79$ 2 subgroup average $k(210)=.43$ 2 controls $k=.31/.38$ Total EI expert > consensus $F(1,1984)=3463^{***}$ Branch scores expert > consensus $F(3,5952)=1418^{***}$	branch x scoring interaction $F(3,5952)=2611^{***}$ branch 1 $F(1,1984)=1631^{***}$ branch 3 $F(1,1984)=5968^{***}$ consensus > expert branch 2 $F(1,1984)=711^{***}$ Consensus v expert scoring $r(2004-2028)=.96$ to $.98$ across general EI and branches Positive manifold $r(1995-2111)=.17$ to $.59^{**}$
MSCEIT Perform. Lopes et al. (2003)	Definition only Total EI Perception Utilization Understanding Regulation		0.88 0.89 0.74 0.67 0.60	Total EI agreeableness $r=.32^*$ conscientiousness $r=.23^*$ openness $r=-.22^*$ friend -ve interaction $r=-.45^*$ Perception friend -ve interaction $r=-.25^*$ Utilization verbal SAT $r=-.22^*$ agreeableness $r=.24^*$ openness $r=-.28^*$	Regulation agreeableness $r=.33^*$ conscientiousness $r=.24^*$ openness $r=-.22^*$ TMMS repair $r=.27^*$ social skills $r=.24^*$ positive relations $r=.27^*$ parental social support $r=.22^*$ friend -ve interaction $r=-.36^*$ Regulation positive relations $\beta=.22^{**}$ - p:1



Authors	Factor structure	Variance	Reliability	Results	Results
				friend -ve interaction $r=-.33^*$ Understanding verbal IQ $r=.39^*$ verbal SAT $r=.36^*$ conscientiousness $r=.22^*$ TMMS repair $r=.21^*$ friend -ve interaction $r=-.36^*$	parental support $\beta=.22^*$ - p:1 Utilization friend -ve interact $\beta=-.21^*$ - p:1 Understanding friend -ve interact $\beta=-.23^*$ - p:1 Regulation friend -ve interact $\beta=-.20^*$ - p:1
MSCEIT Perform. Schulte, Ree & Carretta (2004)				Total EI IQ $r=.45^*$ neuroticism $r=-.28^*$ extraversion $r=.18^*$ openness $r=.27^*$ agreeableness $r=.27^*$ conscientiousness $r=.22^*$	Total EI IQ, Big Five, Sex $R^2=.63^*$ IQ, Big Five $R^2=.57^*$ IQ $R^2=.45^*$ IQ, Big Five composite, Sex $R^2=.62$ IQ, agreeable, sex $R^2=.61$
MSCEIT Perform. Day & Carroll (2004)	Perception/Under/ Regulation Perception/Utilize	41.40% 13.70%		Confirmatory factor analysis two-factor model $\chi^2(19)=40.35^{**}$ four-factor model $\chi^2(14)=34.20^{**}$ Perception openness $r=.18^{**}$ gender $r=.24^{**}$ age $r=-.14^*$ study year $r=.13^*$ group sportsmanship $r=.17^{**}$ individual performance $r=.17^{**}$ Utilization	study year $r=.13^*$ group civic virtue $r=.14^*$ group sportsmanship $r=.21^{***}$ Understanding extraversion $r=-.15^*$ openness $r=.13^*$ gender $r=.18^{**}$ group civic virtue $r=.17^{**}$ group sportsmanship $r=.19^{**}$ Regulation openness $r=.23^{***}$ agreeableness $r=.16^{**}$ gender $r=.30^{***}$

Authors	Factor structure	Variance	Reliability	Results	Results
				extraversion $r = -.11^*$ openness $r = .18^{**}$ gender $r = .22^{***}$	study year $r = .17^{**}$ group civic virtue $r = .14^*$ group sportsmanship $r = .32^{***}$
MSCEIT Perform. Warwick & Nettelbeck (2004)				MSCEIT total difficult id feeling <sup>d</sup> $r = -.33^{**}$ difficult express feeling <sup>e</sup> $r = -.28^{**}$ MSCEIT utilization agreeableness $r = .34^{**}$ MSCEIT regulation TMMS attention $r = .25^*$ agreeableness $r = .27^*$ abstract reasoning $r = .26^*$ TMMS total difficult id feeling <sup>d</sup> $r = -.49^{**}$	difficult express feeling <sup>e</sup> $r = -.61^{**}$ task orientation $r = .29^{**}$ TMMS attention extraversion $r = .34^{**}$ openness $r = .29^{**}$ agreeableness $r = .34^{**}$ TMMS clarity neuroticism $r = -.47^{**}$ TMMS repair extraversion $r = .41^{**}$ agreeableness $r = .41^{**}$
MSCEIT Perform. Bastian, Burns & Nettelbeck (2005)	Definition only Total Perception Utilization Understanding Regulation		0.83 0.91 0.68 0.45 0.49	MSCEIT total ravens <sup>f</sup> $r = .27^{**}$ phonetic word test $r = .26^{**}$ openness $r = .23^{**}$ agreeableness $r = .19^{**}$ satis with life <sup>g</sup> $r = .14^*$ anxious thoughts $r = -.24^*$ TMMS total neuroticism $r = -.37^{**}$ extraversion $r = .61^{**}$ openness $r = .43^{**}$ agreeableness $r = .23^{**}$	satis with life <sup>g</sup> $r = .48^{**}$ anxious thoughts $r = -.22^{**}$ prob solving <sup>h</sup> $r = -.55^{**}$ coping $r = .36^{**}$ Satis with life <sup>g</sup> TMMS clarity $\beta = .13^* - p:1$ TMMS repair $\beta = .19^* - p:1$ Coping TMMS R2 change = .04* - p:1 AES R2 change = .06* - p:1 Anxious thoughts MSCEIT R2 change = .06* - p:1

\*  $p < .05$ ; \*\*  $p < .01$ ; \*\*\*  $p < .001$ .  $p:1$  = partialled intelligence and personality. <sup>a</sup> EQ-i, neuroticism, conscientiousness and wellbeing; <sup>b</sup> MSCEIT, SAT, agreeableness; <sup>c</sup> AES, wellbeing, openness and extraversion; <sup>d</sup> difficulty identifying feelings; <sup>e</sup> difficulty expressing feelings; <sup>f</sup> Ravens Progressive Matrices; <sup>g</sup> satisfaction with life; <sup>h</sup> problem solving.

Evidence for the incremental validity of the MSCEIT has ranged from 3% to 10%. Brackett and Mayer (2003) reported weak negative correlations between the MSCEIT and social deviance of  $r = -.20, p < .01$  after verbal SAT and the Big Five were controlled for. Incremental validity was calculated by computing partial correlations between the EI test and the criterion variable. Lopes et al. (2003) conducted multiple regression analyses to investigate the incremental validity of the MSCEIT by entering the Big Five and verbal intelligence into the regression equation first followed by the MSCEIT branch scores. The outcome was weak positive correlations between the MSCEIT and (1) parental support and (2) positive relations but weak negative correlations between three of the four EI subscales and negative interactions with friends. The additional variance accounted for by the MSCEIT ranged from 3% to 10%. Finally, Bastian et al. (2005) reported that, following regression analysis, the MSCEIT total score accounted for anxious thought variance in the order of 6% after personality and intelligence were partialled out.

In the main, internal reliability levels and factorial validity outcomes for the MSCEIT were improved compared to the MEIS but some of the results were still lower than desirable (Table 2.9). The consensually scored internal reliability estimates for the MSCEIT ranged from .52 for the blends subtest (understanding of emotions) to .88 for the pictures task on the perception of emotions (Mayer et al., 2000c). For expert scores, the range of internal reliability levels was similar, ranging from .55 for the facilitation subtest (utilization of emotions) to .87 for the pictures subtest (perception of emotions) (Mayer et al., 2003). On a more positive note, Mayer et al. (2000c) reported a correlation of .98 between consensus scores and expert scores with respect to the MSCEIT.

However, ultimately the lower than desirable reliability levels negatively impacts on the confidence with which assertions can be made about the measure. With respect to the factorial validity of the MSCEIT, Mayer et al. (2000c) recovered a general EI factor, and a two-factor as well as a four-factor solution. The authors adopted the four-factor solution on the basis that it was consistent with the original theoretical model. However, this contravenes a key objective of factor analysis, to seek the most parsimonious explanation for a data set. In essence, the two-factor solution is preferred provided that the factors are clear and interpretable. Moreover, Day and Carroll (2004) recovered two factors that they subsequently labelled (1) perception/understanding/regulation of emotions, and (2) perception/utilization of emotions.

#### **2.4.5 Summary of Abilities-Based EI Measures**

The major difficulty for proponents of ability EI relate to suboptimal internal reliability levels, particularly at the subtest level, and to problems surrounding the factor structure of measures. Despite this, abilities-based measures of EI have generally demonstrated some evidence for convergent, discriminant and predictive validity. Results pertaining to the incremental validity of these measures have been in the order of 3% to 10%.

#### **2.5 Conclusion**

The measurement of EI is still in its infancy and further research is necessary to refine the definition and measurement of the construct. The EI construct shows early promise in relation to well-being and quality of life variables. But the capacity of EI test scores to account for additional variance over and above that accounted for by existing measures of personality and/or abilities in relation to criterion variables requires further

investigation. That said, there are several areas that need addressing for the field to advance. Trait-based conceptualisations of EI need to focus on the development of test-items that are distinct from existing personality domains and investigate the incremental validity of measures. Conversely, abilities-based definitions of EI need to address issues associated with reliability levels and the veracity of consensually scored test items. Once these measurement issues have been adequately addressed we will be in a better position to evaluate the validity of the EI construct.

## **CHAPTER 3**

### **THE DEVELOPMENT OF A SELF-REPORT AND PEER-REPORT MEASURE OF EMOTIONAL INTELLIGENCE**

#### **3.1 Introduction**

From the literature review in the previous chapter it is apparent that the field lacks robust measures of trait EI. The aim of chapter 3 was to report development of a self-report and peer-report trait EI measure. The two measures were constructed, based on Mayer and Salovey's (1997) ability EI definition, in part because the definition does not include existing personality domains. Following development, each of the instruments was subjected to an initial examination of psychometric properties. This examination included an investigation of internal reliability, factorial validity and convergence with the theoretically related construct of empathy. Gender differences and developmental trends in trait EI were also examined. In a follow-up study, the psychometric properties of the two new EI measures were investigated further with respect to test-retest reliability levels and convergent validity in relation to an alternative trait EI measure: the Assessing Emotions Scale (Schutte et al., 1998).

#### **3.2 The Need for New Trait-Based Emotional Intelligence Measures**

The review of existing scales in chapter 2 revealed that there is a need for new psychometrically sound measures of EI. Each of the various trait-based measures of EI, whilst having a number of strengths, nonetheless has exhibited varying problems with respect to their definition, factor structure, discriminant, and/or incremental validity. Many of the difficulties associated with various trait EI measures relate to the

wording of test items. The problems in relation to the discriminant validity, and ultimately the incremental validity of trait EI, are to some degree related to the fact that some test-items have questions of similar semantic content to those of well-known personality domains. Essentially then, the field of trait EI will benefit from the development of new measures with test items that are distinguishable from existing personality traits.

### **3.3 Pilot Study 1**

The aim of the first pilot study was to develop two new trait-based measures of EI based on Mayer and Salovey's (1997) definition of the construct and evaluate psychometric properties of the scales.

It was decided in the first instance to operationalise the construct of EI via a self-report and peer-report instrument on three grounds. First, self-report and peer-report instruments are easier to construct than performance-based measures, and they obviate the need to identify correct answers to emotional problems. They are also easier than performance-based measures to administer to participants (Groth-Marnat, 1997; Petrides & Furnham, 2001). Second, self-report measures are known to be vulnerable to response bias and one approach to overcoming this is to cross-validate a self-report measure against a peer-report instrument (Geher et al., 2001; Roberts et al.,



2001). That said, it is important to consider the extent to which EI abilities are visible to an external rater<sup>1</sup>. Third, there are relatively few empirical studies comparing self-report and peer-report outcomes in relation to EI. Thus, an examination of the relationship between these two types of assessment was warranted.

The two new EI measures were based on Mayer and Salovey's (1997) definition of the construct because the abilities-based definition (unlike trait EI definitions) does not include a range of personality factors such as empathy and impulsivity. Therefore, the two new trait EI measures were ultimately expected to correlate less highly with well-known personality domains.

Following the development of a self-report and peer-report measure of EI, the focus of the first study was to investigate the internal reliability levels as well as the factorial and convergent validity of the two measures. Gender and age differences in trait-based EI were also explored.

### **3.4 The Validation of Two New Trait-Based Emotional Intelligence Measures**

#### **3.4.1 Convergent Validity**

To examine the convergent validity of the new EI scales, a measure of empathy was included. The construct of EI involves the ability to perceive another person's

---

<sup>1</sup> In the case of a peer being able to rate a target person's ability to perceive emotions, it is argued that the speed with which the target recognised their own and others emotions would be one observable marker. The ability to use one's emotions to solve problems would be evident in the extent to which a target person was able to motivate themselves and prioritise tasks. An understanding of emotions would be visible to an external rater by virtue of a target's awareness that is possible to simultaneously experienced mixed emotions such as that associated with love hate relationships. The ability to regulate one's own and others emotions would be apparent to a peer by virtue of the effectiveness with which a target was able to inhibit the inappropriate expression of emotion.

emotions (Mayer, DiPaolo & Salovey, 1990). Likewise, the construct of empathy includes the ability to comprehend another person's feelings (Mehrabian & Epstein, 1972). Therefore the relationship between EI and empathy are of theoretical interest in the validation of EI (Mayer et al., 1990). In support of this idea Charbonneau and Nicol (2002) reported moderate significant positive relationships between EI (AES) and overall empathy ( $r=.22, p<.05$ ); empathic perspective ( $r=.38, p<.001$ ); empathic fantasy ( $r=.45, p<.001$ ); and empathic concern ( $r=.38, p<.001$ ). Other researchers have reported similar outcomes, including Salovey et al. (2002), who found that the attention subscale of the TMMS was significantly positively correlated with empathy ( $r=.44, p<.001$ ).

### 3.4.2 Gender Differences

Research concerning EI has found evidence of gender differences, typically in favour of females although the differences depend upon the type of abilities being assessed (Mayer et al., 1999; Saklofske et al., 2003). It has been suggested that females are better able to read the emotions of others as a consequence of both biological and social differences (Ciarocchi et al., 2000). However, there is a lack of consensus about which subscales favour each gender. Slaski and Cartwright (2002) indicated that females tended to score higher than males in relation to the EQ-i subscales of emotional self-awareness, interpersonal relationships, empathy, and social responsibility ( $p<.05$ ). In contrast, males tended to score more highly than females in relation to the subscales of self-regard, and reality testing ( $p<.05$ ). Saklofske et al. (2003) reported that females outperformed males on the AES appraisal of emotions

( $t_{(351)}=2.66, p<.008$ ), and social skills factors ( $t_{(351)}=4.59, p<.001$ ), whereas males outperformed females on the AES utilisation of emotions factor ( $t_{(351)}=-2.25, p<.05$ ). The finding of variations in EI test performance is of interest insofar as any characteristic patterns among the respective subscales warrant ongoing scrutiny for the potential purpose of ameliorating EI deficits.

### 3.4.3 Developmental Trends in Emotional Intelligence

Mayer and Salovey (1997) maintained that as a form of intelligence EI levels increase with age. Therefore, an exploration of developmental trends in EI is of theoretical interest in terms of the validity of the construct. Mayer et al. (1999) identified increases in EI ability from adolescence to adulthood in three of seven MEIS subscales. Adults outperformed adolescents on the perception of emotions (faces) ( $M_{Adults}=.40$  v  $M_{Adol.}=.38; F=5.2, p<.05$ ); utilization of emotions (synesthesia) ( $M_{Adults}=.30$  v  $M_{Adol.}=.29; F=7.8, p<.01$ ); and understanding of emotions (blends) ( $M_{Adults}=.49$  v  $M_{Adol.}=.42; F=52.2, p<.01$ ). In a subsequent study, Mayer et al. (2000c) identified significant cross-sectional differences in EI test performance among people ranging from 17 to 50+ years of age. EI scores tended to increase with age in relation to the MSCEIT utilization of emotions, understanding of emotions, and regulation of emotions subscales. The reverse trend was evident for the perception of emotions subscales, where EI ability declined with old age.

### 3.5 Objectives

In keeping with the objective to develop a new self-report measure and peer-report measure of trait EI and to evaluate the validity of these measures, it was

hypothesized that (1) self-report scores for participants would be significantly positively correlated with peer-report scores. It was further hypothesized that (2) self-report scores would be significantly positively correlated with empathy scores, and (3) that peer-report scores would be significantly positively correlated with empathy scores for participants. Next, it was hypothesized that scores for females would be higher than for males on the (4) self-report, and (5) peer-report measures. Finally, it was hypothesized that scores for older participants (30 to 45 year olds) would be higher than for their younger counterparts (17 to 23 year olds) on the (6) self-report, and (7) peer-report EI instruments.

### **3.6 Method**

#### **3.6.1 Participants**

The sample comprised 134 respondents (98 females and 36 males) from students at University of Adelaide. First year psychology students were credited with 5% of their final mark for their voluntary participation in the study. The age of participants ranged from 17 to 45 years ( $M = 21.13$ ;  $SD = 6.12$ ). Respondents were recruited in pairs and each respondent within pairs completed a self-report and peer-report measure of EI. The participants within pairs were required to have known each other for a period of at least three months<sup>2</sup>.

#### **3.6.2 Materials**

A review of social-cognition literature and EI scales provided the basis for test development. The first consideration in developing the new self-report and peer-

---

<sup>2</sup> In response to an examiners comment, it was noted that the relationship between peers could have been casual.

report measures was to select the definition to be operationalised. The Mayer and Salovey (1997) definition of EI was regarded as the definition of choice on both conceptual and empirical grounds. The four-factor abilities-based EI definition is as follows:

“the ability to perceive accurately, appraise and express emotion; the ability to access and/or generate feelings when they facilitate thought; the ability to understand emotion and emotional knowledge; and the ability to regulate emotions to promote emotional and intellectual growth,” (p. 10).

A “domain-referenced approach” for the development of affective questions was adopted to generate test items (Anderson, 1981). This approach facilitates the generation of test items by deriving items from the conceptual definition of the construct. A domain-referenced approach involves identifying a range of potential variable names from commonly used conceptual terms in the literature that then form the basis of test items. This was followed by the identification of appropriate descriptive terms to differentiate individual differences in traits and/or abilities. Subsequently, draft statements were constructed and semantically transformed statements devised, following guidelines provided by Anderson (1981). In accordance with this approach, potential variables names were identified (Table 3.1). Next, positive and negative descriptive terms were generated to accompany the respective variable names, and to differentiate between individuals with or without specified abilities (Table 3.2).

The final stage of test construction involved developing draft statements by combining variable names with the respective descriptive terms. The self-report

measure was developed first, beginning with the draft statement “In general, I am able to identify my feelings as I experience them”. The first statement was semantically

Table 3.1. Variable Names for Two New EI Tests

<b>Perception of one's own and others emotions</b>	<b>Utilization of emotions</b>	<b>Understanding of emotions</b>	<b>Regulation of one's own and others emotions</b>
Identify Express Read Disclose Recognize	Use Aid Guide Reproduce Utilize Take	Understand Grasp Comprehend	Manage Handle Regulate Control

Table 3.2. Descriptive Terms for Two New EI Tests

<b>Descriptive terms (positive adjectives)</b>	<b>Descriptive terms (negative adjectives)</b>
Able Good Straightforward Easy Comfortable Effective Like Skilful Solve	Difficult Confused Not very well Hard Ineffective Challenging Problem Unclear

transformed to generate a range of self-report test items using both positive and negative descriptive terms; for example, “I find it straightforward to recognise how people are feeling”. Finally, the test items were edited to fine tune the scale.

The final measure, the Self-Report Measure of Emotional Intelligence (SRMEI), comprised 30 items (Appendix 3.1). The scale was operationally defined by the addition of a 5-point Likert scale for each test item with responses ranging from (1) strongly disagree to (5) strongly agree. Scores were obtained by summing the total

items for each subscale. Items 2, 4, 9, 11, 13, 18, 19, 22, 26, 28, 29, and 30 were reverse scored. Higher scores reflected higher EI, with subscale scores ranging from 7 to 40 (Table 3.3).

The peer-report measure, the PRMEI, was constructed separately but in the same fashion as the SRMEI. The PRMEI consisted of 30 items (Appendix 3.2). Test items included statements such as “It seems to be easy for him/her to identify how other people feel”. Participants indicated on a 5-point Likert scale the extent to which they (1) strongly disagreed to (5) strongly agreed with test questions. Scores were obtained by summing the total number of items for each subscale. Items 3, 4, 6, 7, 9, 11, 15, 17, 19, 21, 24, 25, and 29 were reverse scored. Higher scores reflected higher EI with subscale scores ranging from 7 to 40 (Table 3.3).

The Questionnaire Measure of Empathic Tendency (QMET) is a widely used measure of empathy, as defined by Mehrabian and Epstein (1972) (Appendix 3.3). The scale comprises 33 items with statements such as “It makes me sad to see a lonely stranger in a group”. Originally, the questionnaire was designed based on an 8-point Likert scale with responses being (-4) very strong disagreement to (+4) very strong agreement. However in this study, items were presented on a 5-point Likert scale with responses ranging from (1) strongly disagree to (5) strongly agree, to facilitate a more precise interpretation of responses (Cattell & Johnson, 1986). An overall score was obtained by summing the total number of items. Item 2, 3, 4, 6, 11, 13, 15, 20, 21, 22, 23, 24, 26, 28, 30, 32, and 33 were reverse scored. Higher scores reflected higher empathy with scores ranging from 33 to 165. The split-half reliability was recorded as

.84 by Mehrabian and Epstein (1972). Consistent with this outcome, the internal reliability of the QMET in the present study was .82. The measure has exhibited good discriminant validity in relation to social desirability; construct validity in relation to aggressiveness; and convergent validity in relation to helping behaviour (Mehrabian & Epstein, 1972).

### **3.6.3 Procedure**

A poster inviting participants to take part in the study was placed on the main noticeboard in the Psychology Department's foyer (Appendix 3.4). At the same time, an information sheet was provided with a detailed description of the study along with a consent form for interested participants to complete (Appendix 3.5). Once the consent form had been completed, participants were contacted and a testing session arranged. At the commencement of the testing session, demographic details were obtained. Subsequently, each pair of participants completed the three questionnaires. The individual testing sessions took approximately 30 minutes to complete.

## **3.7 Results**

### **3.7.1 Descriptive statistics**

The means, standard deviations and ranges for the respective variables are presented in Table 3.3 and for Empathic Tendency were comparable with previous results (Mehrabian & Epstein, 1972).



**Table 3.3.** Descriptive Statistics for SRMEI, PRMEI, and QMET

<b>Variable</b>	<b>Mean</b>	<b>SD</b>	<b>Range</b>
SRMEI perception of emotions	29.68	4.85	8-40
SRMEI utilization of emotions	23.99	4.55	7-35
SRMEI understanding of emotions	23.86	4.62	7-35
SRMEI regulation of emotions	27.40	4.72	8-40
PRMEI perception of emotions	29.69	4.10	8-40
PRMEI utilization of emotions	23.32	4.43	7-35
PRMEI understanding of emotions	24.49	2.87	7-35
PRMEI regulation of emotions	28.62	4.69	8-40
Questionnaire Measure of Empathic Tendency	123.26	12.42	33-165

### 3.7.2 Factor Analyses

To determine if each of the correlation matrices for the SRMEI, and PRMEI were suitable for factor analysis Kaiser-Meyer-Olkin (KMO) and Bartlett's test of sphericity test statistics were calculated (Tabachnick & Fidell, 2001). Following this, the optimal factorial structure for each of the SRMEI and PRMEI was identified. Consistent with the majority of EI research, principal axis factor analyses with oblimin rotations were conducted. This was compared with principal components analyses with varimax rotation. Results from the two methods of analysis were comparable but the principal components outcome provided slightly clearer factor structures. Moreover, principal components outcomes analysed all of the variance associated with the variables whereas only shared variance is analysed in principal axis factor analyses (Tabachnick & Fidell, 2001). The selection criteria for determining the optimal number of factors was based on the eigenvalue > 1.0 rule; on the clarity and

interpretability of factors; and on the convergence between factors and the theoretical model (Tabachnick & Fidell, 2001)

For the SRMEI, a KMO measure of sampling adequacy of .83 and Bartlett's test of sphericity ( $X^2_{(435)}=2032.31, p<.001$ ) indicated that the EI measure was suitable for factor analysis. Results indicated the existence of a six-factor solution. Following preliminary data analysis, it was evident that the scale could be improved either by the deletion of unwanted items or by the amendment of items to convey a clearer meaning (Tabachnick & Fidell, 2001). In the first instance, the SRMEI was improved by deleting seven items that were redundant. Item 13, and 19 were removed because they failed to load on any factor. Items 10 and 21 were deleted because they coalesced to form a factor by themselves and two items are considered insufficient to form a factor (Tabachnick & Fidell, 2001). Similarly, items 26 and 16 were deleted because they were the only two items to form a factor. Finally, item 4 was deleted to improve the internal reliability level of factor 4.

The 23-item SRMEI was again subjected to factor analysis. A KMO measure of sampling adequacy of .83, and Bartlett's test of sphericity ( $X^2_{(253)}=1494.88, p<.001$ ) indicated that the measure was suitable for factor analysis. The SRMEI factor analysis indicated that a four-factor solution should be retained (Table 3.4). First, factors with

Table 3.4. Rotated Component Matrix for the SRMEI

No.	Item	PR(o)	Use	Pund	R(s)	h <sup>2</sup>
30	Not easy to work out others' feelings	<b>0.82</b>	-0.03	0.10	-0.06	<b>0.73</b>
24	Skilful at regulating others' emotions	<b>0.80</b>	0.02	-0.22	0.10	<b>0.58</b>
5	Good at managing others' emotions	<b>0.78</b>	0.17	-0.22	0.11	<b>0.61</b>
12	Handling people's feelings is straightforward	<b>0.77</b>	-0.10	-0.11	-0.05	<b>0.51</b>
14	Reading people's feelings is easy	<b>0.71</b>	0.00	0.24	-0.15	<b>0.65</b>
2	Managing others' feelings is difficult	<b>0.57</b>	0.10	0.18	-0.02	<b>0.48</b>
23	Feelings are easy to understand	<b>0.51</b>	-0.08	0.29	0.04	<b>0.46</b>
25	Good at understanding complex emotions	<b>0.51</b>	-0.04	0.40	-0.03	<b>0.56</b>
3	I solve problems by using my emotions	0.17	<b>0.80</b>	-0.19	0.10	<b>0.69</b>
6	I use my feelings to guide me	-0.07	<b>0.79</b>	0.07	-0.01	<b>0.63</b>
27	I like using feelings to assist me	0.05	<b>0.78</b>	-0.12	-0.09	<b>0.58</b>
22	I utilize my emotions to solve problems	0.11	<b>0.77</b>	0.08	-0.07	<b>0.69</b>
11	I don't take feelings into account in decisions	-0.23	<b>0.66</b>	0.19	-0.17	<b>0.46</b>
17	Good at using feelings for everyday issues	0.05	<b>0.60</b>	0.18	0.23	<b>0.61</b>
20	I am able to grasp what my feelings are saying	0.08	-0.03	<b>0.78</b>	-0.24	<b>0.55</b>
1	I am able to identify my feelings	-0.11	0.10	<b>0.72</b>	-0.03	<b>0.50</b>
9	Trying to identify my emotions is confusing	0.03	-0.08	<b>0.70</b>	0.21	<b>0.65</b>
28	Understanding my emotions is hard	0.14	-0.09	<b>0.69</b>	0.14	<b>0.65</b>
7	I have a good understanding of my emotions	-0.16	0.19	<b>0.60</b>	0.08	<b>0.44</b>
8	Able to control my feelings	0.06	-0.10	-0.20	<b>0.88</b>	<b>0.67</b>
29	Controlling my emotions is difficult	0.05	-0.07	-0.04	<b>0.85</b>	<b>0.70</b>
15	Good at managing my emotions	-0.10	0.16	0.10	<b>0.79</b>	<b>0.72</b>
18	Ineffective at regulating own emotions	-0.08	-0.08	0.32	<b>0.71</b>	<b>0.75</b>
<b>Percent of variance</b>		<b>17.67</b>	<b>15.28</b>	<b>14.73</b>	<b>12.92</b>	<b>60.60</b>

eigenvalues greater than one were selected being 4.06, 3.51, 3.39 and 2.97 respectively with a total of 60.60% of variance accounted for. Second, the factor outcome was clear and interpretable with item loadings suggesting that the four factors be labelled: (1) perception/regulation of others emotions, (2) utilization of emotions, (3) perception/understanding of one's own emotions, and (4) regulation of one's own emotions. The factor correlations for the SRMEI ranged from weak to moderate (Table 3.4.1). The

internal reliability levels for the SRMEI were .87, .85, .78, and .85 for the respective subscales.

Table 3.4.1: Component Transformation Matrix for the SRMEI

SRMEI Factors	1	2	3	4
1 Per/reg others emotions	0.59	0.44	0.57	0.35
2 Utilization of emotions	0.24	0.60	-0.27	-0.71
3 Per/understand emotions	-0.71	0.65	0.07	0.27
4 Regulation of own emotions	0.29	0.18	-0.77	0.54

For the PRMEI, a KMO measure of sampling adequacy of .81 and Bartlett's test of sphericity ( $X^2_{(435)}=1735.75, p<.001$ ) indicated that the measure was suitable for factor analysis. Results of the PRMEI factor analysis indicated that an eight-factor solution should be retained but the EI measure could be improved by the deletion of eight redundant items. Items 4, and 16 each formed a separate factor. Items relating to a further two factors were deleted because they were comprised of items 5 and 28; and 14 and 17, respectively. The deletion of items 20 and 27 improved the interpretability of the remaining factors.

The 22-item PRMEI was then analysed. A KMO measure of sampling adequacy of .83, and Bartlett's test of sphericity ( $X^2_{(231)}=1168.31, p<.001$ ) indicated that the measure was suitable for factor analysis. An examination of the analysis indicated that a four-factor solution be retained (Table 3.5). That is, there were four eigenvalues that were greater than one, being 3.71, 3.41, 3.26 and 2.15 respectively, with 57.03% of variance accounted for. In addition, the test items that delineated the

Table 3.5. Rotated Component Matrix for the PRMEI

No.	Item	Use	PR(o)	R(s)	Pund	h <sup>2</sup>
2	S/he often uses emotions to solve problems	<b>0.86</b>	0.04	0.08	-0.17	<b>0.72</b>
7	S/he doesn't use emotions to solve problems	<b>0.77</b>	0.07	0.14	-0.28	<b>0.59</b>
29	S/he doesn't use feelings to problem solve	<b>0.75</b>	-0.09	-0.10	0.25	<b>0.64</b>
8	S/he makes decisions with the aid of emotions	<b>0.75</b>	0.04	-0.10	-0.01	<b>0.61</b>
18	S/he is good at letting feelings guide him/her	<b>0.70</b>	0.01	0.01	0.13	<b>0.53</b>
13	S/he doesn't solve problems using emotions	<b>0.67</b>	-0.05	-0.03	0.06	<b>0.45</b>
6	S/he finds it easy to handle others feelings	-0.05	<b>0.79</b>	0.13	-0.10	<b>0.61</b>
10	S/he finds it easy to read others feelings	-0.03	<b>0.78</b>	-0.14	0.05	<b>0.58</b>
1	It is easy for him/her to identify others feelings	0.04	<b>0.72</b>	-0.15	0.01	<b>0.53</b>
3	S/he doesn't manage others emotions effectively	0.01	<b>0.69</b>	-0.06	0.13	<b>0.53</b>
11	S/he has problems controlling others emotions	0.16	<b>0.59</b>	0.09	0.03	<b>0.48</b>
22	Managing emotions is not a problem for him/her	-0.09	<b>0.58</b>	0.23	-0.14	<b>0.38</b>
25	S/he gets confused trying to recognise emotions	0.06	<b>0.51</b>	-0.06	0.38	<b>0.53</b>
30	S/he is skilful at regulating his/her own emotions	0.03	0.09	<b>0.84</b>	-0.20	<b>0.64</b>
12	Managing his/her emotions is easy for him/her	-0.13	0.06	<b>0.79</b>	-0.06	<b>0.66</b>
15	S/he has problems managing his/her feelings	0.09	-0.14	<b>0.75</b>	0.05	<b>0.55</b>
24	S/he doesn't handle his/her emotions very well	-0.14	0.02	<b>0.62</b>	0.30	<b>0.65</b>
26	He/she is able to comprehend his/her feelings	0.06	-0.07	<b>0.49</b>	0.34	<b>0.47</b>
23	S/he is good at understanding his/her feelings	0.11	-0.02	<b>0.45</b>	0.30	<b>0.40</b>
19	S/he is unclear what she is feeling	-0.08	0.04	-0.15	<b>0.82</b>	<b>0.59</b>
9	Understanding his/her own emotions is difficult	0.01	0.02	0.25	<b>0.66</b>	<b>0.65</b>
21	Identifying his/her feelings is difficult	0.04	-0.01	0.16	<b>0.66</b>	<b>0.55</b>
<b>Percent of variance</b>		<b>16.88</b>	<b>15.51</b>	<b>14.83</b>	<b>9.80</b>	<b>57.03</b>

four factors were clear and interpretable. An examination of the item loadings suggested that the four factors be labelled: (1) utilization of emotions, (2) perception/regulation of others emotions, (3) regulation of one's own emotions, and (4) perception/ understanding of one's own emotions. The factor correlations for the

PRMEI ranged from weak to moderate (Table 3.5.1). The internal reliability levels of the PRMEI were satisfactory being .85, .82, .81, and .73 for the respective subscales.

Table 3.5.1: Component Transformation Matrix for the PRMEI

PRMEI Factors	1	2	3	4
1 Utilization of emotions	0.51	0.65	0.39	0.41
2 Per/reg others emotions	-0.67	-0.05	0.70	0.25
3 Regulation of own emotions	0.47	-0.76	0.27	0.36
4 Per/understand emotions	0.27	-0.02	0.54	-0.80

### 3.7.3 Descriptive Statistics Revisited

In keeping with the factor analytical outcomes, the means, standard deviations and ranges for the SRMEI and PRMEI are revisited in Table 3.6. In addition, the QMET was logarithmically transformed to reduce skewness and kurtosis. The *direction* of QMET outcomes is reversed in the results and discussion section for ease of interpretation.

Table 3.6. Revised Descriptives for the SRMEI, PRMEI and QMET

Variable	Mean	SD	Range
SRMEI per/understand emotions (self)	18.95	3.19	10-25
SRMEI utilization of emotions	21.20	4.22	7-30
SRMEI regulation of emotions (self)	13.99	3.43	6-20
SRMEI per/regulation of emotions (others)	27.28	5.48	11-39
PRMEI per/understand emotions (self)	11.23	2.00	6-15
PRMEI utilization of emotions	19.96	4.23	10-26
PRMEI regulation of emotions (self)	22.16	3.73	10-29
PRMEI per/regulation of emotions (others)	25.32	4.53	14-34
Questionnaire Measure of Empathic Tendency	4.84	1.25	1-8.94

### 3.7.4 Intercorrelations

Correlations for the SRMEI, PRMEI and QMET are shown in Table 3.7. With respect to hypothesis (1) only two correlations were statistically significant between sections of the SRMEI and PRMEI and both were weak. The SRMEI utilization of emotions score was weakly positively correlated with the PRMEI utilization of emotions ( $r=.25, p<.01$ ). The SRMEI regulation of one's own emotions was weakly positively correlated with the PRMEI regulation of one's own emotions ( $r=.16, p<.05$ ).

