

**EMOTIONAL INTELLIGENCE: NEW ABILITY OR RENOWNED
TRAITS? AN INVESTIGATION OF THE CONVERGENT,
DISCRIMINANT AND INCREMENTAL VALIDITY**

WAN NURUL IZZA WAN HUSIN, BHSc.

Thesis submitted to the University of Nottingham
for the degree of Doctor of Philosophy

NOVEMBER 2015

ABSTRACT

Despite the recent popularity of the concept of emotional intelligence, several researchers question current emotional intelligence tests on several grounds including their lack of construct validity and unstable factor structure. This thesis aims to investigate the construct validity of emotional intelligence. In particular, the present study seeks to (1) confirm the factorial validity of emotional intelligence, (2) examine the convergent validity between a performance-based test and self-report measure of emotional intelligence, (3) investigate the convergent validity between emotional intelligence and cognitive intelligence, (4) confirm the place of emotional intelligence in the “general cognitive intelligence” taxonomy, (5) measure the discriminant validity of emotional intelligence when correlated with personality traits, and finally, (6 and 7) assess the incremental validity of emotional intelligence, as measured by a performance-based test, over cognitive intelligence, personality traits, a self-report measure of emotional intelligence, and trait emotional intelligence in predicting [6] leadership practices and [7] positive interpersonal relationships. To achieve these aims, a conceptual framework is developed in line with the concept of ability-based emotional intelligence. As the present study is quantitative in nature, statistical tools such as Rasch measurement model, Structural Equation

Modelling and SPSS are employed to test the proposed hypotheses. Data were collected from 710 undergraduate students registered at a public Malaysian University. The findings revealed that: (1) the four-factor structure of ability-based emotional intelligence construct can be deemed construct valid, (2) there is no convergent validity between performance-based and self-report measure of emotional intelligence (3) there is no convergent validity between emotional intelligence and cognitive intelligence, (4) ability-based emotional intelligence has no place in the intelligence taxonomy, (5) there is a discriminant validity between emotional intelligence and personality, and finally, (6 and 7) emotional intelligence (performance-based measure) exhibits incremental validity in predicting [6] the leadership practices and [7] the positive interpersonal relationships, while controlling for personality traits, self-reported emotional intelligence, and trait emotional intelligence. The implications of these findings are synthesized in terms of the existing literature and the prevailing conceptual framework set out at the beginning of this research, which could shape the direction for future research on the emotional intelligence construct.

ACKNOWLEDGEMENTS

My deepest appreciation goes to my principal supervisor Dr. Angeli Santos, who despite all her other responsibilities, was able to supervise, guide, advise, support and most importantly provide a prompt and thorough feedback on my work. This thesis would never have taken shape without the encouragement and insight of Dr. Angeli. My appreciation also goes to my secondary supervisor Dr. Hazel Melanie Ramos for her helpful suggestions and comments.

A hearty thanks to my parents, Wan Husin and Samariah who were unrelenting sources of motivation to complete my study as early as possible. I am also indebted to the Ministry of Higher Education (MOHE) who assisted in the funding of my studies.

I wish to thank Prof. Chi-Sum Wong and other test developers for granting permission to use their scales in this research, Mr. Flynn Harris who helped me with proofreading, and Dr. Marshall Valencia who taught me bibliometric analysis.

Last but not least, appreciation is due to the International Islamic University Malaysia for permitting me to collect data in their institution and to the voluntary 'gatekeepers' who assisted me with my data

collection. Above all, the accomplishment of this thesis would have been impossible without my respondents who voluntarily responded to the inventories. I acknowledge a debt of gratitude to you for your support and cooperation.

PUBLISHED WORKS

The thesis contributions have essentially extended the body of scientific research on emotional intelligence, particularly in the psychometric research areas. In an ongoing process, the work has been disseminated to both academia through conference inputs, and journal articles.

Parts of this thesis have been published (and are currently under review) in the following refereed publications:

1. Wan Husin, W.N.I., Santos, A., Ramos, H.M., Nordin, M.S. (2013). The place of emotional intelligence in the 'intelligence' taxonomy: crystallized intelligence or fluid intelligence factor?. *Procedia Social and Behavioural Sciences*, 97, 214 – 223.
2. Wan Husin, W.N.I., Santos, A., Ramos, H.M., Nordin, M.S (In press). Confirmatory factor analysis of an emotional intelligence scale. *Procedia Social and Behavioural Sciences*.
3. Wan Husin, W.N.I., Santos, A., Ramos, H.M. & Dzulkifli, M.A. (In Press). Emotional intelligence and personality predict the leadership practices of future Muslim leaders. *Online Journal of Islamic Education*.

4. Wan Husin, W.N.I., Santos, A., Ramos, H.M., Nordin, M.S.
Exploring the nomological network of emotional intelligence construct. (Manuscript is currently under review)

The works described in Chapter 7 until 10 have also been presented for discussion at the following conferences and seminar:

1. Wan Husin, W.N.I., Santos, A., Ramos, H.M., Nordin, M.H. (2012). *Confirmatory factor analysis of an emotional intelligence scale.* Paper presented at the International Conference on Social Sciences and Humanities, December 12-13, 2012, Kuala Lumpur, Malaysia.
2. Wan Husin, W.N.I., Santos, A., Ramos, H.M., Nordin, M.H. *The place of emotional intelligence in the 'intelligence' taxonomy: crystallized intelligence or fluid intelligence factor ?.* Paper presented at the 9th International Conference on Cognitive Sciences (ICCS), August 27-30, 2013, Sarawak, Malaysia.
3. Wan Husin, W.N.I., Santos, A., & Ramos. H.M. *The incremental validity of emotional intelligence in predicting student leadership.* Paper presented at the 4th ASEAN Regional Union of Psychological Societies (ARUPS) Congress, October 23-25, 2013, Manila, Philippines.

4. Wan Husin, W.N.I., Santos, A., Ramos, H.M. *The incremental validity of emotional intelligence in predicting psychological well-being*. Paper presented at the Asian Congress of Applied Psychology (ACAP), May 7-8, 2014, Singapore.

5. Wan Husin, W.N.I., Santos, A., Ramos, H.M., Dzulkifli, M. A. *Emotional intelligence and personality predict the leadership of future Muslim leaders*. Paper presented at the 4th International Conference and Exhibition on Islamic Education 2014 (ICIEd 2014), May 31– June 2, 2014, Kelantan, Malaysia.

Outside the thesis work, and in addition to the publications listed above, the author has authored and co-authored the following publications and participated in the following conference throughout her Ph.D candidature.

1. Hilal, H.M.H., Wan Husin, W.N.I., & Zayed, T.M. (2013). Barriers to Creativity among Students of Selected Universities in Malaysia. *International Journal of Applied Science and Technology*, 3(6), 51-60.

2. Wan Husin, W.N.I, Ibrahim, M.B., Jaafar, J. & Abuhasan, S. (2014). The dimensional structure of the Student Leadership Practices Inventory. *Journal of Education and Practices*, 5(30),109-117.
3. Abuhasan, S., Omar, F., Khairudin, R., Mastor, K.A., Nordin, M.S., Wan Husin, W.N.I., Mohamed Zain, A. (2015). Invariance of organizational citizenship behavior measurement models across institutions in Malaysia. *Asian Social Science*, 11(26),11-18.
4. Che Yusof, N.S.H., Wan Husin, W.N.I., Bee Wah, Y. *The relationship between emotional intelligence and university students' attitude*. Paper presented at the 2nd International Conference on Statistics in Science, Business and Engineering, 2 - 3 September 2015, Putrajaya, Malaysia.
5. Wan Husin, W.N.I, Ibrahim, M.B., Jaafar, J. & Abuhasan, S. Exploring the factor structure of the leadership practices construct. Paper presented at the Southeast Asia Psychology Conference, September 25-27, 2012, Sabah, Malaysia.

TABLE OF CONTENTS

ABSTRACT	2
PUBLISHED WORKS	6
TABLE OF CONTENTS	10
PREFACE	24
LIST OF TABLES	32
LIST OF FIGURES.....	36
LIST OF ABBREVIATIONS AND ACRONYMS.....	38
CHAPTER 1 – INTRODUCTION.....	39
1.1 Chapter overview	39
1.2 Background of the study.....	39
1.3. Background and popularization of emotional intelligence	44
1.3.1 Academic interest in emotional intelligence research	45
1.4 General statement of the problem.....	48
1.4.1 The definition of emotional intelligence: What exactly is it?	48
1.4.2 Emotional intelligence assessments require various forms of validity evidence.....	50
1.4.3 Forms of validity evidences required by the emotional intelligence construct	53
1.4.3.1 Factorial validity	54
1.4.3.2 Convergent validity	55

1.4.3.2 Discriminant validity	56
1.4.3.3 Incremental validity	57
1.5 Significance of and motives for the study	58
1.6 Aims of the thesis	62
1.7 Parameters and scope of the research	64
1.8 Thesis importance and contributions.....	65
1.9 Chapter summary and conclusions	67
CHAPTER 2 – THE CONCEPTUALISATION AND MEASUREMENT OF EMOTIONAL INTELLIGENCE: A REVIEW OF THE LITERATURE	68
2.1 Chapter overview	68
2.2 Definitional issues of emotional intelligence: Ability or trait? Or both? 69	
2.2.1 Ability-based emotional intelligence	71
2.2.2 Mixed-models emotional intelligence	73
2.2.3 Trait emotional intelligence	75
2.3 The initial conceptualization of emotional intelligence and related schisms	77
2.4 Toward refinement of the construct: Examination of issues on the conceptualization of emotional intelligence	80
2.4.1 Views pertaining to the ability-based emotional intelligence model.....	81
2.4.2 Views pertaining to the mixed- models of emotional intelligence	84

2.4.3 Views pertaining to the trait emotional intelligence model	87
2.4.4 Examination of the preference of emotional intelligence model: A bibliometric review	88
2.4.4.1 Objectives	90
2.4.4.2 Search strategy, study selection and review process	90
2.4.4.3 Results and discussion: Popularity of ability-based emotional intelligence in academic research.....	94
2.4.4.4 Limitations of the bibliometric review	95
2.4.5 Discussion and conclusion: The future of emotional intelligence is grounded on ability-based emotional intelligence construct	95
2.5 Issues surrounding the measurement of emotional intelligence.....	96
2.5.1 Measures of ability-based emotional intelligence.....	97
2.5.1.1 Performance-based measure	97
2.5.1.2 Self-report measure	100
2.5.1.3 Multi-rater report	101
2.5.2 Measures of mixed-models emotional intelligence.....	103
2.5.3 Measures of trait emotional intelligence	104
2.6 The dominant performance-based measures for the ability-based emotional intelligence.....	105
2.6.1 The MSCEIT: The most prominent measure of ability-based emotional intelligence	106
2.6.2 The WEIS as an alternative to the MSCEIT in Asian context: Background of the measure.....	109

2.7 Research gaps and the remaining issues identified in the review	111
2.8 Chapter summary and conclusion	114
CHAPTER 3 – CONCEPTUAL FRAMEWORK	117
3.1 Chapter overview	117
3.2 Establishing a valid emotional intelligence concept: A need for a validation study	118
3.3 Proposed conceptual framework of emotional intelligence	120
3.3.1 The concept of emotional intelligence: Emotional intelligence as an ability.....	120
3.3.2 The dimensional structure of emotional intelligence	120
3.3.3 Emotional intelligence and cognitive intelligence	123
3.3.3.1 Emotional intelligence involves cognitive process: Mayer and Salovey’s perspective on the emotional intelligence concept	124
3.3.3.2 Emotional intelligence and the Cattell-Horn and Carroll (CHC) model of cognitive intelligence.....	126
3.3.4 Emotional intelligence and personality.....	132
3.3.5. The relationship between emotional intelligence and its relevant outcome variables.....	134
3.3.5.1 Emotional intelligence and leadership	135
3.3.5.2 Emotional intelligence and interpersonal relationships skills	139
3.3.6 Trait emotional intelligence and its related outcomes	141
3.4 Summary of the proposed conceptual framework	143

3.5 Research questions and hypotheses	144
3.5.1 Research Question One (RQ1).....	145
3.5.2 Research Question Two (RQ2).....	145
3.5.3 Research Question Three (RQ3)	146
3.5.4 Research Question Four (RQ4)	147
3.5.5 Research Question Five (RQ5).....	147
3.5.6 Research Question Six (RQ6).....	148
3.5.7 Research Question Seven (RQ7)	149
3.6 Chapter summary and conclusion.....	150
CHAPTER 4 – METHODOLOGY.....	151
4.1 Chapter overview	151
4.2 An overview of the studies (Study 1 and Study 2).....	151
4.2.1 Study 1: Pilot study	152
4.2.2 Study 2: Main study	153
4.3 Research design	154
4.4 Research context and setting.....	154
4.5 Sampling frame.....	157
4.6 Sampling type	159
4.7 Sampling strategy	160
4.8 Study 1: Measures and procedures	162
4.8.1 Cognitive ability.....	162
4.8.2 Emotional intelligence (performance-based measure).....	164

4.8.3 Emotional intelligence (self-report measure).....	165
4.8.4 Personality	167
4.8.5 Leadership practices.....	168
4.8.6 Data collection procedures.....	170
4.8.7 Ethical considerations	173
4.9 Study 2: Measures and procedures	175
4.9.1 Cognitive ability	176
4.9.2 Emotional intelligence (performance-based measure).....	176
4.9.3 Emotional intelligence (self-report measure).....	176
4.9.4 Personality	176
4.9.5 Leadership practices	176
4.9.6 Trait emotional intelligence	176
4.9.7 Positive Interpersonal relationships.	178
4.9.8 Data collection procedures.....	181
4.9.9 Ethical considerations	181
4.9.10 Sample size and statistical power consideration.....	181
4.9.11 Obtaining face validity evidence.....	185
4.10 Summary of rationale for research design and analysis for both studies.....	187
4.11 Chapter summary and conclusions	188