In light of this, correspondence between self-report and peer-report was of interest in terms of response bias. A paired samples t-test was conducted to compare the two EI measures (Table 3.8). Results revealed that self-reported EI scores were significantly higher than peer-report estimates for perception/understanding (self), utilization, and perception/regulation (others) subscales. Conversely, self-report ratings for the regulation of one's own emotions were significantly lower than peer-report estimates.

In terms of the relationships between the SRMEI and the convergent validity measure of empathy (QMET), results revealed four statistically correlations from eight between the two measures. The SRMEI utilization of emotions was moderately positively correlated with the QMET ( $r=.38, p<.01$ ). In addition, the SRMEI

Table 3.7. Intercorrelations for the SRMEI, PRMEI and QMET

	1	2	3	4	5	6	7	8	9
1 SRMEI per/understand emotions (self)	(.78)								
2 SRMEI utilization of emotions	<b>.36**</b>	(.85)							
3 SRMEI regulation of emotions (self)	<b>.45**</b>	.15	(.85)						
4 SRMEI per/regulation emotions (others)	<b>.51**</b>	<b>.37**</b>	<b>.22*</b>	(.87)					
5 PRMEI per/understand emotions (self)	.11	.05	.02	.00	(.73)				
6 PRMEI utilization of emotions	.01	<b>.25**</b>	-.11	.06	.15	(.85)			
7 PRMEI regulation of emotions (self)	.03	.06	.16	.00	<b>.49**</b>	-.03	(.81)		
8 PRMEI per/regulation emotions (others)	.10	.15	.02	<b>.16*</b>	<b>.40**</b>	<b>.38**</b>	<b>.28**</b>	(.82)	
9 Quest. Measure of Empathic Tendency	.00	<b>.38**</b>	<b>-.23**</b>	<b>.21*</b>	.02	.15	-.05	<b>.17*</b>	(.82)

\*  $p < .05$ ; \*\*  $p < .01$ ; \*\*\*  $p < .001$ . SRMEI = Self-Report Measure of Emotional Intelligence, and PRMEI = Peer-Report Measure of Emotional Intelligence. Internal reliability results indicated in brackets.



Table 3.8. A Comparison of SRMEI and PRMEI Mean Scores

Variable	Mean	SD	t(133)
SRMEI per/understand emotions (self)	18.95	3.19	<b>23.89***</b>
PRMEI per/understand emotions (self)	11.23	2.00	
SRMEI utilization of emotions	21.20	4.22	<b>2.82**</b>
PRMEI utilization of emotions	19.96	4.23	
SRMEI regulation of emotions (self)	13.99	3.43	<b>21.58***</b>
PRMEI regulation of emotions (self)	22.16	3.73	
SRMEI per/regulation of emotions (others)	27.28	5.48	<b>3.45***</b>
PRMEI per/regulation of emotions (others)	25.32	4.53	

\*  $p < .05$ ; \*\*  $p < .01$ ; \*\*\*  $p < .001$ . All results are two tailed.

perception/regulation of others emotions was weakly positively correlated with the QMET ( $r=.21, p<.05$ ). Surprisingly, the SRMEI regulation of one's own emotions was weakly *negatively* correlated with the QMET ( $r=-.23, p<.01$ ). A counter-intuitive result, this outcome will be considered further in the discussion section. The SRMEI perception/understanding of one's own emotions was not significantly correlated with the QMET.

With respect to the PRMEI, Table 3.7 indicates that scores for the perception/regulation of others' emotions were weakly positively correlated with the QMET ( $r=.17, p<.05$ ). There were no other significant correlations between the PRMEI and the QMET.

### 3.7.5 Gender Differences in Trait-Based Emotional Intelligence

Results of a one-way analysis of variance indicated a significant difference in performance for men and women on the utilization of emotions subscale in favour of females ( $\text{Mean}_{\text{males}}=19.86$  v  $\text{Mean}_{\text{females}}=21.69$  -  $F_{(1,132)}=5.38, p<.05$ ). In contrast, scores for males were significantly higher than for their female counterparts on the SRMEI regulation of one's own emotions ( $\text{Mean}_{\text{males}}=15.16$  v  $\text{Mean}_{\text{females}}=13.55$  -  $F_{(1,132)}=6.37, p<.05$ ). For the remaining SRMEI subscales, there were no significant differences in performance between males and females.

An examination of gender differences for the PRMEI revealed that there was a significant difference in performance between men and women in relation to the perception/regulation of others emotions subscale in favour of women ( $\text{Mean}_{\text{males}}=23.77$  v  $\text{Mean}_{\text{females}}=25.88$  -  $F_{(1,132)}=5.51, p<.05$ ). Conversely, PRMEI perception/understanding of one's own emotions, utilization of emotions, and regulation of one's own emotions were not significantly different between males and females.

### 3.7.6 Developmental Trends in Emotional Intelligence

An investigation of potential developmental trends in EI was undertaken by comparing participants in group 1 (aged 17 to 23 years) with group 2 (aged 30 to 45 years). Results of independent samples t-tests indicated an increase in peer-estimates of the ability to utilize emotions to solve problems in favour of older participants (Table 3.9). There were no other significant differences in EI scores between group 1 and group 2 for the remaining SRMEI and PRMEI subscales.

Table 3.9. Developmental Trends for the SRMEI and PRMEI

SRMEI	Group	Mean	SD	t(124)
Per/understand emotions (self)	1 <sup>a</sup>	18.55	3.07	1.79
	2 <sup>b</sup>	20.07	3.20	
Utilization of emotions	1	21.23	3.98	0.55
	2	21.87	5.26	
Regulation of one's own emotions	1	13.59	3.48	0.65
	2	14.20	3.05	
Per/regulation emotions (others)	1	26.93	5.71	1.45
	2	29.13	3.83	
PRMEI				
Per/understand emotions (self)	1	11.16	1.99	0.66
	2	11.53	2.47	
Utilization of emotions	1	19.17	2.92	2.89*
	2	21.47	2.64	
Regulation of one's own emotions	1	22.23	3.64	1.50
	2	20.67	4.67	
Per/regulation emotions (others)	1	24.02	3.57	0.60
	2	24.60	2.64	

\*  $p < .05$ ; \*\*  $p < .01$ ; \*\*\*  $p < .001$ . All results are two tailed.

<sup>a</sup> Group 1= participants aged 17 to 23 years;

<sup>b</sup> Group 2= participants aged 30 to 45 years.

### 3.8 Discussion

The aim of the first pilot study was to develop new self-report and peer-report measures of trait-based EI, and conduct an initial investigation of the psychometric properties of these scales.

The factor structures recovered in relation to the SRMEI and to the PRMEI were inconsistent with the original theoretical model underlying the two new EI measures. The factor analytical outcome for both the SRMEI, and PRMEI comprised: (1) the perception/understanding of one's own emotions, (2) utilization of emotions, (3) regulation of one's own emotions, and (4) perception/regulation of others emotions.

In contrast, Mayer and Salovey (1997) defined EI as involving (1) the perception of one's own and others emotions, (2) utilization of emotions, (3) understanding of emotions, and (4) regulation of one's own and others emotions.

There are at least two possible explanations for the factor analytical outcomes. One explanation is that there are problems with the theory underlying the two EI measures. Results suggested that self-perceived abilities in relation to one's self and others are distinct entities. Similarly, Weisinger (1998) has conceptualised one's own EI abilities and others separately, as have other theorists (Bar-On, 1997; Petrides & Furnham, 2001). Moreover, information concerning EI abilities in relation to one's self are most likely gleaned from internal cues such as bodily sensations and thought processes. Alternatively, the assimilation of information concerning other people's EI abilities will be obtained (for the most part) from external cues such as facial expression, posture, tone of voice, and so forth. Thus, although self and other EI abilities conceptually overlap, it is possible that there are unique aspects to both types of abilities. Another equally plausible explanation is that there are problems with the wording of test items for the two new EI measures. This being the case, it would be beneficial for the two EI measures to be refined. That said, the internal reliability levels for both EI measures were good and this is an important prerequisite for the psychometric soundness of an instrument.

Results indicated that two out of a possible 25 SRMEI, and PRMEI subscales were positively correlated, thereby providing minimal support for the convergent validity of the two EI measures. Of the two correlations, the PRMEI utilization of emotions subscale exhibited a weak positive correlation with the SRMEI utilization of

emotions subscale. A further weak positive correlation was evident between the SRMEI regulation of one's own emotions and the PRMEI regulation of one's own emotions. This result is therefore similar to that reported by Malouff and Schutte (2001) who found a weak positive correlation between the self-report and peer-report versions of the AES ( $r=.31, p<.05$ ).

It was accepted that the small number of significant correlations between the SRMEI, and PRMEI could be a consequence of self or peer-report response bias. The t-test results revealed the possibility of response bias on three out of four scores in favour of self-reported EI compared to peer-reports. One explanation is that the peer-reports were inaccurate to the extent to which EI behaviours were evident to external raters and with respect to the level of skill of the peer-rater. A more likely explanation is that the results indicate a self-enhancing response bias where participants were seeking to behave in a socially desirable manner. In the latter case, it is recommended that future studies evaluating the incremental validity of trait EI include a measure of social desirability, to control for the effects of response bias.

With respect to the convergent validity of the SRMEI in relation to the QMET, three of the four subscales were significantly correlated. In support of the convergent validity, the SRMEI utilization of emotions subscale was weakly positively correlated with empathy. Thus, the propensity to use and listen to one's emotions corresponded to an ability to put one's self in another's shoes. A further noteworthy trend was a weak positive correlation between the QMET and the SRMEI perception/regulation of others' emotions. This is consistent with the notion that the capacity to empathize with others involves the ability to perceive other people's emotions.

In contrast, the SRMEI regulation of one's own emotions was weakly *negatively* correlated with the QMET, thereby indicating a lack of convergent validity between this EI subscale and empathy. Previously, researchers have consistently demonstrated a positive relationship between trait EI measures and empathy; although this has primarily been in relation to the perception of emotions (Charbonneau & Nicol, 2002; Salovey et al., 2002; Schutte et al., 2001; Van der Zee & Wabeke, 2004). One possibility is that there is a qualitative difference between perception of emotion and regulation of emotion self-perceived abilities as they relate to the construct of empathy. For example, the regulation of one's own and others emotions includes the ability to change moods, inhibit the expression of inappropriate emotions and remain flexible (Mayer & Salovey, 1997). Arguably, a propensity to empathise with others might interfere with the ability to regulate emotions as one's own needs and emotions are put on hold.

The PRMEI was also significantly correlated with the QMET, thereby demonstrating the peer-report EI measures' convergent validity with the theoretical related construct of empathy. The PRMEI utilization of emotions, and perception/regulation of others emotions subscale were weakly positively correlated with the QMET

Results indicated the presence of gender differences in relation to two of the SRMEI subscales in favour of males for one and females for the other. Females tended to use their emotions more than males when attempting to solve problems. The outcome is consistent with the notion that females are more inclined to listen to and consider their emotions. But the results are in contrast to previous research. Saklofske

et al. (2003) identified that males were more inclined to use their emotions in everyday problem solving when compared to females, as assessed by the AES (Schutte et al., 1998). The variation in test results may be a consequence of differences in item wording between the SRMEI and the AES. For instance, an example of an SRMEI utilization of emotions subscale test item is “When I am presented with a problem I utilize my emotions to help resolve the situation”. This contrasts with an AES test item such as “When I am in a positive mood, solving problems is easy for me”. In this particular instance, the AES test item includes two ideas in one statement; one idea relates to the mood of participants and the other relates to the individuals’ self-perceived ability to solve problems. This makes a direct comparison of the two EI measures difficult, and thereby confounds an interpretation of the results.

A second indicator of gender differences in EI test performance was evident for the SRMEI regulation of one’s own emotions. In particular, males scores were significantly higher than females, suggesting that males were more inclined to “regulate” their emotions. The most likely explanation for this result is that males are socialized to be independent and are therefore encouraged to inhibit the expression of emotion.

With respect to the PRMEI, gender differences were indicated for one of the subscales. For the PRMEI perception/regulation of others emotions subscale, the scores for females were significantly higher than for males. Results are consistent with the notion that women are socialized and better prepared biologically to read the emotions of others (Ciarocchi et al., 2000). In addition, the outcome suggests that women are more inclined to “regulate” the emotions of others, such as comfort another

person when distressed. The outcome provides further evidence of the impact of socialization processes on women to focus on and maintain relationships.

An initial investigation into potential developmental trends in EI yielded minimal support for the notion that trait EI increases with age. The only subscale that showed a significant difference in EI scores in favour of older participants related to the PRMEI utilization of emotions. This contrasts with previous findings reported by Mayer et al. (1999) and Mayer et al. (2000c) whereby significant increases in EI were evident across the lifespan. A notable difference between the latter two studies and this study is that increases in EI were examined via self-report and maximal performance methods respectively.

### **3.9 Pilot Study 2**

The aim of the second pilot study was to continue investigation of the psychometric properties of the SRMEI and PRMEI. To further examine the reliability of the two new EI measures, an investigation of test-retest reliabilities was of interest. In addition, the relationship between the two new EI measures and an alternative self-report and peer-report measure of trait EI were explored. In particular, an exploration of the SRMEI and PRMEI and the Schutte et al. (1998) trait-based EI measure, the AES, was of interest, to evaluate further the convergent validity of the two newly constructed measures.

### **3.10 Investigation of the Validity of the SRMEI and PRMEI**

#### **3.10.1 Convergent Validity**

To examine further the convergent validity of the SRMEI and PRMEI, a self-report and peer-report version of the AES (Schutte et al., 1998) was included in this



study. The AES is regarded as the best of the available EI instruments for purposes herein. This trait EI measure is a reliable instrument and there is good evidence for the convergent and predictive validity of the measure and a degree of evidence for incremental validity outcomes. In addition, the AES is one of the few trait EI measures that has been transformed and evaluated as a peer-report instrument. Previously, Malouff and Schutte (2001) reported a weak positive correlation between the self-report and peer-report version of the AES ( $r=.31, p<.05$ ).

That said, outcomes relating to the factor structure of the AES have been somewhat inconsistent and this necessitates consideration when analyzing subsequent results. The AES was based on Salovey and Mayer's (1990) three-factor definition of EI: (1) appraisal and expression of emotions in the self and others, (2) regulation of emotions in the self and others, and (3) using emotions in adaptive ways. But researchers have recovered between one and four-factor outcomes (Petrides & Furnham, 2000; Saklofske et al., 2003; Schutte et al., 1998). Of these outcomes, the four-factor solution first reported by Petrides and Furnham (2000) is considered to be the optimal solution and it provided the basis of analysis for study 2. The four factors were labelled: (1) optimism/mood regulation, (2) appraisal of emotions, (3) social skills, and (4) utilization of emotions.

### **3.11 Objectives**

With the aim of exploring further the convergent validity of the two new EI measures, it was hypothesized that (1) SRMEI scores would be significantly positively correlated with AES self-report scores. It was further hypothesized that (2) PRMEI scores would be significantly positively correlated with AES peer-report outcomes.

### **3.12 Method**

#### **3.12.1 Participants**

A total of 42 participants (31 females and 11 males) who had participated in study 1 took part in study 2. Participants were University of Adelaide students, including those enrolled in psychology. The ages of participants was lower than in the first study and ranged from 17 to 23 years ( $M = 18.81$ ;  $SD = 1.57$ ). Participants were recruited in pairs. Each pair simultaneously completed the self-report, and peer-report measures of EI and were required to have known each other for at least three months.

#### **3.12.2 Measures**

The SRMEI assessed four components of EI identified in study 1. They were: (1) perception/regulation of others emotions, (2) regulation of one's own emotions, (3) utilization of emotions, and (4) perception/understanding of one's own emotions. The scale comprised 23 items, and included statements such as "In general, I am able to identify my feelings as I experience them". Items were presented on a 5-point Likert scale with responses ranging from (1) strongly disagree to (5) strongly agree. Scores were obtained by summing the total items for each subscale. Items 2, 9, 11, 18, 22, 28, 29, and 30 were reverse scored. Higher scores reflected higher EI with outcomes ranging from 6 to 36.

The PRMEI also measures four aspects of EI as identified in study 1. The four aspects included: (1) perception/regulation of others emotions, (2) regulation of one's own emotions, (3) utilization of emotions, and (4) perception/understanding of one's own emotions. The revised measure consisted of 22 items, with statements such as "It seems to be easy for him/her to identify how other people feel". Respondents

were asked to indicate on a 5-point Likert scale the extent to which they (1) strongly disagree to (5) strongly agree with each statement. Scores were obtained by summing the total number of items for each subscale. Items 3, 9, 11, 15, 19, 21, 25, and 29 were reverse scored with higher scores reflecting higher EI. Scores ranged from 6 to 30.

The Assessing Emotions Scale (SRAES) is a self-report EI measure developed by Schutte et al. (1998), based on Salovey and Mayer's (1990) original three-factor definition of EI (Appendix 3.6). The three factors include: "(1) appraising and expressing emotions in the self and others, (2) regulating emotion in the self and others, and (3) using emotions in adaptive ways" (p. 190). However, in consideration of earlier comments about the factor structure of the AES, the measure will be analysed in terms of the four factors identified by Petrides and Furnham (2000). The four factors include: (1) optimism/mood regulation, (2) appraisal of emotions, (3) social skills, and (4) utilization of emotions. The AES comprises statements such as "I can tell how other people are feeling by listening to the tone of their voice". Participants indicated on a 5-point Likert scale the extent to which they (1) strongly disagree to (5) strongly agree with each statement. Scores were obtained by summing responses for each subscale with items 5, 28, and 33 reverse scored. Higher scores reflected higher EI with scores ranging from 6 to 53. The peer-report measure (PRAES) was constructed by converting self-report AES items to "report on another individual" (p. 5) (Malouff & Schutte, 2001). Internal reliability levels have been reported as .90 with test-retest reliability in the order of .78 (Schutte et al., 1998). In the present study, the internal reliability for the AES self-report ranged from .78 to .86, and peer-report from .61 to .79 (Table 3.12). The AES has demonstrated convergent validity in

relation to the Trait Meta-Mood Scale and predictive validity with respect to optimism, pessimism, depression, impulsiveness and grade point average (Schutte et al., 1998).

### 3.12.3 Procedure

Respondents who had participated in study 1 were contacted and their consent obtained to take part in study 2. Both pairs of participants completed the three questionnaires a second time. The testing sessions took approximately 20 minutes.

## 3.13 Results

### 3.13.1 Descriptive Statistics

The means, standard deviations and ranges are presented in Table 3.10 and are consistent with prior results (Schutte et al., 1998). Paired samples t-tests revealed no significant difference in SRMEI and PRMEI scores for study 1 and 2 (Table 3.11).

**Table 3.10. Descriptive Statistics for SRMEI, PRMEI, SRAES, and PRAES**

<b>Variable</b>	<b>Mean</b>	<b>SD</b>	<b>Range</b>
SRMEI per/understand emotions (self)	18.88	2.52	14-24
SRMEI utilization of emotions	20.73	3.93	12-28
SRMEI regulation of emotions (self)	14.02	2.99	6-18
SRMEI per/regulation of emotions (others)	27.47	5.61	12-36
PRMEI per/understand emotions (self)	11.40	1.86	6-15
PRMEI utilization of emotions	19.28	3.04	13-25
PRMEI regulation of emotions (self)	22.33	3.57	13-29
PRMEI per/regulation of emotions (others)	24.90	2.46	19-30
SRAES optimism/mood regulation	34.61	5.51	16-44
SRAES appraisal of emotions	32.73	6.03	16-45
SRAES social skills	43.23	6.24	18-50
SRAES utilization of emotions	14.83	2.93	6-19
PRAES optimism/mood regulation	36.16	4.94	25-45
PRAES appraisal of emotions	32.83	3.44	24-40
PRAES social skills	43.21	4.74	30-53
PRAES utilization of emotions	15.42	2.33	9-20

### 3.13.2 Internal Reliability Analysis

The internal reliability levels of the SRMEI, PRMEI, as well as the SRAES and PRAES were calculated and are presented in Table 3.12. For the SRMEI the alpha coefficients were .61, .81, .76, and .89 for the (1) perception/understanding of one's own emotions, (2) utilization of emotions, (3) regulation of one's own emotions, and (4) perception/regulation of others emotions respectively. The internal reliability levels for the PRMEI were .63, .82, .74, and .77 for the (1) perception/understanding of

**Table 3.11. Mean Score Differences for Study 1 and 2**

<b>Variable</b>	<b>Study</b>	<b>Mean</b>	<b>SD</b>	<b>t(41)</b>
<b>SRMEI</b>	1	18.88	2.53	0.15
Per/understand emotions (self)	2	18.98	3.00	
	1	20.74	3.94	0.61
Utilization of emotions	2	20.24	3.63	
	1	14.02	3.00	1.29
Regulation of one's own emotions	2	13.07	3.58	
	1	27.48	5.61	0.31
Per/regulation emotions (others)	2	27.12	5.39	
<b>PRMEI</b>	1	11.40	1.86	2.00
Per/understand emotions (self)	2	10.45	2.36	
	1	19.29	3.05	0.22
Utilization of emotions	2	19.14	2.59	
	1	22.33	3.57	1.24
Regulation of one's own emotions	2	21.24	3.91	
	1	24.90	2.47	0.84
Per/regulation (others)	2	24.31	3.80	

\*  $p < .05$ ; \*\*  $p < .01$ ; \*\*\*  $p < .001$ . All results are two-tailed.

levels for the SRAES were .78, .86, .81 and .78 for (1) optimism/mood regulation, (2) appraisal of emotions, (3) social skills, and (4) utilization of emotions respectively.

For the PRAES the coefficient alphas were .79, .61, .73, and .74 for (1) optimism/mood regulation, (2) appraisal of emotions, (3) social skills, and (4) utilization of emotions, respectively.

### 3.13.3 Test-Retest Reliability Analysis

The test-retest reliability levels for the SRMEI were .70, .83, .81, and .88 for the (1) perception/understanding of one's own emotions, (2) utilization of emotions, (3) regulation of one's own emotions, and (4) perception/regulation of others emotions. For the PRMEI, test-retest reliability levels were .68, .84, .78, and .80, for the (1) perception/understanding of one's own emotions, (2) utilization of emotions, (3) regulation of one's own emotions, and (4) perception/regulation of others emotions.

### 3.13.4 Intercorrelations

Due to the size of the matrix, correlations in the order of  $p < .01$  and above have been interpreted as outcomes at  $p < .05$  may have emerged by chance alone. There was only modest support for hypothesis (1), with two of a possible 16 significant correlations between the SRMEI and SRAES (Table 3.12). The SRMEI perception/understanding of one's own emotions was moderately positively correlated with the SRAES appraisal of emotions ( $r = .43, p < .01$ ). Likewise, the SRMEI perception/regulation of others emotions was moderately positively correlated with the SRAES appraisal of emotions ( $r = .40, p < .01$ ).

For hypothesis (2) there was more convincing evidence for the convergence of the PRMEI and PRAES, with nine of a possible 16 correlations between the two peer report measures (Table 3.12). The PRMEI utilization of emotions subscale was

moderately positively correlated with PRAES optimism/mood regulation ( $r=.40$ ,  $p<.01$ ) and PRAES utilization of emotions ( $r=.40$ ,  $p<.01$ ). In addition, the PRMEI regulation of one's own emotions was strongly positively correlated with the PRAES optimism/mood regulation subscale ( $r=.71$ ,  $p<.01$ ) but exhibited moderate positive correlations with the PRAES appraisal of emotions ( $r=.41$ ,  $p<.01$ ) and PRAES social skills subscale ( $r=.51$ ,  $p<.01$ ). The PRMEI perception/ regulation of others emotions was also moderately positively correlated with PRAES optimism/mood regulation ( $r=.53$ ,  $p<.01$ ); PRAES appraisal of emotions ( $r=.43$ ,  $p<.01$ ); PRAES social skills ( $r=.60$ ,  $p<.01$ ) and PRAES utilization of emotions ( $r=.53$ ,  $p<.01$ ).

To examine response bias, a series of paired samples t-tests were conducted on the SRMEI and PRMEI and in relation to the SRAES and PRAES (Table 3.13). Results again indicated the presence of response bias in favour of self-reports for the SRMEI perception/understanding of one's own emotions, utilization of emotions, and perception/regulation of others emotions. The reverse trend was evident for the SRMEI regulation of one's own emotions subscale with peer-estimates of EI abilities being significantly higher than self-estimates. Notably, there were no significant differences in scores between self-reported and peer-reported EI for the AES (Table 3.14).

Table 3.12. Intercorrelations for the SRMEI, PRMEI, SRAES, and PRAES

	1	2	3	4	5	6	7	8	9
1 SRMEI per/understand emotions (self)	(.61)								
2 SRMEI utilization of emotions	.25	(.81)							
3 SRMEI regulation of emotions (self)	<b>.45**</b>	-.20	(.76)						
4 SRMEI per/reg emotions (others)	<b>.64**</b>	.26	.32*	(.89)					
5 PRMEI per/understand emotions (self)	.11	.02	.16	-.05	(.63)				
6 PRMEI utilization of emotions	-.35*	.08	-.14	-.08	.00	(.82)			
7 PRMEI regulation of emotions (self)	.11	-.08	.20	.00	<b>.50**</b>	-.13	(.74)		
8 PRMEI per/reg emotions (others)	.18	.06	.29	.06	<b>.58**</b>	.02	<b>.64**</b>	(.77)	
9 SRAES optimism/mood regulation	.27	.13	.16	.09	.02	-.03	.19	.23	(.78)
10 SRAES appraisal of emotions	<b>.43**</b>	.23	-.11	<b>.40**</b>	.00	-.21	.20	.16	<b>.60**</b>
11 SRAES social skills	.30*	.15	.01	.25	.11	-.09	.20	.21	<b>.66**</b>
12 SRAES utilization of emotions	.16	.11	.16	.19	-.02	.16	.02	.16	<b>.67**</b>
13 PRAES optimism/mood regulation	-.07	.12	.03	-.11	<b>.40**</b>	.07	<b>.71**</b>	<b>.53**</b>	<b>.40**</b>
14 PRAES appraisal of emotions	.15	.04	.09	.12	.22	.06	<b>.41**</b>	<b>.43**</b>	.18
15 PRAES social skills	-.05	.11	.19	-.04	.27	.02	<b>.51**</b>	<b>.60**</b>	.34*
16 PRAES utilization of emotions	.09	.18	.04	-.10	<b>.40**</b>	.04	.29	<b>.53**</b>	<b>.45**</b>

\*  $p < .05$ ; \*\*  $p < .01$ ; \*\*\*  $p < .001$ . SRMEI = Self-Report Measure of Emotional Intelligence; PRMEI = Peer-Report Measure of Emotional Intelligence; SRAES = Self-Report Assessing Emotions Scale; and PRAES = Peer-Report Assessing Emotions Scale. Internal reliability results indicated in brackets.



Table 3.12. Intercorrelations for the SRMEI, PRMEI, SRAES, and PRAES

	10	11	12	13	14	15	16
10 SRAES appraisal of emotions	(.86)						
11 SRAES social skills	<b>.70**</b>	(.81)					
12 SRAES utilization of emotions	.39*	<b>.60**</b>	(.78)				
13 PRAES optimism/mood regulation	.14	.18	.13	(.79)			
14 PRAES appraisal of emotions	.18	.14	.17	.20	(.61)		
15 PRAES social skills	.21	.22	.35*	<b>.57**</b>	<b>.58**</b>	(.73)	
16 PRAES utilization of emotions	.28	.34*	.17	<b>.58**</b>	.20	<b>.53**</b>	(.74)

\*  $p < .05$ ; \*\*  $p < .01$ ; \*\*\*  $p < .001$ . SRMEI = Self-Report Measure of Emotional Intelligence; PRMEI = Peer-Report Measure of Emotional Intelligence; SRAES = Self-Report Assessing Emotions Scale; and PRAES = Peer-Report Assessing Emotions Scale. Internal reliability results indicated in brackets.

Table 3.13. Paired Samples t-test Results for the SRMEI and PRMEI

	Mean	SD	t(41)
SRMEI per/understand emotion (self)	18.88	2.53	<b>16.39***</b>
PRMEI per/understand emotion (self)	11.40	1.86	
SRMEI utilization	20.74	3.94	<b>1.97*</b>
PRMEI utilization	19.29	3.05	
SRMEI regulation (self)	14.02	3.00	<b>12.95***</b>
PRMEI regulation (self)	22.33	3.57	
SRMEI per/regulation emotion (others)	27.48	5.61	<b>2.78**</b>
PRMEI per/regulation emotion (others)	24.90	2.47	

\*  $p < .05$ ; \*\*  $p < .01$ ; \*\*\*  $p < .001$ . All results are two tailed.  
 SRMEI = Self-Report Measure of Emotional Intelligence;  
 PRMEI = Peer-Report Measure of Emotional Intelligence.

Table 3.14. Paired Samples t-test Results for the SRAES and PRAES

	Mean	SD	t(41)
SRAES optimism/mood regulation	34.61	5.51	1.75
PRAES optimism/mood regulation	36.16	4.94	
SRAES appraisal of emotions	32.73	6.03	.09
PRAES appraisal of emotions	32.83	3.44	
SRAES social skills	43.23	6.24	.02
PRAES social skills	43.21	4.74	
SRAES utilization of emotions	14.83	2.93	1.12
PRAES utilization of emotions	15.42	2.33	

\*  $p < .05$ ; \*\*  $p < .01$ ; \*\*\*  $p < .001$ . Results are two tailed.  
 SRAES = Self-report Assessing Emotions Scale;  
 PRAES = Peer-report Assessing Emotions Scale.

### 3.14 Discussion

The aim of the second pilot study was to investigate further the psychometric properties of the SRMEI and PRMEI by examining test-retest reliability levels as well as the convergent validity in relation to an alternative trait EI scale.

The reliability levels for the two new EI measures were (in the main) satisfactory to good. The internal reliability and test-retest reliability for the SRMEI and PRMEI were satisfactory to good with the exception of both of the internal reliability levels for the perception/understanding of one's own emotions subscale. Likewise, the alpha coefficients for the SRAES and PRAES were satisfactory to good with the exception of the PRAES appraisal of emotions subscale that was lower than desirable.

Overall, there was limited support for the convergent validity of the SRMEI with respect to the SRAES (due to response bias in the first measure) but good support for the convergence of the PRMEI and PRAES. There was minimal support for the convergent validity of the two self-report EI measures, with a total of two from a possible 16 moderate positive correlations between the two scales. The SRMEI perception/understanding of one's own emotions was moderately positively correlated with the SRAES appraisal of emotions subscale. Similarly, the SRMEI perception/regulation of others emotions was moderately positively correlated with the SRAES appraisal of emotions. Typical SRAES appraisal of emotion questions included an assessment of knowing how other people feel. Previously, the SRAES has exhibited moderate positive correlations with the Trait Meta-Mood Scale subscales of attention to, clarity and the repair of emotions (Schutte et al., 1998). It is argued that it is aspects

of both scales reflecting the perception of emotions that provides the basis for the correlations. The SRMEI perception/understanding of one's own emotions was also weakly positively correlated with the SRAES social skills subscale. Upon closer inspection, the wording of SRAES social skills test items reflected questions pertaining to the expression of emotions (conceptually related to the ability to perceive emotions) and to the understanding of emotions.

It is argued that the small number of correlations between the SRMEI and SRAES is a consequence of response bias in relation to the first measure but not the second. Results of the paired samples t-tests revealed what is most likely a self-enhancing response bias for each of the subscales when SRMEI and PRMEI outcomes were compared. Alternatively, none of the SRAES and PRAES subscales was significantly different, thereby indicating a lack of response bias and this is thought to reflect test items that assess more observable EI behaviours. Taken together, the outcome indicates that future studies based on the SRMEI need to include a measure of social desirability to control for the effects of response bias. Although the same strategy does not appear to be necessary for the AES, it is nevertheless recommended that an estimate of response bias be included in future studies for all EI measures due to the nature of the construct.

There was good support for the convergent validity of the new peer-report EI measure, with nine from a possible 16 positive correlations with the PRAES subscales. A moderate positive correlation was evident between the PRMEI utilization of emotions and PRAES optimism/mood regulation; and utilization of emotions subscales. The PRAES optimism/mood regulation test items that were significantly

correlated with the PRMEI were typically conceptualised in terms of knowing how to make positive emotions last. Arguably, knowing how to make positive emotions last involves the ability to use one's EI skills to solve emotional problems as well as ultimately regulate one's own emotions. The PRAES utilization of emotion questions that were correlated with PRMEI utilization of emotions were best described in terms of the ability to use one's emotions to solve problems and generate new ideas.

The PRMEI regulation of one's own emotions was strongly positively correlated with PRAES optimism/mood regulation; but moderately positively with PRAES appraisal of emotions; and PRAES social skills. For the PRAES optimism/mood regulation subscale the test items that were the basis of the correlation reflected the ability to regulate one's own emotions. By way of example, the PRAES questions assessed the ability to seek activities that would make one happy, the ability to control one's own emotions and the ability to remain expectant of positive outcomes. The PRMEI regulation of one's own emotions subscale was related to various test items on the PRAES appraisal of emotions subscale. Thus the outcome indicates a degree of convergence between the ability to perceive and regulate emotions. The PRMEI regulation of one's own emotions subscale was correlated with a number of the PRAES social skills test items that were similarly conceptualised in terms of the ability to regulate one's own and others' emotions. For instance, the relevant PRAES social skills questions assessed the ability to speak at appropriate times, to positively evaluate past events, to make a good impression, and to help others feel better.

The PRMEI perception/regulation of others' emotions was moderately and positively correlated with PRAES optimism/mood regulation; appraisal of emotions, social skills, and utilization of emotions subscales. The PRAES optimism/mood regulation questions related to the ability to regulate one's own emotions. Of the PRAES test items, there were three questions that were related to peer-estimates of the ability to expect positive outcomes, three items relating to the ability to motivate one's self in the face of obstacles, and one test item directly related to the ability to regulate one's own emotions. The PRAES appraisal of emotions questions that were the source of the correlation with the PRMEI perception/regulation of others emotions were (in the main) related to the perception of other people's emotions. For example, there were four correlations for the PRAES subscale that related to knowing how other people feel and one correlation that assessed an awareness of how other people feel. In the case of the PRMEI perception/ regulation of others emotions, peer-estimates of the ability to regulate one's own and others emotions was the basis of the correlations with the PRAES social skills subscale. PRAES questions included an assessment of the ability to speak at appropriate times, positively evaluate past events, make a good impression, and help others feel better. Lastly, the PRAES utilization of emotion test items that were significantly correlated with the PRMEI perception/regulation of others' emotions were typically conceptualised in terms of being able to solve problems and generate new ideas when in a positive mood. Both are key dimensions of the ability to utilize one's emotions.

### 3.15 Conclusion

In sum, the results of studies 1 and 2 provided preliminary support for the reliability of the SRMEI and PRMEI but not the factorial validity of the two new trait EI measures. Internal reliability and test-retest reliability were (in the main) satisfactory to good. However, the recovered factor structures were inconsistent with the underlying theory. Problems with the factor structure may be a consequence of difficulties with the definition of EI. It is also possible that there are problems with the wording of test items. In the first study it was decided to delete redundant items. The focus of further research in study 3 will be to reword any ambiguous test items and thereby improve the factor structure of the SRMEI and PRMEI.

There was reasonable support for the convergent validity of the two new EI measures in relation to empathy and the EI measure, the AES, but not in relation to each other. First, the SRMEI and PRMEI were positively correlated with the theoretically related construct of empathy. Second, there was a minimal degree of convergence between the SRMEI and the SRAES due to a self-enhancing response bias for the first instrument but not the latter. Given this response bias, it is important that future research consider the inclusion of a measure of social desirability in subsequent test batteries. There was considerably greater convergence between the PRMEI and PRAES. However, as a consequence of the self-enhancing response bias there was also a general absence of convergence between the SRMEI and PRMEI. A further confounding effect may have been the selection criteria for recruiting pairs of

participants who were only required to have known each other for three months. It is recommended that future research consider obtaining information concerning the length of time participants have known each other and the nature of the relationship between participants.



**CHAPTER 4**  
**AN ASSESSMENT OF THE VALIDITY OF**  
**A SELF-REPORT AND PERFORMANCE-BASED MEASURE**  
**OF EMOTIONAL INTELLIGENCE**

**4.1 Introduction**

One objective of chapter 4 was to refine the trait-based EI measure developed in the first study. A second objective was to develop an abilities-based measure of EI scored according to consensus protocols, and a newly devised scoring system termed confidence protocols. The final aim of chapter 4 was to conduct a comprehensive psychometric investigation of the refined and newly devised EI measures.

**4.2 Refinement of the New Trait-Based Emotional Intelligence Measure**

As reported in chapter 3, it was apparent that the SRMEI could be improved. Initial results indicated that the SRMEI was a reliable instrument that demonstrated convergent validity with empathy as well as a trait-based EI measure (the AES). But there were difficulties with the factor structure of the measure. Possible explanations for these difficulties relate to the wording of several test items. The difficulties were evident with a number of items cross-loading onto other factors, and a lack of distinctiveness between perception of emotion, and understanding of emotion questions. In addition, test items relating to the perception of emotions diverged into three separate factors: (1) the perception of one's own emotions, (2) the perception of others emotions, and (3) the expression of one's own emotions. It is argued that refining the wording of several SRMEI test items should improve the measure.

### 4.3 The Need for New Abilities-Based Emotional Intelligence Measures

It is evident that there is a range of problems with current performance-based instruments and that there are comparatively few measures of abilities-based EI. The advantage of performance-based measures is that they are designed to measure actual ability rather than self-perceived ability.

The MEIS (Mayer et al., 1999) and the MSCEIT (Mayer et al., 2000c) are the best abilities-based measures to date because the instruments have been based on the most recent definition of EI that include all four-factors. Although the two instruments have consistently been reported as having good total score and branch level internal reliabilities, the same has not been the case for several subtests, and there have been concerns about the factor structure of both measures (Ciarrochi et al., 2000; Mayer et al., 1999; Mayer et al., 2000c; Roberts et al., 2001). There are several possible explanations for the suboptimal outcomes for the MEIS and MSCEIT relating to response options, instructions to participants, and scoring methods.

Inspection of several MSCEIT questions reveals that more than one response from the five possible options is plausible in several instances. The outcome is that participants are likely to strongly endorse more than one response option. For example, the following question pertaining to MSCEIT branch 3 (changes) and resultant outcome illustrates the potential difficulties (Table 4.1) (Warwick & Nettelbeck, 2004).

“After Charlie’s car was stolen, he installed a car alarm in his new car. When his new car was also stolen, he first felt shock and surprise, and then \_\_\_\_\_”.

Table 4.1. Example of Endorsement of Items for the MSCEIT

	<b>Items</b>	<b>N</b>	<b>%</b>
1	Amazement and astonishment	6	6.89
2	Helplessness, despair and anger	43	49.42
3	Anger and disgust	35	40.22
4	Jealousy and envy	0	0
5	Depression and contempt	3	3.44

Ultimately, this will undermine the consistency with which participants respond to questions but this can be overcome by providing response options that are plausible yet distinguishable from each other. For example, it is important that test items include one answer that is clearly distinguishable as the optimal response. At the same time, distractor items are needed that are plausible on initial inspection but do not represent the best answer on closer examination.

It was also observed that the wording of MSCEIT regulation of emotion questions is ambiguous in several instances. For example, it is unclear what the test authors mean by the term “*better*” in the following question:

“Andrew works as hard, if not harder, than one of his colleagues. In fact, his ideas are usually better at getting positive results for the company. His colleague does a mediocre job but engages in office politics so as to get ahead. So, when Andrew’s boss announces that the annual merit award is being given to this colleague, Andrew is very angry. How effective would each action be in helping Andrew feel *better*?”

- (a) Andrew sat down and thought about all the good things in his life and his work.
- (b) Andrew made a list of the positive and negative traits of his colleague.
- (c) Andrew felt terrible that he felt that way, and he told himself that it wasn’t right to be so upset over an event not under his control.
- (d) Andrew decides to tell people just what a poor job his colleague had done, and that he did not deserve the merit award.
- (e) Andrew gathered memos and notes to prove his point, so it wasn’t just his word.

It is unclear whether a participant is being asked to determine if a strategy will help Andrew feel greater acceptance, less anger, or some other emotion. A new abilities-based measure of EI can address this problem by directing participants to indicate whether a specified strategy will be helpful in (1) increasing, (2) decreasing, or (3) maintaining a particular emotion.

Finally, abilities-based EI measures are presently scored according to consensus, expert and target methodologies but questions have been raised about these approaches (Roberts et al., 2001). One explanation for the difficulties with these scoring approaches is that researchers have been attempting to identify a single “correct” answer to an emotional problem. But factors such as intelligence, personality, values, self-concept, age, gender, ethnicity, culture, context, experience and so forth will impact on what an individual perceives to be the correct solution to a problem. Therefore it is unlikely there is a single correct answer to an emotional problem. Rather, there will be a range of correct answers that will vary depending upon the person and it is the effectiveness of an answer in solving a problem that is critical. For example:

“Jack broke his wrist during a motorbike rally and was worried about how long he would be unable to work. As someone with a high level of EI ability, Jack was able to identify a solution that completely resolved his worry, and he did so quickly”.

In this instance, the type of solution that Jack identified and adopted was secondary. What was important was the “degree” to which he was able to resolve the source of his worry without any lingering or residual concerns. In this case Jack was

able to resolve his concerns completely. In addition, the speed with which Jack was able to solve the problem was important. Based on the aforementioned, an alternative method of scoring maximal-performance based EI measures is proposed where the “degree of confidence” an individual has about a given solution is evaluated. In support of this idea, Stankov (1998) has used this type of scoring method for cognitive test items where participants are required to carry out a specific task and indicate how confident they are that their answer is correct. For a review of confidence ratings in general refer to Garb and Schramke (1996). In sum, current measures of abilities-based EI, although well constructed, can nevertheless be improved upon. Thus, the field of EI will benefit from the development of a new maximal performance instrument that will facilitate further the investigation of the construct.

#### **4.4 The Current Study**

The aim of the present study was to refine the SRMEI presented in chapter 3, and to develop a new abilities-based maximal performance measure of EI: the Ability Measure of Emotional Intelligence (AMEI). Following this, a comprehensive analysis of the psychometric properties of both measures was conducted to evaluate whether the EI construct is valid. The investigation included an analysis of internal reliability levels as well as the factorial, convergent, discriminant and incremental validity of the measures. An analysis of the incremental validity of the trait and ability EI measures was of particular interest both before and after controlling for personality as explicated in chapter 2. Individual differences in EI in relation to gender were also explored.

## **4.5 The Validation of Two Emotional Intelligence Measures**

### **4.5.1 Convergent Validity**

To examine the convergent validity of the SRMEI and AMEI, a measure of empathy was included in this study. Proponents of both ability and trait EI regard empathy as the cornerstone of emotion perception and therefore of theoretical interest (Mayer et al., 1990). In support of this idea, Mayer et al. (1999) reported a moderate significant positive relationship between EI, and empathy of  $r=.33, p<.01$ . Charbonneau and Nicol (2002) and Ciarrochi et al. (2000) have reported similar outcomes.

To examine further the convergent validity of the AMEI, two measures of cognitive ability (fluid and crystallised intelligence) were included in this study. The inclusion of these measures is based on the proposition that all mental ability measures should exhibit a positive relationship with pre-existing intelligences (Guttman, 1992). Previously, Mayer et al. (1999) reported weak to moderate significant positive correlations between the MEIS, and verbal intelligence of  $r=.36, p<.01$  (adults) and  $r=.45, p<.001$  (adolescents). Other researchers have also recorded the existence of a relationship between fluid and crystallised ability and EI (Roberts et al., 2001; Warwick & Nettelbeck, 2004).

### **4.5.2 Discriminant Validity**

The discriminant validity of the SRMEI and AMEI were examined by including a measure of the Big Five personality traits in order to test whether both measures were distinct from personality. Previously, trait EI measures have tended to correlate highly

with well-known personality domains, whereas ability EI measures have typically been distinguishable from existing personality traits (Chapter 2).

### **4.5.3 Incremental Validity**

#### **(i) Grade Point Average**

To assess the incremental validity of the AMEI and SRMEI the present study included a measure of grade point average (GPA) as an objective behavioural measure of academic achievement. Previously, Schutte et al. (1998) identified a weak positive correlation between the AES and GPA ( $r=.32, p<.01$ ). Brackett, Mayer and Warner (2004) reported a weak significant positive relationship between the MSCEIT, and GPA ( $r=.14, p<.05$ ). O'Connor and Little (2003) reported similar findings.

#### **(ii) Stress**

The incremental validity of the AMEI and SRMEI was assessed in relation to stress levels. A relationship between EI and stress is proposed on the basis that the ability to perceive and manage one's emotions will result in a more effective resolution of stress. Slaski and Cartwright (2003) found that individuals with high EI levels reported significantly less stress ( $r=-.40, p<.01$ ). Salovey et al. (2002) reported comparable results.

#### **(iii) Loneliness**

To explore further the incremental validity of the AMEI and the SRMEI, a measure of loneliness was included in this study. Saklofske et al. (2003) suggested that individuals with low levels of EI (as characterised by a reduced ability to perceive others emotions, and manage one's own emotions) are more likely to be lonely because

they are less able to connect with others. In support of this proposition, Saklofske et al. (2003) reported weak to moderate negative correlations between EI and loneliness family ( $r=-.29, p<.001$ ); social life ( $r=-.33, p<.001$ ); and romantic life ( $r=-.19, p<.001$ ).

#### **(iv) General Well-being**

A measure of general well-being was included in the present study as part of an assessment of the incremental validity of the AMEI and SRMEI. It is proposed that an individual who has a high level of EI will be better able to perceive and use their emotions to attain their goals and will therefore experience a greater sense of well-being. The measure of general well-being will capture both the cognitive and affective components of well-being with life (Campbell, Converse & Rodgers, 1976).

#### **4.5.4 Social Desirability**

A measure of social desirability was included in this study to evaluate response bias. Self-report measures are vulnerable to a social desirability bias (Stanley & Hopkins, 1972). The processing of emotional information is likely to be especially vulnerable to such a bias. Charbonneau and Nicol (2002) reported a moderate significant positive relationship between the AES and social desirability ( $r=.49, p<.01$ ). Likewise, Saklofske et al. (2003) reported a weak significant positive relationship between the AES and social desirability ( $r=.12, p<.05$ ).

#### **4.5.5 A Comparison of Trait and Ability EI**

The simultaneous development and evaluation of a self-report and performance-based instrument will enable a comparison of outcomes in relation to trait and ability EI. Thus far there have been relatively few studies examining the nature of



the relationship between trait and ability EI (Brackett & Mayer, 2003; Lopes et al., 2003). Of these studies, correlations have generally been weak and positive, or non-significant. Brackett and Mayer (2003) found a correlation of  $r=.21$ ,  $p<.01$  between the MSCEIT and EQ-i. Lopes et al. (2003) reported non-significant correlations between the Trait Meta-Mood subscales and the MSCEIT ranging from  $r=.01$  to  $r=.15$ . Moreover, self-report measures of IQ typically correlate with actual ability in the order of  $r=.30$  or below (Paulhus, Lysy & Yik, 1998). In consideration of the above, the SRMEI together with the AMEI-CS and AMEI-CF are based on the same definition thereby providing an opportunity for direct comparison not conducted to date.

#### **4.5.6 Gender Differences**

An investigation of gender differences in EI was undertaken in order to examine variations in performance between males and females. Some research has revealed the existence of gender differences in favour of females as well as males depending upon the type of abilities being assessed (Brackett & Mayer, 2003; Chapter 3: study 1; Ciarrochi et al., 2000; Mayer et al., 1999). The purpose of this investigation was to elucidate these potential differences in more detail with respect to both trait and ability EI.

#### **4.6 Objectives**

The principal aim of this study was to revise the SRMEI, develop an abilities-based EI measure, and examine the validity of the two measures. In keeping with this, it was proposed that trait and ability EI would be correlated (1) positively with empathy; and abilities-based EI will be (2) positively correlated with fluid and

crystallized ability. It was proposed that both abilities-based, and trait-based EI would be correlated (3) positively with extraversion, (4) negatively with neuroticism, (5) positively with openness, (6) positively with conscientiousness, and (7) positively with agreeableness. It was further proposed that trait and ability EI would be correlated (8) positively with GPA, (9) negatively with stress, (10) negatively with loneliness, and (11) positively with general well-being both before and after controlling for cognitive ability, personality and social desirability.

## **4.7 Method**

### **4.7.1 Participants**

Two hundred and seventy three undergraduate psychology students at the University of Adelaide took part in the study as part of course credit. The participants comprised 67 males and 206 females ranging in age from 17 to 43 (Mean=19.65, SD=4.16)<sup>3</sup>.

### **4.7.2 Materials**

The SRMEI-R is a revised version of the SRMEI. It was modified as a result of the analyses outlined in chapter 3 (Appendix 4.2). The modifications involved the amendment of several items, the deletion of some items, and the addition of some items. The two questions relating to the expression of emotions were reworded to provide an assessment of the perception of one's own emotions. This should give rise to a clearer perception of emotions factor. Utilization of emotions questions were reworded to reduce ambiguity. Questions pertaining to the understanding of emotions

---

<sup>3</sup> Although common in the discipline of psychology, it was noted that there was a gender imbalance in the number of participants in favour of females.

were reworded to be more readily distinguishable from perception test items. The revised SRMEI-R comprised 30 items with statements such as “In general, I am able to identify my feelings as I experience them”. Items were presented on a 5-point Likert scale; with responses ranging from (1) strongly disagree to (5) strongly agree. Items 2, 4, 9, 11, 13, 16, 18, 19, 28, 29, 30 were reverse scored. Scores were obtained by summing the total items. Higher scores represented higher EI.

The Ability Measure of Emotional Intelligence Version 1.0 (AMEI 1.0) is a performance-based measure that assesses Mayer and Salovey’s (1997) four-factor definition of EI (Appendix 4.3). The measure assessed various aspects of EI using six subscales: one perception, one utilization, two understanding, and two regulation of emotion subscales. The measure is scored in accordance with proportionate consensual protocols and confidence levels. Outcomes for the 82-item consensus measure are referred to as AMEI-CS results. According to a consensus method of scoring, a correct answer to a problem is calculated based on the degree to which a participant’s response agrees with the sample group. For example, if 25% of the sample group selects “5” (5-point Likert scale) to indicate that they strongly agree that happiness is evident in a facial expression, then respondents selecting option “5” receive a score of .25. Scores are obtained by summing responses, with high scores indicating higher emotional intelligence. Outcomes for the 22-item confidence measure are referred to as AMEI-CF results. For confidence levels, participants were asked to indicate how confident (%) they were about their responses to a series of three or more of the

consensus questions. Scores were calculated by summing responses with higher scores reflecting greater confidence.

The AMEI 1.0 branch 1 subscale has been designed to measure the ability to perceive emotion in other people's faces. Participants were presented with four faces chosen to represent a variety of emotions from the Facial Action Coding System (Ekman & Friesen, 1975). Each face was followed by a choice of five emotions and participants indicated on a 5-point Likert scale whether they (1) strongly disagree or (5) strongly agree that a specified emotion is evident.

The branch 2 task has been designed to assess the ability to generate emotions as part of the ability to use one's emotions to assist in problem solving (Izard, 1977). The subscale comprised six items, with questions such as "To what extent would each of the following three emotions be useful to feel when striving to do well in a particular subject". Participants were asked to indicate on a 5-point Likert scale the extent to which three emotions might be useful to feel ranging from (1) not useful to (5) useful.

The first branch 3 task has been designed to assess the ability to understand how emotions change over time (Plutchik, 1984). The subscale comprised 10 questions with five accompanying emotions, and respondents were instructed to select the most likely emotional change. For instance:

"Daniel was annoyed when a colleague used his computer without asking, so he spoke to him about it. When the colleague did it again, Daniel felt ...".

- (a) guilty
- (b) angry
- (c) disappointed
- (d) worried
- (e) regret

Particular attention was paid to providing response options that were distinguishable from each other.

The second branch 3 task was designed to assess the ability to understand blended emotions (Plutchik, 1984). The subscale comprised 10 questions. For example, "The feeling of jealousy is a combination of which two emotions?". Participants were presented with five combinations of emotions, and instructed to select the most likely blend of emotions. Again the focus during test construction was to clearly differentiate between response options.

The first branch 4 task examined the ability to regulate one's own emotions. It consisted of four scenarios (Salovey, Hsee & Mayer, 1993). Participants were instructed to indicate how effective three possible actions would be to increase, decrease or maintain a specified emotion on a 5-point Likert scale with (1) very ineffective to (5) very effective. For example:

"Doug works at the local children's hospital. He knows that a positive environment can help the children cope with illness and accidents better, so Doug aims to be in a happy mood when he is working. One morning before work he received some bad news, and now he feels let down. How effective would each of the following actions be to help Doug increase his level of happiness".

- (1) "Doug performed a few party tricks for the children".
- (2) "He shared several funny jokes with friends at work".
- (3) "Doug recalled a number of positive times he had shared with the children".

The second branch 4 task was designed to assess the regulation of other people's emotions. It comprised four scenarios (Salovey et al., 1993). Participants indicated how effective three possible actions to increase, decrease or maintain an

emotion might be on a 5-point Likert scale, with (1) very ineffective to (5) very effective. For instance:

“As Mark and Leonie were about to present a training seminar, Mark received some bad news, and was feeling let down. Leonie felt it was important that the presentation be delivered with enthusiasm so she tried to lift Mark’s spirits. If Leonie adopted any of the following actions to increase Mark’s enthusiasm how effective would each of them be”.

- (a) “Leonie reminded Mark of some of the people he had helped through the training seminars”.
- (b) “Leonie insisted she present the training seminar”.
- (c) “Leonie kept on reminding Mark that it was important the training session be a success”.

A Swaps Test (Stankov, 2000) (Appendix 4.4) provided an assessment of fluid ability; a widely used and readily available test in the public domain. Participants were presented with a set of 3 letters – A, B, and C – in random order, and asked to mentally interchange, or “swap,” the positions of two of the letters. Respondents indicated their answers by selecting one of six possible outcomes. The measure included a total of 32 items consisting of four sections of items at increasing levels of difficulty. Section 1 comprised eight items involving one swap; section 2 comprised eight items and involved two swaps; section 3 comprised seven items and required three swaps; and section 4 comprised seven items and involved four swaps.

- Section 1: C B A. “Swap 1 and 2”. (Answer: B C A).
- Section 2: B C A. “Swap 2 and 3”, then “Swap 1 and 3”. (Answer: C A B).
- Section 3: B A C. “Swap 2 and 3”, then “Swap 1 and 3”, then “Swap 1 and 2”.(Answer: C A B).
- Section 4: A B C. “Swap 2 and 3”, “Swap 1 and 3”, “Swap 1 and 2”, “Swap 1 and 3”.(Answer: A B C).

Results were obtained by summing scores. Higher scores indicated a higher level of fluid ability. Convergent validity for the Swaps Task has been indicated by

moderate correlations with fluid ability markers: Raven's Progressive Matrices, Letter Series, and Counting Letters (Stankov, 2000).

Crystallised ability was assessed by a general knowledge task that could be administered online (Burns, 2004) (Appendix 4.5). The measure comprised 40 items. Participants indicated their answer to each question by choosing from one of four available options. For example, "How many hours are there in a day?" Results were obtained by the summing of scores with high scores indicating higher crystallised ability.

The Quickscales is a 30-item questionnaire that was designed to measure the Big Five personality domains. It was selected because it is brief and capable of being administered online (Brebner, 1998) (Appendix 4.6). The five domains are neuroticism, extraversion, openness, agreeableness, and conscientiousness (Costa & McCrae, 1992). The instrument comprised questions such as "How lively, outgoing, and extraverted are you?" Respondents were asked to indicate on a 7-point Likert scale the extent to which statements reflected their usual feelings or behaviour with (1) not at all to (7) extremely. Results were obtained by summing the scores for each subscale. Higher scores reflected a greater presence of the respective personality trait. Internal reliability has been reported as .78, .75, .64, .82, and .53 for extraversion, neuroticism, openness, conscientiousness, and agreeableness respectively (Brebner, 2001). The Quickscales have demonstrated good convergent validity in relation to the NEO PI-R (Thalbourne, 2000).

The Questionnaire Measure of Empathic Tendency is a widely used measure of emotional empathy, as defined by Mehrabian and Epstein (1972) (Appendix 3.3).

Refer to chapter 3: study 1 for instrument details.

The Depression Anxiety and Stress Scale is a public domain instrument that is widely used to assess: (1) depression, (2) anxiety, and (3) stress (Lovibond & Lovibond, 1995) (Appendix 4.7). The subscale relating to stress was used in the current study. The stress subscale comprised 14 items with questions such as “I find it hard to wind down”. Participants were asked to read each statement and indicate how much the statement applied to them on a 4-point Likert scale with (1) did not apply to me at all to (4) applied to me very much, or most of the time. Scores were obtained by summing all of the items. Higher scores indicated higher levels of stress. Internal reliability levels have been reported as .90 (Lovibond & Lovibond, 1995).

The UCLA Loneliness Scale Version 3 provided a measure of loneliness (Russell & Cutrona, 1988) (Appendix 4.8) that could be administered. The scale comprised 20 items with questions such as “How often do you feel you are ‘in tune’ with the people around you?” Participants were instructed to respond to each of the questions on a 4-point Likert scale with (1) never to (4) always. Items 1, 5, 6, 9, 10, 15, 16, 19, and 20 were reverse scored. Scores were obtained by summing all the items with higher scores representing greater loneliness. Internal reliability levels have been reported as ranging from .89 to .94 (Russell & Cutrona, 1988). The scale has exhibited good convergent and discriminant validity (Russell & Cutrona, 1988).



The Index of General well-being is a two-part well-being measure that assessed both the cognitive and affective aspects of well-being including (1) general affect, and (2) life satisfaction (Campbell et al., 1976) (Appendix 4.9). The general affect component included 8 items on a semantic differential scale. For example, respondents were asked to indicate on a 7-point scale the extent to which they find life (1) interesting to (7) boring. Items 1, 3, 6, and 7 were reverse scored. The life satisfaction subscale comprised a single-item. Participants were instructed to indicate on a 7-point scale “How satisfied or dissatisfied are you with your life as a whole”. “Which number comes closest to how satisfied or dissatisfied you feel?” with (1) completely dissatisfied to (7) completely satisfied. General well-being is the sum of (1) the average score of the general affect component, and (2) the single-item life satisfaction component. Higher scores indicated higher general well-being. Internal reliability has been reported as .89 with test-retest reliability as .43 (Campbell et al., 1976). The measure has exhibited discriminant and convergent validity (Campbell et al., 1976).

The Marlow-Crowne Scale is a widely used instrument in the public domain that was included as a measure of social desirability response bias (Crowne & Marlow, 1960) (Appendix 4.10). The scale comprised 33 items that were rated true or false as they related to the respondent. Each item consisted of statements like “Before voting I thoroughly investigate the qualifications of all the candidates”. Higher scores reflected higher social desirability response bias. The internal consistency of the measure has been reported as .88, with test-retest reliability in the order of .89 (Crowne & Marlow,

1960). Weingerber, Schwartz and Davidson (1979) reported that the Marlow-Crowne Scale has demonstrated good convergent validity.

#### **4.7.3 Procedure**

A description of the study along with an invitation to participate was provided to undergraduate students via the Psychology Department home page. Participants were asked to complete the online consent form and grant permission for the researcher to access their end of semester final grades (Appendix 4.1). Once the consent form was completed, participants were able to undertake the study online. This involved completion of 11 questionnaires. The testing sessions were divided into two segments with each session taking 1 hour to complete over a 6-week period.

### **4.8 Results**

#### **4.8.1 Descriptive Statistics**

The means, and standard deviations for the respective variables were in the main consistent with expectations (Brebner, 1998; Campbell et al., 1976; Chapter 3; Crowne & Marlow, 1960; Mayer et al., 1999; Russell & Cutrona, 1988; Stankov, 2000) (Table 4.2). Notable exceptions were mean scores for SRMEI-R utilization and understanding of emotions that paired samples t-tests revealed were significantly different from Chapter 3: study 1 (Table 4.2). Items relating to these two subscales were amended from study 1 to study 3.

#### 4.8.2 Factor Analyses

To determine if the correlation matrices were suitable for factor analysis, Kaiser-Meyer-Olkin (KMO) and Bartlett's test of sphericity test statistics were calculated. Subsequently, the optimal factorial structures of the SRMEI-R, AMEI-CS and AMEI-CF were identified. Consistent with the majority of EI research, principal axis factor analyses with oblimin rotations were conducted. This was compared with principal components analyses with varimax rotation. Results from the two methods of analysis were comparable but the principal components outcome provided slightly clearer factor structures. Moreover, the principal components technique analysed all of the variance associated with the variables whereas only shared variance is analysed in principal axis factor analyses (Tabachnick & Fidell, 2001). The selection criteria for determining the optimal number of factors was based on the eigenvalue > 1.0 rule; on the clarity and interpretability of factors; and on the convergence between factors and the theoretical model (Tabachnick & Fidell, 2001)<sup>4</sup>.

For the SRMEI-R, a KMO measure of sampling adequacy of .89, and Bartlett's test of sphericity ( $\chi^2_{(435)} = 5152.59, p < .001$ ) indicated that the measure was suitable for factor analysis. Results of the factor analysis indicated the existence of a six-factor

---

<sup>4</sup> One of the examiner's of this thesis commented that the criterion for choosing the number of factors to extract appeared to be based on the eigenvalues >1 rule but broader selection criterion were indicated as a precursor to the reporting of results as indicated .

**Table 4.2.** Descriptive Statistics for the SRMEI-R, AMEI-CS, AMEI-CF Cognitive Ability, Personality, and Criterion Variables

SRMEI-R	Current Study		Norms		Source	t(147)
	Means	SD	Means	SD		
Per self/others	29.46	4.25	29.68	4.85	Chapter 3: study #1	0.32
Utilization	22.20	4.78	23.99	4.55		-3.17**
Understanding	25.02	4.45	23.86	4.62		2.11*
Reg self/others	27.55	4.60	27.40	4.72		1.26
AMEI-CS					Mayer et al. (1999)	
Per (others)	0.41	0.07	0.40	0.08		
Utilization	0.46	0.07	0.31	0.04		
Under (changes)	0.70	0.11	0.58	0.10		
Under (blends)	0.56	0.11	0.49	0.10		
Reg (self)	0.49	0.07	0.28	0.04		
Reg (others)	0.48	0.07	0.27	0.04		
AMEI-CF						
Per (others)	81.04	11.83	-	--		
Utilization	86.10	10.53	-	-		
Under (changes)	87.07	10.83	-	-		
Under (blends)	75.31	14.50	-	-		
Reg (self)	83.90	11.00	-	-		
Reg (others)	82.94	11.34	-	-		
Fluid Ability	28.06	5.17	49.09	24.42	Stankov (2000)	
Crystallised Ability	28.35	4.41			Burns (2004)	
Extraversion	27.19	5.90	26.98	6.01	Brebner (1998)	
Neuroticism	21.60	6.39	22.28	5.61		
Openness	29.93	4.32	30.88	5.11		
Conscientiousness	29.69	4.96	30.15	4.34		
Agreeableness	28.56	4.02	27.95	4.23		
Social Desirability	15.80	5.05	15.00	5.91	Crowne & Marlow (1960)	
Empathy	120.31	10.87	123.26	12.42	Chapter 3: study #1	-1.16
GPA	67.83	9.76	-	--		
Stress	28.41	7.17	10.11	7.91	Lovibond & Lovibond ('95)	
Loneliness	41.24	9.65	40.10	9.50	Russell & Cutrona (1988)	
General well-being	11.53	2.37	11.80	2.20	Campbell et al. (1976)	

\*  $p < .05$ ; \*\*  $p < .01$ . Results are all two-tailed.

solution but the interpretation of factors would be enhanced by the deletion of two cross-loaded items; items 4 and 17.

The revised 28-item self-report EI measure (SRMEI-R) was subjected to factor analysis. A KMO measure of sampling adequacy of .89, and Bartlett's test of sphericity ( $X^2_{(378)}=4732.51, p<.001$ ) indicated that the measure was suitable for factor analysis. The SRMEI-R factor analysis indicated that a six-factor solution should be retained with eigenvalues for the first six factors being 4.29, 4.04, 3.95, 3.21, 2.53 and 1.58 respectively with a total of 70.05% of the variance being accounted for (Table 4.3). An examination of the item loadings for the rotated factor solution suggested that the six factors be labelled: (1) understanding of emotions, (2) utilization of emotions, (3) perception of other people's emotions, (4) regulation of one's own emotions, (5) perception of one's own emotions, and (6) regulation of other people's emotions. The factor correlations for the SRMEI ranged from weak to moderate (Table 4.3.1). The internal reliability levels for the SRMEI-R were .90, .90, .88, .90, .80, and .79 for the respective subscales (Table 4.7: Refer to correlation matrix).

A factor analysis of the 82-item AMEI-CS revealed a satisfactory KMO measure of .71, and Bartlett's test of sphericity ( $X^2_{(3321)}= 6986.80, p <.001$ ). But the analysis indicated a 28-factor solution should be retained and this was considered implausible. To explore the factor structure further, a parallel roots analysis was conducted to identify the relationship between the observed data set and a 1000 random permutations of the raw data with

Table 4.3. Rotated Component Matrix of the SRMEI-R

No.	Item	Und	Use	P(o)	R(s)	P(s)	R(o)	h <sup>2</sup>
25	Emotions are connected	<b>0.90</b>	0.03	0.04	0.00	-0.13	0.02	<b>0.78</b>
23	Links between feelings	<b>0.85</b>	-0.02	0.03	-0.02	-0.08	0.02	<b>0.69</b>
20	Able to grasp emotions	<b>0.82</b>	-0.04	0.00	-0.04	0.10	-0.07	<b>0.68</b>
7	Understand emotions	<b>0.77</b>	0.10	0.07	0.01	0.07	-0.07	<b>0.68</b>
13	Don't comprehend feelings	<b>0.73</b>	-0.02	-0.05	-0.07	0.22	0.00	<b>0.66</b>
28	Hard to understand emotions	<b>0.70</b>	-0.01	-0.17	0.03	0.23	0.12	<b>0.70</b>
22	Use emotions to solve problems	0.01	<b>0.89</b>	-0.11	0.07	-0.09	0.10	<b>0.77</b>
19	I don't rely on emotions	-0.02	<b>0.86</b>	-0.12	-0.10	0.10	0.13	<b>0.73</b>
11	Feelings don't guide me	-0.18	<b>0.82</b>	-0.01	-0.07	0.13	0.11	<b>0.68</b>
27	I like using feelings	0.08	<b>0.79</b>	0.00	0.13	-0.07	-0.02	<b>0.66</b>
3	I utilize my emotions	-0.01	<b>0.76</b>	0.09	-0.02	-0.04	-0.11	<b>0.62</b>
6	My feelings guide me	0.15	<b>0.75</b>	0.05	-0.03	0.00	-0.17	<b>0.63</b>
26	Easy to identify others feelings	-0.01	-0.05	<b>0.92</b>	-0.01	0.02	-0.04	<b>0.79</b>
14	Able to read people's feelings	-0.10	0.02	<b>0.86</b>	0.06	0.04	0.09	<b>0.78</b>
10	Recognise others feelings	-0.02	-0.05	<b>0.80</b>	-0.06	0.04	0.09	<b>0.66</b>
30	Not easy to work out feelings	0.05	-0.03	<b>0.66</b>	-0.05	0.27	0.14	<b>0.69</b>
15	Good at managing my emotions	0.01	0.01	0.02	<b>0.95</b>	-0.05	-0.15	<b>0.83</b>
8	Able to regulate my feelings	0.08	-0.02	0.03	<b>0.91</b>	-0.07	-0.09	<b>0.81</b>
29	Difficult to manage my feelings	-0.03	-0.02	-0.04	<b>0.81</b>	0.15	0.09	<b>0.79</b>
18	Unable to regulate own emotions	-0.16	0.02	-0.04	<b>0.78</b>	0.19	0.13	<b>0.74</b>
21	I am aware of how I feel	0.14	0.04	0.13	0.09	<b>0.72</b>	-0.27	<b>0.69</b>
16	Difficult to work out how I feel	0.06	-0.02	-0.14	0.05	<b>0.72</b>	0.26	<b>0.72</b>
1	Able to identify my feelings	-0.02	0.11	0.30	0.00	<b>0.71</b>	-0.12	<b>0.62</b>
9	Emotions are confusing	0.10	-0.12	-0.12	0.03	<b>0.68</b>	0.24	<b>0.67</b>
2	Manage others feelings is difficult	-0.09	0.01	0.14	-0.09	0.20	<b>0.80</b>	<b>0.75</b>
24	Able to manage others emotions	0.15	0.03	0.38	0.07	-0.16	<b>0.55</b>	<b>0.72</b>
5	Help people with their emotions	0.00	0.09	0.40	0.00	-0.09	<b>0.50</b>	<b>0.57</b>
12	Handle others feelings	0.18	-0.02	0.32	0.09	-0.25	<b>0.43</b>	<b>0.51</b>
<b>Percent of variance</b>		<b>15.33</b>	<b>14.43</b>	<b>14.10</b>	<b>11.46</b>	<b>9.06</b>	<b>5.64</b>	<b>70.05</b>

eigenvalues greater than whole numbers. Thus, a parallel roots analysis describes the number of roots or factors that the two data sets have in common and therefore the

Table 4.3.1: Component Transformation Matrix for the SRMEI-R

SRMEI Factors		1	2	3	4	5	6
1	Understand emotions	0.61	0.20	0.52	0.35	0.37	0.25
2	Utilization of emotions	-0.08	0.87	0.18	-0.39	-0.24	0.02
3	Perception of others emotions	0.15	0.42	-0.69	0.38	0.32	-0.27
4	Regulation of own emotions	-0.63	0.17	0.25	0.70	-0.12	0.10
5	Perception of own emotions	-0.45	0.02	0.10	-0.32	0.83	0.07
6	Regulation of others emotions	-0.01	0.03	-0.38	-0.02	-0.05	0.92

optimal factor structure (Tabachnick & Fidell, 2001).. The outcome suggested the presence of either a four, five or six factor solution. Following principal components factor analysis it was apparent that a four-factor solution was the optimal outcome and that the EI measure could be improved by the deletion of 44 redundant items. Of these, 24 items failed to load on any of the factors, four items cross-loaded and the deletion of a further 16 items improved factor interpretation.