CHAPTER 5 – RESULTS OF THE PILOT STUDY: EXPLORING THE NOMOLOGICAL NETWORK OF EMOTIONAL INTELLIGENCE CONSTRUCT.....	189
5.1 Chapter overview	189
5.2 The nomological network: Relationships among constructs.....	190
5.3 The current investigation: Exploring the nomological network of the emotional intelligence construct	193
5.3.1 The nomological network of the emotional intelligence construct	193
5.3.2 Statistical analysis and results	196
5.3.2.1 Brief overview of the collected data	196
5.3.2.2 Results	196
5.3.3 Discussions.....	201
5.3.4 Limitations of Study 1	203
5.4 Chapter summary and conclusions	203
 CHAPTER 6 – PRELIMINARY ANALYSES OF STUDY VARIABLES ...	205
6.1 Chapter overview	205
6.2 Characteristics of the study respondents	205
6.3 Data analysis procedures.....	207
6.4 Data screening	208
6.4.1 Brief overview of the collected data	208
6.4.2 Examination of data entry errors	209
6.4.3 Missing data.....	210

6.5 Preliminary data analyses	210
6.5.1 Assessing the assumption of normality	210
6.5.2 Assessing the assumption of ‘absence of multicollinearity’	214
6.5.3 Assessing the assumptions of no outliers and no influential cases	215
6.6 Overview on the assessment of item fit and measurement model for all study variables	216
6.6.1 Model estimation: Goodness-of-fit indices (GOF)	217
6.7 Assessment of item fit for polytomous data	223
6.7.1 Model assessment	223
6.7.2 Respecification of measurement model: Post Hoc analyses of model assessment	223
6.7.3 Personality	225
6.7.3.1 Openness	225
6.7.3.2 Conscientiousness	227
6.7.3.3 Extraversion	229
6.7.3.4 Agreeableness	230
6.7.3.5 Neuroticism	232
6.7.4 Trait emotional intelligence	233
6.7.5 Leadership practices	236
6.7.6 Positive interpersonal relationships	239
6.7.7 Emotional intelligence (self-report measure)	240
6.8 Assessment of item fit for dichotomous data	243
6.8.1 Cognitive intelligence	244

6.8.1.1 Fluid intelligence	245
6.8.1.2 Crystallized intelligence	247
6.8.2 Emotional intelligence (performance-based measure)	249
6.9 Correlations among study variables	252
6.10 Chapter summary and conclusions	254

CHAPTER 7 – TOWARD CLARIFICATION OF A CONCEPT: WHAT

DOES EMOTIONAL INTELLIGENCE MEASURE?	255
7.1 Chapter overview	255
7.2 Introduction	255
7.3 Results of H1: Factorial validity of the ability-based emotional intelligence	258
7.3.1 Description of the hypothesized model for a performance-based measure of emotional intelligence and the target groups.....	258
7.3.2 CFA on the hypothesized model for performance-based measure of emotional intelligence	262
7.3.2.1 CFA on the hypothesized model (Model 1a) for group 1	262
7.3.2.2 CFA on the final revised model (Model 1b) for group 1	264
7.3.2.3 CFA on the hypothesized model (Model 2a) for group 2.....	267
7.3.2.4 CFA on the final revised model (Model 2b) for group 2.....	269
7.3.3 Description on the hypothesized model for the self-report measure of emotional intelligence and the target groups.....	272
7.3.3.1 CFA on the hypothesized model (Model 3) for group 1	274

7.3.3.2 CFA on the hypothesized model (Model 4) for group 2.....	276
7.3.4 Summary of results pertaining to H1	280
7.4 Results of H2: Convergent validity of performance-based and self-report measures of emotional intelligence.....	281
7.4.1 Summary of results pertaining to H2.....	284
7.5 Discussion: The concept of emotional intelligence and its purported measures	285
7.5.1 H1: Factorial validity of emotional intelligence	286
7.5.2 H2: Convergent validity of the performance-based and self-report measure of emotional intelligence.....	292
7.5.3 Summary of the discussion	294
7.6 Chapter summary and conclusion.....	295
CHAPTER 8 – EMOTIONAL INTELLIGENCE AND COGNITIVE INTELLIGENCE: THE INTERRELATEDNESS	297
8.1 Chapter overview	297
8.2 Introduction	297
8.3 Results of H3: Convergent validity between emotional and cognitive intelligence	299
8.3.1 Summary of results pertaining to H3.....	302
8.4 Results of H4: The place of emotional intelligence in the ‘intelligence’ taxonomy	302
8.4.2 Evaluation of model fit for the two-factor model of intelligence ..	305

8.4.3 Evaluation of model fit for the three-factor model of intelligence	307
8.4.4 Summary of results pertaining to H4	308
8.5 Discussion: Failing to account for 'intelligence' in emotional intelligence	309
8.5.1 H3: Convergent validity between emotional intelligence and cognitive intelligence	309
8.5.2 H4: The place of emotional intelligence in the 'intelligence' taxonomy	311
8.5.3 Summary of the discussion	315
8.6 Chapter summary and conclusion	317

CHAPTER 9 – EMOTIONAL INTELLIGENCE AND PERSONALITY

TRAITS: THE CONCEPTUAL DISTINCTION	318
9.1 Chapter overview	318
9.2 Introduction	318
9.3 Results of H5: Discriminant validity between emotional intelligence and personality	321
H5a: Discriminant validity between emotional intelligence and 'openness'	322
H5b: Discriminant validity between emotional intelligence and 'conscientiousness'	323
H5c: Discriminant validity between emotional intelligence and 'extraversion'	324

H5d: Discriminant validity between emotional intelligence and 'agreeableness'	324
H5e: Discriminant validity between emotional intelligence and 'neuroticism'	325
9.4 Summary of results pertaining to H5	325
9.5 Discussion: The distinctiveness of emotional intelligence from personality	326
9.6 Chapter summary and conclusion	331
CHAPTER 10 – THE LINK BETWEEN EMOTIONAL INTELLIGENCE AND ITS RELATED OUTCOMES	332
10.1 Chapter overview	332
10.2 Introduction	332
10.3 Results of H6: Incremental validity of emotional intelligence in explaining leadership practices	335
10.3.1 Preliminary investigation of the correlation between the predictors and leadership practices	338
10.3.2 Regression analyses predicting the leadership practices.....	340
10.4 Results of H7: Incremental validity of emotional intelligence in explaining positive interpersonal relationships with peers	344
10.4.1 Preliminary investigation of the correlation between the predictors and the positive interpersonal relationships with peers	346

10.4.2 Regression analyses predicting the positive interpersonal relationships with peers	346
10.5 Discussion: Emotional intelligence (performance-based test) explains a significant increment of variance to important outcomes.....	350
10.5.1 Incremental validity of emotional intelligence in explaining leadership practices	352
10.5.2 Incremental validity of emotional intelligence in explaining positive interpersonal relationships	357
10.5.3 Summary of the discussion	359
10.6 Chapter summary and conclusion	360

CHAPTER 11 – GENERAL DISCUSSION, IMPLICATIONS AND FUTURE RESEARCH	361
11.1 Chapter overview	361
11.2 Summary of research findings and general discussion	361
11.2.1: Is emotional intelligence a new ability? Emotional intelligence is not a putative new ability.....	363
11.2.2: Is emotional intelligence a renowned personality? Emotional intelligence is distinct from personality traits	366
11.2.3: Emotional intelligence explains a significant incremental variance in predicting the outcomes	368
11.2.4: Conclusion: The construct of emotional intelligence requires more validity evidence	369

11.3 Conceptual implications	370
11.4 Measurement implications.....	374
11.5 Practical implications.....	378
11.6 Towards strengthening the theory and measurement of emotional intelligence: issues and suggestions for future research.....	381
11.7 Limitations of the study.....	383
11.8 Chapter summary and conclusions	386
REFERENCES.....	389
APPENDIX A - A SUMMARY OF EMOTIONAL INTELLIGENCE MODEL PREFERENCE FOR JOURNAL ARTICLES PUBLISHED IN THE WEB OF KNOWLEDGE DATABASE 2012.....	442
APPENDIX B1 – TABLE FOR DETERMINING SAMPLE SIZE	472
APPENDIX B2 – TABLE FOR STATISTICAL POWER ANALYSIS	474
APPENDIX C – ITEM AND ITS ABBREVIATIONS	Error! Bookmark not defined.
C1: Emotional intelligence (self-report measure) items	Error! Bookmark not defined.
C2: Emotional intelligence (performance-based measure) items	Error! Bookmark not defined.
C3: Personality items	Error! Bookmark not defined.
C4: Trait emotional intelligence items	Error! Bookmark not defined.
C5: Leadership practices items	Error! Bookmark not defined.
C6: Interpersonal relationships items	Error! Bookmark not defined.
APPENDIX D – QUESTIONNAIRES	Error! Bookmark not defined.
APPENDIX E – ETHICS APPROVAL	475

PREFACE

The concept of emotional intelligence has gained immense popularity across a variety of disciplines because of the idea that cognitive intelligence alone is insufficient to explain human behaviour and success (Cherniss, 2010a; Goleman, 1995b; Kaplan, Cortina & Ruak, 2010; Mayer & Salovey, 1990). However, recent researchers raised several issues concerning the construct validity of emotional intelligence. On one hand, there appears to be little consensus over how emotional intelligence should be operationally conceptualised (Brackett, Rivers & Salovey, 2011; Cherniss, 2010b; Joseph & Neman, 2010b; Libbrecht & Lievens, 2012; Matthews, Zeidner & Roberts, 2012; Parker, Keefer & Wood, 2011; Siegling, Saklofske, Vesely & Nordstokke, 2012).

On the other hand, the construct validity of emotional intelligence measures has been called into question. Furthermore, emotional intelligence researchers assert that emotional intelligence measures are in great need of various forms of validity evidences as its progress depends on greater rigor in conceptualisation and validation of measurements (Antonakis & Dietz, 2010; Cherniss, 2010b; Fiori & Antonkis, 2011; Harms & Crede, 2010b; Martin & Thomas, 2011; Matthews et al., 2012; Maul, 2011, 2012b; Sharma, Gangopadhyay, Austin & Mandal, 2013; Van Rooy, Whitman & Viswesvaran, 2010).

While some emotional intelligence researchers asserted that emotional intelligence has unstable factor structure (Cherniss, 2010b; Maul, 2011, 2012; Sharma et al. 2013; Van Rooy et al., 2010), other researchers pointed out that the concept of emotional intelligence lacks of construct validity (Cherniss, 2010b; Fiori & Antonkis, 2011; Harms & Crede, 2010b; Martin & Thomas, 2011; Matthews et al., 2012; Maul 2012b; Sharma et al. 2013). The lack of construct validity includes lack of empirical support for either convergent validity or discriminant validity (Cherniss, 2010b; Harms & Crede, 2010b). Meanwhile, there is also a relative paucity of information regarding the incremental validity of emotional intelligence over cognitive intelligence and personality traits (Antonakis & Dietz, 2010; Harms & Crede, 2010b; Martin & Thomas, 2011).

In an attempt to address this issue, this thesis sought to gather evidences on the validity of the emotional intelligence construct. First, it sought to confirm the factor structure of emotional intelligence. Second, it assessed the convergent validity between the performance-based and self-report measures of emotional intelligence. Third, it investigated the convergent validity between emotional and cognitive intelligence. Fourth, it attempted to confirm the place of emotional intelligence in the 'general intelligence' taxonomy. Fifth, it measured the discriminant validity of

emotional intelligence and personality traits. The sixth and seventh objectives examined the incremental validity (adding additional variance) of emotional intelligence in predicting leadership practices and positive interpersonal relationships respectively.

This thesis is structured into 11 chapters. Chapter 1 [Introduction] provides a general overview of the study presented in this thesis. It describes the background of the research and highlights the unresolved issues on emotional intelligence research. It also outlines the focus and scope of the study, and explains the motives for conducting this research.

Chapter 2 [The conceptualisation and measurement of emotional intelligence: A review of the relevant literature] focuses on reviewing previous studies in this area. It begins with the issue of the conceptualisation of emotional intelligence and the associated measurement issues. From here, the available definitions, measurements, and its consequences on the progress of emotional intelligence research are both identified and discussed. First, the conceptual distinctions between the ability-based emotional intelligence model, the mixed ability-trait model, and the trait emotional intelligence model are discussed. Following this, the available measures are discussed in light of its advantages and disadvantages. Further, the

bibliometric review process is undertaken to investigate the evidences on the preference of the emotional intelligence model in recent researches. The chapter not only reveals that there are remaining unresolved issues on emotional intelligence, particularly the conflict on the multiple theoretical frameworks of emotional intelligence, but also highlights the need for validity evidences of emotional intelligence measures in addressing this issue. Findings from this literature review are used to identify areas for further research, which serves the ground for the specific research questions of the thesis.

Chapter 3 [Conceptual framework] first discusses the proposed conceptual framework of emotional intelligence and its related criterion variables, followed by a justification of the theoretical approach underlying this thesis. It is argued that the ability-based emotional intelligence model of the Mayer & Salovey model (1990) offers a coherent analytical framework to address the concept of emotional intelligence from cognitive intelligence perspectives and its associated outcomes. From this model, the conceptualisation of emotional intelligence as a new kind of ability is discussed. The chapter concludes by formulating the research questions and hypotheses that this thesis examines and providing an explanation of the proposed hypotheses.

Chapter 4 [Methodology] highlights the research design, sampling frame, and data collection procedures. Given the nature of research that involves a time-based IQ test, the chapter argues that the best way to investigate the relationships among study variables is to use a quantitative research method. The chapter then collates the psychometric properties of the instruments adopted in the study. Additionally, the chapter justifies the decision to use Structural Equation Modelling (SEM), the Rasch measurement model (WINSTEPS), and Statistical Package for Social Sciences (SPSS) as analytical tools best suited to address the research problems. The chapter concludes by arguing the rationale of research design, data analysis, and addressing the practical issues of research ethics.

Chapter 5 [Results of the pilot study: Exploring the nomological network of emotional intelligence construct] highlights the first phase of the study (Study 1) and discusses the nomological network (inter-relationships) of emotional intelligence with other theoretically-related constructs (such as cognitive intelligence, personality, and leadership practices). At the outset, it provides the background for establishing a nomological network of the emotional intelligence construct. It also investigates how well the emotional intelligence measures fit lawfully into a network of expected relationships. The chapter concludes with a discussion of the findings.

Chapter 6 [Preliminary analyses of study variables] reports the preliminary analyses of the study variables. It first describes the characteristics of the study respondents. The chapter continues with data screening and Exploratory Data Analysis (EDA) to assess the normality of the data. The study focuses, among other things, on the assessment of item fit and the measurement model of all study variables. The chapter concludes by analysing the correlations among study variables.

Chapter 7 [Toward clarification of a concept: What does emotional intelligence measure?] highlights the findings on the concept of ability-based emotional intelligence particularly the underlying factors that make up the construct. The chapter interprets the findings and presents answers to research questions and hypotheses number 1 and 2 (RQ 1 and RQ 2) posed in Chapter 3. The factor structure of emotional intelligence for both the performance-based and self-report measures are examined to investigate the congruence of purported measures in gauging the emotional intelligence construct. In addition, the chapter also investigates the convergent validity between the performance-based and self-report measure of emotional intelligence. The chapter concludes with the discussion on the concept of ability-based emotional intelligence and the distortion of its measures.

Chapter 8 [Emotional intelligence and cognitive intelligence: The interrelatedness] reports the results of the convergent validity between emotional intelligence and cognitive intelligence in responding to research questions number 3 and 4 (RQ 3 and RQ 4). This chapter specifically examines the place of emotional intelligence in the 'intelligence' taxonomy. As the findings fail to support the proposed hypotheses on this issue, the discussion focuses on the failure to take 'intelligence' in emotional intelligence seriously.

Chapter 9 [Emotional intelligence and personality traits: The conceptual distinction] presents a discriminant validity between emotional intelligence and the Big Five personality traits (O, C, E, A, N), namely openness, conscientiousness, extraversion, agreeableness and neuroticism. This chapter specifically responds to research question 5 (RQ 5). By revealing the results of this analysis, the major findings are then discussed and synthesized in light of the conceptual distinction of both emotional intelligence and personality traits.

Chapter 10 [The link between emotional intelligence and its related outcomes] responds to research questions 6 and 7 (RQ 6 and RQ 7). It highlights the incremental validity of emotional intelligence (performance-based measure) in predicting leadership practices (RQ 6) and positive

interpersonal relationships (RQ 7) while controlling the cognitive intelligence, personality, emotional intelligence (self-report measure), and trait emotional intelligence. The obtained results lead to a discussion on the little predictions made by emotional intelligence (performance-based measure) in explaining its outcome variables.

Chapter 11 [General discussion, implications, and direction of future research] summarises the evidence obtained from the analyses in responding to research questions 1 to 7 (RQ 1 to RQ 7). In addition, the implications of the research's results for the concept and measurement of emotional intelligence are discussed. Next, the theoretical and methodological issues arising from this study are elaborated. The chapter also highlights the contributions that the thesis has made in advancing the progress emotional intelligence research. Finally, it presents suggestions for future research that may be embarked upon in continuation of this study.

LIST OF TABLES

		Page No.
Table 2.1	Frequency analysis on the preference of emotional intelligence model for research articles published in the Web of Knowledge year 2012	94
Table 4.1	The original items and amended items of positive interpersonal relationships of the Ryff's Psychological Well-being scale (PWB)	180
Table 5.1	The descriptive statistics and the reliability coefficient of the measured constructs	199
Table 5.2	The correlation analysis between emotional intelligence and its theoretically-related constructs	200
Table 6.1	Demographic information of the respondents (n = 710)	206
Table 6.2	Descriptive statistics and Exploratory Data Analysis (EDA) of study variables (n = 710)	213
Table 6.3	The recommended criteria in assessing fit indices for SEM models	222
Table 6.4	The measurement model of 'Openness' trait:	227

	Goodness-of-fit statistics and its parameter estimates	
Table 6.5	The measurement model of 'Conscientiousness' trait: Goodness-of-fit statistics and its parameter estimates	228
Table 6.6	The measurement model of 'Extraversion': Goodness-of-fit statistics and its parameter estimates	230
Table 6.7	The measurement model of 'Agreeableness' trait: Goodness-of-fit statistics and its parameter estimates	231
Table 6.8	The measurement model of 'Neuroticism' trait: Goodness-of-fit statistics and its parameter estimates	232
Table 6.9	The measurement model of 'Trait Emotional Intelligence': Goodness-of-fit statistics and its parameter estimates	235
Table 6.10	The measurement model of 'Leadership practices': Goodness-of-fit statistics and its parameter estimates	237
Table 6.11	The measurement model of 'Positive Interpersonal Relationships': Goodness-of-fit	240

	statistics and its parameter estimates	
Table 6.12	The measurement model of the 'Self-Report measure of Emotional Intelligence': Goodness-of-fit statistics and its parameter estimates	242
Table 6.13	Item polarity statistics of the fluid intelligence measurement model: Correlation order	246
Table 6.14	Item polarity statistics of the crystallized intelligence measurement model: Correlation order	248
Table 6.15	Item polarity statistics of the emotional intelligence (performance-based measure): Correlation order	251
Table 6.16	Correlations among study variables	253
Table 7.1	Results of the chi-square difference for the two CFA groups of performance-based emotional intelligence test	272
Table 7.2	Results of the chi-square difference for the two CFA groups of self-report measure of emotional intelligence	280
Table 7.3	Correlation analysis among the performance-based measure and self-report measure of emotional intelligence	284

Table 8.1	The correlation among emotional intelligence and IQ, and their respective dimensions	301
Table 9.1	Correlation analysis between emotional intelligence and personality traits	323
Table 10.1	Correlation analysis between the predictors and the outcome variables: leadership practices and positive interpersonal relationships	339
Table 10.2	Regression analyses predicting the student leadership practices	340
Table 10.3	Regression analyses predicting the positive interpersonal relationships with peers	347

LIST OF FIGURES

		Page No.
Table 1.1	Number of publications with 'emotional intelligence' in its title as indexed by the Web of Knowledge database for the 1990-2014 period.	48
Figure 2.1	Flowchart on the selection of eligible studies	92
Figure 4.1	The relationship between sample size and total population (Taken from the original source Krejcie & Morgan (1970) page 609)	182
Figure 5.1	An illustration of the nomological of XYZ construct with its theoretically related construct of A, B, and C	191
Figure 5.2	An illustration of the nomological of emotional intelligence with its theoretically related constructs	195
Figure 7.1	The hypothesized model of the four-factor structure of emotional intelligence construct (performance-based measure)	259
Figure 7.2	Results for the hypothesized model of the four-factor structure of emotional intelligence (performance-based measure) for group 1	263
Figure 7.3	Results for the final revised model of the four-factor structure of emotional intelligence (performance-	265

	based measure) for group 1	
Figure 7.4	Results for the hypothesized model of the four-factor structure of emotional intelligence (performance-based measure) for group 2	268
Figure 7.5	Results for the final revised model of the four-factor structure of emotional intelligence (performance-based measure) for group 2	270
Figure 7.6	The hypothesized model on the four-factor structure of the emotional intelligence construct (self-report measure)	273
Figure 7.7	Results for the hypothesized model of the four-factor structure of emotional intelligence (self-report measure) for group 1	275
Figure 7.8	Results for the hypothesized model of the four-factor structure of emotional intelligence (self-report measure) for group 2	278
Figure 8.1	The hierarchical confirmatory factor analysis of two competing models of intelligence	303
Figure 8.2	The result of the goodness-of-fit indices for the two-factor model of intelligence	306
Figure 8.3	The result of the goodness-of-fit indices for the three-factor model of intelligence	307

LIST OF ABBREVIATIONS AND ACRONYMS

AMOS	Analysis of Moment Structures
SEM	Structural equation modelling
CFI	Comparative Fit Index
EI	Emotional Intelligence
MSCEIT	Mayer-Salovey-Caruso Emotional Intelligence Test
RMSEA	Root Mean Square Error of Approximation
SPSS	Statistical Package for Social Science
WEIS	Wong Emotional Intelligence Scale
WLEIS	Wong and Law Emotional Intelligence Scale
IQ	Intelligence Quotient (cognitive intelligence)
CHC	Cattell-Horn-Carroll cognitive intelligence framework
US	United States of America
CFA	Confirmatory factor analysis
SEA	Self-emotional appraisal
OEA	Others' emotional appraisal
RE	Regulation of emotion
UE	Use of emotion

CHAPTER 1 – INTRODUCTION

1.1 Chapter overview

This chapter examines and discusses the major problem of emotional intelligence construct and potential contributions of a validation study to the scientific development of the emotional intelligence construct. It provides the background to the problem and context of the thesis, outlines the focus and scope of the research, and explains the motivation for conducting the present study. Issues raised by recent researches concerning the construct validity of emotional intelligence measures as well as its incremental validity in predicting particular outcomes are addressed. The chapter then summarizes the contributions of the thesis and discusses the importance of the present study.

1.2 Background of the study

The linking of emotions and intelligence was a relatively novel idea when first introduced by Salovey and Mayer about two decades ago (Salovey & Mayer, 1990). Peter Salovey and John D. Mayer, the pioneers of the concept of emotional intelligence, asserted that solving problems and making wise decisions requires both thought and feeling, or logic and intuition. This idea led them to coin the term “emotional intelligence”

(Salovey & Mayer, 1990). Because the concept was unfamiliar to the public and researchers alike, many questions arose about the nature of emotional intelligence such as whether or not emotional intelligence was an innate cognitive ability. Can it be acquired and improved through training? Can it be measured empirically, and in what ways does emotional intelligence influence social relationships, academic achievement, workplace performance and mental health? Despite these queries, the emergence of this new construct became useful for personal, social, academic and workplace domains and remains a matter of discussion as to how and why this happened.

The notion that initially led to the emergence of emotional intelligence as a construct is that success in life and work depends on more than just the basic intellectual abilities measured by IQ tests (Cherniss, 2010a; Goleman, 1995a; Kaplan et al, 2010; Salovey & Mayer, 1990). Possessing a high IQ is not enough to determine one's success in work and life as there are personal qualities other than traditional intelligence that are deemed more important for success. A growing number of psychologists became interested in research on emotional intelligence because of the notion that cognitive intelligence is narrowly defined and accounts for only a portion of the variance in outcomes (Cherniss, 2010a). A meta-analysis study published in the "Journal of Applied Psychology" revealed that IQ and other similar measures of cognitive

intelligence accounted for only 7% of the variance in leadership effectiveness (Judge, Colbert & Illies, 2004).

The initial notion that there are personal qualities other than traditional intelligence that are more important for success was introduced by the publication of Goleman's (1995b) best-selling trade book, "Emotional intelligence: Why it can matter more than IQ?". The book caught the eye of the media, the general public and researchers alike as a result of the claim that there is a connection between emotional competencies and prosocial behaviour. Goleman went so far as to claim the importance and effectiveness of emotional intelligence "as powerful and at times more powerful than IQ" in predicting success in life (Goleman, 1995a; p.34). Hitherto, the concept gained immense popularity across a variety of disciplines because of the belief that emotional intelligence could predict life success above and beyond that predicted by cognitive intelligence (Goleman, 1995a).

A substantial amount of research has shown that emotional intelligence is a significant predictor of important educational, workplace and social criteria. A number of studies, for example, have revealed that emotional intelligence has been found to be positively correlated to academic achievement among college students (Gil-Olarte, Martin & Brackett, 2006; Lyons & Schneider, 2005; Rivers et al., 2010; Zeidner, Shani-

Zinovich, Matthews & Roberts, 2005) and secondary school students (Costa & Faria, 2015), and also related to high school students' resilience (Di Fabio & Kenny, 2015). In relation to social functioning, researchers have found that emotional intelligence significantly accounted for the quality of social interactions and interpersonal relationships, (Brackett, Rivers, Shiffman, Lerner & Salovey, 2006; Lopes, Salovey, Cote & Beers, 2005; Rivers et al., 2010) and psychological well-being (Augusto-Landa, Pulido-Martos & Lopez-Zafra, 2011; Higgs, & Dulewicz, 2014; Montes-Berges, & Augusto-Landa, 2014).

At the organizational level, emotional intelligence has been shown to demonstrate a positive relationship with individual and team task performance (Carmeli & Josman, 2006; Cohen & Abedallah, 2015; Law, Wong & Song, 2004; Ono, Sachau, Deal, Englert, & Taylor, 2011), organizational citizenship behaviour (Cohen & Abedallah, 2015) and leadership effectiveness (Cote, Lopes, Salovey & Miners, 2010; Kerr, Garvin, Heaton & Boyle, 2006; Rao, 2006). In addition, research also showed that emotional intelligence has been found to be negatively correlated with employees' intention to leave their organisation (Bande, Fernández-ferrín, Varela, & Jaramillo, 2015)

Despite almost 20 years of research, researchers continue to argue that the emotional intelligence construct remains elusive as a result of much confusion and controversy concerning the concept itself. A diverse number of conceptualisations of emotional intelligence exist, leading to a lack of theoretical robustness and poor operationalisation of the construct. Among the many questions and statements posed by the researchers were: “The emotional intelligence construct has been an elusive one. After nearly 2 decades of research, there still appears to be little consensus over how emotional intelligence should be conceptualised...” (Zeidner, Roberts & Matthews, 2008, p.64).

Not only Zeidner et al., (2008), but Cherniss (2010b, p.110) also raised the question on “how valid existing measures of emotional intelligence are?” Although a substantial amount of research has revealed that emotional intelligence has predicted important outcomes on educational, workplace and social criteria beyond what can be predicted by general mental abilities measured by IQ tests (e.g., Elias & Weissberg, 2000; Fisher & Ashkanasy, 2000; Fox & Spector, 2000; Goleman, 1995b; Law, Wong, Huang & Li, 2008; Mehrabian, 2000, Rao, 2006; Saarni, 1999), why did Zeidner et al., (2008) and Cherniss (2010b) perceive emotional intelligence as a problematic construct? What are the sources of controversy over this emerging construct and its measures?