The revised 38-item AMEI-CS was factor analysed and a KMO measure of sampling adequacy of .78, and Bartlett's test of sphericity ( $X^2_{(703)} = 2583.17, p < .001$ ) indicated that the improved EI measure was suitable for factor analysis. The analysis indicated that a four-factor solution should be retained (Table 4.4). The eigenvalues for the four factors were 4.80, 3.05, 2.85 and 2.19 respectively. The total variance accounted for was 33.97%. The four factors were labelled: (1) perception of other people's emotions, (2) understanding of emotions, (3) utilization of emotions, and (4) regulation of one's own, and other people's emotions. The factor correlations for the AMEI-CS

Table 4.4. Rotated Component Matrix of the AMEI-CS

No.	Item	Per	Und	Use	Reg	h <sup>2</sup>
11	Loneliness	<b>0.81</b>	0.05	-0.23	-0.07	<b>0.62</b>
12	Fear	<b>0.81</b>	-0.04	-0.05	0.00	<b>0.63</b>
15	Sadness	<b>0.77</b>	0.02	-0.19	0.02	<b>0.55</b>
13	Disgust	<b>0.76</b>	-0.04	0.07	-0.03	<b>0.61</b>
17	Happiness	<b>0.69</b>	-0.03	0.02	0.02	<b>0.48</b>
20	Excitement	<b>0.63</b>	-0.08	0.14	-0.05	<b>0.45</b>
14	Happiness	<b>0.61</b>	-0.04	0.08	0.13	<b>0.42</b>
9	Happiness	<b>0.58</b>	-0.08	0.19	0.07	<b>0.42</b>
6	Shyness	<b>0.56</b>	0.09	-0.04	-0.14	<b>0.34</b>
19	Amusement	<b>0.48</b>	0.15	0.21	-0.05	<b>0.39</b>
57	Anger, disgust and contempt	0.06	<b>0.70</b>	-0.16	-0.11	<b>0.43</b>
53	Disgust and anger	-0.12	<b>0.55</b>	-0.03	-0.10	<b>0.27</b>
41	Happy to content	0.09	<b>0.52</b>	-0.11	0.12	<b>0.30</b>
44	Content to elated	-0.03	<b>0.51</b>	-0.02	0.10	<b>0.29</b>
49	Envy and anger	-0.02	<b>0.49</b>	0.08	-0.17	<b>0.26</b>
54	Care, anxiety and anticipation	-0.07	<b>0.46</b>	0.09	-0.11	<b>0.22</b>
42	Excited to disappointed	0.15	<b>0.44</b>	0.18	0.22	<b>0.45</b>
50	Contempt and pride	-0.06	<b>0.41</b>	0.10	0.06	<b>0.21</b>
52	Anger and sadness	-0.05	<b>0.41</b>	-0.10	-0.03	<b>0.14</b>
48	Calm and content to worried	0.06	<b>0.40</b>	-0.08	0.05	<b>0.17</b>
43	Sad to angry	0.14	<b>0.37</b>	-0.07	0.10	<b>0.18</b>
56	Security, serenity and relaxation	-0.10	<b>0.34</b>	0.19	-0.11	<b>0.17</b>
30	Calm	0.01	-0.17	<b>0.74</b>	0.00	<b>0.49</b>
24	Respect	-0.03	0.00	<b>0.68</b>	-0.14	<b>0.44</b>
37	Calm	-0.08	-0.02	<b>0.62</b>	0.01	<b>0.35</b>
21	Enthusiasm	-0.04	0.27	<b>0.52</b>	-0.04	<b>0.42</b>
29	Courage	0.05	-0.13	<b>0.48</b>	-0.08	<b>0.22</b>
33	Determination	0.12	0.24	<b>0.46</b>	0.20	<b>0.49</b>
25	Openness	0.05	-0.01	<b>0.42</b>	-0.12	<b>0.19</b>
26	Optimism	-0.02	0.00	<b>0.42</b>	0.21	<b>0.24</b>
71	Increase enthusiasm	-0.03	-0.07	0.08	<b>0.62</b>	<b>0.38</b>
80	Reduce disappointment	-0.13	0.08	0.04	<b>0.58</b>	<b>0.39</b>
68	Reduce anxiety	-0.01	0.02	-0.02	<b>0.51</b>	<b>0.26</b>
60	Increase happiness	-0.17	0.07	-0.21	<b>0.44</b>	<b>0.27</b>
69	Reduce anxiety	0.04	-0.24	-0.04	<b>0.44</b>	<b>0.20</b>
78	Increase happiness	0.03	0.07	-0.13	<b>0.44</b>	<b>0.21</b>
65	Reduce excitement	0.01	0.07	-0.10	<b>0.42</b>	<b>0.19</b>
75	Reduce anger	0.10	-0.16	0.07	<b>0.39</b>	<b>0.16</b>
<b>Percent of Variance</b>		<b>12.66</b>	<b>8.04</b>	<b>7.50</b>	<b>5.77</b>	<b>33.97</b>



ranged from weak to strong (Table 4.4.1). The internal reliability levels for the AMEI-CS were .86, .69, .71, and .54 for the four factors (Table 4.7: Refer to correlation matrix). The internal reliabilities at the subtest level were .56 for understanding (changes) and .58 (blends); and .32 for regulation of emotions (self) and .41 (others).

Table 4.4.1: Component Transformation Matrix for the AMEI-CS

	<b>Factor</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>
1	Perception of emotion	0.82	0.36	0.44	0.07
2	Understanding of emotion	-0.52	0.68	0.34	0.40
3	Utilization of emotion	0.25	0.14	-0.68	0.67
4	Regulation of emotion	-0.03	-0.62	0.47	0.62

For confidence level outcomes, results revealed that the AMEI-CF was suitable for factor analysis (KMO of .95; Bartlett's test of sphericity  $X^2_{(231)}=4383.98, p<.001$ ) and indicated the presence of a three-factor solution. The interpretation of the factor structure was improved by the deletion of 3 cross-loaded items.

The revised 19-item AMEI-CF was factor analysed (KMO of .95; Bartlett's test of sphericity  $X^2_{(171)}= 3618.45, p<.001$ ) and the outcome indicated that a three-factor solution should be retained. The eigenvalues for the first three factors were 5.09, 3.92 and 3.38 respectively with a total of 65.30% of the variance accounted for (Table 4.5). The three factors were labelled: (1) regulation of one's own and other people's emotions, (2) perception/utilization of emotions, (3) understanding of emotions. The factor correlations for the AMEI-CF ranged from weak to strong (Table 4.5.1). The internal reliability levels for the AMEI-CF were .93, .87, and .87, respectively (Table 4.7: Refer to correlation matrix).

**Table 4.5.** Rotated Component Matrix of the AMEI-CF

No.	Item	Reg	Puse	Und	h <sup>2</sup>
21	Increase happiness - others	<b>0.87</b>	0.03	-0.03	<b>0.75</b>
17	Reduce excitement - self	<b>0.85</b>	-0.04	0.03	<b>0.71</b>
15	Increase happiness - self	<b>0.82</b>	-0.04	0.03	<b>0.65</b>
16	Maintain contentment - self	<b>0.81</b>	-0.06	0.12	<b>0.72</b>
22	Reduce disappointment - others	<b>0.73</b>	0.07	0.01	<b>0.62</b>
20	Reduce anger - others	<b>0.70</b>	0.18	0.02	<b>0.73</b>
19	Increase enthusiasm - others	<b>0.68</b>	-0.01	0.23	<b>0.70</b>
2	Anger	-0.27	<b>0.85</b>	0.22	<b>0.68</b>
4	Sadness	-0.01	<b>0.78</b>	-0.01	<b>0.58</b>
3	Fear	0.27	<b>0.75</b>	-0.32	<b>0.59</b>
1	Happiness	-0.11	<b>0.66</b>	0.27	<b>0.60</b>
9	Striving for a goal	0.22	<b>0.58</b>	0.02	<b>0.58</b>
6	Working on a joint project	0.24	<b>0.55</b>	0.04	<b>0.59</b>
7	Attempting to win a debate	0.34	<b>0.48</b>	-0.08	<b>0.49</b>
14	Concern, anxious, calm, hostile, humiliated	0.04	-0.15	<b>0.96</b>	<b>0.80</b>
13	Jealous, smug, love, bitter, contempt	0.08	-0.02	<b>0.85</b>	<b>0.80</b>
12	Content, distress, angry, surprise, calm	0.21	0.17	<b>0.56</b>	<b>0.71</b>
10	Attempting to resolve a conflict	0.00	0.27	<b>0.55</b>	<b>0.56</b>
11	Annoy, anxious, happy, excited, sad	0.35	0.09	<b>0.38</b>	<b>0.54</b>
<b>Percent of Variance</b>		<b>26.80</b>	<b>20.67</b>	<b>17.83</b>	<b>65.30</b>

**Table 4.5.1:** Component Transformation Matrix for the AMEI-CF

	Factor	1	2	3
1	Regulation of emotion	0.66	0.56	0.50
2	Per/utilization of emotion	-0.46	0.83	-0.31
3	Understanding of emotion	-0.59	-0.02	0.80

### 4.8.3 Descriptive Statistics Revisited

In keeping with the factor analytical outcomes, the means, standard deviations and ranges for the SRMEI-R, AMEI-CS, and AMEI-CF were retabulated (Table 4.6).

As a result of skewness and kurtosis, the AMEI-CS, fluid ability and general well-

being scores were logarithmically transformed (Table 4.6). The *direction* of the respective outcomes is reversed for ease of interpretation.

**Table 4.6.** Revised Descriptives for the SRMEI-R, AMEI-CS, AMEI-CF, Fluid Ability, and General well-being

<b>Variable</b>	<b>Mean</b>	<b>SD</b>	<b>Range</b>
SRMEI-R understanding of emotions	21.27	3.86	8-30
SRMEI-R utilization of emotions	18.88	4.35	6-30
SRMEI-R perception of emotions (others)	14.39	2.68	7-20
SRMEI-R regulation of emotions (self)	13.61	3.22	4-20
SRMEI-R perception of emotions (self)	15.07	2.53	6-20
SRMEI-R regulation of emotions (others)	13.93	2.54	6-20
AMEI-CS perception	0.47	0.42	0-1.85
AMEI-CS understanding	0.51	0.48	0-2.57
AMEI-CS utilization	0.29	0.33	0-1.87
AMEI-CS regulation	0.46	0.27	0-1.38
AMEI-CF regulation	585.77	75.88	348-700
AMEI-CF perception/utilization	588.76	72.51	276-700
AMEI-CF understanding	407.05	55.94	180-500
Fluid Ability	0.53	0.36	0-1.49
General well-being	0.55	0.25	0-1.13

#### 4.8.4 Intercorrelations

In general, correlations in relation to the respective variables were as expected (Table 4.7). Due to the relatively large matrix, correlations in the order of  $p < .01$  and above have been interpreted but not  $p < .05$  as the latter may have emerged by chance alone. A comparison of consensus scores and confidence levels for the AMEI 1.1 indicated moderate positive correlations between the two scoring methods with nine

out of 12 outcomes being significantly positively related ( $r=.17$  to  $r=.37$ ,  $p<.01$ ). The non-significant correlations were related to the AMEI-CS regulation of emotions. In terms of a positive manifold, a total of four out of six AMEI-CS subscales were positively correlated ( $r=.16$  to  $r=.34$ ,  $p<.01$ ). For the AMEI-CF a positive manifold was evident for all of the scales with correlations ranging from  $r=.72$  to  $r=.93$ ,  $p<.01$ .

With respect to hypotheses (1) the measure of empathy was weakly positively correlated with the SRMEI-R perception of one's own emotions  $r=.21$ ,  $p<.01$ , and the perception of others emotions  $r=.26$ ,  $p<.01$ . In contrast, empathy correlated with most of the AMEI-CS and AMEI-CF subscales except those relating to the perception of emotion. For example, empathy was weakly positively correlated with the AMEI-CS utilization of emotions  $r=.32$ ,  $p<.01$ ; and understanding of emotions  $r=.24$ ,  $p<.01$ . In a similar vein, the measure of empathy was weakly positively correlated with the AMEI-CF understanding of emotions  $r=.16$ ,  $p<.01$ .

In support of hypothesis (2) three of four AMEI-CS scales were weakly positively correlated with fluid ability  $r=.21$  to  $r=.27$ ,  $p<.01$ . In addition, two of four AMEI-CS scales were weakly positively correlated with crystallized ability  $r=.15$  to  $r=.36$ ,  $p<.01$ . Further support for hypothesis (2) was evident for the AMEI-CF with weak positive correlations with fluid ability of  $r=.20$  to  $r=.26$ ,  $p<.01$ . A further one of three AMEI-CF subscales were positively correlated with crystallized ability  $r=.24$ ,  $p<.01$ .

Table 4.7. Correlations for SRMEI-R, AMEI-CS, AMEI-CF, Cognitive Ability, Personality and Criterion Variables.

	1	2	3	4	5	6	7	8	9	10	11	12	13
1 SRMEI-R Per (self)	(.80)												
2 SRMEI-R Per (other)	<b>.33**</b>	(.88)											
3 SRMEI-R Utilization	.01	<b>.18**</b>	(.90)										
4 SRMEI-R Under	<b>.59**</b>	<b>.44**</b>	<b>.15**</b>	(.90)									
5 SRMEI-R Reg (self)	<b>.48**</b>	<b>.23**</b>	-.06	<b>.32**</b>	(.90)								
6 SRMEI-R Reg (other)	<b>.31**</b>	<b>.68**</b>	<b>.18**</b>	<b>.46**</b>	<b>.26**</b>	(.79)							
7 AMEI-CS Perception	.11	-.02	.01	.04	.04	-.05	(.86)						
8 AMEI-CS Use	<b>.20**</b>	<b>.18**</b>	.00	<b>.16**</b>	.07	.07	<b>.30**</b>	(.71)					
9 AMEI-CS Under	<b>.35**</b>	<b>.23**</b>	.03	<b>.31**</b>	.11*	.13*	<b>.16**</b>	<b>.34**</b>	(.69)				
10 AMEI-CS Reg	-.09	.04	.05	-.02	.03	-.02	.06	.04	<b>.16**</b>	(.54)			
11 AMEI-CF Per/use	<b>.23**</b>	<b>.21**</b>	.07	<b>.21**</b>	.06	.08	<b>.37**</b>	<b>.28**</b>	<b>.30**</b>	.10	(.87)		
12 AMEI-CF Und	<b>.26**</b>	<b>.22**</b>	.03	<b>.27**</b>	.11	.12*	<b>.17**</b>	<b>.28**</b>	<b>.36**</b>	.11	<b>.72**</b>	(.87)	
13 AMEI-CF Reg	<b>.16**</b>	<b>.25**</b>	.08	<b>.15**</b>	.05	.15*	<b>.18**</b>	<b>.26**</b>	<b>.19**</b>	.08	<b>.76**</b>	<b>.76**</b>	(.93)
14 Fluid Ability	<b>.17**</b>	.03	-.04	<b>.15**</b>	.08	-.01	<b>.21**</b>	<b>.27**</b>	<b>.26**</b>	.14*	<b>.23**</b>	<b>.26**</b>	<b>.20**</b>
15 Crystal. Ability	<b>.16**</b>	.01	-.06	.15*	.11	.00	.04	<b>.15**</b>	<b>.36**</b>	.07	.14*	<b>.24**</b>	.09
16 Extraversion	.14*	<b>.24**</b>	<b>.16**</b>	.12*	<b>.21**</b>	<b>.31**</b>	.03	.06	.05	.09	.05	.03	.11
17 Neuroticism	<b>-.32**</b>	-.15*	.06	-.13*	<b>-.46**</b>	<b>-.18**</b>	.06	.01	<b>-.22**</b>	.02	-.15*	-.13*	-.08
18 Openness	.13*	<b>.17**</b>	.10	<b>.30**</b>	.11*	<b>.19**</b>	-.02	<b>.20**</b>	.05	.01	.09	<b>.16**</b>	.14*
19 Conscientious	.11	.12*	.09	<b>.18**</b>	<b>.17**</b>	<b>.16**</b>	.14*	<b>.23**</b>	.01	-.04	<b>.17**</b>	.11	<b>.15**</b>
20 Agreeable	.11	.07	.13*	.13*	.14*	.12*	.10	<b>.24**</b>	.07	.06	.10	.06	.06
21 Social Desire	<b>.30**</b>	.12*	-.05	<b>.24**</b>	<b>.35**</b>	<b>.20**</b>	.14*	.10	.04	-.15*	-.02	-.01	-.01
22 Empathy	<b>.21**</b>	<b>.26**</b>	<b>.35**</b>	<b>.32**</b>	-.04	<b>.27**</b>	.11	<b>.32**</b>	<b>.24**</b>	.00	.12	<b>.16**</b>	.14*
23 GPA	.01	-.06	-.10	.11	.00	-.10	.02	.12*	<b>.20**</b>	-.02	.07	.11	.03
24 Stress	<b>-.32**</b>	<b>-.19**</b>	-.01	<b>-.18**</b>	<b>-.50**</b>	<b>-.21**</b>	.07	-.05	-.12*	-.05	-.04	-.10	-.03
25 Loneliness	<b>-.34**</b>	<b>-.26**</b>	<b>-.20**</b>	<b>-.24**</b>	<b>-.38**</b>	<b>-.28**</b>	<b>-.19**</b>	-.15*	<b>-.19**</b>	-.07	<b>-.18**</b>	<b>-.15**</b>	-.13*
26 Well-being	<b>.24**</b>	.09	.09	<b>.16**</b>	<b>.35**</b>	<b>.17**</b>	-.10	.08	.02	.09	.06	.08	.06

\*  $p < .05$ ; \*\*  $p < .01$ . Results are all two-tailed. Numbers in brackets are coefficient alphas.

Table 4.7. Correlations for SRMEI-R, AMEI-CS, AMEI-CF, Cognitive Ability, Personality and Criterion Variables

	14	15	16	17	18	19	20	21	22	23	24	25	26
14 Fluid Ability	(.90)												
15 Crystal Ability	<b>.20**</b>	(.73)											
16 Extraversion	-.03	-.10	(.80)										
17 Neuroticism	.06	-.11	<b>-.40**</b>	(.80)									
18 Openness	-.06	.13*	<b>.18**</b>	.04	(.63)								
19 Conscientious	.10	.06	.03	.01	.14*	(.77)							
20 Agreeable	-.02	.06	-.07	.14*	<b>.20**</b>	<b>.37**</b>	(.50)						
21 Social Desire	.13*	.01	.03	<b>-.23**</b>	.09	<b>.30**</b>	<b>.25**</b>	(.66)					
22 Empathy	.11*	.01	.02	<b>.18**</b>	<b>.32**</b>	<b>.20**</b>	<b>.36**</b>	.08	(.81)				
23 GPA	.12*	<b>.29**</b>	<b>-.22**</b>	.06	.11	.10	-.02	.00	.11	(-)			
24 Stress	-.09	-.08	<b>-.17**</b>	<b>.53**</b>	-.05	.02	-.06	<b>-.32**</b>	.08	-.05	(.90)		
25 Loneliness	<b>-.16**</b>	-.03	<b>-.48**</b>	<b>.54**</b>	.03	-.11*	-.07	<b>-.26**</b>	-.09	-.03	<b>.50**</b>	(.93)	
26 Well-being	.13*	.05	<b>.29**</b>	<b>.46**</b>	-.02	<b>.19**</b>	.12*	<b>.29**</b>	-.02	.07	<b>-.32**</b>	<b>-.58**</b>	(.93)

\*  $p < .05$ ; \*\*  $p < .01$ . Results are all two-tailed. Numbers in brackets are coefficient alphas.

With respect to the SRMEI-R, AMEI-CS, and AMEI-CF hypotheses (3) to (7) were largely consistent with expectations with significant correlations with many of the Big Five personality domains. In general, the SRMEI-R subscales were weakly positively correlated with extraversion  $r=.16$  to  $r=.31$ ,  $p<.01$ ; and weakly to moderately negatively correlated with neuroticism  $r=-.18$  to  $r=-.46$ ,  $p<.01$ . The SRMEI-R subscales were weakly positively correlated with openness  $r=.17$  to  $r=.30$ ,  $p<.01$ ; and conscientiousness  $r=.16$  to  $r=.18$ ,  $p<.01$ . There were no significant correlations between the SRMEI-R and agreeableness exceeding  $p<.05$ .

There were fewer correlations apparent between the AMEI-CS and personality. These included a weak negative correlation between the AMEI-CS understanding of emotions subscale and neuroticism of  $r=-.22$ ,  $p<.01$ . A number of the AMEI-CS subscales were also weakly positively correlated with openness  $r=.20$ ,  $p<.01$ ; conscientiousness  $r=.23$ ,  $p<.01$ ; and agreeableness  $r=.24$ ,  $p<.01$ .

For the AMEI-CF, hypotheses (5) and (6) were supported with the several subscales being weakly positively correlated with openness  $r=.16$ ,  $p<.01$ ; and conscientiousness  $r=.15$ ,  $p<.01$  to  $r=.16$ ,  $p<.01$ .

There was good support for hypotheses (8) to (11) for the SRMEI-R but less so for the AMEI-CS and AMEI-CF outcomes. The majority of the SRMEI-R subscales were weakly to moderately negatively correlated with stress  $r=-.18$  to  $r=-.50$ ,  $p<.01$ , and loneliness  $r=-.20$  to  $r=-.44$ ,  $p<.01$ . The SRMEI-R was also weakly positively correlated with general well-being  $r=.16$  to  $r=.35$ ,  $p<.01$ . There were no significant correlations between the SRMEI-R and GPA.

The AMEI-CS scales were positively correlated with GPA  $r=.24, p<.01$ ; but negatively with loneliness  $r=-.19, p<.01$ . The negative correlation between the EI scale and stress failed to reach the designated significance level of  $p<.01$ . There were no significant correlations between the AMEI-CS and general well-being.

With respect to the AMEI-CF there were fewer significant correlations with the criterion variables. The AMEI-CF subscales were weakly negatively correlated with loneliness  $r=-.15$  to  $r=-.18, p<.01$ . The AMEI-CF scales were not significantly correlated with grade point average, stress or general well-being.

A further inspection of the correlation matrix indicated a number of significant correlations between the SRMEI-R, AMEI-CS and AMEI-CF. Specifically, 6 of a possible 24 weak positive correlations emerged between the AMEI-CS and SRMEI-R subscales ranging from  $r=.16$  to  $r=.35, p<.01$ . A further 9 of a possible 18 weak positive correlations were evident between the SRMEI-R and AMEI-CF ranging from  $r=.15$  to  $r=.27, p<.01$ .

#### **4.8.5 Multiple Regression Analyses**

The incremental validity of each of the EI measures was investigated for the whole sample and then with respect to extreme scorers. In the latter case, the bottom 15% of participants were of interest to identify potentially at risk groups. Conversely, the top 15% of participants were investigated to identify any protective effects that high scoring EI individuals may benefit from. The analyses were conducted via hierarchical multiple regression analyses with the four criterion variables as separate dependent variables: GPA, stress, loneliness and general wellbeing. To isolate the impact of personality variables on the incremental validity of EI, in the first series of



analyses, the Big Five are not controlled for. In the second series of analyses personality is partialled from the regression equation. Only results pertaining to significant outcomes for the dependent variables were reported.

In the first series of analyses for the SRMEI-R, the independent variables [without controlling for personality - results labelled (a)] were: step 1 – social desirability; step 2 – SRMEI-R subscales. For the second series of analysis for the SRMEI-R, the predictor variables [controlling for the Big Five – results labelled (b)] were: step 1 – extraversion, neuroticism, openness, conscientiousness, and agreeableness; step 2 – social desirability; and step 3 – SRMEI-R subscales.

In the next set of analyses for the AMEI-CS and AMEI-CF, the independent variables [without controlling for the Big Five – results labelled (a)] were: step 1 – fluid and crystallised ability; step 2 – social desirability; and step 3 – the AMEI-CS and AMEI-CF subscales respectively. The final analyses for the AMEI-CS and AMEI-CF were conducted with personality partialled out - [results labelled (b)]: step 1 – fluid and crystallised ability; step 2 – extraversion, neuroticism, openness, conscientiousness, and agreeableness; step 3 – social desirability; and step 4 – the respective EI subscales. Effect sizes in the order of  $p < .05$  were interpreted with caution because of potential random error as a consequence of multiple comparisons.

As hypothesized, the SRMEI-R ability to understand emotions was a positive predictor of GPA(a) and (b) both before and after personality was controlled for. The self-perceived ability to regulate one's own emotions predicted lower levels of stress(a) and (b) before and after personality were entered into the regression equation. At the same time, the SRMEI-R perception of one's own emotions, utilization of emotions

and regulation of one's own emotions subscale accompanied less loneliness(a) before the inclusion of personality in the regression model. When the Big Five were taken into consideration only the SRMEI-R utilization of emotions subscale continued to significantly predict lower loneliness(b).

Table 4.8. Multiple Regression Analyses for SRMEI-R

Step	R <sup>2</sup>	Independent Variables	F	Beta	t
<b>Grade Point Average(a)</b>					
1	0.00	SRMEI-R understand	F(7,265)=2.21,p<.05	0.26	3.21***
2	0.05				
<b>Grade Point Average(b)</b>					
1	0.09	Extraversion	F(12,260)=3.03,p<.001	-0.24	-3.56***
2	0.09	Openness		0.14	2.24*
3	0.12	Conscientiousness		0.13	2.03*
		SRMEI-R understand		0.19	2.33*
<b>Stress(a)</b>					
1	0.10	Social desirability	F(7,265)=15.49,p<.001	-0.15	-2.75**
2	0.29	SRMEI-R regulation (self)		-0.40	-6.47***
<b>Stress(b)</b>					
1	0.31	Neuroticism	F(12,260)=15.20,p<.001	0.39	6.40***
2	0.34	Conscientiousness		0.16	2.92**
3	0.41	Social desirability		-0.15	-2.72**
		SRMEI-R regulation (self)		-0.27	-4.40***
<b>Loneliness(a)</b>					
1	0.06	Social desirability	F(7,265)=13.24,p<.001	-0.11	-2.06*
2	0.26	SRMEI-R perception (self)		-0.17	-2.37*
		SRMEI-R utilization		-0.20	-3.78***
		SRMEI-R regulation (self)		-0.25	-4.07***
<b>Loneliness(b)</b>					
1	0.41	Extraversion	F(12,260)=20.62,p<.001	-0.31	-5.81***
2	0.42	Neuroticism		0.33	5.86***
3	0.48	Openness		0.17	3.47***
		SRMEI-R utilization		-0.17	-3.63***

\* p < .05; \*\* p < .01; \*\*\* p < .001. All results are two-tailed. (a) outcome before controlling for personality. (b) outcome after controlling for personality.

Unexpectedly, the AMEI-CS was not a significant predictor of any of the criterion variables prior to personality being controlled for (Table 4.9). However, when personality was controlled for in the AMEI-CS analyses, a high level of understanding of emotions became a positive predictor of GPA(b) and general well-being(b). Average AMEI-CF scores did not predict any of the criterion variables.

**Table 4.9.** Multiple Regression Analyses for AMEI-CS

Step	R <sup>2</sup>	Independent Variables	F	Beta	t
<b>Grade Point Average(a)</b>					
1	0.09	Crystallised Ability	F(7,265)=4.54,p<.001	0.24	3.94***
2	0.09				
3	0.10				
<b>Grade Point Average(b)</b>					
1	0.09	Crystallised Ability	F(12,260)=4.69,p<.001	0.21	3.29**
2	0.15	Extraversion		-0.23	-3.47***
3	0.15	Agreeableness		-0.14	-2.14*
4	0.17	AMEI-CS understanding		0.14	2.08*
<b>General well-being(a)</b>					
1	0.01	Social desirability	F(7,265)=4.41,p<.001	-0.27	-4.49***
2	0.10				
3	0.10				
<b>General well-being(b)</b>					
1	0.01	Fluid Ability	F(12,260)=10.77,p<.001	0.12	2.20*
2	0.29	Extraversion		0.18	2.97**
3	0.31	Neuroticism		-0.39	-6.43***
4	0.33	Agreeableness		0.15	2.56*
		AMEI-CS understanding		0.13	2.08*

\* p < .05; \*\* p < .01; \*\*\* p < .001. All results are two-tailed. (a) outcome before controlling for personality. (b) outcome after controlling for personality.

Results of extreme scorers were also of interest to investigate differences in outcomes among high and low EI scoring individuals. Before and after personality was partialled out, for low scoring SRMEI-R individuals (1) a sound ability to perceive other people's emotions was associated with less stress; (2) a well-developed ability to

regulate other people's emotions accompanied less stress, and (3) the inclination to use emotions to solve problems was associated with less loneliness (Table 4.10).

Unexpectedly, for high scoring SRMEI-R individuals, a propensity to regulate other people's emotions predicted high levels of loneliness but only after personality was controlled for (Table 4.10).

**Table 4.10.** Multiple Regression Analyses for SRMEI-R Low Scores

Step	R <sup>2</sup>	Independent Variables	F	Beta	t
<b>Stress(a)</b>					
1	0.06	Social desirability	F(2,65)=7.81,p<.001	-0.28	-2.56*
2	0.19	SRMEI-R low perception others		-0.35	-3.18**
<b>Stress(b)</b>					
1	0.43	Neuroticism	F(7,60)=8.54,p<.001	0.65	5.47***
2	0.43	SRMEI-R low perception others		-0.27	-2.75**
3	0.50				
<b>Stress(a)</b>					
1	0.07	Social desirability	F(2,67)=8.92,p<.001	-0.25	-2.30*
2	0.21	SRMEI-R low regulation others		-0.37	-3.45***
<b>Stress(b)</b>					
1	0.39	Neuroticism	F(7,62)=7.35,p<.001	0.58	5.08***
2	0.39	SRMEI-R low regulation others		-0.26	-2.48*
3	0.45				
<b>Loneliness(a)</b>					
1	0.03	SRMEI-R low utilization	F(2,43)=7.60,p<.001	-0.47	-3.60***
2	0.26				
<b>Loneliness(b)</b>					
1	0.49	Openness	F(7,38)=9.08,p<.001	0.25	2.27*
2	0.50	Conscientiousness		-0.25	-2.25*
3	0.62	SRMEI-R low utilization		-0.41	-3.50**
<b>Loneliness(a)</b>					
Non-significant					
<b>Loneliness(b)</b>					
1	0.40	Neuroticism	F(7,72)=8.58,p<.001	0.27	2.33*
2	0.42	SRMEI-R high regulate others		0.20	2.13*
3	0.45				

\* p < .05; \*\* p < .01; \*\*\* p < .001. All results are two-tailed. (a) outcome before controlling for personality. (b) outcome after controlling for personality.

Surprisingly, prior to personality entering the regression equation, the AMEI-CS high perception EI subgroup did not report experiencing higher levels of stress(a). But once personality was taken into consideration and controlled for, results for this subgroup indicated that a well-developed ability to perceive other people's emotions corresponded to a greater experience of stress (b) (Table 4.11). Also unexpected, the AMEI-CS low scores on the regulation of one's own and others emotions accompanied greater loneliness. The effect was evident before and after the contribution of personality was calculated (Table 4.11).

**Table 4.11.** Multiple Regression Analyses for AMEI-CS Extreme Scores

Step	R <sup>2</sup>	Independent Variables	F	Beta	t
		<b>Stress(a)</b>	Non significant		
		<b>Stress(b)</b>			
1	0.10	Neuroticism	F(9,31)=3.28,p<.01	0.34	<b>2.45*</b>
2	0.40	Openness		0.40	<b>2.31*</b>
3	0.41	Conscientiousness		0.32	<b>2.08*</b>
4	0.48	Agreeableness		-0.39	<b>-2.32*</b>
		AMEI-CS high perception		0.29	<b>2.05*</b>
		<b>Loneliness(a)</b>			
1	0.03	AMEI-CS low regulation	F(4,37)=4.51,p<.01	0.54	<b>4.01***</b>
2	0.03				
3	0.32				
		<b>Loneliness(b)</b>			
1	0.03	Neuroticism	F(9,32)=7.95,p<.001	0.48	<b>4.05***</b>
2	0.61	Agreeableness		-0.32	<b>-2.79**</b>
3	0.62	AMEI-CS low regulation		0.31	<b>2.62*</b>
4	0.69				

\* p < .05; \*\* p < .01; \*\*\* p < .001. All results are two-tailed. (a) outcome before controlling for personality. (b) outcome after controlling for personality.

In keeping with expectations for AMEI-CF low EI scorers, confidence in one's ability to perceive/utilize emotions led to less loneliness before and after personality was taken into consideration (Table 4.12). At the same time, for AMEI-CF low scorers, confidence in one's ability to regulate emotions accompanied increased levels of general well-being(b) but only when personality was entered into the regression equation (Table 4.12).

Table 4.12. Multiple Regression Analyses for AMEI-CF Extreme Scores

Step	R <sup>2</sup>	Independent Variables	F	Beta	t
<b>Loneliness(a)</b>					
1	0.01	Social desirability	F(4,66)=5.88,p<.001	-0.40	<b>-3.70***</b>
2	0.12	AMEI-CF low per/utilization		-0.38	<b>-3.46***</b>
3	0.26				
<b>Loneliness(b)</b>					
1	0.01	Extraversion	F(9,61)=8.95,p<.001	-0.28	<b>-2.70**</b>
2	0.52	Neuroticism		0.39	<b>3.60***</b>
3	0.53	Agreeableness		-0.21	<b>-2.22*</b>
4	0.57	AMEI-CF low per/utilization		-0.21	<b>-2.16*</b>
<b>General Well-being(a)</b>			Non significant		
<b>General Well-being(b)</b>					
1	0.00	Neuroticism	F(9,59)=2.87,p<.01	-0.37	<b>-2.79**</b>
2	0.22	AMEI-CF low regulation		0.24	<b>2.07*</b>
3	0.25				
4	0.30				

\*p < .05; \*\* p < .01; \*\*\* p < .001. All results are two-tailed. (a) outcome before controlling for personality. (b) outcome after controlling for personality.

#### 4.8.6 Gender Differences in Emotional Intelligence

An examination of gender differences in scores for the self-report and abilities-based instrument (scored according to consensus and confidence protocols) revealed individual differences in EI in favour of females and in favour of males depending upon the ability being tested (Table 4.13). There were significant gender differences

in relation to the SRMEI-R perception of others emotions and utilization of emotions subscales in favour of females. For the AMEI-CS there were significant differences in EI performance in favour of males with respect to the utilization of emotions subscale. There were no significant differences in EI scores between males and females for the AMEI-CF or for the remaining subscales.

**Table 4.13.** Gender Differences for SRMEI-R and AMEI-CS

<b>SRMEI-R</b>	<b>Gender</b>	<b>Mean</b>	<b>SD</b>	<b>t(271)</b>
Perception of others emotions	Males	13.78	2.76	<b>2.19*</b>
	females	14.60	2.63	
Utilization of emotions	Males	17.67	4.09	<b>2.66**</b>
	females	19.28	4.38	
<b>AMEI-CS</b>				
Utilization of emotions	Males	.43	0.45	<b>3.97***</b>
	females	.25	0.27	

\*  $p < .05$ ; \*\*  $p < .01$ ; \*\*\*  $p < .001$ . Results are all two-tailed.

## 4.9 Discussion

The aim of study 3 was to refine the self-report measure, develop a performance-based measure and conduct a comprehensive analysis of the psychometric properties of both instruments.

### 4.10 SRMEI-R Results

#### 4.10.1 SRMEI-R Factor Structure and Internal Reliability Levels

An examination of the factor structure of the SRMEI-R revealed an instrument that exhibited factorial validity. The factor structure was (in the main) consistent with the underlying theoretical model. Mayer and Salovey (1997) defined EI as involving: (1) the perception of one's own and others emotions, (2) utilization of emotions, (3)

understanding of emotions, and (4) regulation of one's own and others emotions. In the case of study 3, the SRMEI-R yielded six factors by virtue of both the perception and regulation of emotions subscales diverging into self and other abilities. Several theorists have likewise conceptualised one's own and others EI abilities separately (Bar-On, 1997; Petrides & Furnham, 2001; Weisinger, 1998). The internal reliability of the SRMEI-R was good to excellent ranging from .79 to .90.