In conclusion, research on emotional intelligence has mushroomed, in part, because of the increasing importance of intelligence as an integral factor to succeed in the 21st century. For instance, Goleman (1995b) claimed that emotional intelligence is more important than IQ in determining life success. However, as the field develops, there is a growing rejection of the early, overstated claims made in popular works about the importance of emotional intelligence (Daus & Ashkanasy, 2003; Landy, 2005; Zeidner et al., 2008). For instance, a meta-analysis study conducted by Van Rooy and Visweswaran (2004) has disconfirmed the overstated claims made by Goleman (1995a, b) as their meta-analysis result showed that the average correlation between emotional intelligence and work performance was, at best, only moderate. Lindebaum and Cartwright (2011) also pointed out that these claims made on the predictive power of emotional intelligence “have been overly expansive and lack scientific rigour” (p.284). Thus, despite a high level of scientific interest, the science of emotional intelligence remains in its infancy with many controversial issues still being debated and cardinal questions still unanswered.

1.3. Background and popularization of emotional intelligence

Salovey and Mayer (1990) defined ‘emotional intelligence’ as ‘the ability to monitor one’s own feelings and emotions and those of others, to

discriminate among them, and to use this information to guide one's thinking and actions' (p.189). In their initial study, Salovey and Mayer empirically demonstrated that emotional intelligence involves the human ability to accurately perceive and express emotions and as such could be measured as a mental ability (Mayer, DiPaolo & Salovey, 1990). As stated in earlier section, interest in the topic of emotional intelligence was spurred by the idea that cognitive ability alone is insufficient to explain human behaviour and success (Goleman, 1995a).

1.3.1 Academic interest in emotional intelligence research

To date, research on emotional intelligence has gained much attention from researchers from all fields of study. Not just researchers, but practitioners like psychologists, educators and corporate executives have tried to incorporate emotional intelligence into their daily life and professional practices. A growing number of emotional intelligence articles also indicated that this topic is currently becoming popular in academic field. Investigating the popularity of emotional intelligence research in academic field would be significant in gaining insights on the usefulness of this construct in improving life success.

To investigate the popularity of emotional intelligence in academic arena, the number of emotional intelligence publications published throughout year 1990 until 2014 was examined through Web of Knowledge

database¹. Based on the data retrieved from the Web of Knowledge database, it revealed that the number of academic publications on emotional intelligence is increasing year by year. In the Web of Knowledge database, all document types (including journal articles, review papers, books, editorial papers, case reports and etc.) that include the term 'emotional intelligence' in its title between 1990 and 2014 have been extracted. As shown in Figure 1.1, only one paper was published in 1990. The number of scientific publications however increased to 41 by 2000. By 2010 and 2011, the number substantially increased to 217 and 229 respectively. And by 2014, the number of publications on emotional intelligence research reached 297. These numbers are good testimony to the increased academic interest in emotional intelligence topic.

¹ Web of Knowledge [formerly known as ISI (Institute for Scientific Information) Web of Knowledge] is the world's leading source of scholarly research database and academic citation indexing provided by Thomson Reuters (Web of Knowledge, 2013). This database has been chosen because it has the largest collection of research databases that consist of books, journals, proceedings, publications and patents, and provides bibliographic content and tools to access, analyze, and manage research information (Web of Knowledge, 2013).

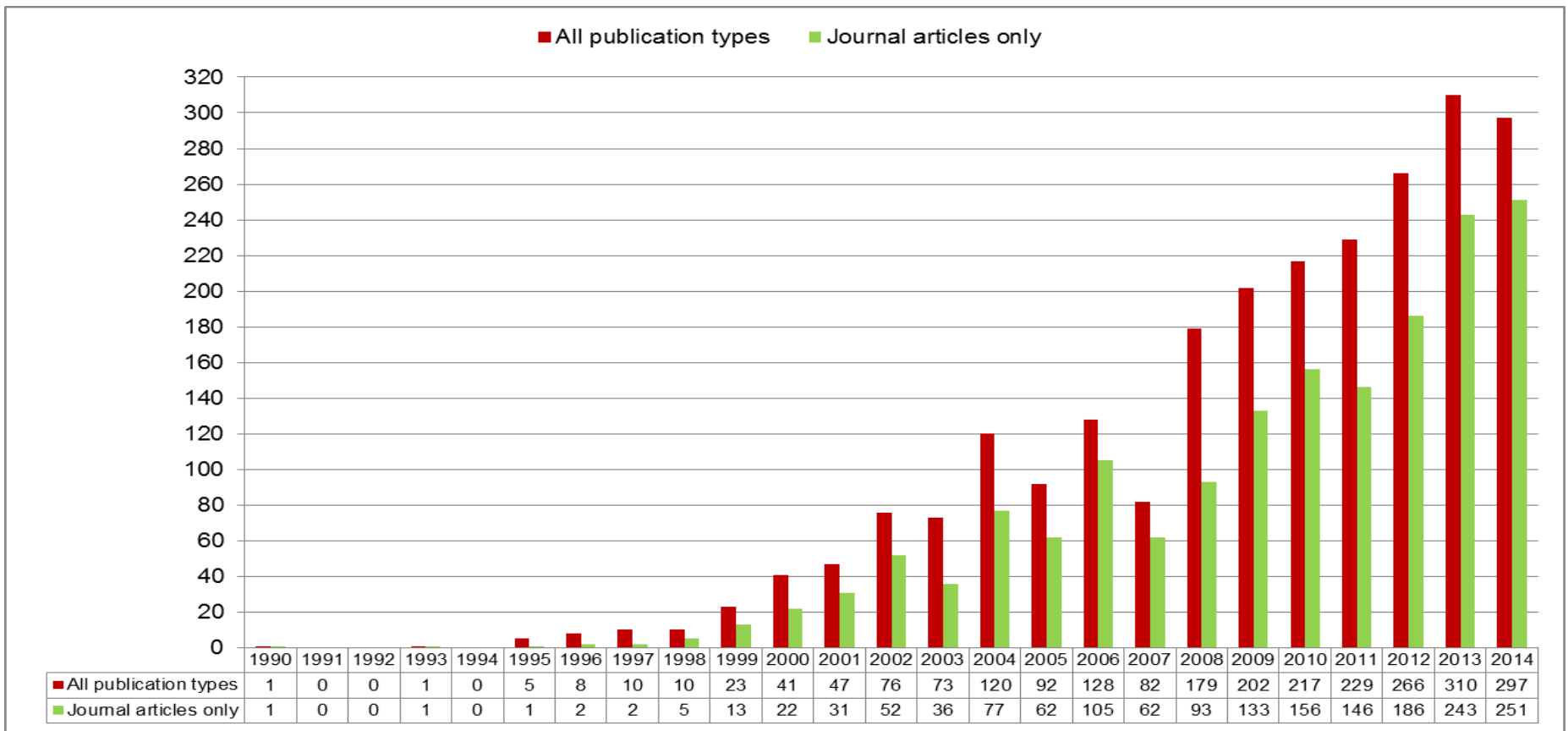


Figure 1.1: Number of publications with “emotional intelligence” in its title as indexed by the Web of Knowledge database for the 1990-2014 period

From Figure 1.1, there is a clear upward trend in the number of academic publications on the topic of emotional intelligence despite being subjected to strong criticism since its inception. It appears that the concept of emotional intelligence is now widely accepted by researchers and practitioners from all professions. The increasing number of publications on emotional intelligence suggests that perhaps the psychologists, educators, corporate executives and emotional intelligence researchers are overcoming their initial scepticism of the concept and continue to explore the implications of the concept of emotional intelligence for personal, social, academic and workplace success.

1.4 General statement of the problem

1.4.1 The definition of emotional intelligence: What exactly is it?

As indicated in the earlier section (Section 1.3), the number of emotional intelligence research is increasing year by year. However, although a plethora of research on emotional intelligence were conducted, some fundamental issues on the validity of emotional intelligence as a scientifically rigorous construct remain unresolved (Brackett et al., 2011; Cherniss, 2010b; Fiori & Antonkris, 2011; Harms & Crede, 2010b; Joseph & Newman, 2010b; Libbrecht & Lievens, 2012; Martin & Thomas, 2011; Matthews et al., 2012; Maul 2012a; Naeem & Muijtjens, 2015; Parker et al., 2011; Siegling et al., 2012; Sharma et al. 2013). Therefore, research

on the current status of emotional intelligence especially concerning the conceptualisation, assessment and application may provide a platform for new research in both basic and applied domains of emotional intelligence.

Despite the popularity of emotional intelligence in recent years, there appears to be little consensus over how emotional intelligence should be conceptualized and precisely defined (Brackett et al., 2011; Cherniss, 2010b; Joseph & Newman, 2010b; Libbrecht & Lievens, 2012; Matthews et al., 2012; Naeem & Muijtjens, 2015; Parker et al, 2011; Siegling et al.,2012). The term emotional intelligence has given rise to a diverse number of conceptualizations by a diverse set of researchers (Bar-On, 1997; Mayer & Salovey, 1990; Petrides & Furnham, 2003). Some defined emotional intelligence as an ability to reason out emotions in guiding behaviour and thinking, while others equated the definition with a constellation of emotional self-perceptions such as happiness, self-regard and flexibility. For instance, Mayer and Salovey, (1990) defined emotional intelligence as “the ability to monitor one’s own and others’ feelings and emotions, to discriminate among them and to use this information to guide one’s thinking and actions” (p. 189). On the other hand, Bar-On (1997) defined emotional intelligence as broad as “an array of noncognitive capabilities, competencies and skills that influence one’s ability to succeed in coping with environmental demands and

pressures” (p. 14). Other researchers conceptualised emotional intelligence as “a constellation of behavioural dispositions and self-perceptions concerning one’s ability to recognize, process and utilize emotion-laden information” (Petrides & Furnham, 2003, p.278). It is therefore, evident from the literature that a number of definitions of emotional intelligence exist with respect to both its terminology and operationalization. In light of the diversity of opinions, the question remains, what exactly is emotional intelligence? (Further discussion on the conceptualisation of emotional intelligence are elaborated Sections 2.2 to 2.4).

1.4.2 Emotional intelligence assessments require various forms of validity evidence

Other than conceptual issues, several researchers question current emotional intelligence tests on many grounds including lack of construct validity (Cherniss, 2010b; Curci, Lanciano, Soletti, & Zammuner, 2014, Fiori & Antonkris, 2011; Harms & Crede, 2010b; Joseph & Newman, 2010b; Martin & Thomas, 2011; Matthews et al., 2012; Maul 2012a; Sharma et al., 2013) and unstable factor structure (Cherniss, 2010b; Fiori & Antonkris, 2011; Maul, 2011, 2012a; Naeem & Muijtjens, 2015; Sharma et al. 2013; Van Rooy et al., 2010). The lack of evidences on construct validity of emotional intelligence includes the factorial validity, convergent validity, discriminant validity and incremental validity

(Nunnally & Bernstein, 1994). With regard to the factorial validity of emotional intelligence, researches showed that the stability of emotional intelligence dimensions is equivocal. For example, using the MSCEIT², Mayer and his colleagues (Mayer, Salovey, Caruso and Sitareniois, 2003), Gignac (2005) and Fiori & Antonkis, (2011) found that the four-factor structure of emotional intelligence had a good fit, whereas, other researchers such as Keele and Bell (2008) and Maul (2011) found support for a three-factor solution. Thus, the factorial validity issue of emotional intelligence test has caught attention whether it conform to expectations given by the theoretical model of emotional intelligence which is built upon four-factor structure.

Another major stumbling block for emotional intelligence research has been the lack of adequate evidence on convergent validity and discriminant validity as some researchers claimed that emotional intelligence overlaps with other psychological constructs such as personality and cognitive intelligence. Among the claims were stemmed from Fiori and Antonakis's (2011) study which found that emotional intelligence (measured by MSCEIT) overlaps with personality and intelligence, and thus potentially offering quite low discriminant validity. However, evidence found in Joseph and Newman's (2010a) study

² MSCEIT refers to the Mayer-Salovey-Caruso Emotional intelligence Test

indicated that emotional intelligence (measured by WLEIS³) is distinguishable from personality traits. Whereas, Sharma et al. (2013) found that emotional intelligence assessed through Situational Judgement Test has low correlation with cognitive intelligence. Because the past studies showed results which were inconsistent with the theoretical framework of emotional intelligence that is related to cognitive intelligence but discriminant from personality, further validation studies are needed to support the validity of emotional intelligence construct (Curci, et al., 2014, Fiori & Antonkis, 2011; Harms & Crede, 2010b; Joseph & Newman, 2010b; Martin & Thomas, 2011; Maul 2012a; Sharma et al., 2013).

Another validity evidence that has not been well investigated in emotional intelligence research is evidence on the incremental validity of emotional intelligence (Antonakis & Dietz, 2010; Harms & Crede, 2010b; Martin & Thomas, 2011) over and above the variance explained by cognitive intelligence and personality (Fiori & Antonakis, 2011). Although a plethora of research has established a relationship between emotional intelligence and its outcome variables, such researches do not shed light on the incremental validity of emotional intelligence in predicting outcomes while taking into account the potential influences of IQ and

³ WLEIS refers to Wong and Law Emotional intelligence Scale

personality (Harms & Crede, 2010b). For example, past researches revealed that emotional intelligence alone has a predictive validity on leadership effectiveness (Antonakis, Ashkanasy & Dasborough, 2009; Brackett et al., 2011) and social relationships (Lopes et al., 2005). These researches merely investigated the predictive validity of emotional intelligence on the outcome variables without controlling the potential influence of personality and cognitive intelligence. In short, not all forms of validity evidence have been the subject of empirical research on emotional intelligence.