#### **4.10.2 SRMEI-R Convergent Validity**

The convergent validity of the SRMEI-R was indicated by several weak positive correlations with empathy, and in relation to the AMEI-CS as well as the AMEI-CF. In general, the SRMEI-R scales were positively correlated with empathy ranging from  $r=.21$  to  $r=.37$ ,  $p<.01$  with the exception of the regulation of one's own emotions. The results are consistent with previous outcomes including those of Chapter 3: study 1 (See also Charbonneau & Nicol, 2002; Ciarrochi et al., 2000; Mayer et al., 1999). There was additional support for the convergent validity of the SRMEI-R, with 13 of a possible 35 significant positive correlations with the AMEI-CS subscales ranging from  $r=.16$  to  $r=.35$ ,  $p<.01$ . A further 19 out of 28 positive correlations were evident between the SRMEI-R and AMEI-CF. Altogether, the correlations ranged from a low of  $r=.12$ ,  $p<.05$  to  $r=.21$ ,  $p<.01$ . Again the results are consistent with previous findings (Brackett & Mayer, 2003; Mayer et al., 2000; Warwick & Nettelbeck, 2004).

#### **4.10.3 SRMEI-R Discriminant Validity**

The SRMEI-R exhibited improved discriminant validity compared to alternative trait EI measures in relation to the Big Five personality domains with one



exception. There were several weak positive correlations between the SRMEI-R and extraversion, openness, conscientiousness and agreeableness ranging from  $r=.12, p<.05$  to  $r=.31, p<.01$ . The majority of correlations between the SRMEI-R and neuroticism were also typically weak and negative. A notable exception was the SRMEI-R regulation of one's own emotions and neuroticism with a moderate negative correlation of  $r=.46, p<.01$ . A number of alternative measures of trait EI have recorded strong correlations with neuroticism (negative) and extraversion (positive). These include the EQ-i (Dawda & Hart, 2000; Newsome et al., 2000); TMMS (Coffey et al., 2003); AES (Saklofske et al., 2003) TEIQue (Petrides & Furnham, 2003) and the TEIQ (Vakola, Tsaousis & Nikolaou, 2004). Nevertheless, it is essential that future research investigate the SRMEI-R in relation to other personality measures to evaluate further the discriminant validity of the measure.

#### **4.10.4 SRMEI-R Incremental Validity**

There was support for the incremental validity of the SRMEI-R in relation to GPA, stress, and loneliness but not general well-being.

##### **(i) GPA**

In accordance with outcomes related to the SRMEI-R, the ability to understand emotions positively predicted GPA before and after personality was entered into the regression model. Similar findings have been reported by a number of researchers (Brackett et al., 2004; O'Connor & Little, 2003; Schutte et al., 1998). Results are congruent with the notion that the understanding of emotions subscale is most related to cognitive intelligence (Mayer, Salovey & Caruso, 2004). The additional variance accounted for in the final regression equation was 5% prior to the inclusion of personality in the model but reduced to 3% when personality was entered and

controlled for. But the minimal proportion of GPA variance and weak effect size in the order of  $p < .05$  suggested that the result may be a consequence of the relatively high number of comparisons and the results should therefore be interpreted with caution.

**(ii) Stress**

For the SRMEI-R, a well-developed ability to regulate one's own emotions was associated with lower levels of stress in the first and second analysis. Slaski and Cartwright (2002; 2003) likewise reported that a higher level of EI was related to lower levels of stress. The result is congruent with the idea that a well-developed ability to recognize and regulate one's own emotions will facilitate a speedy resolution of stress. With the inclusion of the SRMEI-R self-regulation of emotions subscale in the regression equation an additional 19% of the variance or 7% of the variance was accounted for when personality was excluded or controlled for respectively. The contribution of the EI subscale in the second model was modest ( $p < .05$ ). But the subscale was a significant predictor in the first regression ( $p < .001$ ) and the proportion of variance explained in the second analysis was considered reasonable. Thus, the results are thought to reflect a true effect rather than represent a statistical artefact.

This outcome was further supported by low EI subgroup outcomes such that before and after personality was included in the regression model a sound ability to perceive other people's emotions was associated with lower levels of stress. In a similar vein, a well-developed ability to regulate other people's emotions predicted reduced stress levels in both instances. However, correlation does not imply causation and the reverse may also be true. The addition of the SRMEI-R perception subscale accounted for an additional 13% and 7% of the variance before and after personality was controlled for respectively. The inclusion of the regulation of other people's

emotions subscale accounted for 14% of the variance prior to personality entering the regression equation and 6% of the variance after personality was entered into the model.

**(iii) Loneliness**

Prior to the inclusion of personality into the regression equation, a SRMEI-R well-developed ability to perceive one's own emotions, utilize emotions, and regulate one's own emotions accompanied lower levels of loneliness. In keeping with this, Saklofske et al. (2003) identified a relationship between the trait-based AES and various aspects of loneliness. Saklofske et al. (2003) contended that a low level of ability to perceive and regulate one's own emotions would impair an individual's capacity to connect with others. It would appear that the self-perceived ability to use one's own emotions to solve problems is also a key variable in reducing loneliness. The proportion of variance accounted for by the inclusion of the SRMEI-R subscale in the regression model was an additional 20%. However, when the effects of personality were taken into account only the SRMEI-R utilization of emotions subscale continued to predict lower levels of loneliness and the variance predicted decreased to 6%.

In keeping with the aforementioned, a well-developed ability to use one's emotions to solve problems for low EI scorers was associated with lower levels of loneliness. The additional variance accounted for before personality entered the regression equation was 24% but subsequently decreased to 12% when the effect of the Big Five were taken into consideration.

Finally, for the high SRMEI-R EI scorer group, a high propensity to regulate other people's emotions was associated with increased loneliness but only when the

impact of personality variables were taken into consideration and partialled out. The outcome following the inclusion and control of personality in the regression model suggests that a strong inclination to regulate other people's emotions might lead to an inability to connect with and relate to others. The proportion of variance accounted for by the inclusion of this subscale in the regression equation after personality was taken into account was an additional 3%. However, the initial lack of predictive capacity of the EI subscale in relation to loneliness and modest effect size ( $p < .05$ ) was interpreted as reducing support for the notion of a relationship between the regulation of other people's emotions and loneliness.

With respect to each of the SRMEI-R subscales there were no significant predictors of general well-being. One possibility is that although previous studies have identified a relationship between these two variables the effect was weak. An alternative measure of general well-being could have yielded a different outcome. Taken together, the results pertaining to the incremental validity of the SRMEI-R show early promise.

#### **4.11 AMEI-CS and AMEI-CF Results**

##### **4.11.1 AMEI-CS and AMEI-CF Factor Structure**

There was a degree of support for the factorial validity of the abilities-based EI measure when scored according to consensus and confidence protocols, albeit in different ways. For the AMEI-CS, results of principal components analysis yielded a four-factor solution that was congruent with the underlying theoretical model. The factors were labelled: (1) perception, (2) utilization, (3) understanding, and (4) regulation of emotions. Previously, Mayer et al. (2000c) reported a four-factor and a

two-factor outcome with respect to the abilities-based MSCEIT. The authors adopted the four-factor solution on the basis that it was consistent with the original theoretical model of EI. Notably, a substantial number of items were deleted to obtain the optimal solution. Moreover, a key difference between this study and other research is that individual tests items were factor analysed not just subscale scores, and results initially yielded a 28-factor solution. The outcome signaled that there were qualitative differences among factors relating to positive and negative emotions as well as different types of emotions. In addition, the four-factor solution only accounted for 34% of the variance. Thus, a significant amount of variance in test scores remained unaccounted for. The results should be interpreted with this in mind.

Results pertaining to the AMEI-CF indicated a three-factor solution instead of the theorized four-factor model of EI. The three factors were labelled: (1) regulation of one's own and other people's emotions, (2) perception/utilization of emotions, (3) understanding of emotions. Researchers examining the factor structure of the abilities-based MEIS have encountered similar difficulties. The ability to utilize one's emotions has coalesced with the understanding of emotions factor (Mayer et al., 1999); the understanding and regulation of emotions factor (Ciarrochi et al., 2000); and across all factors (Roberts et al., 2001). Nevertheless, these results are considered more convincing than consensus scores with 65% of the variance in test scores accounted for.

Arguably, the outcomes relating to the AMEI-CF indicate that there are other ways that are useful to score abilities-based EI measures. Results from the AMEI-CF

provide tentative support for the notion that there is a range of answers to emotional problems and it is the effectiveness of an answer in solving a problem that is critical.

#### **4.11.2 AMEI-CS and AMEI-CF Internal Reliability Levels**

The internal reliabilities of the AMEI-CS and AMEI-CF indicated that consensus score results were lower than desirable whereas confidence scores were good to excellent. The AMEI-CS internal reliability levels were satisfactory for the total score and perception of emotion subscale. Conversely the utilization and understanding of emotions subscale results were borderline and the regulation of emotions subscale outcome was suboptimal. A number of researchers have reported difficulties with the internal reliability of performance-based measures of EI (Mayer et al., 1999; Mayer et al., 2000c).

The difficulty with reliability results appears to pertain to the persistent problem of adequately distinguishing response options. Attempts were made during the construction of the current abilities-based EI measure to adequately differentiate test items. But an inspection of the data indicated the strong endorsement of a single popular item, as well as the strong endorsement of several distractor items. By way of example, the AMEI-CS understanding of emotions (changes) task yielded the following results (Table 4.14):

“Heather felt surprised and embarrassed when her boss approached her, and began criticising her work in front of her colleagues. Heather tried to explain what had happened but her boss wouldn’t listen, and she felt...”

**Table 4.14.** AMEI-CS Example of Endorsement of Items

	<b>Items</b>	<b>N</b>	<b>%</b>
1	Depressed	14	5.1
2	Afraid	129	47.3
3	Shocked	54	19.8
4	Angry	72	26.4
5	Calm	4	1.5

The strong endorsement of various distractor items highlights the difficulties associated with defining a correct answer to an emotional problem. The complex interplay of individual difference variables such as age, gender, culture and so forth will invariably undermine the reliability of any EI measure when scored according to pooled responses. In short, the difficulties in relation to consensually scored reliability levels for abilities-based measures represent a significant problem for proponents of the construct.

By comparison, the internal reliability results for confidence scores were consistently good to excellent. The alpha coefficients ranged from a low of .87 for the understanding subscale to a high of .93 for the regulation of emotions subscale. This is a significant improvement in internal reliability at the subtest level over other methods of scoring ability EI measures. That is, as the reliability levels of the abilities-based measure of EI rise so does the confidence with which assertions can be made about the underlying construct.

#### **4.11.3 AMEI-CS and AMEI-CF Interrelated Abilities**

Results provided limited support for the presence of interrelated abilities for the AMEI-CS but more convincing evidence for the AMEI-CF. Four of six AMEI-CS subscales were significantly positively correlated. The regulation of emotions subscales failed to correlate significantly with the remaining subscales. One possible

explanation for their failure to intercorrelate is the suboptimal internal reliability levels recorded for the regulation of emotions subscale. For the AMEI-CF, the evidence for interrelated abilities was consistently high, with three out of three subscales being positively correlated. Previously, Mayer et al. (1999) identified that all of the abilities in relation to the MEIS were interrelated. Likewise, Roberts et al. (2001) reported finding the presence of a positive manifold. The identification, in the main, of a set of interrelated abilities for both methods of scoring provides preliminary support for the notion that abilities-based EI is a type of mental ability. Finally, confidence scores correlated weakly to moderately and positively with consensus scores ranging from  $r=.08$  n.s. to  $r=.45$ ,  $p<.01$ . The modest degree of correlation between consensus and confidence protocols indicates that the two methods are assessing somewhat different constructs.

#### **4.11.4 AMEI-CS and AMEI-CF Convergent Validity**

##### **(i) Empathy**

AMEI-CS and AMEI-CF scores exhibited a degree of convergent validity in relation to empathy. The AMEI-CS utilization of emotions and understanding of emotions exhibited weak significant positive correlations with empathy. Similar outcomes were evident for the AMEI-CF in relation to understanding of emotions, and regulation of emotions subscales with weak positive correlations with empathy. A number of researchers have previously identified a positive link between EI and empathy (Ciarrochi et al., 2000; Mayer et al., 1999; Mayer et al., 1990).



## **(ii) Fluid Ability and Crystallised Ability**

There was more substantial support for the convergent validity of the AMEI-CS and AMEI-CF in relation to the two markers for cognitive abilities. Specifically, all of the AMEI-CS scores were weakly positively correlated with fluid ability. In addition, the AMEI-CS utilization and understanding of emotions subscales were weakly positively correlated with crystallised ability. A similar story was evident for confidence outcomes of the AMEI-CF. In particular, all of the AMEI-CF subscales were weakly positively correlated with fluid ability. Likewise, the AMEI-CF perception/utilization and understanding of emotions subscales were positively correlated with crystallised ability. Results are in keeping with previous reports of weak to moderate positive correlations between abilities-based EI measures and cognitive ability (Mayer et al., 1999; Roberts et al., 2001; Warwick & Nettelbeck, 2004). In sum, there is good evidence that the new abilities-based EI measures are correlated with pre-existing intelligences when scored according to both consensus and confidence protocols. That said, research evaluating the convergent validity of the AMEI-CS and AMEI-CF with additional measures of cognitive ability is recommended.

### **4.11.5 AMEI-CS and AMEI-CF Discriminant Validity**

The discriminant validity of the AMEI-CS and AMEI-CF was explored in relation to the Big Five personality domains with support for several hypotheses. A number of the AMEI-CS subscales were weakly negatively correlated with neuroticism but positively with openness, conscientiousness, and agreeableness. To a lesser extent the AMEI-CF subscales were correlated with the Big Five, including weak negative

correlations with neuroticism and weak positive correlations with openness and conscientiousness. Outcomes are consistent with previous findings exploring the relationship between abilities-based EI measures and existing personality domains (Brackett & Mayer, 2003; Ciarrochi et al., 2001; Lopes et al., 2003; Roberts et al., 2001). Essentially then, the AMEI-CS and AMEI-CF could be adequately distinguished from the Big Five.

#### **4.11.6 AMEI-CS Incremental Validity**

There was reasonable support for the incremental validity of the AMEI-CS in relation to stress and loneliness but not GPA or general well-being.

##### **(i) GPA**

For the AMEI-CS, there were no significant predictors of GPA when personality was excluded from the initial analysis. Conversely, a well-developed ability to understand emotions became a significant positive predictor of GPA once personality was entered into and controlled for in the regression model. With respect to the opposing outcomes, it is contended that the AMEI-CS understanding subscale captures emotional knowledge acquired via acculturation and that variance was redistributed from crystallised ability to the EI subscale in the second analysis. The second findings echo that of other researchers and the notion that the ability to understand relations among emotions is akin to abilities required for academic success (Brackett et al., 2004; O'Connor & Little, 2003; Schutte et al., 1998). The additional variance accounted for in GPA in the latter regression equation was minimal at 2%. Arguably, the inability of the AMEI-CS understanding of emotions subscale to predict GPA in the first analysis and the weak effect size in the second analysis ( $p < .05$ )

indicated that the result may be a consequence of the relatively high number of comparisons. This being the case, results require careful interpretation.

**(ii) Stress**

For AMEI-CS high scorers, a high level of ability to perceive other people's emotions corresponded to a greater experience of stress, but unexpectedly only after the Big Five were partialled out. Interestingly, Ciarrochi et al. (2002) suggested that individuals who were low on emotion perception might be relatively insensitive to stress, or not realize that stress is having a negative impact on them. Therefore, it was contended that individuals with a high degree of emotion perception might be vulnerable to poor mental health. The relationship between EI and stress that emerged only after the Big Five were taken into consideration arguably reflects a conceptual overlap among personality variables such as openness and the perception of emotions. In total, the additional proportion of stress variance accounted for by the AMEI-CS perception subscale after personality was partialled out was 7%. The inability of the AMEI-CS perception subscale to predict stress variance prior to the inclusion of personality in the analysis and weak effect size ( $p < .05$ ) led to the conclusion that the results might be a consequence of a high number of comparisons. With this in mind, the outcome was flagged as a possible statistical artefact.

**(iii) Loneliness**

In addition, the AMEI-CS low EI subgroup experienced greater loneliness when attempting to regulate strongly their own and other people's emotions both before and after personality was controlled for. This unexpected outcome echoes results found in relation to the SRMEI-R, thereby providing additional support for the

notion that a strong inclination to regulate other people's emotions leads to an inability to connect with and relate to others. Additional loneliness variance accounted for was in the order of 29% prior to the Big Five being controlled for but decreased to 7% when personality was entered into the regression equation.

#### **(iv) General Well-being**

The AMEI-CS understanding of emotion subscale did not significantly predict general well-being when personality was excluded from the analysis. Conversely, when personality was entered into the regression model and controlled for, a high level of emotional understanding was associated with greater general well-being. Interestingly, the understanding of emotions subscale appeared to predict general well-being in the second analysis because of a redistribution of variance to EI from the measure of social desirability. Arguably, individuals' with a well-developed ability to understand emotions are better equipped to identify and attain their goals and as a consequence experienced greater general well-being. In the second regression equation, the AMEI-CS understanding of emotions subscale accounted for minimal additional variance in general well-being in the order of 2%. The results are interpreted cautiously because of the weak effect size in the second analysis ( $p < .05$ ), low proportion of variance accounted for and inability of the AMEI-CS understanding of emotions subscale to predict well-being in the first analysis.

#### **4.11.7 AMEI-CF Incremental Validity**

There was modest support for the incremental validity of the AMEI-CF in relation to loneliness and general well-being. There were no significant predictors of GPA and stress in relation to the AMEI-CF.

**(i) Loneliness**

According to results of high EI scorers on the AMEI-CF, a high level of confidence in one's ability to perceive and use emotions to solve problems leads to decreased loneliness irrespective of whether personality is controlled for or not. The outcome is consistent with the notion that an individual with a high level of ability to perceive other people's emotions is more likely to be able to connect with and relate to others. The additional loneliness variance accounted for in the regression model was 14% prior to controlling for personality but was more modest at 4% when the Big Five were taken into consideration. Although the EI subscale was a weak contributor in the second model ( $p < .05$ ), the initial regression analysis revealed an effect size of  $p < .001$  and the proportion of variance explained was substantial. The results were therefore interpreted as reflecting a true effect.

**(ii) General Well-being**

For low EI scorers on the AMEI-CF, confidence in one's ability to regulate emotions was associated with increased general well-being but only after controlling for personality. The absence of a relationship between the EI subscale and general well-being prior to the inclusion of the Big Five in the regression analysis was thought to be a result of a redistribution of variance to EI after neuroticism was added to the model. The additional well-being variance accounted for was 5%. The inability of the AMEI-CF regulation of emotions subscale to predict general well-being in the initial analysis as well as the weak effect size in the second analysis ( $p < .05$ ) arguably challenge the veracity of this outcome.

#### 4.11.8 A Comparison of Trait and Ability EI

Results pertaining to trait and ability EI indicate a weak positive convergence between both the SRMEI-R and consensus scores as well as for SRMEI-R and confidence scores. Correlations between the SRMEI-R and AMEI-CS ranged from  $r=.16$  to  $r=.35$ ,  $p<.01$ , and between the SRMEI-R and confidence scores from  $r=.15$  to  $r=.27$ ,  $p<.01$ . Previously Brackett and Mayer (2003) found a weak positive correlation between the abilities-based MSCEIT and trait-based EQ-i of  $r=.21$ ,  $p<.01$ . Thus, although there was a weak correlation between trait and ability EI measures, in the main self-estimated intelligence is different to one's actual intelligence.

#### 4.11.9 Gender Differences in Emotional Intelligence

For the SRMEI-R, females' self-estimated ability to perceive other people's emotions and ability to use emotions to solve problems was higher than for their male counterparts. These results are consistent with outcomes obtained for the self-report EI measure in study 1 (Chapter 3). Potentially, the results obtained for the SRMEI-R reflect a self-enhancing response bias. With respect to the AMEI-CS, gender differences tended to favour males for the utilization of emotions subscale. But results with respect to the utilization of emotions remain somewhat equivocal and appear to depend upon the measure being adopted. Saklofske et al. (2003) reported that males outperformed females when utilizing emotions to solve problems. Conversely, Mayer et al. (1999) reported that females outperformed males on all 12 subtests of the MEIS including the utilization of emotions subscale.

#### 4.12 Conclusion

In summary, the SRMEI-R exhibited good factorial validity and consistent internal reliability. There was good evidence for the convergent validity of the SRMEI-R with a number of significant correlations with empathy and in relation to the abilities-based EI measure. The discriminant validity was improved over alternative measures of trait EI with the exception of the regulation of one's own emotions. Of notable interest, there was good evidence for the incremental validity of the SRMEI-R in relation to GPA, stress, and loneliness but not general well-being. Essentially then, the SRMEI-R was able to predict adaptive success. The SRMEI-R was able to account for additional amounts of variance both before and after personality variables were controlled for. Outcomes ranged from 5% to 23% prior to the inclusion of the Big Five in the analyses but subsequently decreased to 3% to 12% of the variance.

Overall, there was reasonable support for the validity of the AMEI-CS and AMEI-CF. Although both methods of scoring appear to be assessing somewhat different constructs they can nevertheless both contribute to an understanding of EI. For the AMEI-CS, outcomes were supportive of the factorial validity of the measure, although the proportion of variance accounted for was modest. The internal reliability results continue to be of concern when abilities-based EI measures are scored consensually. More compelling evidence was exhibited for the convergent validity of the measure in relation to empathy, and fluid and crystallized ability. Likewise, there was good evidence for the discriminant validity of the AMEI-CS with weak correlations with several of the Big Five personality domains. There was some support for the incremental validity of the AMEI-CS in relation to GPA, stress, loneliness and

general well-being. The additional proportion of variance accounted for in the respective regression models ranged reached a maximum of 29% before personality was taken into consideration but decreased to between 2% to 7% after the Big Five were partialled out. That said, there were questions raised concerning weak effect sizes in relation to GPA, well-being and stress variance.

The AMEI-CF results indicated good to excellent internal reliability levels. The factor structure was somewhat inconsistent with the underlying theoretical model and equated (in the main) with the regulation of emotions. Nevertheless, the AMEI-CF converged with empathy and the two cognitive ability markers. The new abilities-based EI measure, in contrast, was able to be distinguished from the Big Five. There was modest evidence to support the incremental validity of the AMEI-CF in relation to loneliness, and general well-being with additional variance accounted for before personality was controlled in the order of up to 14% but later decreased to between 4% and 5%. However, there were concerns with respect to weak effects sizes with respect to well-being variance.

Finally, there was evidence of gender differences for all three EI measurement approaches. Gender differences existed in favour of both females and males, depending upon the ability being assessed.



## CHAPTER 5

### GENERAL DISCUSSION AND CONCLUSIONS

#### 5.1 Introduction

The overall aim of this thesis was to develop new trait-based and abilities-based measures of EI and to evaluate their psychometric characteristics. The objective of this the final chapter is to interpret results as they relate to the original terms of reference. First, chapter 5 revisits the context for this research by virtue of a brief summary of theoretical and measurement considerations in the field of EI prior to the commencement of research for this thesis. Subsequently, results relating to the development of the new trait-based and abilities-based measures are discussed in terms of the contributions of this thesis to the field of EI. Finally, a number of recommendations are made for future research.

#### 5.2 The Context for this Research

The aims of this thesis have been to develop new trait-based and abilities-based measures of EI and to investigate their psychometric properties. The need for new measures stems from a lack of robust instruments to assess the EI construct and this in turn has resulted in limited ability to evaluate the popular notion that EI can incrementally predict life success (Bar-On, 1997; Goleman, 1995; Mayer & Salovey, 1997; Salovey & Mayer, 1990). Various problems in the field of EI are related to definition and measurement difficulties.

As with many fields of research there have been difficulties with attempts to define EI. To the present time, there has been a lack of consensus among researchers as to the best definition of EI (Van Rooy & Viswesvaran, 2004). That said, a notable

distinction between trait-based and abilities-based models has been made on the basis of the method of operationalisation (Petrides & Furnham, 2000; 2001). In particular, self-report measures have been said to assess trait-based conceptualisations of the construct, whereas performance-based measures assess ability EI (Petrides & Furnham, 2000; 2001). Arguably, abilities-based definitions of EI are the best models at present on both conceptual and empirical grounds. First, ability EI, at least as defined by Mayer and Salovey (1997), who have played a major role in generating interest in EI, makes sense as a form of mental ability. In addition, measures of the construct have converged with other intelligence measures and diverged from existing personality domains (Brackett & Mayer, 2003; Ciarrochi et al., 2000; Mayer et al., 1999; Roberts et al., 2001). Conversely, trait-based models of EI have failed to converge with intelligence measures and have tended to correlate highly with personality measures (Dawda & Hart, 2000; Newsome et al., 2000; Petrides & Furnham, 2003).

It has been noted that for the field of EI to advance it is essential that psychometrically sound instruments are available for the construct to be evaluated. Of the current EI measures, trait-based instruments have been reliable and have demonstrated good convergent and predictive validity (Bar-On, 1997; Salovey et al., 1995; Schutte, et al., 1998). But difficulties among trait EI measures include problems with factorial, discriminant and incremental validity outcomes (Newsome et al., 2000; Petrides & Furnham, 2000; Slaski & Cartwright, 2002; 2003). With respect to ability EI measures, there is good evidence for the convergent, discriminant and predictive validity of instruments and limited support for incremental validity outcomes (Brackett & Mayer, 2003; Ciarrochi et al., 2000; Mayer et al., 1999; Roberts et al., 2001). There

have been serious concerns about the method of scoring ability EI measures and the reliability estimates for consensually scored test items. Essentially then, future trait-based EI measures need to demonstrate their distinctiveness in relation to existing personality domains. In contrast, ability EI measures need to resolve problems in relation to reliability levels and seek alternative methods for scoring performance-based test items.

There has also been a need for detailed psychometric analysis of new EI instruments. In the majority of instances, trait-based measures of EI have been subjected to only limited psychometric analysis. Researchers have often focussed on the predictive validity of EI measures, to the exclusion of the discriminant and incremental validity of scales (Bar-On, 1997; Carmeli, 2003; Nikolaou & Tsaousis, 2002; Salovey et al., 2002). Research investigating the incremental validity of EI before personality is controlled for is of interest to identify the total variance that the construct contributes to criterion variables that may otherwise be masked in certain contexts. In addition, although results from trait-based measures have suggested a number of important relationships between EI and adaptive outcomes, the degree to which the outcomes are moderated by existing personality domains is unclear. It was argued that a comprehensive investigation of the psychometric properties of a measure would include an analysis of reliability levels, together with factorial, convergent, discriminant and incremental validity outcomes.

When the aforementioned difficulties have been adequately addressed then confident inferences can be made about the construct of EI. Of particular interest is whether EI is able to account for additional variance in test scores beyond the variance

accounted for by measures of intelligence and/or personality (as appropriate) in relation to positive life outcomes. In addition, the construct of EI will be of interest if it is capable of being applied to the diagnosis, treatment and prevention of mental health problems over the course of time.

In keeping with the above, two new trait and one ability EI measure were devised, based on Mayer and Salovey's (1997) definition of the construct. The new measures were subjected to analyses of their psychometric properties over the course of three studies. Overall, the focus of this thesis has been to address four main issues:

- (i) To develop a new trait-based measure of EI that can be differentiated from existing personality domains.
- (ii) To develop a new consensually scored performance-based measure of EI with changes to response options and instructions to participants, to improve internal reliability at the branch and subtest level.
- (iii) To develop an alternative method of scoring the new performance-based measure of EI.
- (iv) To investigate the psychometric properties of the new trait and abilities-based measures of EI via a comprehensive research design. Specifically, the research design included an analysis of the reliability as well as the factorial, convergent, discriminant and incremental validity of both measures.

### **5.3 The contributions of this thesis to the field of Emotional Intelligence**

The overarching aim of EI research is to advance our understanding of the nature of the construct. With that in mind, the contributions of this thesis to the field of

EI are discussed. Findings in relation to the four objectives of the thesis are outlined followed by a discussion of additional findings that emerged during investigations.

In response to the four aims of this thesis, it was found that:

- (i) A new trait-based measure of EI was developed that could be differentiated (in the main) from the Big Five personality domains. The self-report instrument exhibited non-significant to weak correlations with a number of the personality domains. A notable exception, however, was the regulation of one's own emotions subscale. This yielded a single moderate negative correlation with neuroticism. Nonetheless, it could be argued that the self-report measure of EI exhibited improved discriminant validity in relation to the Big Five, compared to alternative trait EI measures.
- (ii) Whereas a new consensually scored performance-based measure of EI was developed with changes to response options and instructions to participants, no evidence was found to suggest that this improved internal reliability either at the branch or subtest level.
- (iii) A new scoring method for the performance-based measure of EI was developed termed confidence scoring. From a theoretical perspective, the rationale underlying confidence scoring was considered tenable. Nevertheless, it was argued that the operationalisation of confidence levels could be improved upon by adopting a more objective index such as that provided by a physiological measure.
- (iv) There was good evidence to support the psychometric properties of the self-report measure of EI. Analysis of the trait-based EI measure revealed an

instrument that was reliable and exhibited good factorial, convergent, discriminant (in the main) and incremental validity in relation to positive outcomes (Figure 5.1). When scored according to consensus protocols, the performance-based measure of EI exhibited good factorial, convergent, discriminant and modest incremental validity (Figure 5.2). But problems with internal reliability at the branch and subtest level persist. Good support was found for the alternative method of scoring the new performance-based measure of EI. In particular, confidence scores yielded good to excellent internal reliability as well as convergent, and discriminant validity, but modest incremental validity outcomes (Figure 5.3).

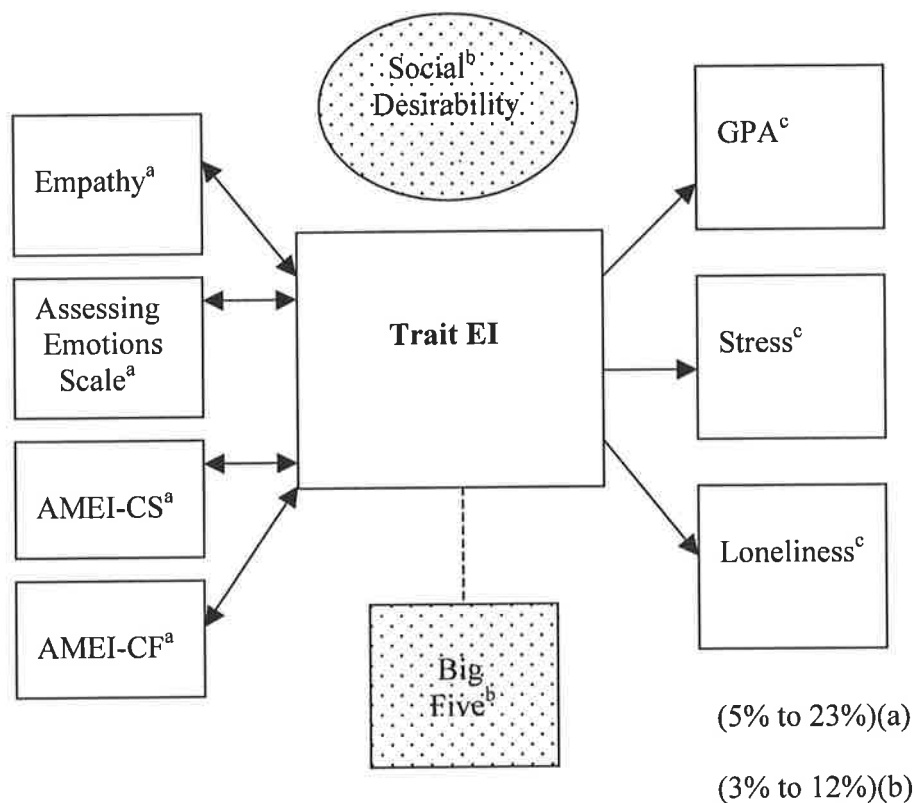
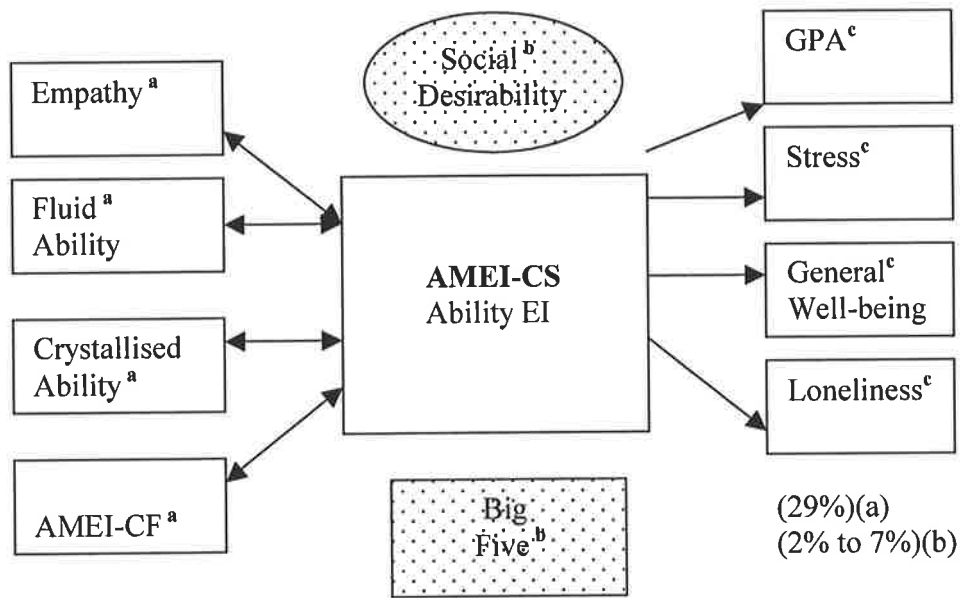
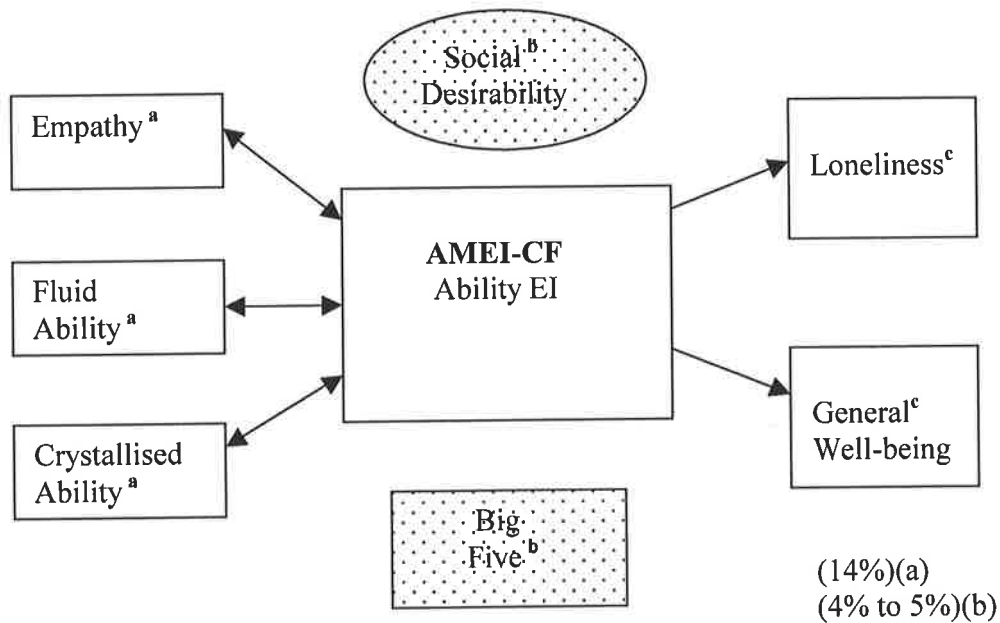


Figure 5.1. <sup>a</sup> = Convergent validity demonstrated; <sup>b</sup> = Discriminant validity demonstrated; <sup>c</sup> = Incremental Validity demonstrated for SRMEI-R



**Figure 5.2.** <sup>a</sup> = Convergent validity demonstrated; <sup>b</sup> = Discriminant validity demonstrated; <sup>c</sup> = Incremental Validity demonstrated for AMEI-CS



**Figure 5.3.** <sup>a</sup> = Convergent validity demonstrated; <sup>b</sup> = Discriminant validity demonstrated; <sup>c</sup> = Incremental Validity demonstrated for AMEI-CF

In addition to the aforementioned, there have been a number of noteworthy findings that potentially advance an understanding of the EI construct. These outcomes are generally discussed in terms of trait and ability EI with a combined discussion of incremental validity results.

### **5.3.1 Trait Emotional Intelligence**

Over the course of three studies, further light has been shed on trait EI with respect to the Mayer and Salovey (1997) definition; social desirability response bias; and developmental trends. Results from the factor analyses of the self-report measure of EI yielded a different outcome to the underlying definition of the construct. The definition selected to be operationalised was that of Mayer and Salovey (1997) involving: (1) the perception of one's own and others emotions, (2) utilization of emotions, (3) understanding of emotions, and (4) regulation of one's own and others emotions. But in the analysis of the SRMEI-R, the perception and regulation of emotions subscales diverged into self and other abilities. Thus, the final factor outcome included: (1) perception of one's own emotions, (2) perception of others emotions, (3) utilization of emotions, (4) understanding of emotions, (5) regulation of one's own emotions, and (6) regulation of others emotions. Moreover, a number of EI researchers have distinguished EI abilities along the same lines (Bar-On, 1997; Petrides & Furnham, 2001; Weisinger, 1998). Potentially, the divergence of self and other EI abilities may lead to the refinement of the definition of the construct provided such results are replicated and found to be robust.

From the outset, it was anticipated that the trait EI measure might be vulnerable to response bias by virtue of (1) being a self-report instrument, and (2) requiring



participants to provide an estimate of emotional functioning. To evaluate the presence of response bias, a peer-report measure was compared to self-report outcomes in study 1 and 2, and a measure of social desirability included in study 3. Results from all three studies indicated that the trait EI measure was vulnerable to social desirability response bias. The implication of these findings is that it is essential social desirability be controlled for in future studies of trait EI to ensure that outcomes are not an artifact of a self-enhancing bias.

An examination of developmental trends in this thesis indicated minimal support for the notion that trait EI increases with age. Previously, Mayer et al. (1999) and Mayer et al. (2000c) reported significant increases in EI across the lifespan. More recently, Palmer, Gignac, Manocha and Stough (2005) found little evidence for increases in EI with age. Notably, the current series of studies examined increases in EI in relation to a self-report or trait-based measure, whereas other researchers have explored these increases via maximal performance measures or ability EI. Moreover, each of these analyses have been based on cross-sectional data, leading to the recommendation that longitudinal studies are needed to more thoroughly assess developmental trends in EI.

### **5.3.2 Ability Emotional Intelligence**

This thesis has also added to the understanding of ability EI via (1) consensus score outcomes, and (2) a new method of scoring ability-based measures termed confidence protocols.

**(i) Ability Measure of Emotional Intelligence – Consensus Scores**

Results of consensually-scored outcomes have added further data with respect to the factor structure and internal reliability of ability EI.

The factor analysis of the AMEI-CS was conducted based on all 82 items of the measure. During the process of factor analysis, an anomaly emerged whereby the AMEI-CS yielded a 28-factor outcome in the first instance. A parallel roots analysis subsequently indicated a more plausible solution of four, five or six factors, and upon closer inspection relatively few items defined factors seven through 28. Of these additional factors, items tended to reflect positive and negative affect as well as different types of emotions. A follow-up forced 4-factor principal components analysis was successful, provided that a substantial number of items were deleted.

Interestingly, the MSCEIT was likewise subjected to a forced 4-factor analysis during test development (Mayer et al., 2000c). It is presently unclear whether the MSCEIT and its predecessor, the MEIS, would have yielded similar factor structure outcomes to this thesis had all of the items and not just the subscales been analysed. Potentially, these findings have important implications for the definition of EI. That is, if EI abilities are shown to differ as a function of positive and negative as well as different types of emotions, then the widely accepted definition proffered by Mayer and Salovey (1997) will need to address these differences.

A further noteworthy outcome of the factor analysis of the AMEI-CS was the low proportion of total variance accounted for (34%). By this account, 66% of the variance in test scores remained unaccounted for. In general, the proportion of variance that the MEIS and MSCEIT accounted for have not been reported, thereby

precluding a comparison of results (Brackett & Mayer, 2003; Ciarrochi et al., 2000; Mayer et al., 1999; Mayer et al., 2000).

Results of internal reliability analysis, irrespective of whether they are at the branch or subtest level, indicate a further challenge to proponents of consensus scoring. Problems associated with adequately differentiating response options were flagged at the beginning of chapter 4, and attempts were made in study 3 to improve upon distinguishing optimal response options. Despite these attempts, difficulties with participants strongly endorsing more than one response option persisted. Given the potential for a diverse range of responses relative to cultural, gender, and age differences (amongst others) it is difficult to see how these problems can be adequately addressed within a consensus-scoring framework.

**(ii) Ability Measure of Emotional Intelligence – Confidence Scores**

For ability EI (confidence scores), we have gained insight into an alternative scoring methodology, and a number of important psychometric properties associated with this method of scoring.

From the outset, there have been questions raised in the literature with respect to consensus scoring and some researchers have argued for the need to develop alternative scoring approaches (Roberts et al., 2001). One of the difficulties with consensus scoring was seen to be a consequence of the vast array of response options that are appealing to individuals, depending upon influences such as culture, gender, age and so forth. Confidence scoring has provided a means of assessing individual differences in the ability to solve effectively an emotional problem rather than focusing on the efficacy of specific strategies. Conceptually at least, confidence protocols

indicate that there are other ways of scoring abilities-based EI measures other than consensus/expert based that are useful. The implication is that the theory underlying confidence scoring will open up new avenues of exploring EI.

In terms of the psychometric properties associated with confidence scoring, analyses have indicated an important improvement in internal reliabilities. As mentioned previously, consensually scored ability EI tests have consistently experienced difficulties with reliability levels, particularly at the subtest level. In contrast, confidence reliability levels have been good to excellent. Ultimately, an improvement in the reliability levels of ability tests has important implications for coherent inferences to be made about the EI construct.

The factor analyses of confidence scores have also yielded interesting results. First, principal components analysis indicated a three-factor solution. The three factors were labelled: (1) regulation of one's own and other people's emotions, (2) perception/utilization of emotions, (3) understanding of emotions. Although not entirely consistent with the underlying theoretical model, a number of researchers have encountered similar difficulties with the utilization of emotions factor. The ability to utilize one's emotions has coalesced with the understanding of emotions factor (Mayer et al., 1999); the understanding and regulation of emotions factor (Ciarrochi et al., 2000); and across all factors (Roberts et al., 2001). Second, confidence scores accounted for 65% of the variance in test scores - a substantial increase over consensus scores.

Investigations into the convergent validity of confidence scores have indicated early promise. Study 3 found that confidence scores converged with the theoretically

related construct of empathy, as well as fluid ability and crystallized ability. Thus, there was good evidence that the new abilities-based EI measure was correlated with pre-existing intelligences. At the same time, confidence scores correlated with consensus scores and outcomes pertaining to the SRMEI-R.

There was also good support for the discriminant validity of confidence scores in relation to the Big Five personality domains. For example, the AMEI-CF was weakly positively correlated with openness and conscientiousness. In short, the AMEI-CF was distinguishable from the Big Five.

### **5.3.3 Discussion of Trait and Ability EI Incremental Validity Results**

The findings of this thesis have alluded to potential new directions for the study of EI and its relationship to existing personality domains. In chapter 2, the possibility was raised that a distinction was needed between explanatory versus predictive utility when considering control variables such as personality. On this basis, it was recommended that the incremental validity of EI be examined by conducting two analyses: one without personality entered into a regression equation and the second with personality entered into a regression model first, followed by EI. Results from study 3 prior to the inclusion of the Big Five into the regression analysis indicated good incremental validity for the SRMEI-R (5% to 23%); AMEI-CS (29%) and AMEI-CF (14%). By comparison, when personality was entered into the respective regression equations and thereby controlled for, the proportion of variance accounted for by the EI subscales markedly declined. In the case of the SRMEI-R (3% to 12%); AMEI-CS (2% to 7%) and AMEI-CF (4% to 5%). For trait EI, the later results are an improvement over alternative measures with the proportion of variance accounted for

by other instruments (when it has been assessed) being in the order of 1% to 2.8% (Saklofske et al., 2003). The outcomes pertaining to the AMEI-CS and AMEI-CF are in keeping with alternative abilities-based measures that have ranged from 3% to 10% (Bastian et al., 2005; Brackett & Mayer, 2003; Lopes et al., 2003). Notably, some of the results needed to be interpreted with caution because the relatively high number of multiple comparisons may have lead to artificially inflated outcomes. Taken together, the additional variance accounted for by EI over and above that of the Big Five is less than some researchers have espoused (Goleman, 1995).

#### **5.3.4 A Comparison of Trait and Ability EI**

A further outcome worth noting was the weak positive correspondence between trait and ability EI. In the case of study 3, a comparison between a self-report and performance-based measure was conducted based on the same Mayer and Salovey (1997) EI definition: a study not previously conducted. Results indicated a degree of correlation between trait and EI but that in the main self-estimated intelligence is different to one's actual intelligence.

#### **5.4 Limitations of this Research**

There were three notable limitations with respect to this thesis in terms of sample characteristics, internal reliability levels, and criterion variables. First, each of the studies was conducted with university students, resulting in relatively homogenous samples. As a consequence, the generalizability of results to other subgroups is limited. To address this limitation the new trait and ability EI measures will need to be evaluated in relation to more representative samples. Second, a number of outcomes for consensus scores need to be interpreted with caution. That is, the internal

reliability levels for the AMEI-CS utilization of emotions subtests, and the regulation of emotions branch score as well as the subtests were lower than desirable. Third, the criterion variables selected as part of the main study were designed to capture adaptive and maladaptive behaviours. But data were collected via self-report measures and these types of measures are vulnerable to response bias. As such the aforementioned outcomes need to be investigated further with objective indices.

## **5.5 Directions for Future Research**

The field of EI is still comparatively young and as such there are many areas that are in need of investigation. In the context of this thesis there are seven issues recommended for future research including the: (1) replication of the foregoing analyses, (2) expansion of the foregoing analyses, (3) refinement of the new abilities-based EI method of scoring, (4) investigation of EI via an experimental research design, (5) investigation of EI abilities via different types of emotions, (6) location of EI within Carroll's (1993) Three Stratum Theory, and (7) investigation of developmental trends in EI.

### **5.5.1 Replication of the Foregoing Analyses**

Importantly, results of the foregoing analyses are best viewed as exploratory and in need of replication to evaluate further the psychometric properties of the new trait and ability EI measures. For instance, the results need to be re-examined in relation to the general population, to evaluate more definitively the psychometric properties of the new EI measures. Moreover, given the potential application of EI abilities in educational and organizational settings, it would be desirable to investigate further the psychometric properties of the EI instruments in these settings. A further

consideration is the extent to which the new measures adequately cover the sampling domain of EI, and whether the deletion of suboptimal test items would improve both scales and lead to shorter measures. It was also noted that the factor structures of each of the measures are in need of additional investigation. Many EI instruments have previously yielded unstable factor structures and the same may be the case here.

### **5.5.2 Expansion of the Foregoing Analyses**

The initial results identified in this thesis are considered promising but there is still ample scope to examine the psychometric properties of the new trait and ability EI measures. The convergent validity of the EI measures in relation to alternative constructs are of interest. For example, constructs that would be expected to converge with both of the new measures include other EI measures, optimism and so forth. Additional cognitive ability measures are recommended to assess the convergent validity of the abilities-based EI scale. It is also considered essential that further research be conducted to explore the discriminant validity of the SRMEI-R in relation to other personality measures such as the EPQue (Eysenck, 1981) and the 16PF (Cattell, 1982). This is particularly the case because the discriminant validity of trait EI instruments has been a source of ongoing difficulty. Finally, additional analyses of the incremental validity of the new EI instruments are recommended. One objective would be to examine the extent to which the EI measures are able to account for additional variance in relation to other outcomes.

### **5.5.3 Refinement of the New Abilities-Based EI Method of Scoring**

In principal, the rationale underlying confidence scoring is regarded as plausible but there is scope for improving the method of measurement. Up to the



present time, abilities-based EI researchers have focused on identifying the effectiveness of specific strategies in resolving posed scenarios (Mayer et al., 1999; Mayer et al., 2000c). In chapter 4 it was contended that it is the degree of effectiveness of an answer in solving a problem that is critical. It was argued that the (1) degree to which an individual is able to resolve a problem without residual concerns, and (2) the time taken to resolve a problem, are important. The first attempt at operationalising the aforementioned notion assessed the degree of confidence that an individual had about various response options that were available. Notably, a more objective index such as individual differences in cortisol levels may yield further insights into individual differences in the effectiveness of solving emotional problems.

#### **5.5.4 Investigation of EI via an experimental research design**

Results from this thesis were obtained by correlational studies but an important objective of intelligence research is to explain rather than describe psychological phenomena and this would be better achieved via an experimental research design. There are relatively few experimental studies evident in the EI literature. Of these, initial results have provided useful insights into the construct of EI. Salovey et al. (1995) reported that trait EI levels related to baseline mood, mood recovery and impaired mood. Ciarrochi et al. (2001) found that the ability to regulate one's own emotions was related to mood management behaviour. Petrides and Furnham (2003) reported that the speed with which participants were able to perceive emotions was directly related to trait EI levels, as was mood induction sensitivity. A key advantage of an experimental research design is that simple relationships between variables rather than complex multi-dimensional relationships are more readily evaluated (Petrides &

Furnham, 2003). In short, experimental data have a key role to play in EI research, to the extent to which these data are able to elucidate EI behaviour.

#### **5.5.5 Investigation of EI Abilities via Different Types of Emotions**

The initial factor analysis of the AMEI-CS in chapter 4 flagged the distinctive nature of many emotions by virtue of recovering a 27-factor outcome but to date there is no evidence of test developers assessing EI abilities in terms of different types of emotions. EI measures typically comprise test items that assess the ability to identify and/or regulate “emotions”. Thus, differences between positive, negative, mixed and neutral emotions in EI research have been overlooked. Both conceptually and empirically there are qualitative differences between various types of emotions (Matthews et al., 2002). On the one hand, an individual may find it relatively easy to perceive feelings of happiness and joy, whereas attempting to recognise negative emotions such as sadness or anger may be more problematical (or vice versa). There are also qualitative differences within emotion types. For example, individuals may be able to readily identify when they are angry but have difficulty recognising when they are feeling afraid. To evaluate EI abilities fully it is regarded as essential that researchers investigate the impact of different types of emotions on test performance.

#### **5.5.6 Location of EI within Carroll’s (1993) Three Stratum Theory**

Initial evidence from this thesis and indeed other studies have demonstrated that abilities-based measures relate to various measures of cognitive ability but further research is needed to better understand how EI relates to intelligence overall. Thus, an examination of how abilities-based EI relates to traditional conceptualisations of intelligence such as Carroll’s (1993) Three-Stratum theory is recommended. The

Three-Stratum theory is regarded as the most comprehensive conceptualisation of intelligence at present. At a conceptual level at least, it would appear that EI has the potential to relate to many aspects of intelligence as outlined in Carroll's (1993) theory. From chapter 1 it was argued that ability EI may be subsumed within one or more of the level factors associated with the first and lowest stratum of Carroll's (1993) theory. For example, two socio-emotional factors that are represented at the first stratum of verbal intelligence include communication ability, and listening ability. A further possibility is that ability EI may be subsumed within one or more of the level factors associated with the second stratum of the Three Stratum theory, like verbal intelligence, performance intelligence, or broad cognitive speediness. With the aforementioned in mind, it is desirable that the construct of EI be investigated in terms of its relationship to the various aspects of Carroll's (1993) theory via a comprehensive test battery. Such an investigation would shed further light on EI and advance our understanding of the construct.

### **5.5.7 Developmental trends in Emotional Intelligence**

An exploration of developmental trends in EI is also needed to examine how the construct relates to traditional conceptualisations of intelligence. Mayer and Salovey (1997) asserted that, as a type of intelligence, EI abilities increase with age. In terms of traditional conceptualisations of intelligence, Schaie (1994) identified consistent developmental trajectories for cognitive abilities. Typically, fluid intelligence (problem solving ability) increases from young adulthood to middle age and then declines. In contrast, crystallised ability (knowledge learned via acculturation) increases throughout the lifespan (Schaie, 1994). Therefore, an

investigation of developmental trends in EI is of interest to determine if the construct increases and/or declines in the same way as, or differently from, pre-existing intelligences.

## 5.6 Conclusion

The primary objective of this thesis has been to advance our understanding of the EI construct via the development and evaluation of the psychometric properties of a new trait and ability EI measure. Specific objectives related to: (1) developing a self-report measure that was distinguishable from existing personality domains; (2) improving consensually scored ability EI test items; (3) devising a new ability EI scoring method; and (4) conducting a thorough psychometric analysis of each of the new measures.

A comprehensive psychometric investigation of the new EI measures yielded promising results with respect to the self-report measure of EI, the SRMEI-R. In particular, the SRMEI-R was found to be a reliable instrument, demonstrating factorial validity and at the same time flagging a distinction between self and other EI abilities. The self-report measure converged with the theoretically related construct of empathy, and weakly positively correlated with consensus and confidence scores. Discriminant validity was evidenced by typically weak correlations with the Big Five with the exception of a moderate negative correlation between the regulation of one's own emotions and neuroticism. Incremental validity was good with additional variance accounted for in relation to GPA, stress, and loneliness.

To a lesser extent there was support for the psychometric properties of the performance-based measure of EI when scored according to consensus protocols. For

the AMEI-CS, results indicated a factor structure consistent with the underlying theoretical model. The AMEI-CS converged with empathy, two cognitive ability markers and the alternative EI measures. Discriminant validity was evidenced in relation to the Big Five, and incremental validity was demonstrated in relation to GPA, stress, loneliness and general well-being. That said, internal reliability levels were suboptimal.

In contrast, when ability EI was scored according to confidence protocols, results indicated a highly reliable instrument. At the same time, there was good support for the convergent and discriminant validity of the AMEI-CF. There was also a modest degree of support for the incremental validity of the AMEI-CF for low and high scoring EI subgroups in relation to loneliness and general well-being.

LIST OF APPENDICES

Appendix 3.1. Self-Report Measure of Emotional Intelligence .....	213
Appendix 3.2. Peer-Report Measure of Emotional Intelligence .....	216
Appendix 3.3. Questionnaire Measure of Empathic Tendency .....	219
Appendix 3.4. Pilot Study 1 Invitation to Participate .....	221
Appendix 3.5. Pilot Study 1 Consent Form .....	222
Appendix 3.6. Assessing Emotions Scale .....	223
Appendix 4.1. Study 3 Invitation to Participate, and Consent Form. ....	226
Appendix 4.2. Self-Report Measure of Emotional Intelligence - Revised.....	229
Appendix 4.3. Ability Measure of Emotional Intelligence .....	232
Appendix 4.4. Swaps Test.....	248
Appendix 4.5. General Knowledge Task .....	256
Appendix 4.6. The Quickscales.....	263
Appendix 4.7. Depression, Anxiety and Stress Scale .....	267
Appendix 4.8. The UCLA Loneliness Scale .....	269
Appendix 4.9. General Index of Well-being .....	271
Appendix 4.10. Marlow-Crowne Scale.....	272

### Appendix 3.1: Self-Report Measure of Emotional Intelligence

Name: ..... Date: .....

This questionnaire consists of several statements describing general characteristics about yourself. Please read each statement and then indicate your response in the space provided next to each statement. If you strongly disagree, circle SD. If you disagree, circle D. If you are neutral about the statement, circle N. If you agree with the statement, circle A. If you strongly agree, circle SA.

- |     |  |    |   |   |   |    |
|-----|--|----|---|---|---|----|
| 1.  | In general, I am able to identify my feelings as I experience them                     | SD | D | N | A | SA |
| 2.  | Trying to manage the feelings of other people is difficult for me                      | SD | D | N | A | SA |
| 3.  | When I am presented with a problem I utilize my emotions to help resolve the situation | SD | D | N | A | SA |
| 4.  | I find it difficult to understand complex combinations of emotions within myself       | SD | D | N | A | SA |
| 5.  | I am good at managing emotions that other people are experiencing                      | SD | D | N | A | SA |
| 6.  | In the face of obstacles I use my feelings to guide me                                 | SD | D | N | A | SA |
| 7.  | I have a good understanding of how my emotions progress over time                      | SD | D | N | A | SA |
| 8.  | I am able to control my own feelings effectively                                       | SD | D | N | A | SA |
| 9.  | I get confused when trying to identify my feelings                                     | SD | D | N | A | SA |
| 10. | I find it straightforward to recognise how people are feeling                          | SD | D | N | A | SA |
| 11. | When I am making decisions I don't generally take feelings into account                | SD | D | N | A | SA |

12.	When I have to handle other peoples feelings, I find it straightforward.	SD	D	N	A	SA
13.	I don't always comprehend how feelings change and progress	SD	D	N	A	SA
14.	The feelings of other people are usually easy for me to read	SD	D	N	A	SA
15.	I believe I am good at managing my own emotions	SD	D	N	A	SA
16.	I am comfortable with disclosing how I feel	SD	D	N	A	SA
17.	The ability to use feelings to deal with everyday issues is something I am good at	SD	D	N	A	SA
18.	When faced with trying to regulate my emotions, I don't seem to be very effective	SD	D	N	A	SA
19.	I find it difficult to re-produce feelings on demand	SD	D	N	A	SA
20.	I am able to grasp what my feelings are trying to tell me	SD	D	N	A	SA
21.	I like working out how I feel	SD	D	N	A	SA
22.	In general, I utilize my emotions to solve problems	SD	D	N	A	SA
23.	Feelings are easy to understand	SD	D	N	A	SA
24.	I am skilful at regulating the emotions of other people	SD	D	N	A	SA
25.	I am good at understanding complex emotions	SD	D	N	A	SA
26.	I find it difficult to express how I am feeling	SD	D	N	A	SA



- |     |  |    |   |   |   |    |
|-----|--|----|---|---|---|----|
| 27. | I like using feelings to assist me with problem solving      | SD | D | N | A | SA |
| 28. | I find it hard to understand my emotions                     | SD | D | N | A | SA |
| 29. | I find it difficult to control my emotions                   | SD | D | N | A | SA |
| 30. | Trying to work out how people are feeling is not easy for me | SD | D | N | A | SA |

### Appendix 3.2: Peer-Report Measure of Emotional Intelligence

Name: ..... Date: .....

This questionnaire consists of a number of statements that require you to describe general characteristics of the friend who has accompanied you today who you have known for 3 months or more. Your friend's name is.....  
Please read each statement and then indicate your response in the space provided next to each statement. If you strongly disagree, circle SD. If you disagree, circle D. If you are neutral about the statement, circle N. If you agree with the statement, circle A. If you strongly agree, circle SA.

- |     |  |    |   |   |   |    |
|-----|--|----|---|---|---|----|
| 1.  | It seems to be easy for him/her to identify how other people feel.                 | SD | D | N | A | SA |
| 2.  | S/he often uses emotions in order to solve problems.                               | SD | D | N | A | SA |
| 3.  | S/he does not usually manage the emotions of others very effectively.              | SD | D | N | A | SA |
| 4.  | I believe s/he finds it somewhat challenging to express his/her feelings           | SD | D | N | A | SA |
| 5.  | S/he finds it easy to understand the complexities of emotional life.               | SD | D | N | A | SA |
| 6.  | S/he finds it easy to handle other people's feelings.                              | SD | D | N | A | SA |
| 7.  | In general, s/he does not use his/her emotions to solve problems.                  | SD | D | N | A | SA |
| 8.  | Whenever s/he has to make decisions s/he usually does so with the aid of emotions. | SD | D | N | A | SA |
| 9.  | S/he appears to find it difficult to understand his/her own emotions.              | SD | D | N | A | SA |
| 10. | The feelings of other people are easy to read for him/her.                         | SD | D | N | A | SA |

- |     |  |    |   |   |   |    |
|-----|--|----|---|---|---|----|
| 11. | When it comes to controlling the emotions of others s/he experiences problems.           | SD | D | N | A | SA |
| 12. | Managing his/her own emotions is easy for him/her.                                       | SD | D | N | A | SA |
| 13. | S/he doesn't use emotions to solve everyday difficulties.                                | SD | D | N | A | SA |
| 14. | For him/her, understanding his/her own emotions is straightforward.                      | SD | D | N | A | SA |
| 15. | S/he experiences problems when trying to manage his/her own feelings.                    | SD | D | N | A | SA |
| 16. | S/he is comfortable disclosing how s/he feels to other people.                           | SD | D | N | A | SA |
| 17. | It is hard for him/her to grasp how emotions progress over time.                         | SD | D | N | A | SA |
| 18. | S/he is good at letting feelings guide him/her in problem solving.                       | SD | D | N | A | SA |
| 19. | S/he is often unclear about what s/he is feeling.  | SD | D | N | A | SA |
| 20. | Complex emotions are not very well understood by him/her.                                | SD | D | N | A | SA |
| 21. | It is difficult for him/her to identify how s/he feels.                                  | SD | D | N | A | SA |
| 22. | When someone is upset, it is rare for him/her to have any problems managing emotions.    | SD | D | N | A | SA |
| 23. | S/he has a good understanding of how his/her own emotions progress and change over time. | SD | D | N | A | SA |
| 24. | S/he does not handle his/her emotions very well.   | SD | D | N | A | SA |
| 25. | When trying to recognise the emotions of others s/he often seems confused.               | SD | D | N | A | SA |
| 26. | In general, s/he is able to comprehend his/her own emotions.                             | SD | D | N | A | SA |

- |     |   |    |   |   |   |    |
|-----|---|----|---|---|---|----|
| 27. | S/he is able to re-produce emotions when it is useful to do so.                 | SD | D | N | A | SA |
| 28. | S/he can readily identify his/her feelings as s/he experiences them.            | SD | D | N | A | SA |
| 29. | S/he doesn't typically utilize feelings as part of the problem solving process. | SD | D | N | A | SA |
| 30. | S/he is skilful at regulating his/her emotions.                                 | SD | D | N | A | SA |

### Appendix 3.3: Questionnaire Measure of Empathic Tendency

Name: ..... Date: .....

This questionnaire consists of a number of statements that describe general characteristics about yourself. Please read each statement and then indicate your response in the space provided next to each statement. If you strongly disagree, insert 1. If you disagree, insert 2. If you are neutral about the statement, insert 3. If you agree with the statement, insert 4. If you strongly agree, insert 5.

- |     | strongly<br>disagree   | disagree | neutral | agree | strongly<br>agree |       |
|-----|--|----------|---------|-------|-------------------|-------|
|     | 1  | 2        | 3       | 4     | 5                 |       |
| 1.  | It makes me sad to see a lonely stranger in a group                  |          |         |       |                   | _____ |
| 2.  | People make too much of the feelings and sensitivity of animals      |          |         |       |                   | _____ |
| 3.  | I often find public displays of affection annoying                   |          |         |       |                   | _____ |
| 4.  | I am annoyed by unhappy people who are just sorry for themselves     |          |         |       |                   | _____ |
| 5.  | I become nervous if others around me seem to be nervous              |          |         |       |                   | _____ |
| 6.  | I find it silly for people to cry out of happiness                   |          |         |       |                   | _____ |
| 7.  | I tend to get emotionally involved with a friend's problems          |          |         |       |                   | _____ |
| 8.  | Sometimes the words of a love song can move me deeply                |          |         |       |                   | _____ |
| 9.  | I tend to lose control when I am bring bad news to people            |          |         |       |                   | _____ |
| 10. | The people around me have a great influence on my moods              |          |         |       |                   | _____ |
| 11. | Most foreigners I have met seemed cool and unemotional               |          |         |       |                   | _____ |
| 12. | I would rather be a social worker than work in a job training centre |          |         |       |                   | _____ |
| 13. | I don't get upset just because a friend is acting upset              |          |         |       |                   | _____ |

14. I like to watch people open presents \_\_\_\_\_
15. Lonely people are probably unfriendly \_\_\_\_\_
16. Seeing people cry upsets me \_\_\_\_\_
17. Some songs make me happy \_\_\_\_\_
18. I really get involved with the feelings of the characters in a novel \_\_\_\_\_
19. I get very angry when I see someone being ill-treated \_\_\_\_\_
20. I am able to remain calm even though those around me worry \_\_\_\_\_
21. When a friend starts to talk about his problems, I try to steer the conversation to something else \_\_\_\_\_
22. Another's laughter is not catching for me \_\_\_\_\_
23. Sometimes at the movies I am amused by the amount of crying and sniffing around me \_\_\_\_\_
24. I am able to make decisions without being influenced by people's feelings \_\_\_\_\_
25. I cannot continue to feel ok if people around me are depressed \_\_\_\_\_
26. It is hard for me to see how some things upset people so much \_\_\_\_\_
27. I am very upset when I see an animal in pain \_\_\_\_\_
28. Becoming involved in books or movies is a little silly \_\_\_\_\_
29. It upsets me to see helpless old people \_\_\_\_\_
30. I become more irritated than sympathetic when I see someone's tears \_\_\_\_\_
31. I become very involved when I watch a movie \_\_\_\_\_
32. I often find that I can remain cool in spite of the excitement around me \_\_\_\_\_
33. Little children sometimes cry for no apparent reason \_\_\_\_\_

### Appendix 3.4: Pilot Study 1 Invitation to Participate

**UNIVERSITY OF ADELAIDE  
DEPARTMENT OF PSYCHOLOGY  
INFORMATION SHEET**

My name is Jan Warwick and I am a PhD student in Psychology at University of Adelaide, under the supervision of Professor Ted Nettelbeck and Dr Lynn Ward. I am looking for PAIRS OF FRIENDS WHO HAVE KNOWN EACH OTHER FOR 3 MONTHS OR MORE who are interested in participating together in a study on emotional intelligence.

Emotional intelligence involves the ability to identify and express emotions, as well as understand and regulate emotions. It is thought by some to contribute to achievements in some areas. I am particularly interested in developing two new measures of emotional intelligence that are both valid and reliable.

The study involves completing two short questionnaires assessing emotional intelligence, and one questionnaire measuring empathy. The questionnaires should take about 20 to 30 minutes to complete.

Your participation in the study may provide us with valuable information about the construct of emotional intelligence. You will not necessarily personally benefit from participating in the study, other than that I will be pleased to provide you with all personal results, and to give you a full account of what I have found when the study is completed.

Your identity will remain anonymous, and all information produced from your participation will remain confidential.

The study will be conducted within the Psychology Department at a time convenient to you between 9.00 a.m. and 5.00 p.m., Monday to Friday. If you are interested in participating in this research with me, please respond by filling out the attached **Consent Form and Available Times**, and placing it in the box located in the Psychology Department main office.

If you have any queries regarding this study, please contact me on phone : ( ) or by email at . Alternatively, you may contact the thesis supervisor, Professor Ted Nettelbeck, at the Department of Psychology, University of Adelaide on phone : . Any queries about ethical considerations should be addressed to the Convenor of the Psychology Department's Human Ethics Subcommittee, Dr Peter Delin, on : .

### Appendix 3.5: Pilot Study 1 Consent Form

**UNIVERSITY OF ADELAIDE  
DEPARTMENT OF PSYCHOLOGY  
CONSENT FORM**

**Participants Names (capitals)**.....

and .....

**Project Title:** An evaluation of the construct emotional intelligence

**Name of Supervisors:** Professor Ted Nettelbeck.  
Dr Lynn Ward

**Name of PhD student:** Janette Warwick.

I consent to participate in the above project. The nature of the project, including questionnaires or procedures, has been explained to me, and is summarised on an information sheet I have been given.

I authorise the Supervisor or PhD student named above to use these questionnaires or procedures with me.

I understand that:

I am free to withdraw from the project at any time.

The project is for the purpose of research or teaching, and is not for treatment.

The confidentiality of the information I provide will be safeguarded.

There are no known adverse effects of these questionnaires or procedures.

**Signed:** ..... **Date:** .....  
(Participant)

**Signed:** ..... **Date:** .....  
(Participant)

**Available Times**

We are free to participate at any of the following times.

Weekday	Time
.....	
.....	
.....	

We can be contacted on Phone: ..... Mobile: .....



### Appendix 3.6: Assessing Emotions Scale

Name: ..... Date: .....

This questionnaire consists of several statements intended to help you describe some of your typical characteristics. Please read each statement and circle the response that best describes you.

- 1 = strongly disagree
- 2 = somewhat disagree
- 3 = neither agree nor disagree
- 4 = somewhat agree
- 5 = strongly agree

- |     |   |           |
|-----|---|-----------|
| 1.  | I know when to speak about my personal problems to others   | 1 2 3 4 5 |
| 2.  | When I am faced with obstacles, I remember times I faced similar obstacles and overcame them        | 1 2 3 4 5 |
| 3.  | I expect that I will do well on most things I try   | 1 2 3 4 5 |
| 4.  | Other people find it easy to confide in me  | 1 2 3 4 5 |
| 5.  | I find it hard to understand the non-verbal messages of other people                                | 1 2 3 4 5 |
| 6.  | Some of the major events of my life have lead me to re-evaluate what is important and not important | 1 2 3 4 5 |
| 7.  | When my mood changes, I see new possibilities   | 1 2 3 4 5 |
| 8.  | I think that emotions are one of the things that make my life worth living                          | 1 2 3 4 5 |
| 9.  | I am aware of my emotions as I experience them  | 1 2 3 4 5 |
| 10. | I expect good things to happen  | 1 2 3 4 5 |
| 11. | I like to share my emotions with others   | 1 2 3 4 5 |
| 12. | When I experience a positive emotion, I know how to make it last                                    | 1 2 3 4 5 |
| 13. | I arrange events others enjoy   | 1 2 3 4 5 |

- |     |   |           |
|-----|---|-----------|
| 14. | I seek out activities that make me happy  | 1 2 3 4 5 |
| 15. | I am aware of the non-verbal messages I send to others  | 1 2 3 4 5 |
| 16. | I present myself in a way that makes a good impression on others  | 1 2 3 4 5 |
| 17. | When I am in a positive mood, solving problems is easy for me   | 1 2 3 4 5 |
| 18. | By looking at their facial expressions, I recognise the emotions people are experiencing  | 1 2 3 4 5 |
| 19. | I know why my emotions change   | 1 2 3 4 5 |
| 20. | When I am in a positive mood, I am able to come up with new ideas   | 1 2 3 4 5 |
| 21. | I have control over my emotions   | 1 2 3 4 5 |
| 22. | I easily recognise my emotions as I experience them   | 1 2 3 4 5 |
| 23. | I motivate myself by imagining a good outcome to tasks I take on  | 1 2 3 4 5 |
| 24. | I compliment others when they have done something well  | 1 2 3 4 5 |
| 25. | I am aware of the non-verbal messages other people send   | 1 2 3 4 5 |
| 26. | When another person tells me about an important event in their life, I almost feel as though I have experienced this event myself | 1 2 3 4 5 |
| 27. | When I feel a change in emotions, I tend to come up with new ideas  | 1 2 3 4 5 |
| 28. | When I am faced with a new challenge, I give up because I believe I will fail   | 1 2 3 4 5 |
| 29. | I know what other people are feeling just by looking at them  | 1 2 3 4 5 |
| 30. | I help other people feel better when they are down  | 1 2 3 4 5 |

31. I use good moods to help myself keep trying in the face of obstacles 1 2 3 4 5
32. I can tell how people are feeling by listening to the tone of their voice 1 2 3 4 5
33. It is difficult for me to understand why people feel the way they do 1 2 3 4 5

**Appendix 4.1: Study 3 Invitation to Participate, and Consent Form.****Emotional Intelligence Validation Study  
Invitation to Participate****General Information:**

Thank you for your interest in this study. My name is Janette Warwick and I am a PhD student in Psychology. The purpose of my study is to explore the topic of emotional intelligence, and its relationship to intelligence (IQ), personality, and well-being.