1.4.3 Forms of validity evidences required by the emotional intelligence construct

The above discussions point that the construct of emotional intelligence is lacking of evidences on construct validity. Validity is important in the development and use of assessment because it examines the extent to which a test measures what it is purported to measure. Construct validity is viewed as a unifying and all-encompassing concept for all validity evidences and all types of validity evidence including convergent validity, discriminant validity and incremental validity come under the umbrella of construct validity (American Educational Research Association [AERA], American Psychological Association [APA] and National Council on Measurement in Education [NCME], 1999; Cohen & Swerdlick, 2005; Kaplan & Saccuzo, 2009; Matthews, Zeidner & Roberts, 2007a; Messick,

1995; Nunnally & Bernstein, 1994). On top of these validities, factorial validity of a particular construct must be secured first, as the factorial validity assesses the internal structure of a construct/test (AERA et al., 1999; Matthews et al., 2007a; Nunnally & Bernstein, 1994). Hence, in the quest for construct validity of emotional intelligence, research should focus on factorial validity, convergent validity, discriminant validity and test criterion relationships (AERA et al., 1999; Matthews et al., 2007a).

1.4.3.1 Factorial validity

Factorial validity refers to validity of the internal factor structures of a particular construct (Byrne, 2001; Nunally & Bernstein, 1994). Psychometricians agree that in testing the validity of an instrument, it is important to examine the extent to which an instrument does measure what it is purported to measure, and the validity of the factorial structure reflects this quality (AERA et al., 1999; Byrne, 2001; Nunally & Bernstein, 1994). Examination of the internal structure of a construct can demonstrate the degree to which the relationship among the underlying factors conform to the construct on which the proposed test score interpretations are based (AERA et al., 1999).

In other words, the factorial validity works closely with the conceptual framework of a particular construct. For instance, the construct of 'peer influence' is a multidimensional construct and it assesses both peer

selection and peer participation. Thus, the extent to which the items map on to their respective factors and the interrelationships among these two factors bear out the presumptions of the 'peer influence' conceptual framework, and is relevant to its factorial validity. As recent researchers argue that the data attesting the factorial structure of emotional intelligence measures are equivocal (Harms & Crede, 2010b; Maul, 2011; Zeidner et al., 2008), research on the factorial validity of emotional intelligence is sorely needed to test its factor structure.

1.4.3.2 Convergent validity

Convergent validity refers to the degree to which an assessment is related to what it should theoretically be related to (Cohen & Swerdlick, 2005; Kaplan & Saccuzo, 2009). The validity of a measure could be gauged by comparing it to measures of the same concept developed through other methods. For example, to show the convergent validity of a test of mathematics skills, the scores on the test can be correlated with scores on other tests that are also designed to measure mathematics competency. High correlations between these test scores would demonstrate evidence of convergent validity. In this case, as the pioneers of emotional intelligence construct conceptualize emotional intelligence as a kind of intelligence, it must show convergent validity with other cognitive intelligence tests (Mayer & Salovey, 1997; Salovey & Mayer, 1990). MacCann (2010) argued that while there is a diversity of

emotional intelligence tests, little research has been done on the convergent validity between emotional intelligence and cognitive intelligence especially in examining the interrelatedness of emotional intelligence with the major domains of intelligence (i.e. crystallized intelligence and fluid intelligence).

1.4.3.2 Discriminant validity

Contrary to convergent validity, discriminant validity assesses whether measures or concepts that are supposed to be unrelated are, in fact, unrelated (Cohen & Swerdlick, 2005; Kaplan & Saccuzo, 2009). A test will demonstrate discriminant validity with other tests if that test is not highly correlated with other tests designed to measure theoretically different concepts. Recent researchers argue that one of the limitations of emotional intelligence research is lack of sufficient evidence that the emotional intelligence construct is different from older, more established psychological constructs, particularly personality (Joseph & Newman, 2010a). While the critics on emotional intelligence criticize that this newly developed construct highly overlaps with personality traits, an evaluation of its discriminant validity should demonstrate that ability-based emotional intelligence is not related to the personality construct (Harms & Crede, 2010b; Joseph & Newman, 2010b; Sharma et al., 2013; Zeidner et al., 2008). Hence, demonstrating a discriminant validity of emotional intelligence from personality is needed to clarify this issue.

1.4.3.3 Incremental validity

The term incremental validity is used to describe the gain in validity resulting from adding new predictor to existing predictors of particular criterion variable (Cohen & Swerdlick, 2005; Kaplan & Saccuzo, 2009). Incremental validity shows that a new measure improves upon existing measures. For instance, an existing measure for depression might be an interview with a clinician. A new test of depression might be a paper-and-pencil test. For the new test to be considered incrementally valid, the paper-and-pencil test would have to demonstrate empirically that it adds an incremental variance to depression together with the interview. Emotional intelligence researchers argue that if emotional intelligence is truly a valid, useful and meaningful construct, then it should provide incremental validity to its related outcomes (such as job performance, leadership, social functioning, life satisfaction and etc.) above and over the cognitive intelligence and personality (Harms & Crede, 2010b; Mayer, Salovey & Caruso, 2008; Zeidner et al., 2008). As there is a relative paucity of information regarding the incremental validity of emotional intelligence over cognitive intelligence and the Big Five personality traits (Harms & Crede, 2010b), attesting its incremental validity will establish another piece of evidence on the validity of emotional intelligence construct.

1.5 Significance of and motives for the study

Research on emotional intelligence is essential as past researches concluded that emotions play an important role in human life despite the fact that the human ability to perceive, understand, regulate, and manage emotions vary between individuals (Antonakis & Dietz, 2010; Mayer & Salovey, 1990). A growing body of research suggests that emotional intelligence plays a role in almost every aspect of human life including education (Gil-Olart et al., 2006; Lyons & Schneider, 2005; Rivers et.al., 2010), workplace (Carmeli & Josman, 2006; Garvin & Heaton, 2006; Cote, Lopes, Salovey & Miners, 2010) and social adjustment (Brackett, Rivers et al., 2006; Rivers et.al., 2010). Thus, the importance of emotional intelligence research manifests in its potential to provide clarity on the influence of emotional intelligence in directing human behaviour toward greater life successes.

As noted in the previous sections, of all the criticisms that have been raised in emotional intelligence research, the most fundamental issue involves the lack of a unifying concept and validity of emotional intelligence measures. Resolving these issues take priority over other issues because other issues, such as to what extent does emotional intelligence predict work-related performance, depend on the validity and

reliability of emotional intelligence measures (Matthews et al., 2012). Therefore, it is believed that a validation study on emotional intelligence construct is significant in that it accumulates evidences to support the meaningfulness⁴, usefulness⁵ and appropriateness of the specific inferences made from emotional intelligence test scores. This research attempts to gather construct-related evidences as specified by AERA et al., (1999). The AERA et al., (1999), emphasize that research should be invested in obtaining eclectic evidences that optimally reflects the value of a test for an intended purpose. It further states that in some circumstances, evidence pertaining to test content is critical, while in other circumstances, criterion related evidence is critical. However, evidence regarding the psychological meaning of the construct is a central issue and the heart of any test (AERA et al., 1999; Cohen & Swerdlick, 2005; Messick, 1995).

⁴ In the language of psychological assessment, “meaningfulness” of a test refers to a meaningfulness interpretability of the test scores and its implications. For example, a score obtained from a valid IQ test can be said meaningful if it can predict student’s academic performance a couple of years later.

⁵ “Usefulness” of a test refers to usefulness of score inferences which can provide useful information about test taker’s performance. For instance, a score on an IQ test can provide useful information for diagnosis, remediation and placement of children with learning disability.

As there still appears to be little consensus over how emotional intelligence should be conceptualized and measured (Cherniss, 2010b; Libbrecht & Lievens, 2012; Martin & Thomas, 2011; Matthews et al., 2012; Maul 2012; Siegling et al., 2012), its progress depends on greater rigor in conceptualization, measurement and in validation of scales against objective criteria for emotional-social functioning (Zeidner et al., 2008). Thus, it is believed that a study on its construct validity would make a meaningful contribution to the progress of this field of study as the construct remains problematic while its incipient stage.

The present study also contributes towards clarifying the practical utility of emotional intelligence tests. As several researches claim that emotional intelligence has incremental validity in predicting important life outcomes above and beyond cognitive ability (Fisher & Ashkanasy, 2000; Fox & Spector, 2000; Goleman 1995b; Judge et al. 2004; Law et al., 2008; Mehrabian, 2000; Rao, 2006), training and intervention programmes in helping managers, employees, future leaders and other groups of professionals to become more emotionally intelligent have mushroomed in recent years (Clarke, 2010; Desiree, Jose, Rosario, Raquel & Pablo, 2012; Durlak, Weissberg, Dymnicki, Taylor & Schellinger, 2011; Jahangard et al., 2012; Min & Peng, 2012). As the available emotional intelligence tests have questionable validity evidence, thus, training programmes aimed to enhance emotional

intelligence in educational and occupational settings appear to lack theoretical and methodological rationale, and employ a miscellany of strategies with ambiguous psychological bases (Zeidner, Roberts & Matthews, 2002).

Practically, the theoretical foundations of emotional intelligence should be secured before developing any emotional intelligence enhancement modules; otherwise, the training will have little practical value, as the construct itself remains ambiguous. In light of this, the practical importance of this study is its potential to reach a consensus over the conceptualization and assessment of emotional intelligence, in addition to further assisting the practitioner in developing intervention programmes or training on emotional intelligence that is grounded on a firm, stable and valid construct.

Finally, this research is necessary as the researcher intends to test the validity and applicability of a specific measure of emotional intelligence, the Wong Emotional Intelligence Scale (WEIS; Wong, Law & Wong, 2004) in the Malaysian context. This is because no emotional intelligence instrument has to date, been developed in Malaysia. Moreover, as Malaysia is a part of Asia, it is expected that the WEIS should also be suitable for Malaysia context as this scale is originally developed and tested in an Asian country, Hong Kong. Furthermore,

AERA et al., (1999) point out that to establish a concept as a valid psychological construct requires the validation process of a measure to be on-going, with continuing efforts to establish the usefulness of the measure for specific populations and purposes. (A plausible explanation on selecting this measure is described in Section 2.8)

1.6 Aims of the thesis

Given the above issues and influences, this study aims to examine the construct validity of emotional intelligence, particularly ability-based emotional intelligence. Specifically, it seeks to investigate the convergent and discriminant validity of the ability-based emotional intelligence as a relatively new psychological construct as well as the incremental validity of ability-based emotional intelligence scores over measures of trait emotional intelligence, cognitive ability and Big Five personality traits in predicting leadership practices and positive interpersonal relationships. In addressing these issues, thus the present research attempts to answer the following research questions:

1. To what extent does ability-based emotional intelligence demonstrate evidence of factorial validity in the Malaysian context?
2. To what extent does ability-based emotional intelligence (performance-based measure) demonstrate evidence of

convergent validity when correlated with a self-report measure of ability-based emotional intelligence?

3. To what extent does ability-based emotional intelligence demonstrate evidence of convergent validity when correlated with cognitive intelligence?
4. What is the status of ability-based emotional intelligence in the “general intelligence” taxonomy: a crystallized intelligence or fluid intelligence factor?
5. To what extent does ability-based emotional intelligence demonstrate evidence of discriminant validity when correlated with personality traits?
6. To what extent does ability-based emotional intelligence (performance-based measure) demonstrate evidence of incremental validity over cognitive intelligence, personality traits, self-report measure of emotional intelligence and trait emotional intelligence in predicting leadership practices?
7. To what extent does ability-based emotional intelligence demonstrate evidence of incremental validity over cognitive intelligence, personality traits, self-report measure of emotional intelligence and trait emotional intelligence in predicting positive interpersonal relationships with others?

Based on these 7 research questions, 7 hypotheses have been developed and discussed in detail in Chapter 3. Answers to these questions and hypotheses were then sought through responses obtained from a set of instruments that consist of an IQ test, personality test, emotional intelligence tests, as well as leadership practices and positive interpersonal relationships questionnaire.

1.7 Parameters and scope of the research

This thesis has its own parameters in order to achieve clarity and focus in emotional intelligence research. First, this study investigates the construct validity of a performance-based test, the Wong Emotional Intelligence Scale (WEIS), and this test developed within the framework of the ability-based emotional intelligence model. From the outset, it is important to note that a number of conceptualisations of emotional intelligence exist (ability-based emotional intelligence, mixed-model emotional intelligence and trait emotional intelligence) (Matthews, Zeidner & Roberts, 2007). As such, it may not be appropriate to generalise the results to other measures of emotional intelligence which are not based on ability conceptualisation. In addition, the present study sample consisted of solely ethnic Malay Malaysian undergraduates. The

findings of the study should be interpreted within the boundaries of the stated contexts.

1.8 Thesis importance and contributions

Based on the research questions, motivation, scope and objectives of the research, it is appropriate to conclude this chapter by outlining the significant contributions of the thesis. Continuing previous work in this field, this thesis contributed to a number of branches of psychology, particularly psychometric/quantitative psychology, cognitive psychology, educational psychology and social psychology.

As the main purpose of this study is to examine the psychometric properties particularly construct validity, it attempts to clarify the conceptualization of emotional intelligence and explain the theoretical understanding of emotional intelligence by examining the construct from multiple perspectives such as the cognitive intelligence framework, personality theory and other criterion variables including leadership and interpersonal skills.

In responding to the call of the current researches to gather evidence of validity of emotional intelligence construct (Antonakis & Dietz, 2010; Fiori & Antonkis, 2011; Harms & Crede, 2010b; Martin & Thomas, 2011;

Matthews et al., 2012; Maul, 2011, 2012a; Sharma et al., 2013; Siegling et al., 2012; Van Rooy et al., 2010), this thesis provides empirical evidence for the validity, reliability and utility of the Wong Emotional Intelligence Scale (WEIS) according to the professional standards for educational and psychological testing specified by the AERA et al., (1999). Through such an approach, this thesis provides an up to date and extensive empirical assessment of the concept and measurement of emotional intelligence construct.

Second, this thesis discusses the place of emotional intelligence in the general intelligence taxonomy. It provides a deeper understanding on the association of emotional intelligence with other existing intelligence factors. This thesis also attempts to validate the notion that emotional intelligence is a putative new intelligence that can be considered as a new domain of cognitive intelligence and therefore indirectly advances the field of cognitive psychology.

Third, the present study contributes towards the advancement of the field of industrial and organisational psychology, educational psychology and social psychology as it examines the role of emotional intelligence in explaining socially relevant outcomes like leadership practices and interpersonal relationships skills. Because emotional intelligence is relatively a new construct, this study explains the possibility of emotional

intelligence as a relatively novel significant predictor to both leadership effectiveness and interpersonal skills especially in the context of university student development.

1.9 Chapter summary and conclusions

This chapter highlighted certain issues surrounding the conceptualisation of the emotional intelligence construct and the remaining psychometric issues of its measurement. It also discussed the context and background of the research especially from the perspective of the scientific development of its measurement. Above all, this introductory chapter has provided the rationale and justification on the need for the present study in order to delineate the theoretical foundations of emotional intelligence and clarify its practical implications in various aspects of human life. Additionally, this chapter also described the scope of the research, including the research problems and research questions. Having set the context, the next chapter provides a more systematic review of key research and relevant literature.

CHAPTER 2 – THE CONCEPTUALISATION AND MEASUREMENT OF EMOTIONAL INTELLIGENCE: A REVIEW OF THE LITERATURE

2.1 Chapter overview

The previous chapter provided an overview of this thesis' motivation for investigating the construct validity of emotional intelligence and highlighted the importance of addressing this issue from the trajectories of research, theory, and practice. This chapter continues with a review of the literature that summarises and synthesises the existing evidence on the issues of conceptualization and measurement of emotional intelligence. This literature review aims towards elucidating the current state of the aforementioned issues and identifying the key gaps in the field of emotional intelligence that require further empirical investigation.

The first section of this chapter describes the definitional issues surrounding the emotional intelligence concept (Section 2.2). This is followed by a discussion on the issues of conceptualization and measurement of emotional intelligence (Section 2.3, 2.4 and 2.5). An outline of the conceptual distinction between the models of emotional intelligence and its measurements is necessary to provide a basis for further development of the conceptual framework of the concept. Section 2.4 also describes the current investigation and methodology adopted in

conducting the bibliometric review, particularly in examining the conceptual model of emotional intelligence preferred by recent researches. Section 2.5 further elaborates the issues on the measurements of emotional intelligence. Under Section 2.6, discussion on the most prominent measure of emotional intelligence (the MSCEIT) and its advantages and drawbacks are presented. Section 2.6 also highlights the background and applicability of the validating measure (the WEIS; Wong Emotional Intelligence Scale) in the context of this study. Finally, Section 2.7 discusses the gaps identified in the review and considers the implications of the findings reached from the literature review. The chapter concludes with the suggestion that findings of the literature review provide a basis for considering the ability-based emotional intelligence model and its measurement.

It is worth highlighting that the scope of this chapter primarily focuses on the issues associated with conceptualization and measurement of emotional intelligence. The following chapter includes the proposed conceptual framework developed for the current study and the formulation of the research questions and its hypotheses.

2.2 Definitional issues of emotional intelligence: Ability or trait? Or both?

The term emotional intelligence is now under criticism as proponents of the concept employ the term to refer to a distinct group of cognitive abilities, whereas, other researchers study it as eclectic traits (Mayer, Salovey, et al., 2008). During the dramatic growth in the study of emotional intelligence throughout the late 90s, the term was used to designate an eclectic collection of traits, and this practice has left the concept in an on-going state of confusion as to what emotional intelligence is and is not, or what emotional intelligence should or should not be (Daus & Ashkanasy, 2003; Gohm, 2004; Mayer, 2006; Mayer, Salovey, et al., 2008). Matthews, Roberts & Zeidner (2004) asserted that some of the attributes like self-esteem, happiness and motivation included in these models do not directly focus on emotion or intelligence or their intersection. Daus & Ashkanasy (2003, p. 69-70) critically argued that “These models, have done more harm than good regarding establishing emotional intelligence as a legitimate, empirical construct with incremental validity potential”.

The main source of criticism on this newly coined construct is the conceptualization of emotional intelligence as there remains an ongoing debate on the multiple definitions and conceptual models that have emerged in the field of emotional intelligence. Thus, it can be inferred that the current emotional intelligence researchers are very concerned with the questionable nature of competing conceptual models, and as to

date there is no mutually agreed single definition of emotional intelligence.

Although the surplus of research has been conducted on emotional intelligence over the past 20 years, many important questions about the theoretical bases of emotional intelligence remain unanswered. The term emotional intelligence has given rise to a diverse number of conceptualizations by a diverse set of interested researchers. Some investigators defined emotional intelligence as an ability to reason out emotions in guiding behaviour and thinking, while others equated the definition with a constellation of emotional self-perceptions such as happiness, self-regard and flexibility. Currently, there are three main conceptual models of emotional intelligence: (1) the ability-based emotional intelligence model; (2) mixed models of emotional intelligence; and (3) trait emotional intelligence. Often, mixed models of emotional intelligence are subsumed under trait emotional intelligence (Martins, Ramalho & Morin, 2010). To sum up, the definitional differences emerge from the models of emotional intelligence which underpin them.

2.2.1 Ability-based emotional intelligence

The first model refers to the ability-based emotional intelligence model, which views emotional intelligence as an ability. This model is proposed by Peter Salovey and John D. Mayer, the pioneers of the emotional

intelligence concept (Salovey & Mayer, 1990). As mentioned earlier, they defined emotional intelligence as “the ability to monitor one’s own and others’ feelings and emotions, to discriminate among them and to use this information to guide one’s thinking and actions” (p. 189). The later definition proposed by Mayer and Salovey (1997) conceptualized emotional intelligence as the ability to deal with emotion perception, emotion understanding, emotion facilitation, and emotion regulation. In summary, the ability model views the overall emotional intelligence as interrelated abilities from four areas: (a) the ability to accurately perceive emotion; (b) the ability to use emotions to facilitate thought; (c) the ability to understand emotion; and (d) the ability to manage or regulate emotion (Mayer & Salovey, 1997; Mayer et al., 2003).

The pioneers of the ability-based emotional intelligence model affirm that emotional intelligence concerns the ability to solve emotional problems particularly the use of emotions in the reasoning process. Mayer and his colleagues conceptualized emotional intelligence within the confines of the standard criteria for a new intelligence that can enrich the discussion of human capabilities (Mayer, Salovey, Caruso & Sitarenios, 2001) and argue that the construct meets the traditional criteria for intelligence. They perceive their model as a “cognitive ability” or “information-processing” approach, and tend to correlate highly with general mental

ability (Mayer, Roberts & Barsade, 2008; Van Rooy & Viswesvaran, 2004).

Analogously, as verbal intelligence deals with the capacity to understand the words and their meaning, or, similarly, spatial intelligence deals with arranging and rotating objects in space, among others, the ability-based emotional intelligence focuses on (a) the capacity to reason with and about emotions and/or (b) the contribution of the emotion systems in enhancing intelligence (Mayer, Salovey, et al., 2008). In such a case, this model reflects the pivotal role of individual mental abilities in emotional intelligence.

2.2.2 Mixed-models emotional intelligence

The second model refers to the mixed model emotional intelligence. This conceptual model conceptualises emotional intelligence as a set of competencies. This model has more recently been dominated by Bar-On's model and Goleman's models. Bar-On (1997) defined emotional intelligence as broad as "an array of non-cognitive capabilities, competencies and skills that influence one's ability to succeed in coping with environmental demands and pressures" (p. 14). This mixed-model of emotional intelligence contains five major dimensions, namely, interpersonal skills, intrapersonal skills, general mood, stress management and adaptability (Bar-On 1997, 2006).

However, recently, Bar-On (2004) re-named his model the “emotional and social intelligence model” (p. 122). Although this model has emotion-related qualities like empathy and emotional self-awareness in its subdomains, it also includes other additional qualities like self-regard, assertiveness, and self-actualization. Thus, the conceptualisation of the model may cause confusion as it reflects emotional intelligence as a set of non-cognitive abilities (Mayer, Salovey & Caruso, 2000a). This mixing of cognitive abilities and non-cognitive abilities has led researchers to call this model the ‘mixed model of emotional intelligence’ (Mayer, Salovey, et al., 2000a).

With emotional intelligence installed in the public mind as a collective group of positive attributes, subsequent approaches continued to expand the concept (Mayer, Salovey, et al., 2008). The second mixed-model of emotional intelligence introduced by Goleman, also includes the mixing up of related and unrelated qualities like trustworthiness, adaptability, innovation, communication and team capabilities as emotional competencies (Goleman, 1998). This model conceptualizes emotional intelligence to encompass the social and emotional competencies that drive leadership and workplace performance (Goleman, 1998). According to Goleman, (1998), this model has four clusters of specific competencies that make up the construct of emotional intelligence: self-

awareness, self-management, social awareness and relationship management.

Recently, Goleman (2006) made a distinction between emotional intelligence and “social intelligence (SI)”. He further proposed that the last two dimensions in the original model could be considered as dimensions of SI and has renamed them as *social awareness* and *social facility*. Thus, similar to Bar-On’s model, this model has also left the public in a state of considerable confusion as it equates diverse attributes, abilities and other irrelevant characteristics to emotional intelligence.

2.2.3 Trait emotional intelligence

The most recent model that emerged in the history of emotional intelligence is known as “trait emotional intelligence” and this conceptual model recognizes emotional intelligence as a personality trait (Petrides & Furnham, 2003). Petrides, Pita and Kokkinaki, (2007) asserted that this model can be considered a second generation model as it includes many of the personal attributes included in the earlier models. The pioneers of trait emotional intelligence conceptualize this model as “a constellation of behavioural dispositions and self-perceptions concerning one’s ability to recognize, process and utilize emotion-laden information” (Petrides & Furnham, 2003, p.278). A later definition of trait emotional

intelligence refers to a constellation of emotional self-perceptions located at the lower levels of personality hierarchies (Petrides et al., 2007). Despite being located at the lower level of the personality hierarchy, trait emotional intelligence has shown incremental validity over the Big Five personality traits and other related constructs in predicting affect-laden criteria (e.g., Petrides et al., 2007; Saklofske, Austin, & Minski, 2003).

As mentioned by Petrides et al., (2007), this model measures six major dimensions: (a) well-being (including happiness, self-confidence and optimism), (b) sociability (assertiveness, social competence and emotion-management of others), (c) self-control (emotion regulation, stress management and low impulsiveness), (d) emotionality (empathy, emotional expression and emotional perception of self and others), (e) motivation, and (f) adaptability. Petrides (2010) proclaimed that these dimensions clearly lie outside the cognitive intelligence taxonomy (Carroll, 1993) and as such, there should be little doubt that this operational definition is antithetical to Salovey and Mayer's, Bar-On's, and Goleman's definitions and instruments of emotional intelligence. The trait emotional intelligence is named as such because a large number of personality traits are amassed and mixed in with a few social and emotional abilities. To this end, the pioneers of trait emotional intelligence have recently renamed their approach as 'trait emotional efficacy' (Petrides, 2010).

2.3 The initial conceptualization of emotional intelligence and related schisms

As mentioned earlier (especially in Section 2.2), the original definition of emotional intelligence was conceptualized as a composite of interrelated mental abilities (Mayer & Salovey, 1990). In its inception, Mayer and Salovey defined emotional intelligence as ‘the ability to monitor one’s own and others’ feelings and emotions, to discriminate among them and to use this information to guide one’s thinking and actions ’ (Salovey & Mayer, 1990, p.189). As the field grew matured, the pioneers of emotional intelligence refined their earlier definition and redefined it as a set of interrelated emotional reasoning abilities, such as the ability to perceive emotions, use emotions to facilitate thought, understand emotions and manage/regulate emotions (Mayer & Salovey, 1997). Thus, the proponents of emotional intelligence initially conceptualized emotional intelligence as a unitary intelligence and argue that that some individuals have better ability to reason about and use emotions effectively to enhance thought compared to others.

However, it is unfortunate that the pioneers of emotional intelligence did not clearly specify its domain based on the traditional definition of intelligence (Mayer, Salovey, et al., 2008). For instance, the general

intelligence is made up of a few domains such as crystallized intelligence, fluid intelligence, abstract reasoning domains and a few more domains. Mayer and his colleagues provided no clarification on the domain of general cognitive intelligence in which emotional intelligence maps onto. This situation has led later researchers and practitioners to gradually mix up the ability conception with other non-ability conceptions and personality traits such as optimism, self-esteem and emotional efficacy as part of emotional intelligence (Cherniss, 2010b; Mayer, Salovey, et al., 2008).

The term 'trait emotional intelligence model' or 'mixed-model of emotional intelligence' are among the schisms of the field. The advent of the mixed-model of emotional intelligence has confounded the ability components of emotional intelligence with non-ability traits. For instance, although Goleman's (1995) idea on emotional intelligence was inspired by the earlier thinking of Mayer and Salovey (1990), he expanded the emotional intelligence construct to encompass competencies such as persistence, self-control, trustworthiness and other positive attributes (Mayer, Salovey, et al., 2008). Conversely, another group of researchers conceptualized emotional intelligence in terms of traits or predispositions of behaviour and thought (Petrides & Furnham, 2003). The later model also deviated from the original concept of emotional intelligence as it encompasses almost all positive characteristics including empathy,

assertiveness as well as elements of social intelligence and personal intelligence.

As can be seen from their domains, the advent of mixed-models and trait emotional intelligence have contributed to the loss of focus on emotional intelligence as it covers both the relevant and irrelevant aspects of the concept, as stated by Locke, (2005), these approaches are “preposterously all-encompassing” (p. 428). Generally speaking, most measures in this approach examine one or more emotional intelligence domains like emotional perception, but then mix it to varying degrees of other domains like self-regard (Bar-On, 1997); relationship management (Goleman, 1998); and social competence and low impulsiveness (Petrides & Furnham, 2001). Mayer, Salovey, et al. (2008) added that virtually these models have little or no justification for why certain traits and qualities are included and others are not, or why certain emotional abilities and others are not, except for an occasional mention that the qualities have been chosen because they are most likely to predict success (e.g., Bar-On 1997).