**Survey Questions:**

The study involves completing a web based questionnaire that includes background information, a range of measures of emotional intelligence, and related topics. We also require your permission to gain access to your end of year academic results (for Psychology I students). To be eligible to complete this study, it is necessary that you be 18 years of age or more.

**Benefits:**

I will be pleased to provide you with personal results of your emotional intelligence score at the end of the study. Please fill in your email address so I can return the results to you. Equally important, you will be contributing to a growing body of research that aims to understand the nature of emotional intelligence.

**Time:**

I estimate that the study takes approximately 2 hours to complete, although there is no time limit. For participant comfort, the study has been split into two (2) sections, namely Part '1' and Part '2' so that you may take a break if so desired. Importantly, both Part '1' and Part '2' must be completed and submitted for research participation to be recorded

**Your Rights:**

Your participation in this study is completely voluntary. You may withdraw from the study at any time simply by leaving the web site without submitting your responses.

**Anonymity/Confidentiality:**

Your responses will remain confidential. Any identifying information is collected solely for the purpose of cross matching both sections of the study. All data will be pooled and presented in summary form only.

**For More Information:**

This study has been approved by the University of Adelaide, Department of Psychology Human Ethics Committee. If you have any queries regarding this study, please contact me at [jan@netadvantage.com.au](mailto:jan@netadvantage.com.au). Alternatively, you may contact my thesis supervisor, Professor Ted Nettelbeck, at the University of Adelaide, Department of Psychology, on 8303 5738 or [ted.nettelbeck@adelaide.edu.au](mailto:ted.nettelbeck@adelaide.edu.au). Any queries regarding ethical considerations should be addressed to the Acting Chairperson of the Department of Ethics Committee, Dr. Paul Delfabbro on 8303 5744 or [paul.delfabbro@psychology.adelaide.edu.au](mailto:paul.delfabbro@psychology.adelaide.edu.au).

**How Do I Complete the Survey?**

Use your mouse to click on the "buttons" to enter your responses. You can only choose one response per question, and all questions must be answered - otherwise the questionnaire can't be submitted. Don't worry if you accidentally miss any - when you click on the "I have finished the questionnaire" button at the end of the questionnaire, a box will pop up and tell you if any questions were missed. Good luck.

**Consent Form**

I acknowledge that I have read and understood this information and understand that:-

I am free to withdraw from the project at any time.

The project is for the purpose of research only.

The confidentiality of the information will be safeguarded.

There are no known adverse effects of these questionnaires or procedures.

If you wish to proceed with this experiment please press the 'Agree' button.

1.If you are an Adelaide University Psychology I Student, please enter your seven digit student number (if not, leave blank and move to the next question)

2.For cross matching purposes only, please enter your first initial and up to seven letters of your surname (i.e. if your name is Janette Warwick, you would insert "jwarwick")

3.(Optional) If you would like results for your Emotional Intelligence score, please fill in your email address so I can email your score back to you

4.Enter your age

5.What is your gender?

Male

Female

6.What culture do you identify with?

African

American

Asian

Australian

European

Middle Eastern

Other

### Appendix 4.2: Self-Report Measure of Emotional Intelligence - Revised

Each of the following 30 questions measures various aspects of emotional intelligence. Please select the most appropriate "button" that best describes how that statement applies to you.

1. In general, I am able to identify my feelings as I experience them

Strongly disagree      Disagree      Neutral      Agree      Strongly agree

2. Trying to manage the feelings of other people is difficult for me

Strongly disagree      Disagree      Neutral      Agree      Strongly agree

3. When I am presented with a problem I generally use my emotions to help resolve the situation

Strongly disagree      Disagree      Neutral      Agree      Strongly agree

4. I find it difficult to understand how feelings are interrelated

Strongly disagree      Disagree      Neutral      Agree      Strongly agree

5. I am good at helping other people with their emotions

Strongly disagree      Disagree      Neutral      Agree      Strongly agree

6. In the face of obstacles I use my feelings to guide me

Strongly disagree      Disagree      Neutral      Agree      Strongly agree

7. I have a good understanding of how one emotion is associated with another

Strongly disagree      Disagree      Neutral      Agree      Strongly agree

8. I am able to regulate my own feelings effectively

Strongly disagree      Disagree      Neutral      Agree      Strongly agree

9. I get confused when trying to identify my feelings

Strongly disagree      Disagree      Neutral      Agree      Strongly agree

10.I find it straightforward to recognise how other people are feeling

Strongly disagree      Disagree      Neutral      Agree      Strongly agree

11.When I am making decisions I don't rely on my emotions to guide me

Strongly disagree      Disagree      Neutral      Agree      Strongly agree

12.When I have to handle other people's feelings, I find it straightforward

Strongly disagree      Disagree      Neutral      Agree      Strongly agree

13.I don't always comprehend how feelings are linked

Strongly disagree      Disagree      Neutral      Agree      Strongly agree

14.The feelings of other people are usually easy for me to read

Strongly disagree      Disagree      Neutral      Agree      Strongly agree

15.I believe I am good at managing my own emotions

Strongly disagree      Disagree      Neutral      Agree      Strongly agree

16.I find it difficult to work out how I feel

Strongly disagree      Disagree      Neutral      Agree      Strongly agree

17.The ability to use feelings to deal with everyday issues is something I'm good at

Strongly disagree      Disagree      Neutral      Agree      Strongly agree

18.When faced with trying to regulate my emotions, I don't seem to be very effective

Strongly disagree      Disagree      Neutral      Agree      Strongly agree

19.I don't rely on my emotions to help me solve problems

Strongly disagree      Disagree      Neutral      Agree      Strongly agree

20.I am able to grasp many of the underlying connections between emotions

Strongly disagree      Disagree      Neutral      Agree      Strongly agree



21.I am aware of how I feel

Strongly disagree      Disagree      Neutral      Agree      Strongly agree

22.In general, I use my emotions to solve problems

Strongly disagree      Disagree      Neutral      Agree      Strongly agree

23.The links between feelings are easy for me to understand

Strongly disagree      Disagree      Neutral      Agree      Strongly agree

24.I am skilful at managing the emotions of other people

Strongly disagree      Disagree      Neutral      Agree      Strongly agree

25.I am good at understanding how complex emotions are interconnected

Strongly disagree      Disagree      Neutral      Agree      Strongly agree

26. Identifying how other people are feeling is easy for me

Strongly disagree      Disagree      Neutral      Agree      Strongly agree

27.I like using feelings to assist me with problem solving

Strongly disagree      Disagree      Neutral      Agree      Strongly agree

28.I find it hard to understand how some of my emotions are related

Strongly disagree      Disagree      Neutral      Agree      Strongly agree

29.I find it difficult to manage my feelings

Strongly disagree      Disagree      Neutral      Agree      Strongly agree

30.Trying to work out how people are feeling is not easy for me

Strongly disagree      Disagree      Neutral      Agree      Strongly agree

### Appendix 4.3: Ability Measure of Emotional Intelligence

The following 24 questions relate to the perception of emotion in people's faces. Examine the faces below, each one expresses one (or more) emotions. Indicate the extent to which EACH of the five (5) emotions is expressed by every face.



Face number one

#### 1.Happiness

Definitely not present	Not present	Neutral	Definitely Present	present
---------------------------	----------------	---------	-----------------------	---------

#### 2.Surprise

Definitely not present	Not present	Neutral	Definitely Present	present
---------------------------	----------------	---------	-----------------------	---------

#### 3.Anger

Definitely not present	Not present	Neutral	Definitely Present	present
---------------------------	----------------	---------	-----------------------	---------

#### 4.Relief

Definitely not present	Not present	Neutral	Definitely Present	present
---------------------------	----------------	---------	-----------------------	---------

#### 5.Excitement

Definitely not present	Not present	Neutral	Definitely Present	present
---------------------------	----------------	---------	-----------------------	---------

1.Indicate how confident (%) you are about your responses .....



**Face number two**

6. Shyness

Definitely not present	Not present	Neutral	Definitely Present	present
---------------------------	----------------	---------	-----------------------	---------

7. Serenity

Definitely not present	Not present	Neutral	Definitely Present	present
---------------------------	----------------	---------	-----------------------	---------

8. Anger

Definitely not present	Not present	Neutral	Definitely Present	present
---------------------------	----------------	---------	-----------------------	---------

9. Happiness

Definitely not present	Not present	Neutral	Definitely Present	present
---------------------------	----------------	---------	-----------------------	---------

10. Pity

Definitely not present	Not present	Neutral	Definitely Present	present
---------------------------	----------------	---------	-----------------------	---------

2. Indicate how confident (%) you are about your responses .....



**Face number three**

11.Loneliness

Definitely not present	Not present	Neutral	Definitely Present	present
---------------------------	----------------	---------	-----------------------	---------

12.Fear

Definitely not present	Not present	Neutral	Definitely Present	present
---------------------------	----------------	---------	-----------------------	---------

13.Disgust

Definitely not present	Not present	Neutral	Definitely Present	present
---------------------------	----------------	---------	-----------------------	---------

14.Happiness

Definitely not present	Not present	Neutral	Definitely Present	present
---------------------------	----------------	---------	-----------------------	---------

15.Sadness

Definitely not present	Not present	Neutral	Definitely Present	present
---------------------------	----------------	---------	-----------------------	---------

3.Indicate how confident (%) you are about your responses .....



**Face number four**

16.Sadness

Definitely not present	Not present	Neutral	Definitely Present	present
---------------------------	----------------	---------	-----------------------	---------

17.Happiness

Definitely not present	Not present	Neutral	Definitely Present	present
---------------------------	----------------	---------	-----------------------	---------

18.Smugness

Definitely not present	Not present	Neutral	Definitely Present	present
---------------------------	----------------	---------	-----------------------	---------

19.Amusement

Definitely not present	Not present	Neutral	Definitely Present	present
---------------------------	----------------	---------	-----------------------	---------

20.Excitement

4.Indicate how confident (%) you are about your responses .....

The following 24 questions relate to the usefulness of various emotions.

Section 1: Indicate how useful EACH of the following three (3) emotions would be for a student to feel when striving to do well in a subject.

21. Enthusiasm

Not at all Useful	Not useful	Neutral	Useful	Very useful
----------------------	---------------	---------	--------	----------------

22. Surprise

Not at all Useful	Not useful	Neutral	Useful	Very useful
----------------------	---------------	---------	--------	----------------

23. Indifference

Not at all Useful	Not useful	Neutral	Useful	Very useful
----------------------	---------------	---------	--------	----------------

5. Indicate how confident (%) you are about your responses .....

Section 2: Indicate to what degree it would be helpful to feel the following emotions when working on a joint project with a colleague.

24. Respect

Not at all Useful	Not useful	Neutral	Useful	Very useful
----------------------	---------------	---------	--------	----------------

25. Shyness

Not at all Useful	Not useful	Neutral	Useful	Very useful
----------------------	---------------	---------	--------	----------------

26. Openness

Not at all Useful	Not useful	Neutral	Useful	Very useful
----------------------	---------------	---------	--------	----------------

6. Indicate how confident (%) you are about your responses .....

Section 3: Indicate to what degree it might be helpful to feel the following emotions when attempting to win a debate.

27.Optimism

Not at all Useful	Not useful	Neutral	Useful	Very useful
----------------------	---------------	---------	--------	----------------

28.Isolation

Not at all Useful	Not useful	Neutral	Useful	Very useful
----------------------	---------------	---------	--------	----------------

29.Courage

Not at all Useful	Not useful	Neutral	Useful	Very useful
----------------------	---------------	---------	--------	----------------

7.Indicate how confident (%) you are about your responses .....

Section 4: Indicate to what extent it might be useful to feel the following emotions when attempting to resolve a conflict between two people.

30.Calm

Not at all Useful	Not useful	Neutral	Useful	Very useful
----------------------	---------------	---------	--------	----------------

31.Guilt

Not at all Useful	Not useful	Neutral	Useful	Very useful
----------------------	---------------	---------	--------	----------------

32.Empathy

Not at all Useful	Not useful	Neutral	Useful	Very useful
----------------------	---------------	---------	--------	----------------

8.Indicate how confident (%) you are about your responses .....

Section 5: Indicate to what degree each of the following emotions would be helpful to feel when striving for a goal.

33.Determination

Not at all Useful	Not useful	Neutral	Useful	Very useful
----------------------	---------------	---------	--------	----------------

34.Confusion

Not at all Useful	Not useful	Neutral	Useful	Very useful
----------------------	---------------	---------	--------	----------------

35.Annoyance

Not at all Useful	Not useful	Neutral	Useful	Very useful
----------------------	---------------	---------	--------	----------------

9.Indicate how confident (%) you are about your responses .....

Section 6: Indicate to what extent it might be useful to feel the following emotions when attempting to cope with a crises.

36.Sadness

Not at all Useful	Not useful	Neutral	Useful	Very useful
----------------------	---------------	---------	--------	----------------

37.Calm

Not at all Useful	Not useful	Neutral	Useful	Very useful
----------------------	---------------	---------	--------	----------------

38.Uncertainty

Not at all Useful	Not useful	Neutral	Useful	Very useful
----------------------	---------------	---------	--------	----------------

10.Indicate how confident (%) you are about your responses .....



The following 12 questions relate to an understanding of how emotions may change. Please select the best alternative for the following questions.

39. Daniel was annoyed when a colleague used his computer without asking, so he spoke to him about it. When the colleague did it again, Daniel felt ...

Guilty    Angry    Disappointed    Worried    Regret

40. Naomi was told by her employer that she would be required to fly interstate to attend a conference. She became anxious as she had a fear of flying, but a little while later she heard the conference had been cancelled, and she felt ...

Resentful    Anxious    Relieved    Helpless    Foolish

41. Life at home had been going well for Madeleine and she was feeling happy. As she reflected on her good fortune she felt ...

Surprised    Cautious    Suspicious    Content    Isolated

42. Robert was excited because he had applied for a new job and successfully passed through 4 stages of the selection process. Then when he missed out on the job he felt ...

Disappointed    Worried    Lonely    Calm    Guilty

43. Lorraine was saddened when she saw first hand how children were living in squalid conditions in a third world country. Then when she discovered that donations were being mismanaged she felt ...

Helpless    Accepting    Worried    Angry    Confused

11. Indicate how confident (%) you are about your responses .....

44. Kenji was waiting contentedly at a cafe for a friend, then the friend arrived with some much awaited good news, and Kenji felt ...

Uneasy    Pessimistic    Elated    Amused    Annoyed

45. Anna felt distressed when she accidentally ran over the family pet. Then when the pet recovered she felt ...

Embarrassed    Accepting    Guilty    Distressed    Relieved

46. Diane felt angry towards her co-worker because the co-worker was processing fewer invoices than the rest of the employees. Then Diane noticed the supervisor was giving the co-worker extra work to do, and she felt ...

Depressed   Guilty   Nervous   Pleased   Jealous

47. Heather felt surprised and embarrassed when her boss approached her and began criticizing her work in front of her colleagues. Heather tried to explain what had happened but her boss wouldn't listen, and she felt ...

Afraid   Depressed   Shocked   Angry   Calm

48. Fiona was on holidays overseas enjoying herself, and feeling calm and content. Just as she was due to leave she heard that all flights going back home had been cancelled indefinitely. As Fiona had no money left she felt ...

Worried   Lonely   Expectant   Pessimistic   Resigned

12. Indicate how confident (%) you are about your responses .....

The 12 questions that are next relate to an understanding of how emotions may combine. Please select the best alternative for the following questions.

49. The feeling of jealousy is a combination of which TWO emotions?

- Envy and anger
- Disappointment and surprise
- Surprise and anger
- Envy and surprise
- Humiliation and disappointment

50. The feeling of smugness is a combination of which two emotions?

- Jealousy and unease
- Contempt and disappointment
- Contempt and anticipation
- Self-consciousness and anticipation
- Contempt and pride

51. A feeling of love combines which two emotions?

- Admiration and optimism
- Liking and curiosity
- Joy and acceptance
- Acceptance and curiosity
- Liking and optimism

52. Feelings of bitterness are a combination of which two emotions?

- Disappointment and surprise
- Anger and sadness
- Regret and anxiety
- Anger and unease
- Surprise and sadness

53. The feeling of contempt is a combination of which two emotions?

- Laziness and disgust
- Disgust and anger
- Surprise and annoyance
- Disappointment and guilt
- Disgust and unease

13. Indicate how confident (%) you are about your responses .....

54. The feeling of concern is a combination of which THREE emotions?

- Calmness, anticipation, optimism
- Care, anxiety, anticipation
- Worry, curiosity, pride
- Care, acceptance, pride
- Interest, acceptance, contentment

55. The feeling of anxiety combines which three emotions?

- Regret, confusion, bitterness
- Annoyance, bitterness, disgust
- Guilt, annoyance, disgust
- Fear, loneliness, disgust
- Fear, guilt, shyness

56. Feelings of calm are a combination of which three emotions?

- Liking, respect, optimism
- Serenity, optimism, surprise
- Security, serenity, relaxation
- Respect, anticipation, relaxation
- Care, contentment, anticipation

57. A feeling of hostility is a combination of which three emotions?

- Anger, disgust, contempt
- Loneliness, disappointment, surprise
- Confusion, annoyance, anxiety
- Contempt, worry, unease
- Disgust, anticipation, anxiety

58. A feeling of humiliation is a combination of which three emotions?

- Surprise, shame, embarrassment
- Surprise, sadness, contempt
- Regret, confusion, envy
- Disappointment, anxiety, envy
- Surprise, shyness, contempt

14. Indicate how confident (%) you are about your responses .....

The following 16 questions relate to the management of one's own emotions. Please read each story and indicate how effective each of the three (3) actions would be.

Story 1: Doug works at the local children's hospital. He knows that a positive environment can help the children cope with illness and accidents better, so Doug aims to be in a happy mood when he is working. One morning before work he received some bad news and now he feels let down. How effective would each of the following actions be to help Doug increase his level of happiness.

59. Doug went for a jog around the block

Very Ineffective	Ineffective	Neutral	Effective	Very Effective
---------------------	-------------	---------	-----------	-------------------

60.He shared several funny jokes with friends at work

Very Ineffective      Ineffective      Neutral      Effective      Very Effective

61.Doug recalled how worthwhile it felt when he could see that the children were positively affected by a happy environment

Very Ineffective      Ineffective      Neutral      Effective      Very Effective

15.Indicate how confident (%) you are about your responses .....

Story 2: David and Rebecca recently moved into their new home. David is feeling content and wants to maintain that feeling. How effective would each of the following three (3) actions be in helping David maintain is sense of contentment.

62.David listened to some of his favourite music

Very Ineffective      Ineffective      Neutral      Effective      Very Effective

63.David reflected on all the positive things in his life

Very Ineffective      Ineffective      Neutral      Effective      Very Effective

64.He thought about all the things around the house he still wanted

Very Ineffective      Ineffective      Neutral      Effective      Very Effective

16.Indicate how confident (%) you are about your responses .....

Story 3: While at work, Akiko received a phone call from her husband telling her they had just won \$25,000. She was excited. Then Akiko remembered she had a client coming into her office shortly, and it was her job to tell them that their home loan application had been declined, so she wanted to tone down her excitement. If Akiko adopted any of the following three (3) actions to reduce her excitement how effective would each of them be.

65. Akiko stopped herself from thinking about the \$25,000

Very Ineffective	Ineffective	Neutral	Effective	Very Effective
---------------------	-------------	---------	-----------	-------------------

66. She thought about how they could spend the \$25,000

Very Ineffective	Ineffective	Neutral	Effective	Very Effective
---------------------	-------------	---------	-----------	-------------------

67. Akiko focussed all her attention on what she would say to the client

Very Ineffective	Ineffective	Neutral	Effective	Very Effective
---------------------	-------------	---------	-----------	-------------------

17. Indicate how confident (%) you are about your responses .....

Story 4: Brenda has a full-time job and studies part-time. Her exams are only a few days away and Brenda is worried that she won't have enough time to prepare properly for them. Brenda also knows that worrying about the exams can have a negative impact on her performance so she wants to reduce her worrying. How effective would each of the following three (3) actions be in reducing Brenda's anxiety.

68. Brenda worked out how much time she had available and focused her attention on remembering the most important information

Very Ineffective	Ineffective	Neutral	Effective	Very Effective
---------------------	-------------	---------	-----------	-------------------

69. She tried to remember all of her lecture notes

Very Ineffective	Ineffective	Neutral	Effective	Very Effective
---------------------	-------------	---------	-----------	-------------------

70. She tried unsuccessfully to stop thinking about the exams

Very Ineffective	Ineffective	Neutral	Effective	Very Effective
---------------------	-------------	---------	-----------	-------------------

18. Indicate how confident (%) you are about your responses .....

In contrast to the previous group of questions, the 16 items below are designed to assess your ability to manage other people's emotions (such as being able to calm someone down when they are anxious). Please read each story and indicate how effective each of the three (3) actions would be.

Story 1: As Mark and Leonie were about to present a training seminar, Mark received some bad news, and was feeling let down. Leonie felt it was important that the presentation be delivered with enthusiasm so she tried to lift Mark's spirits. If Leonie adopted any of the following three (3) actions to increase Mark's enthusiasm how effective would each of them be.

71. Leonie reminded Mark of how much he had helped people through the training seminars

Very Ineffective      Ineffective      Neutral      Effective      Very Effective

72. Leonie insisted she present the training seminar

Very Ineffective      Ineffective      Neutral      Effective      Very Effective

73. Leonie kept on reminding Mark that it was important the training session be a success

Very Ineffective      Ineffective      Neutral      Effective      Very Effective

19. Indicate how confident (%) you are about your responses .....

Story 2: Lyle has employed Steve for the past 5 years, and has recently noticed that Steve has become angry and difficult to work with, so Lyle attempts to reduce Steve's anger. How effective would Lyle be in reducing Steve's anger if he adopted each of the following three (3) actions.

74. Lyle invited Steve to join him for lunch, and successfully got Steve talking about what was bothering him

Very Ineffective      Ineffective      Neutral      Effective      Very Effective

75.Lyle commented to Steve that he seemed to be angry, and said he was always available if Steve wanted to talk about it

Very Ineffective      Ineffective      Neutral      Effective      Very Effective

76.Lyle ignored Steve's anger as it seemed to be getting worse

Very Ineffective      Ineffective      Neutral      Effective      Very Effective

20.Indicate how confident (%) you are about your responses .....

Story 3: Andrew and Kylie have been married for 10 years, and although they used to be close, in recent times Andrew has become critical of Kylie. Kylie believes that if Andrew were happier he would be less critical of her, so she decides to try and increase his level of happiness. If Kylie adopted any of the following three (3) actions how effective would each of them be in increasing Andrew's level of happiness.

77.Kylie told Andrew that he needed to stop feeling sorry for himself

Very Ineffective      Ineffective      Neutral      Effective      Very Effective

78.Kylie started inviting old friends over to have a meal and play Andrew's favourite game of billiards like they used to

Very Ineffective      Ineffective      Neutral      Effective      Very Effective

79.Kylie began praising and encouraging Andrew when a genuine opportunity arose

Very Ineffective      Ineffective      Neutral      Effective      Very Effective

21.Indicate how confident (%) you are about your responses .....



Story 4: Peter enjoys playing football and usually plays well. He attempted to get a place on his school team but didn't play very well in the try outs, so he wasn't selected and was really disappointed. When he came home from school his mother noticed his disappointment and wanted to help. How effective would the Mother be in reducing Peter's disappointment by adopting each of the following three (3) actions.

80. She suggested that one bad day of play didn't mean he couldn't play football somewhere else, and then encouraged Peter to try out for another team

Very Ineffective      Ineffective      Neutral      Effective      Very Effective

81. She told him he was better off in the long run putting his efforts into his school work

Very Ineffective      Ineffective      Neutral      Effective      Very Effective

82. Even though the teams had been finalised, she contacted the football coach and argued about the selection process

Very Ineffective      Ineffective      Neutral      Effective      Very Effective

22. Indicate how confident (%) you are about your responses .....

**Appendix 4.4: Swaps Test**

The next 32 questions assess reasoning ability, at increasing levels of complexity. The test consists of a set of three letters - A, B, and C - presented in random order, and your task is to mentally interchange or "swap" the position of two or more letters as instructed. Please indicate your answer by selecting one of the six possible answers.

1. The set of letters is C B A. Your task is to "Swap letter 1 and letter 2"

A C B  
C A B  
B A C  
C B A  
A B C  
B C A

2. The set of letters is B C A. Your task is to "Swap letter 1 and letter 2"

A C B  
C A B  
B A C  
C B A  
A B C  
B C A

3. The set of letters is C A B. Your task is to "Swap letter 1 and letter 3"

A C B  
C A B  
B A C  
C B A  
A B C  
B C A

4. The set of letters is B A C. Your task is to "Swap letter 2 and letter 3"

A C B  
C A B  
B A C  
C B A  
A B C  
B C A

5.The set of letters is A C B. Your task is to "Swap letter 1 and letter 3"

A C B  
C A B  
B A C  
C B A  
A B C  
B C A

6.The set of letters is B A C. Your task is to "Swap letter 1 and letter 2"

A C B  
C A B  
B A C  
C B A  
A B C  
B C A

7.The set of letters is A B C. Your task is to "Swap letter 1 and letter 3"

A C B  
C A B  
B A C  
C B A  
A B C  
B C A

8.The set of letters is C B A. Your task is to "Swap letter 2 and letter 3"

A C B  
C A B  
B A C  
C B A  
A B C  
B C A

9. The set of letters is B C A. Your task is to "Swap letter 2 and letter 3" then "Swap letter 1 and letter 3"

A C B  
C A B  
B A C  
C B A  
A B C  
B C A

10. The set of letters is A C B. Your task is to "Swap letter 1 and letter 3" then "Swap letter 2 and letter 3"

A C B  
C A B  
B A C  
C B A  
A B C  
B C A

11. The set of letters is C A B. Your task is to "Swap letter 1 and letter 2" then "Swap letter 2 and letter 3"

A C B  
C A B  
B A C  
C B A  
A B C  
B C A

12. The set of letters is A B C. Your task is to "Swap letter 2 and letter 3" then "Swap letter 1 and letter 3"

A C B  
C A B  
B A C  
C B A  
A B C  
B C A

13. The set of letters is B A C. Your task is to "Swap letter 2 and letter 3" then "Swap letter 1 and letter 2"

A C B  
C A B  
B A C  
C B A  
A B C  
B C A

14. The set of letters is C B A. Your task is to "Swap letter 2 and letter 3" then "Swap letter 1 and letter 2"

A C B  
C A B  
B A C  
C B A  
A B C  
B C A

15. The set of letters is A C B. Your task is to "Swap letter 2 and letter 3" then "Swap letter 1 and letter 2"

A C B  
C A B  
B A C  
C B A  
A B C  
B C A

16. The set of letters is C A B. Your task is to "Swap letter 1 and letter 3" then "Swap letter 1 and letter 2"

A C B  
C A B  
B A C  
C B A  
A B C  
B C A

17. The set of letters is B A C. Your task is to "Swap letter 2 and letter 3" then "Swap letter 1 and letter 3" then "Swap letter 1 and letter 2"

A C B  
C A B  
B A C  
C B A  
A B C  
B C A

18. The set of letters is A B C. Your task is to "Swap letter 2 and letter 3" then "Swap letter 1 and letter 2" then "Swap letter 1 and letter 3"

A C B  
C A B  
B A C  
C B A  
A B C  
B C A

19. The set of letters is C A B. Your task is to "Swap letter 1 and letter 3" then "Swap letter 1 and letter 2" then "Swap letter 1 and letter 3"

A C B  
C A B  
B A C  
C B A  
A B C  
B C A

20. The set of letters is A C B. Your task is to "Swap letter 1 and letter 2" then "Swap letter 2 and letter 3" then "Swap letter 1 and letter 3"

A C B  
C A B  
B A C  
C B A  
A B C  
B C A

21. The set of letters is C B A. Your task is to "Swap letter 1 and letter 3" then "Swap letter 2 and letter 3" then "Swap letter 1 and letter 2"

A C B  
C A B  
B A C  
C B A  
A B C  
B C A

22. The set of letters is B C A. Your task is to "Swap letter 2 and letter 3" then "Swap letter 1 and letter 3" then "Swap letter 1 and letter 2"

A C B  
C A B  
B A C  
C B A  
A B C  
B C A

23. The set of letters is A C B. Your task is to "Swap letter 1 and letter 3" then "Swap letter 1 and letter 2" then "Swap letter 1 and letter 3"

A C B  
C A B  
B A C  
C B A  
A B C  
B C A

24. The set of letters is C B A. Your task is to "Swap letter 1 and letter 3" then "Swap letter 1 and letter 2" then "Swap letter 1 and letter 3"

A C B  
C A B  
B A C  
C B A  
A B C  
B C A

25. The set of letters is A B C. Your task is to "Swap letter 2 and letter 3" then "Swap letter 1 and letter 3" then "Swap letter 1 and letter 2" then "Swap letter 1 and letter 3"

A C B  
C A B  
B A C  
C B A  
A B C  
B C A

26. The set of letters is B A C. Your task is to "Swap letter 1 and letter 3" then "Swap letter 2 and letter 3" then "Swap letter 1 and letter 2" then "Swap letter 2 and letter 3"

A C B  
C A B  
B A C  
C B A  
A B C  
B C A

27. The set of letters is B C A. Your task is to "Swap letter 2 and letter 3" then "Swap letter 1 and letter 2" then "Swap letter 2 and letter 3" then "Swap letter 1 and letter 2"

A C B  
C A B  
B A C  
C B A  
A B C  
B C A

28. The set of letters is C A B. Your task is to "Swap letter 1 and letter 2" then "Swap letter 1 and letter 3" then "Swap letter 1 and letter 2" then "Swap letter 1 and letter 3"

A C B  
C A B  
B A C  
C B A  
A B C  
B C A



29. The set of letters is A C B. Your task is to "Swap letter 1 and letter 3" then "Swap letter 1 and letter 2" then "Swap letter 2 and letter 3" then "Swap letter 1 and letter 3"

A C B  
C A B  
B A C  
C B A  
A B C  
B C A

30. The set of letters is C B A. Your task is to "Swap letter 2 and letter 3" then "Swap letter 1 and letter 3" then "Swap letter 1 and letter 2" then "Swap letter 2 and letter 3"

A C B  
C A B  
B A C  
C B A  
A B C  
B C A

31. The set of letters is B A C. Your task is to "Swap letter 1 and letter 2" then "Swap letter 2 and letter 3" then "Swap letter 1 and letter 3" then "Swap letter 1 and letter 2"

A C B  
C A B  
B A C  
C B A  
A B C  
B C A

32. The set of letters is C B A. Your task is to "Swap letter 1 and letter 2" then "Swap letter 2 and letter 3" then "Swap letter 1 and letter 3" then "Swap letter 1 and letter 2"

A C B  
C A B  
B A C  
C B A  
A B C  
B C A

**Appendix 4.5: General Knowledge Task**

The following questionnaire is a measure of general knowledge. For each statement choose your response by selecting the most appropriate "button".

1. How many hours are there in a day?

- 8
- 24
- 12
- 60

2. What does the stomach do?

- Breathes
- Eats
- Digests food
- Swallows

3. Who was Captain Cook?

- A prime minister
- An explorer
- An inventor
- A cook

4. Name three oceans?

- Lake Eyre, The Murray, Gulf of Carpentaria
- River, Lake, Sea
- Indian, Pacific, Atlantic
- Stream, Pond, Creek

5. Which month has one extra day every four years?

- February
- January
- May
- December

6. In what direction does the sun set?

North  
East  
South  
West

7. How is oxygen returned to the air?

By breathing  
By plants  
By the wind  
By clouds

8. On what continent is China?

Asia  
South Africa  
South America  
Europe

9. What is water made of?

Minerals and chemicals  
Rain  
Helium and oxygen  
Hydrogen and oxygen

10. Who invented the electric light bulb?

Albert Einstein  
Thomas Edison  
Benjamin Franklin  
Thomas Jefferson

11. What country has the largest population?

India  
Russia  
North America  
China

12. Who was Anne Frank?

- A singer
- A pilot
- A girl who wrote a diary
- A teacher of the deaf and blind

13. What are hieroglyphics?

- Ancient Greek letters
- Roman numerals
- Egyptian picture writings
- Cave drawings

14. What is the main material used to make glass?

- Sand
- Plastic
- Hydrogen
- Fibreglass

15. What is the capital of Greece?

- Rome
- Athens
- Crete
- Cairo

16. What causes iron to rust?

- Acid
- Salt
- Oxygen
- Minerals

17. What is a barometer?

- It measures air pressure
- It measures wind speed
- It measures rainfall
- It measures earthquakes

18. Who was Charles Darwin?

- He was a poet
- He developed the theory of evolution
- He was a character in a Dickens novel
- He discovered the structure of DNA

19. How far is it from London to Sydney (approximately)?

- 500 kilometres
- 7,000 kilometres
- 17,000 kilometres
- 40,000 kilometres

20. What does turpentine come from?

- Ethyl alcohol
- Varnish
- Acid
- Pine trees

21. Who wrote Hamlet?

- William Tell
- Mark Twain
- Ernest Hemingway
- William Shakespeare

22. Who was Prime Minister of England during the Second World War?

- Winston Churchill
- Stanley Baldwin
- Margaret Thatcher
- Clement Adlee

23. Whose name is usually associated with the theory of relativity?

- Planck
- Newton
- Watson
- Einstein

24. In what country did the Olympic Games originate?

Egypt  
Greece  
Rome  
Italy

25. On what continent is the Sahara Desert?

Africa  
Europe  
Arabia  
Asia

26. Who painted the Sistine Chapel?

Botticelli  
da Vinci  
Raphael  
Michelangelo

27. Who was Mahatma Gandhi?

An Indian prince  
A cricket player  
An Indian independence leader  
A Buddhist monk

28. Name three kinds of blood vessels in the human body?

Pulmonary, capillary, and aorta  
Artery, vein, and capillary  
Artery, aorta, and vein  
Capillary, jugular, and vein

29. Who was Catherine the Great?

A Roman Empress  
A French Queen  
A Russian Empress  
An Egyptian Queen

30. What was Marie Curie famous for?

- She was a physician
- She was a missionary
- She was a medical doctor
- She was a biologist

31. What is the world population (approximately)?

- 4 billion
- 8 billion
- 6 billion
- 10 billion

32. Vision problems are most often caused by a deficiency in?

- Vitamin A
- Vitamin B
- Vitamin C
- Vitamin D

33. What is the speed of light (approximately)?

- 300,000 km/sec
- 258,000 km/sec
- 362,000 km/sec
- 524,000 km/sec

34. Who wrote Faust?

- Mann
- Hesse
- Nietzsche
- Goethe

35. Which is the closest planet to our Sun?

- Mars
- Mercury
- Earth
- Venus

36. What does the musical term 'piano' mean?

- To be played evenly
- To be played fast
- To be played softly
- To be played smoothly

37. How far above sea level is Mount Everest?

- 7,448 metres
- 7,984 metres
- 9,298 metres
- 8,848 metres

38. What is the capital city of Sri Lanka?

- Sinhal
- Colombo
- Tamil
- Matale

39. From what language does the word 'Ombudsman' originate?

- French
- Swedish
- German
- Dutch

40. Who was the Greek muse of history?

- Urania
- Thalia
- Polymnia
- Clio



### Appendix 4.6: The Quickscales

This questionnaire is a measure of personality and contains 30 statements. For each statement choose the response that is closest to your usual feelings or behaviour by selecting the most appropriate "button" beneath each question

1. How lively, outgoing, and extraverted are you?

Not at all	Slightly	Less than most	Moderately	More than most	Very much so	Extremely
---------------	----------	-------------------	------------	-------------------	-----------------	-----------

2. Do you get anxious, worried, or frightened?

Not at all	Slightly	Less than most	Moderately	More than most	Very much so	Extremely
---------------	----------	-------------------	------------	-------------------	-----------------	-----------

3. Do you easily accept new ideas, different values, or views of what is aesthetically pleasing?

Not at all	Slightly	Less than most	Moderately	More than most	Very much so	Extremely
---------------	----------	-------------------	------------	-------------------	-----------------	-----------

4. How often do you make sure you know what to expect, what will need to be done, and how to be sure you get something right?