In summary, the founders of the concept of emotional intelligence argue that it is a kind of ability, particularly the ability to carry out accurate reasoning about emotions and the ability to use emotions and emotional knowledge to enhance thought (Mayer, Roberts, et al., 2008; Mayer &

Salovey, 1993). However, since the introduction of the concept, a schism has developed in the field of emotional intelligence to the effect that the concept has been employed in reference to a great number of traits, personal attributes, and different concepts. In recent years, other researchers have used the term in markedly different ways, mixing the ability aspect of emotional intelligence with personality traits (Landy, 2005; Mayer, Salovey, et al., 2008, Murphy & Sideman, 2006; Zeidner et al., 2004).

2.4 Toward refinement of the construct: Examination of issues on the conceptualization of emotional intelligence

Arising from these three models of emotional intelligence, there appears little consensus on how emotional intelligence should be conceptualized despite having been subjected to nearly two decades of research (Matthews et al., 2004; Matthews et al., 2002; Roberts et al. 2005; Zeidner et al., 2008). Therefore, there is a compelling need to examine the issues on the conceptualisation of emotional intelligence particularly in investigating the empirical support and criticisms of the three emotional intelligence models in refining the construct.

2.4.1 Views pertaining to the ability-based emotional intelligence model

The proponents of ability-based emotional intelligence claim that the primary concern of emotional intelligence has to do with reasoning about emotions and the facilitation of emotion to enhance thought. Mayer, Roberts et al., (2008) refuted the claim made by certain researchers that certain attributes like self-regard and assertiveness should be considered as an element of emotional intelligence, because to some degree it involves both the emotion and intelligence. According to Hilgard, (1980) and LeDoux, (2000), virtually all mental activities potentially involve emotion and intelligence because emotion and intelligence are active throughout most mental processing; that is mental functions are highly interconnected. They further asserted that emotional intelligence is distinct from other mental processes in that it involves a primary focus on a specific area of problem solving.

As an analogy, verbal-comprehension intelligence primarily focuses on the meaning conveyed by language and although someone could argue that, for example, assertiveness is a part of verbal intelligence as asserting oneself often requires words, the argument fails in regard to the criterion of the primary focus (Mayer, Roberts, et al., 2008). This is because assertiveness is not part of the ability to reason verbally, despite it being susceptible to influence by such reasoning. Thus, equating characteristics such as assertiveness with the ability deviates

the focus of intelligence itself (Mayer, Roberts, et al., 2008). Therefore, the scientific study of emotional intelligence should focus on the ability itself.

Recent researches showed that the ability-based emotional intelligence model is superior to the mixed-model or trait emotional intelligence model and researchers envision that if there is a future for emotional intelligence, it would be grounded on the ability model because it aligns itself with the cognitive intelligence theory (Antonakis & Dietz, 2010; Cherniss, 2010b; Jordan, Dasborough, Daus & Ashkanasy, 2010). Furthermore, in responding to the controversies of the conceptualisation of emotional intelligence, Jordan et al. (2010) found that recent publications showed a strong preference for the ability model. They tried to ascertain what authors, especially those who publish in high profile journals, consider to be emotional intelligence. Based on the examination of the term 'emotional intelligence' in citations in Social Sciences Citation Index in 2009, Jordan et al. (2010) found that authors have a strong preference for the ability model with 16 out of 21 articles that conceptualised emotional intelligence from the ability approach⁶.

⁶ ⁶ However, assessment tools vary widely from the MSCEIT, to specific ability test like Situational Test of Emotional Understanding (STEU: MacCann & Roberts, 2008), to self-report measures of ability-based emotional intelligence like the Schutte et al. (1998) SREIT and the Wong and Law (2002) WLEIS.

Furthermore, when they considered top-tier journals published since 1999, all empirical and theoretical works in these journals (10/10) were based on ability-based emotional intelligence (Jordan et al., 2010). Thus, it would appear that most of researchers are in favour of the ability model of emotional intelligence.

Although several researchers argue that Mayer and Salovey's (1997) conceptualisation of emotional intelligence best fits the definition of the emotional intelligence construct (Antonakis & Dietz, 2010; Brackett et al., 2011; Cherniss, 2010a,b, Jordan et al., 2010), the trait emotional intelligence proponents assert that Mayer and Salovey's (1997) definition of emotional intelligence is a dictionary definition and not scientifically derived from construct operationalization (Petrides, 2010). For example, although Salovey and Mayer's (1990) definition of emotional intelligence as "the ability to monitor one's own and others' feelings and emotions, to discriminate among them and to use this information to guide one's thinking and actions" sounds clear and plausible, Petrides (2010) points out that this definition is highly intuitive and suffers from the underlying operationalization and, thus, is of limited scientific utility. Petrides (2010) further asserts that according to normal practice in psychological science, constructs are defined operationally (Bridgman, 1927) rather than by means of dictionary definitions.

Besides lacking construct operationalization, another criticism also points out that the notion of emotional intelligence as an undiscovered cognitive ability has ignored the inherently subjective nature of emotions. Petrides (2010) contends that the objective nature of the ability-based emotional intelligence instrument does not take into consideration the subjective nature of emotions. He further argues that assessment of emotional experience cannot be artificially objectified in order to be made amenable to genuine IQ test.

2.4.2 Views pertaining to the mixed- models of emotional intelligence

In contrast to the ability-based model of emotional intelligence, the mixed-models of emotional intelligence assesses mixed qualities of related and unrelated attributes of emotional intelligence. For instance, both in 1995 and 1998 (Goleman, 1995a; 1998), Goleman described the construct as an array of positive attributes such as self-confidence, adaptability, conscientiousness, and achievement motives among other positive attributes. Several researchers actively critiqued this claim and argued that Goleman's views on emotional intelligence extended beyond the empirical evidence that was available (Davies, Stankov, & Roberts, 1998; Hedlund & Sternberg, 2000; Mayer, 1999; Mayer & Cobb, 2000; Mayer & Salovey, 1997; Mayer, Salovey, et al., 2000a).

Several researchers dispute that mixed-models of emotional intelligence and trait emotional intelligence are disappointing from a theoretical and construct validity standpoint (Mayer, Salovey, et al., 2008) as the definitions are too inclusive to be useful and defined in too many different ways (Cherniss, 2010b; Elfenbein, 2008; Landy, 2005; Locke, 2005; Matthews et al., 2004; Matthews et al., 2012; Murphy, 2006). To sum up, the emergence of mixed-models and trait emotional intelligence deviates from its original concept of human abilities because they define emotional intelligence in a broader sense that includes both abilities and personality traits that facilitate expression of emotional intelligence. It seems that such models merely relabel “an old wine in new wineskins”. In such a case, O’Sullivan, (2007) asserted that to study stable perceptions of emotional functioning as an aspect of personality is definitely legitimate, but the label “trait emotional intelligence” may be misleading, given its connotations of ability.

On the other hand, another emotional intelligence researcher argues that the mixed-model emotional intelligence does not represent the intended intelligence or ability because its score is derived through self-report measure (Petrides, 2010). As pointed out by Petrides (2010), Bar-On’s (1997) model for example is grounded on the problematic assumption that emotional intelligence (or “ability”) can be validly assessed through self-report questions of the type “It is easy for me to understand my

emotions”. Petrides and Furnham (2001) further point out that psychometrically speaking, this way of measuring intelligence is not a viable option because such self-report questions can only map self-perceptions rather than abilities, thereby questioning the validity of this model. Petrides (2010) also contends that Goleman’s (1995a) model also suffers from its reliance on imprecise terminology, anecdotal evidence and empirically unconfirmed claims, which make it difficult to evaluate scientifically. Such shortcomings pose serious questions as to its scientific credibility.

In conclusion, the inclusion of virtually almost all positive qualities in the definition of emotional intelligence merely opens the door to pass off established constructs like personality traits as emotional intelligence (Antonakis & Dietz, 2010). This conceptual confusion tends to undermine its construct validation. According to Matthews et al., (2002) “a test should not be labelled a measure of emotional intelligence when really it is a measure of some, other well-established personality trait or related individual difference variable....If this practice were repeated throughout the scientific community, thousands of new (but redundant) tests would flood the market each year” (p. 45). Hence, it is clear that the primary concern of the mixed-models of emotional intelligence is not the intelligence, emotion or the intersection between the two; rather it is all encompassing of human positive attributes.

2.4.3 Views pertaining to the trait emotional intelligence model

The term 'trait emotional intelligence' contradicts the conceptualization of emotional intelligence as an ability, as it encompasses emotion-related behavioural dispositions and self-perceived abilities, instead of actual emotion-related abilities (Mavroveli, Petrides, Sangareau & Furnham, 2009; Petrides, 2010; Petrides & Furnham, 2003). The proponents of trait emotional intelligence affirm that trait emotional intelligence is the only operational definition in the field of emotional intelligence that recognizes the inherent subjectivity of emotional experience (Petrides, 2010). This claim is made because the pioneers of trait emotional intelligence claim that the trait emotional intelligence facets are personality traits, as opposed to mental abilities. This is supported by research revealing that the same genes that are involved in the development of individual differences in the Big Five personality traits are also involved in the development of individual differences in trait emotional intelligence (Vernon, Villani, Schermer, & Petrides, 2008).

Another recent study conducted by Pérez-González and Sanchez-Ruiz, (2014) also showed that trait emotional intelligence was anchored within the Big Five personality traits framework. Consistent with the previous studies (Petrides, Furnham, & Mavroveli, 2007; Petrides, Vernon, Schermer, Ligthart, Bloomsma, & Veselka, 2010), Pérez-González and

Sanchez-Ruiz, (2014) also found that trait emotional intelligence shared approximately 50% of the variance with the Big Five personality traits. Their findings showed evidence of convergent validity between trait emotional intelligence and personality traits (Pérez-González & Sanchez-Ruiz, 2014), According to these researchers, moderate to high correlations were found between trait emotional intelligence and personality, and among the 15 trait emotional intelligence facets, five showed moderate-to-high loadings on the personality factor, namely Emotion perception (.76), Emotion expression (.71), Social awareness (.57), Interpersonal regulation (.52) and Empathy (.56) (Pérez-González & Sanchez-Ruiz, 2014), Hence, Pérez-González and Sanchez-Ruiz's (2014), findings supported the view that trait emotional intelligence is a broad personality trait integrated within the Big Five personality framework.

2.4.4 Examination of the preference of emotional intelligence model: A bibliometric review

A bibliometric analysis was conducted to investigate the preference of the emotional intelligence model in recent research particularly in academia field. Bibliometric analysis refers to a set of methods to quantitatively analyse academic literature. In this regard, citation analysis is one of the commonly used bibliometric methods (Bellis,

2009). The bibliometric analysis can be conducted through any citation index, such as the Institute for Scientific Information's (ISI) Web of Knowledge database (Bellis, 2009). The ISI Web of Knowledge for example, allows users to search for specific articles published in certain periods of time. The data obtained from the citation indices can be analysed to investigate the popularity and impact of specific articles or authors (Bellis, 2009; Hoang, Kaur, & Menczer 2010).

While other studies conducted a systematic review to summarise the existing evidence on the nature of certain research, this study conducted a bibliometric review due to the present state of emotional intelligence research. The bibliometric review was chosen over the systematic review because the documented literature revealed that the concept of emotional intelligence was employed to reflect a variety of conceptual definitions. The past and present state of evidence showed that the term of emotional intelligence referred to either (1) an ability model, (2) as a behavioural tendency/trait model, or (3) as an amalgamation of both, ability and trait model. Due to different conceptualisations of emotional intelligence, the findings may yield different erroneous conclusions. Thus, the bibliometric review was deemed appropriate in examining the current inclination of the emotional intelligence model.

One way to examine the current direction of an emotional intelligence model is to examine the preference of emotional intelligence models established in recent researches. However, at present, no bibliometric review has been conducted that summarises the preference of the concept of emotional intelligence. On account of this, a bibliometric analysis of published literature is warranted in order to inform the practitioners and researchers about the current state of evidence on this issue. This section critically examines and evaluates current research preference towards the conceptualisation of the emotional intelligence construct.

2.4.4.1 Objectives

The main objective of this narrowly focused bibliometric analysis of the research database is to examine the preference of the conceptual model of emotional intelligence based on recent published literature. The specific question that this review addresses is “What is the main preference of the emotional intelligence model chosen by recent researches?”

2.4.4.2 Search strategy, study selection and review process

A bibliometric analysis was conducted based on the Web of Knowledge database provided by Thomson Reuters. As stated in Section 1.3.1, this database was selected because it provides the largest source of

scholarly research and academic citation indexing. More importantly, it provides bibliographic content and tools to access, analyse, and manage research information (Web of Knowledge, 2013).Researchers agree that papers indexed by Thomson Reuters maintain its research quality as it indexes publication in peer-reviewed journals (Haslam & Kashima, 2010; Isfandyari-Moghaddam, 2012; Nguyen & Pham, 2011; Vinluan, 2012).

Initially in this review process, data was extracted based on the two search parameters: 1) title = 'emotional intelligence' and 2) timespan = year '2012'. Based on these parameters, 266 manuscripts published throughout 2012 with the term "emotional intelligence" as a part of the title were extracted (n = 266). The search strategy was then specified to document type = 'journal article' only. The data then reduced to 186 (n = 186). The extracted data (n = 186) that contains the title of the paper, authors, month and year of publication, title of journal, publisher, keywords, abstract, and several more details were directly transferred to and saved in Microsoft excel format. Figure 2.1 below shows the flowchart on the selection of eligible studies.