Not at all	Slightly	Less than most	Moderately	More than most	Very much so	Extremely
---------------	----------	-------------------	------------	-------------------	-----------------	-----------

5. Do you think most people are honest, well-meaning, and can be trusted?

Not at all	Slightly	Less than most	Moderately	More than most	Very much so	Extremely
---------------	----------	-------------------	------------	-------------------	-----------------	-----------

6. How much do you prefer meeting people rather than reading, studying, or being at home?

Not at all	Slightly	Less than most	Moderately	More than most	Very much so	Extremely
---------------	----------	-------------------	------------	-------------------	-----------------	-----------

7. Do you often feel moody, low spirited, and negative about yourself?

Not at all	Slightly	Less than most	Moderately	More than most	Very much so	Extremely
---------------	----------	-------------------	------------	-------------------	-----------------	-----------

8. How imaginative, intellectually enquiring, and interested to try new things are you?

Not at all	Slightly	Less than most	Moderately	More than most	Very much so	Extremely
---------------	----------	-------------------	------------	-------------------	-----------------	-----------

9. How often are you organised, well-prepared, and ready for most situations?

Not at all	Slightly	Less than most	Moderately	More than most	Very much so	Extremely
---------------	----------	-------------------	------------	-------------------	-----------------	-----------

10. How often are you careful not to be too direct, or blunt, in case the truth hurts someone?

Not at all	Slightly	Less than most	Moderately	More than most	Very much so	Extremely
---------------	----------	-------------------	------------	-------------------	-----------------	-----------

11. How sociable, friendly, and relaxed are you with other people?

Not at all	Slightly	Less than most	Moderately	More than most	Very much so	Extremely
---------------	----------	-------------------	------------	-------------------	-----------------	-----------

12. Do you feel lonely, unhappy, or a bit left out of activities you would like to be part of?

Not at all	Slightly	Less than most	Moderately	More than most	Very much so	Extremely
---------------	----------	-------------------	------------	-------------------	-----------------	-----------

13. How open-minded, flexible in your attitudes, and interested in other cultures are you?

Not at all	Slightly	Less than most	Moderately	More than most	Very much so	Extremely
---------------	----------	-------------------	------------	-------------------	-----------------	-----------

14. How often are you conscientious, careful, and trustworthy?

Not at all	Slightly	Less than most	Moderately	More than most	Very much so	Extremely
---------------	----------	-------------------	------------	-------------------	-----------------	-----------

15. How often do you consider other people's wishes, feelings, or their need for help?

Not at all	Slightly	Less than most	Moderately	More than most	Very much so	Extremely
---------------	----------	-------------------	------------	-------------------	-----------------	-----------

16. How active, quick and responsive are you?

Not at all	Slightly	Less than most	Moderately	More than most	Very much so	Extremely
---------------	----------	-------------------	------------	-------------------	-----------------	-----------

17. Are you an easily-affected, sensitive person whose feelings are easily hurt?

Not at all	Slightly	Less than most	Moderately	More than most	Very much so	Extremely
---------------	----------	-------------------	------------	-------------------	-----------------	-----------

18. How easily moved, and affected by, or sensitive to beautiful things are you?

Not at all	Slightly	Less than most	Moderately	More than most	Very much so	Extremely
---------------	----------	-------------------	------------	-------------------	-----------------	-----------

19. How often do you feel motivated, looking to achieve some goal, or working to high standards?

Not at all	Slightly	Less than most	Moderately	More than most	Very much so	Extremely
---------------	----------	-------------------	------------	-------------------	-----------------	-----------

20. How difficult do you find it is to be a little bit deceitful to manipulate things for your own ends

Not at all	Slightly	Less than most	Moderately	More than most	Very much so	Extremely
---------------	----------	-------------------	------------	-------------------	-----------------	-----------

21. How easily can you tell jokes, or give your opinion, when you are the centre of attention?

Not at all	Slightly	Less than most	Moderately	More than most	Very much so	Extremely
---------------	----------	-------------------	------------	-------------------	-----------------	-----------

22. Do other people make you flustered, take you for granted, or try to push you around?

Not at all	Slightly	Less than most	Moderately	More than most	Very much so	Extremely
---------------	----------	-------------------	------------	-------------------	-----------------	-----------

23. How often do you want to go to new places, join new groups, or try novel forms of recreation?

Not at all	Slightly	Less than most	Moderately	More than most	Very much so	Extremely
---------------	----------	-------------------	------------	-------------------	-----------------	-----------

24. How often do you put things in order of importance, and pace your efforts, in order to finish what you start?

Not at all	Slightly	Less than most	Moderately	More than most	Very much so	Extremely
---------------	----------	-------------------	------------	-------------------	-----------------	-----------

25. Are you mostly modest, and somewhat retiring, rather than telling others of your successes?

Not at all	Slightly	Less than most	Moderately	More than most	Very much so	Extremely
---------------	----------	-------------------	------------	-------------------	-----------------	-----------

26. How much do you like being at large, noisy parties with lots of people you've never met?

Not at all	Slightly	Less than most	Moderately	More than most	Very much so	Extremely
---------------	----------	-------------------	------------	-------------------	-----------------	-----------

27. Do you have difficulty deciding, reacting to, or coping with, unexpected turns of events that demand an immediate response?

Not at all	Slightly	Less than most	Moderately	More than most	Very much so	Extremely
---------------	----------	-------------------	------------	-------------------	-----------------	-----------

28. How often do you imagine having new experiences, or things you would like to happen, or events involving you that probably will not turn out like that?

Not at all	Slightly	Less than most	Moderately	More than most	Very much so	Extremely
---------------	----------	-------------------	------------	-------------------	-----------------	-----------

29. Do you plan ahead, consider all the possibilities, and think what the best outcome would be?

Not at all	Slightly	Less than most	Moderately	More than most	Very much so	Extremely
---------------	----------	-------------------	------------	-------------------	-----------------	-----------

30. How often do you feel sorry for, and are willing to help someone who is poor, very old, or disabled?

Not at all	Slightly	Less than most	Moderately	More than most	Very much so	Extremely
---------------	----------	-------------------	------------	-------------------	-----------------	-----------

### Appendix 4.7: Depression, Anxiety and Stress Scale

The questionnaire that follows is a measure of stress and contains 14 statements. Using the scale below, indicate how much the statement applies to you. There are no right or wrong answers.

1. I often find it hard to wind down

Does not apply to me at all	Applies to me to some degree	Applies to me to a considerable degree	Applies to me very much
-----------------------------	------------------------------	--	-------------------------

2. I tend to over-react to situations

Does not apply to me at all	Applies to me to some degree	Applies to me to a considerable degree	Applies to me very much
-----------------------------	------------------------------	--	-------------------------

3. In general, I feel that I run on a lot of nervous energy

Does not apply to me at all	Applies to me to some degree	Applies to me to a considerable degree	Applies to me very much
-----------------------------	------------------------------	--	-------------------------

4. I often find myself getting agitated

Does not apply to me at all	Applies to me to some degree	Applies to me to a considerable degree	Applies to me very much
-----------------------------	------------------------------	--	-------------------------

5. I find it difficult to relax

Does not apply to me at all	Applies to me to some degree	Applies to me to a considerable degree	Applies to me very much
-----------------------------	------------------------------	--	-------------------------

6. I am intolerant of anything that keeps me from getting on with what I was doing

Does not apply to me at all	Applies to me to some degree	Applies to me to a considerable degree	Applies to me very much
-----------------------------	------------------------------	--	-------------------------

7. I feel that I am rather touchy

Does not apply to me at all	Applies to me to some degree	Applies to me to a considerable degree	Applies to me very much
-----------------------------	------------------------------	--	-------------------------

8.I find it hard to wind down

Does not apply to me at all	Applies to me to some degree	Applies to me to a considerable degree	Applies to me very much
--------------------------------	---------------------------------	---	----------------------------

9.I frequently find it hard to calm down after something has upset me

Does not apply to me at all	Applies to me to some degree	Applies to me to a considerable degree	Applies to me very much
--------------------------------	---------------------------------	---	----------------------------

10.I am often in a state of nervous tension

Does not apply to me at all	Applies to me to some degree	Applies to me to a considerable degree	Applies to me very much
--------------------------------	---------------------------------	---	----------------------------

11.I easily find myself getting agitated

Does not apply to me at all	Applies to me to some degree	Applies to me to a considerable degree	Applies to me very much
--------------------------------	---------------------------------	---	----------------------------

12.I find that I get irritable easily

Does not apply to me at all	Applies to me to some degree	Applies to me to a considerable degree	Applies to me very much
--------------------------------	---------------------------------	---	----------------------------

13.I am often intolerant of anything that keeps me from getting on with what I am doing

Does not apply to me at all	Applies to me to some degree	Applies to me to a considerable degree	Applies to me very much
--------------------------------	---------------------------------	---	----------------------------

14.I find it difficult to tolerate interruptions to what I am doing

Does not apply to me at all	Applies to me to some degree	Applies to me to a considerable degree	Applies to me very much
--------------------------------	---------------------------------	---	----------------------------

#### Appendix 4.8: The UCLA Loneliness Scale

The next questionnaire is a measure of how people sometimes feel and comprises 20 statements. For each question select the most appropriate "button" that indicates how often you feel the way described.

1. How often do you feel you are "in tune" with people around you?

Never      Rarely      Sometimes      Always

2. How often do you feel you lack companionship?

Never      Rarely      Sometimes      Always

3. How often do you feel there is no one you can turn to?

Never      Rarely      Sometimes      Always

4. How often do you feel alone?

Never      Rarely      Sometimes      Always

5. How often do you feel part of a group of friends?

Never      Rarely      Sometimes      Always

6. How often do you feel you have a lot in common with the people around you?

Never      Rarely      Sometimes      Always

7. How often do you feel you are no longer close to anyone?

Never      Rarely      Sometimes      Always

8. How often do you feel your interests and ideas are not shared by those around you?

Never      Rarely      Sometimes      Always

9. How often do you feel outgoing and friendly?

Never      Rarely      Sometimes      Always

10.How often do you feel close to people?

Never      Rarely      Sometimes      Always

11.How often do you feel left out?

Never      Rarely      Sometimes      Always

12.How often do you feel your relationships with others are not meaningful?

Never      Rarely      Sometimes      Always

13.How often do you feel no one really knows you well?

Never      Rarely      Sometimes      Always

14.How often do you feel isolated from others?

Never      Rarely      Sometimes      Always

15.How often do you feel you can find companionship when you want it?

Never      Rarely      Sometimes      Always

16.How often do you feel there are people who really understand you?

Never      Rarely      Sometimes      Always

17.How often do you feel shy?

Never      Rarely      Sometimes      Always

18.How often do you feel people are around you but not with you?

Never      Rarely      Sometimes      Always

19.How often do you feel there are people you can talk to?

Never      Rarely      Sometimes      Always

20.How often do you feel there are people you can turn to?

Never      Rarely      Sometimes      Always



### Appendix 4.9: General Index of Well-being

Below are 9 statements measuring your views on life. For each of the questions, select the most appropriate "button" that best reflects how you view your life.

1.I view my life as ...

Boring	1	2	3	4	5	6	7	Interesting
Enjoyable	1	2	3	4	5	6	7	Miserable
Useless	1	2	3	4	5	6	7	Worthwhile
Friendly	1	2	3	4	5	6	7	Lonely
Full	1	2	3	4	5	6	7	Empty
Discouraging	1	2	3	4	5	6	7	Hopeful
Disappointing	1	2	3	4	5	6	7	Rewarding
Brings out the best in me	1	2	3	4	5	6	7	Doesn't give me much chance

2.I am ...

Completely dissatisfied with my life as a whole	1	2	3	4	5	6	7	Completely satisfied my life as a whole
---	---	---	---	---	---	---	---	---

**Appendix 4.10: Marlow-Crowne Scale**

The next questionnaire contains 33 statements concerning personal attitudes and traits. Read each item and decide whether the statement is TRUE or FALSE as it relates to you personally

1. Before voting I thoroughly investigate the qualifications of all the candidates

True  
False

2. I never hesitate to go out of my way to help someone in trouble

True  
False

3. It is sometimes hard for me to go on with my work if I am not encouraged

True  
False

4. I have never intensely disliked someone

True  
False

5. On occasion I have had doubts about my ability to succeed in life

True  
False

6. I sometimes feel resentful when I don't get my way

True  
False

7. I am always careful about my manner of dress

True  
False

8. My table manners at home are as good as when I eat out in a restaurant

True  
False

9.If I could get into a movie without paying and be sure I was not seen I would probably do it

True  
False

10.On a few occasions, I have given up doing something because I thought too little of my ability

True  
False

11.I like to gossip at times

True  
False

12.There have been times when I felt like rebelling against people in authority even though I knew they were right

True  
False

13.No matter who I'm talking to, I'm always a good listener

True  
False

14.I can remember "playing sick" to get out of something

True  
False

15.There have been occasions when I took advantage of someone

True  
False

16.I'm always willing to admit it when I make a mistake

True  
False

17.I always try to practise what I preach

True  
False

18.I don't find it particularly difficult to get along with loud-mouthed, obnoxious people

True  
False

19.I sometimes try to get even rather than forgive and forget

True  
False

20.When I don't know something I don't at all mind admitting it

True  
False

21.I am always courteous, even to people who are disagreeable

True  
False

22.At times I have really insisted on having things my own way

True  
False

23.There have been occasions when I felt like smashing things

True  
False

24.I would never think of letting someone else be punished for my wrong-doing

True  
False

25. I never resent being asked to return a favour

- True
- False

26. I have never been irked when people expressed ideas very different from my own

- True
- False

27. I never make a long trip without checking the safety of my car

- True
- False

28. There have been times when I was quite jealous of the good fortune of others

- True
- False

29. I have almost never felt the urge to tell someone off

- True
- False

30. I am sometimes irritated by people who ask favours of me

- True
- False

31. I have never felt that I was punished without cause

- True
- False

32. I sometimes think when people have a misfortune they only get what they deserve

- True
- False

33. I have never deliberately said something that hurt someone's feelings

- True
- False

REFERENCES

- Anastasi, A., & Urbina, S. (1997). *Psychological Testing (7th ed.)*. Upper Saddle River, NJ: Prentice Hall. Press.
- Anderson, L. W. (1981). *Assessing Affective Characteristics in Schools*. Boston: Allyn and Bacon.
- Ashkanasy, N. M., & Daus, C.S. (2005). Rumors of the death of emotional intelligence in organizational behaviour are vastly exaggerated. *Journal of Organizational Behaviour, 26*, 441-452.
- Austin, E. J., Saklofske, D.H., & Egan, V. (2005). Personality, well-being and health correlates of trait emotional intelligence. *Personality and Individual Differences, 38*, 547-558.
- Bar-On, R. (1997). *Bar-On Emotional Quotient Inventory: Technical manual*. Toronto: Multi-Health Systems inc.
- Bar-On, R., Brown, J.M., Kirkcaldy, B.D., & Thome, E.P. (2000). Emotional expression and implications for occupational stress: An application of the Emotional Quotient Inventory (EQ-i). *Personality and Individual Differences, 28*, 1107-1118.
- Bastian, V. A., Burns, N.R., & Nettelbeck, T. (2005). Emotional intelligence predicts life skills, but not as well as personality and cognitive abilities. *Personality and Individual Differences, 39*, 1135-1145.
- Brackett, M. A., & Mayer, J.D. (2003). Convergent, discriminant, and incremental validity of competing measures of emotional intelligence. *Personality and Social Psychology Bulletin, 29*, 1147-1158.

- Brackett, M. A., Mayer, J.D., & Warner, R.M. (2004). Emotional Intelligence and its relation to everyday behaviour. *Personality and Individual Differences, 36*, 1387-1402.
- Brebner, J. (1998). *The Manual of the Quickscales - R*. Adelaide, South Australia: Psychology Department, Adelaide University.
- Brebner, J. (2001). Personality and stress coping. *Personality and Individual Differences, 31*, 317-327.
- Brody, N. (2005). What cognitive intelligence is and what emotional intelligence is not. *Psychological Inquiry, 15*, 234-238.
- Burns, N. (2004). General knowledge task. *Unpublished manuscript*.
- Campbell, A., Converse, P.E., & Rodgers, W.L. (1976). *The quality of American life: Perceptions, evaluation and satisfaction*. New York: Russell Sage.
- Cantor, N., & Kihlstrom, J. (1987). *Personality and social intelligence*. Englewood Cliffs, NJ: Prentice Hall.
- Carmeli, A. (2003). The relationship between emotional intelligence and work attitudes, behavior and outcomes. *Journal of Managerial Psychology, 18*, 788-813.
- Carroll, J. B. (1993). *Human cognitive abilities: A survey of factor-analytic studies*. New York: Cambridge University Press.
- Caruso, D., Mayer, J., & Salovey, P. (2002). Relation of an ability measure of emotional intelligence to personality. *Journal of Personality Assessment, 79*, 306-320.

- Cattell, R. B. (1982). *The inheritance of personality and ability: Research methods and findings*. New York: Academic Press.
- Cattell, R. B., & Johnson, R.C.(ed.). (1986). *Functional psychological testing. Principles and instruments*. New York: Brunner/Mazel, Inc.
- Chan, D. W. (2004). Perceived emotional intelligence and self-efficacy among Chinese secondary school teachers in Hong Kong. *Personality and Individual Differences, 36*, 1781-1795.
- Charbonneau, D., & Nicol, A.A.M. (2002). Emotional intelligence and leadership in adolescents. *Personality and Individual Differences, 33*, 1101-1113.
- Ciarrochi, J. V., Chan, A.Y.C., & Caputi, P. (2000). A critical evaluation of the emotional intelligence construct. *Personality and Individual Differences, 28*, 539-561.
- Ciarrochi, J., Chan, A. Y. C., & Bajgar, J. (2001). Measuring emotional intelligence in adolescents. *Personality and Individual Differences, 31*, 1105-1119.
- Ciarrochi, J., Deane, F.P., & Anderson, S. (2002). Emotional intelligence moderates the relationship between stress and mental health. *Personality and Individual Differences, 32*, 197-209.
- Coffey, E., Berenbaum, H., & Kerns, J.G. (2003). The dimensions of emotional intelligence, alexithymia, and mood awareness: Associations with personality and performance on an emotional stroop task. *Cognition and Emotion, 17*, 671-679.
- Conte, J. M. (2005). A review and critique of emotional intelligence measures. *Journal of Organizational Behaviour, 26*, 433-440.



- Cooper, R. K. (1996/1997). *EQ Map*. San Francisco: AIT and Essi Systems.
- Costa, P. T., Jr., & McCrae, R.R. (1992). *NEO PI-R Professional Manual*. Odessa, Florida: Psychological Assessment Resources, Inc.
- Crowne, D. P., & Marlow, D. (1960). A new scale of social desirability independent of psychopathology. *Journal of Consulting Psychology, 24*, 349-354.
- Day, A. L., & Carroll, S.A. (2004). Using an ability-based measure of emotional intelligence to predict individual performance, group performance, and group citizenship behaviours. *Personality and Individual Differences, 36*, 1443-1458.
- Donaldson-Feilder, E. J., & Bond, F.W. (2004). The relative importance of psychological acceptance and emotional intelligence to workplace well-being. *British Journal of Guidance and Counselling, 32*, 187-203.
- Dulewicz, S. V., & Higgs, M.J. (1999). *Emotional Intelligence Questionnaire Manual and Users' Guide*. Windsor: ASE/NFER-Nelson.
- Dulewicz, S. V., & Higgs, M.J. (2000). A review and evaluation study. *Journal of Managerial Psychology, 15*, 341-372.
- Ekman, P., & Friesen, W.V. (1975). *Unmasking the face - A guide to recognizing emotions from facial cues*. Palo Alto, CA: Consulting Psychologists Press.
- Eysenck, H. J. (1981). *A model for personality*. New York: Springer.
- Ford, M. E., & Tisak, M.S. (1983). A further search for social intelligence. *Journal of Educational Psychology, 75*, 196-206.
- Garb, H.N., & Schramke, C.J. (1996). Judgment research and neuropsychological assessment: A narrative review and meta-analyses. *Psychological Bulletin, 120*, 140-153.

- Gardner, H. (1983). *Frames of Mind*. New York: Basic Books.
- Gardner, H., Kornhaber, M.L., & Wake, W.K. (1996). *Intelligence: Multiple Perspectives*. Orlando, Florida: Harcourt Brace College Publishers.
- Geher, G., Warner, R.M. & Brown, A.S. (2001). Predictive validity of the Emotional Accuracy Research Scale. *Intelligence*, 29, 373-388.
- Goleman, D. (1995). *Emotional intelligence*. New York: Bantam Books.
- Goleman, D. (1998). *Working with emotional intelligence*. New York: Bantam Books.
- Greenspan, S. (1981). *Defining childhood social competence: A proposed working model*. In B.K. Keogh (Ed.), *Advances in special education, Vol. 3: A research annual*. (pp.1-39). Greenwich, CT: Jai Press.
- Groth-Marnat, G. (1997). *Handbook of psychological assessment*. USA: John Wiley & Sons, Inc.
- Guilford, J. P. (1956). The structure of intellect. *Psychological Bulletin*, 53, 267-293.
- Hemmati, T., Mills, J.F., & Kroner, D.G. (2004). The validity of the Bar-On emotional intelligence quotient in an offender population. *Personality and Individual Differences*, 37, 695-706.
- Horn, J. L., & Cattell, R.B. (1966). Refinement and test of the theory of fluid and crystallized ability intelligences. *Journal of Educational Psychology*, 57, 253-270.
- Horn, J.L., & Noll, J. (1997). *Human cognitive capabilities: Gf-Gc theory*. In Flanagan, D.P., Genshaft, J.L., & Harrison, P.L. (Eds.), *Contemporary intellectual assessment* (pp. 53-91). New York: Guilford Press.
- Izard, C. E. (1977). *Human emotions*. New York: Plenum Press.

- Jensen, A. R. (1998). *The g factor: The science of mental ability*. Westport, Conn: Praeger.
- Kobe, L. M., Reiter-Palmon, R., & Rickers, J.D. (2001). Self-reported leadership experiences in relation to inventoried social and emotional intelligence. *Current Psychology, 20*, 154-163.
- Landy, F. J. (2005). Some historical and scientific issues related to research on emotional intelligence. *Journal of Organizational Behaviour, 26*, 411-424.
- Legree, P. J. (1995). Evidence for an oblique social intelligence factor established with a Likert-based testing procedure. *Intelligence, 21*, 247-266.
- Lopes, P. N., Salovey, P., & Straus, R. (2003). Emotional intelligence, personality, and the perceived quality of social relationships. *Personality and Individual Differences, 35*, 641-658.
- Lovibond, P. F., & Lovibond, S.H. (1995). The structure of negative emotional states: Comparison of the Depression Anxiety Stress Scales (DASS) with the Beck Depression and Anxiety Inventories. *Behaviour Research and Therapy, 33*, 335-343.
- Malouff, J. M., & Schutte, N.S. (2001). Validation of an observer-rating measure of emotional intelligence. *Unpublished manuscript*.
- Mandell, B., & Pherwani, S. (2003). Relationship between emotional intelligence and transformational leadership style: A gender comparison. *Journal of Business and Psychology, 17*, 387-404.
- Matthews, G., Zeidner, M., & Roberts, R.D. (2002). *Emotional intelligence: Science and myth*. Boston, MA: The MIT.

- Mayer, J. D., & Geher, G. (1996). Emotional intelligence and the identification of emotion. *Intelligence, 22*, 89-113.
- Mayer, J. D., & Salovey, P. (1993). The intelligence of emotional intelligence. *Intelligence, 17*, 433-442.
- Mayer, J. D., & Salovey, P. (1997). *What is emotional intelligence?* In Salovey, P., & Sluyter, D.J. (Eds.), *Emotional Development and Emotional Intelligence: Educational Implications*. New York: Basic Books.
- Mayer, J. D., Caruso, D.R., & Salovey, P. (1999). Emotional intelligence meets traditional standards for an intelligence. *Intelligence, 27*, 267-298.
- Mayer, J. D., DiPaolo, M., & Salovey, P. (1990). Perceiving affective content in ambiguous visual stimuli: A component of emotional intelligence. *Journal of Personality Assessment, 54*, 772-781.
- Mayer, J. D., Salovey, P., & Caruso, D.R. (2000a). *Models of emotional intelligence*. In R.J. Sternberg (Ed.), *Handbook of Human Intelligence (2nd ed.)*. Cambridge, UK: Cambridge University Press.
- Mayer, J. D., Salovey, P., & Caruso, D.R. (2000b). *Emotional intelligence as zeitgeist, as personality, and as a mental ability*. In R. Bar-On & J. Parker (Eds.), *The handbook of emotional intelligence: Theory, development, assessment, and application at home, school, and in the workplace*. San Francisco: Jossey Blass.
- Mayer, J. D., Salovey, P., & Caruso, D.R. (2000c). *Test Manual for the MSCEIT Version 2.0*. Toronto, ON: Multi-Health Systems.
- Mayer, J. D., Salovey, P., & Caruso, D.R. (2004). Emotional Intelligence: Theory, findings, and implications. *Psychological Inquiry, 15*, 197-215.

- Mayer, J. D., Salovey, P., Caruso, D.R., & Sitarenios, G. (2003). Measuring emotional intelligence with the MSCEIT V2.0. *Emotion, 3*, 97-105.
- Mehrabian, A., & Epstein, N. (1972). A measure of emotional empathy. *Journal of Personality, 40*, 525-543.
- Neisser, U., Boodoo, G., Bouchard, T.J., Boykin, A.W., Brody, N., Ceci, S.J., Halpern, D.F., Loehlin, J.C., Perloff, R., Sternberg, R.J., & Urbina, S. (1996). Intelligence: Knowns and unknowns. *American Psychologist, 51*, 77-101.
- Newsome, S., Day, A.L., & Catano, V.M. (2000). Assessing the predictive validity of emotional intelligence. *Personality and Individual Differences, 29*, 1005-1016.
- Nikolaou, I., & Tsaousis, I. (2002). Emotional intelligence in the workplace: Exploring its effects on occupational stress and organizational commitment. *The International Journal of Organizational Analysis, 10*, 327-342.
- O'Connor Jr., R. M., & Little, I.S. (2003). Revisiting the predictive validity of emotional intelligence: Self-report versus ability-based measures. *Personality and Individual Differences, 35*, 1893-1902.
- Palmer, B. R., Gignac, G., Manocha, R., & Stough, C. (2005). A psychometric evaluation of the Mayer-Salovey-Caruso Emotional Intelligence Test Version 2.0. *Intelligence, 33*, 285-305.
- Palmer, B. R., Manocha, R., Gignac, G., & Stough, C. (2003). Examining the factor structure of the Bar-On Emotional Quotient Inventory with an Australian general population sample. *Personality and Individual Differences, 35*, 1191-1210.

- Palmer, B., Donaldson, C., & Stough, C. (2002). Emotional intelligence and life satisfaction. *Personality and Individual Differences, 33*, 1091-1100.
- Paulhus, D. L., Lysy, D.C., & Yik, M.S.M. (1998). Self-report measures of intelligence: Are they useful as proxy IQ tests? *Journal of Personality Psychology, 66*, 525-554.
- Pérez, J. C. (2003). How can emotional intelligence be measured? Poster presented at the 11th Biennial Meeting of the International Society for the Study of Individual Differences, Graz, Austria, 13-17 July, 2003.
- Pérez, J. C., Petrides, K.V., & Furnham, A. (2005). *Measuring trait emotional intelligence. In R. Schulze and R. D. Roberts (Eds.), International Handbook of Emotional Intelligence (pp.181-201)*. Cambridge, MA: Hogrefe & Huber.
- Petrides, K. V., & Furnham, A. (2000). On the dimensional structure of emotional intelligence. *Personality and Individual Differences, 29*, 313-320.
- Petrides, K. V., & Furnham, A. (2001). Trait emotional intelligence: Psychometric investigation with reference to established trait taxonomies. *European Journal of Personality, 15*, 425-448.
- Petrides, K. V., & Furnham, A. (2003). Trait emotional intelligence: Behavioural validation in two studies of emotion recognition and reactivity to mood induction. *European Journal of Personality, 17*, 39-57.
- Petrides, K. V., Frederickson, N., & Furnham, A. (2004). The role of trait emotional intelligence in academic performance and deviant behavior at school. *Personality and Individual Differences, 36*, 277-293.

- Plutchik, R. (1984). *Emotions: A general psychoevolutionary theory*. In K.R. Scherer and P. Ekman (Eds.), *Approaches to emotion* (pp. 197-219). Hillsdale, NJ: Erlbaum.
- Roberts, R. D., Zeidner, M., & Matthews, G. (2001). Does emotional intelligence meet traditional standards for an intelligence? Some new data and conclusions. *Emotion, 1*, 196-231.
- Russell, D. W., & Cutrona, C.E. (1988). Development and evolution of the UCLA Loneliness Scale. *Unpublished manuscript, Center for Health Services Research, College of Medicine, University of Iowa*.
- Saklofske, D. H., Austin, E.J., & Minski, P.S. (2003). Factor structure and validity of a trait emotional intelligence measure. *Personality and Individual Differences, 34*, 707-721.
- Salovey, P., & Mayer, J.D. (1990). Emotional intelligence. *Imagination, Cognition and Personality, 9*, 185-211.
- Salovey, P., Hsee, C.K., & Mayer, J.D. (1993). *Emotional intelligence and the self-regulation of affect*. In Wegner, D.M., & Pennebaker, J.W. (Eds.), *Handbook of Mental Control*. Engelwood Cliffs, New Jersey: Prentice-Hall, Inc.
- Salovey, P., Mayer, J.D., Goldman, S.L., Turvey, C., & Palfai, T.P. (1995). *Emotional attention, clarity and repair: Exploring emotional intelligence using the Trait Meta-Mood Scale*. In Pennebaker, J.W. (Ed.), *Emotion, disclosure and health*. Washington, DC: American Psychological Association.

- Salovey, P., Stroud, L.R., Woolery, A., & Epel, E.S. (2002). Perceived emotional intelligence, stress reactivity, and symptom reports: Further explorations using the Trait Meta-Mood Scale. *Psychology and Health, 17*, 611-627.
- Schaie, K. W. (1994). The course of adult intellectual development. *American Psychologist, 49*, 304-313.
- Schulte, M. J., Ree, M.J., & Carretta, T.R. (2004). Emotional intelligence: not much more than g and personality. *Personality and Individual Differences, 37*, 1059-1068.
- Schutte, N. S., Malouff, J.M., Hall, L.E., Haggerty, D.J., Cooper, J.T., Golden, C.J., & Dornheim, L. (1998). Development and validation of a measure of emotional intelligence. *Personality and Individual Differences, 25*, 167-177.
- Slaski, M., & Cartwright, S. (2002). Health, performance and emotional intelligence: An exploratory study of retail managers. *Stress and Health, 18*, 63-68.
- Slaski, M., & Cartwright, S. (2003). Emotional intelligence training and its implications for stress, health and performance. *Stress and Health, 19*, 233-239.
- Smith, G. M. (1999). *Local emotions, global moods, and film structure*. In Plantinga, C., & Smith, G.M. (Eds.), *Passionate Views: Film, cognition, and emotion*. Baltimore, Maryland: The John Hopkins University Press.
- Spearman, C. (1927). *The abilities of man*. New York: Macmillan.
- Spence, G., Oades, L. G., & Caputi, P. (2004). Trait emotional intelligence and goal self-integration: important predictors of emotional well-being? *Personality and Individual Differences, 37*, 449-461.



- Stankov, L. (1998). *Mining on the "no man's land" between intelligence and personality*. In Ackerman, P.L., Kyllonen, P.C., & Roberts, R.D. (Eds.), *Learning and individual differences: Process, trait, and content determinants*. Washington, USA: American Psychological Association.
- Stankov, L. (2000). Structural extensions of a hierarchical view on human cognitive abilities. *Learning and Individual Differences, 12*, 35-51.
- Stanley, J. C., & Hopkins, K.D. (1972). *Educational and psychological measurement and evaluation*. New Jersey: Prentice-Hall Inc.
- Sternberg, R. J. (1981). Intelligence and nonentrenchment. *Journal of Educational Psychology, 73*, 1-16.
- Sternberg, R. J. (1994). *In search of the human mind*. Orlando, USA: Harcourt Brace and Company.
- Tabachnick, B. G., & Fidell, L.S. (2001). *Using multivariate statistics (4th ed.)*. Needham Heights, MA: Allyn and Bacon.
- Thalbourne, M. A. (2000). Relation between transliminality and openness to experience. *Psychological Reports, 86*, 909-910.
- Thorndike, E. L. (1920). Intelligence and its uses. *Harper's Magazine, 140*, 227-235.
- Thurstone, L. L. (1938). *Primary mental abilities*. Chicago: University of Chicago Press.
- Tsaousis, I. (2003). Measuring emotional intelligence: Development and psychometric characteristics of the traits emotional intelligence questionnaire (TEIQ). *Submitted for publication*.

- Tsaousis, I., & Nikolaou, I. (2005). Exploring the relationship of emotional intelligence with physical and psychological health functioning. *Stress and Health, 21*, 77-86.
- Vaillant, G. E., & Davis, J.T. (2000). Social/emotional intelligence and midlife resilience in schoolboys with low tested intelligence. *American Journal of Orthopsychiatry, 70*, 215-222.
- Vakola, M., Tsaousis, I., & Nikolaou, I. (2004). The role of emotional intelligence and personality variables on attitudes toward organizational change. *Journal of Managerial Psychology, 19*, 88-110.
- Van Der Zee, K., & Wabeke, R. (2004). Is trait-emotional intelligence simply or more than just a trait? *European Journal of Personality, 18*, 243-263.
- Van Der Zee, K., Thijs, M., & Schakel, L. (2002). The relationship of emotional intelligence with academic intelligence and the big five. *European Journal of Personality, 16*, 103-125.
- Van Rooy, D. L., & Viswesvaran, C. (2004). Emotional intelligence: A meta-analytic investigation of predictive validity and nomological net *Journal of Vocational Behaviour, 65*, 71-95.
- Van Rooy, D. L., Alonso, A., & Viswesvaran, C. (2005). Group differences in emotional intelligence scores: theoretical and practical implications. *Personality and Individual Differences, 38*, 689-700.
- Walker, R. E., & Foley, J.M. (1973). Social intelligence: Its history and measurement. *Psychological Reports, 33*, 839-864.

- Warwick, J., & Nettelbeck, T. (2004). Emotional intelligence is...? *Personality and Individual Differences*, 37, 1091-1100.
- Wechsler, D. (1943). Non-intellective factors in general intelligence. *Journal of Abnormal and Social Psychology*, 38, 101-103.
- Weinberger, D. A., Schwartz, G.E., & Davidson, R.J. (1979). Low-anxious, high-anxious, and repressive coping styles: Psychometric patterns and behavioural and physiological responses to stress. *Journal of Abnormal Psychology*, 88, 369-380.
- Weisinger, H. (1998). *Emotional intelligence at work*. San Francisco, CA: Jossey-Bass Publishers.
- Wong, C., & Law, K.S. (2002). The effects of leader and follower emotional intelligence on performance and attitude: An exploratory study. *The Leadership Quarterly*, 13, 243-274.