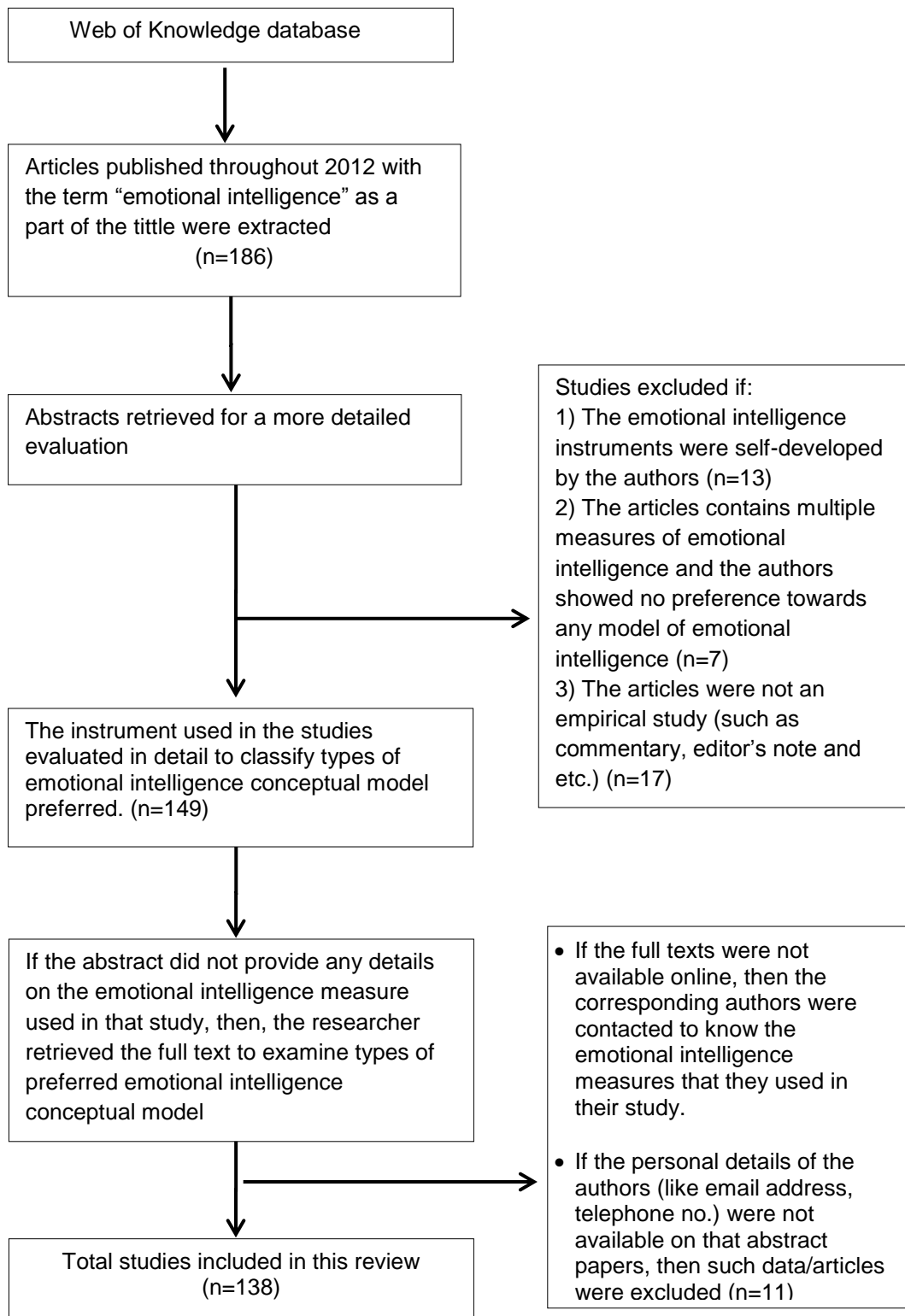


Figure 2.1: Flowchart on the selection of eligible studies

Further, the abstract of these manuscripts were reviewed for the preferred measurement of the emotional intelligence model. The manuscripts were excluded if: (1) The emotional intelligence instruments were self-developed by the authors (n = 13) and/or; (2) The manuscript contains multiple measures of emotional intelligence and the authors showed no preference towards any model of emotional intelligence (n = 7) and/or; (3) The articles were not an empirical study (such as commentary, editor's note and etc.) (n = 17).

In this case, if the abstract did not provide any details on the emotional intelligence measure used in that study, the researcher then retrieved the full text to examine types of emotional intelligence. If the full texts were not available online, then the corresponding authors were contacted to know the emotional intelligence measures that they used in their study. However, if the personal details of the authors (such as email address and/or telephone no.) were not available on that abstract papers, then such data/articles were excluded (n = 11) from the review because no information can be retrieved from these articles. Hence, the number of studies selected for this review were reduced to 138 (n = 138).

2.4.4.3 Results and discussion: Popularity of ability-based emotional intelligence in academic research

Because the extracted data was saved in Excel format, basic descriptive analyses were run to examine the frequency of three emotional intelligence models preferred. Results highlighted that most of the papers published in 2012 were tailored based on ability-based emotional intelligence model (54.3%), followed by mixed-models emotional intelligence (28.3%) and trait emotional intelligence (17.4%). Most of the papers constructed based on the ability-based emotional intelligence model utilized the MSCEIT (n = 30), followed by the WLEIS (n = 22) and the Trait Meta-Mood Scale (TMMS) (n = 13). The findings are summarised in Table 2.1 below. A brief summary of included studies that contains the article's title, author, journal title, month issued, preferred emotional intelligence model and its instrument are given in Appendix A.

Table 2.1: Frequency analysis and percentage on the preference of emotional intelligence model for research articles published in the Web of Knowledge database year 2012

Emotional intelligence model preferred	n	%
1. Ability-based emotional intelligence	75	54.3
2. Mixed-model of emotional intelligence	39	28.3
3. Trait emotional intelligence	24	17.4

2.4.4.4 Limitations of the bibliometric review

One of the limitations of this bibliometric analysis is it is delimited to data solely derived from journal articles to ensure that the findings focus on one specific source. Furthermore, most of the journal articles are available in full format and can be freely retrieved online.

2.4.5 Discussion and conclusion: The future of emotional intelligence is grounded on ability-based emotional intelligence construct

In recent years, majority of academic articles consider the ability-based emotional intelligence model as the “gold standard” in conceptualizing emotional intelligence (Jordan et al., 2010; Walter, Humphrey & Cole, 2012). This is true as the first conceptualisation of emotional intelligence introduced by its chief proponents (Mayer & Salovey, 1997) was defined as an ability to solve emotion-related problem solving, however, later on other investigators have added other aspects of personality and personal preferences that cause it goes astray from its original definition.

Moreover, the proponents of mixed-models emotional intelligence also tend not to refer to their model as emotional intelligence. For instance, Goleman (2006) proposed the model as emotional and social competencies, while Petrides, (2010) recently relabelled their trait emotional intelligence as trait emotional self-efficacy. Furthermore, the results obtained from the bibliometric analyses also showed that most of

the recent academic articles (published in year 2012), were grounded on ability-based emotional intelligence (See Section 2.4.4). In light of the above, future research on emotional intelligence should commit firmly to the ability-based emotional intelligence and its consequences (Antonakis & Dietz, 2010). The researcher also agrees that if there is a future for emotional intelligence, it can be seen from the ability model as it aligns itself with the existing frameworks of intelligence (Mayer, Roberts, et al., 2008; Mayer, Salovey, et al., 2000a).

2.5 Issues surrounding the measurement of emotional intelligence

Although the mutual consensus seems to arrive at the ability-based emotional intelligence, and it is perceived that this model serves as the “gold standard” in defining emotional intelligence (Jordan et al., 2010; Walter et al., 2012), the points of controversy seem to continue when it comes to the measurement models. The debates over the assessment of emotional intelligence have plagued, muddied and overwhelmed the emotional intelligence definition for too long (Cherniss, 2010b; Gignac, 2010; Jordan et al., 2010; Libbrecht & Lievens, 2012; Zeidner, et al., 2008). What is the best measure of emotional intelligence? Is it a performance-based test like an IQ test, a self-report measure, or a multi-rater report?

In general, a considerable part of emotional intelligence research has been devoted to its measurement. Mayer, Salovey & Caruso, (2000b) pointed out that “The development of theoretical models of emotional intelligence has been paralleled by the development of tests to measure the concept” (p. 320). On account of this, all measures of emotional intelligence are classified based on the construct measured (ability model, mixed model or trait model of emotional intelligence) and method employed (self-report or performance-based measure) (Joseph & Newman, 2010b).

2.5.1 Measures of ability-based emotional intelligence

In general, there are three main streams of measures for the ability-based emotional intelligence: (1) performance-based test; (2) self-report measure; and (3) multi-rater report.

2.5.1.1 Performance-based measure

The most well-known measure for the ability-based emotional intelligence is known as performance-based measure. Performance-based test refers to an objective scoring test which assesses the actual performance on particular ability and it is presumed to resemble IQ test (Cohen & Swerdlick, 2005). The most prominent measures for this group are the Multifactor Emotional Intelligence Scale (MEIS; Mayer, Caruso, & Salovey, 1999) and its successor, the Mayer-Salovey-Caruso Emotional

Intelligence Test (MSCEIT; Mayer et al., 2002). The MEIS and its newer version, the MSCEIT are considered the most prominent measures for the ability-based emotional intelligence model (Law et al., 2008). Other measures that fall under this category are the Wong Emotional Intelligence Scale (WEIS; Wong et al., 2004), the Situational Test of Emotional Understanding (STEU), and its counterpart the Situational Test of Emotional Management (STEM) (MacCann & Roberts, 2008).

It is worth highlighting that the MEIS and MSCEIT are scored by marking questions as correct or incorrect based on expert scoring or consensus scoring. For example, one of the Understanding of Emotions tasks (a dimension of the MSCEIT) that gauges the capacity to reason with emotions is: *What feeling, when intensified and coupled with a sense of injustice, is most likely to lead a person to experience anger? (a) frustration (b) guilt (c) melancholy (d) fatigue.* Responses to this item are scored with respect to their degree of correctness, as determined by their correspondence with the answers provided by a group of emotions experts/researchers (expert-scoring method) or a normative sample of the general population (consensus scoring method). The best answer to the sample question above is “(a) frustration” because, intensified, it leads to anger (Mayer et al., 2003). Mayer, Salovey et al., (2008) stress that this scoring approach is somewhat similar to that used for certain subtests of classic intelligence tests such as Comprehension on the

Wechsler Adult Intelligence Scale (Matarazzo, 1972; Wechsler, 1997). Section 2.7 addresses the criticism that has been revolved against these claims.

In contrast to the MEIS and MSCEIT, other performance-based emotional intelligence measures have only one definite objective answer such as the Wong Emotional Intelligence Scale (WEIS; Wong et al., 2004), the Situational Test of Emotional Understanding (STEU), and the Situational Test of Emotional Management (STEM) (MacCann & Roberts, 2008). In STEM for example, an emotional situation is presented for each item that consists of multiple-choice answers. The test-takers are required to select the most effective reaction to manage both the emotions and problems faced in that situation. A typical example of STEM item is (answer with highest score in parentheses): *Alan helps Trudy, a peer he works with occasionally, with a difficult task. Trudy complains that Alan's work isn't very good, and Alan responds that Trudy should be grateful he is doing her a favor. They argue. What action would be the most effective for Alan? (a) Apologize to Trudy, (b) Stop helping Trudy and don't help her again, (c) Try harder to help appropriately, [(d) Diffuse the argument by asking for advice].* The correct answer is scored according to expert mean ratings (MacCann & Roberts, 2008).

However, the scoring of performance-based ability-based emotional intelligence received tremendous criticism over its scoring method as it is difficult to know whether the answer to a test item is right or wrong when dealing with the subjective nature of emotion. For instance, emotion researchers (Spain, Eaton, & Funder, 2000; Watson, 2000) assert that tests of emotional intelligence cannot be objectively scored due to inherent subjectivity of emotional experience. Contrary to other traditional intelligence tests that have only one correct answer for each question, there are no clear-cut criteria for what constitutes a correct response for emotional intelligence tests (Matthews et al., 2006).

2.5.1.2 Self-report measure

The second method in assessing ability-based emotional intelligence is the self-report measure. In this measure, the respondents are asked to rate their own ability based on given items (Wong & Law, 2002). This group includes the following ability-based emotional intelligence measures: Wong & Law Emotional Intelligence Scale (WLEIS; Wong & Law emotional Intelligence Scale, 2002), Emotional Intelligence Scale (EIS, Schutte et al., 1998) and Workgroup Emotional Intelligence Profile (WEIP; Jordan, Ashkanasy, Hartel & Hooper, 2002). Unlike performance-based test, self-report measures ask the participant's judgments on a series of descriptive statements, such as "I am sensitive to the feelings and emotions of others" (Wong & Law, 2002).

Notwithstanding, empirical researches on the psychometric properties of self-report measures of emotional intelligence have accumulated during the last decade, and it was found that faking on self-report emotional intelligence was not uncommon (Brackett et al., 2006; Tett, Freund, Christiansen, Fox & Coaster, 2012). Another limitation is that people tend to overestimate their own abilities especially when those abilities are highly desirable (Cherniss, 2010b). Nonetheless, another researcher in the emotional field agrees that self-reports must be given priority over the objective measures in the study of affect and emotion due to the subjective nature of emotions (Watson, 2000).

2.5.1.3 Multi-rater report

In addition, multi-rater report or “360” degree assessment is also available in assessing the individual’s emotional intelligence (Gignac, 2010). This alternative measure requires others to rate the person rather than rely on the person’s own self evaluations. Among the multi-rater measures that comply to the ability-based emotional intelligence model available in the market are the Genos Emotional Intelligence Inventory (Genos EI; Gignac, 2008) and the WLEIS (Law et al., 2004). The Genos emotional intelligence was formerly known as the Swinburne University Emotional Intelligence Test (or SUEIT), but the name changed to Genos emotional intelligence after revision of the measure (Gignac, 2010).

Among the normal practices of the multi-rater assessment is that it asks the informant to judge a focal person on the items in the self-reported scale (e.g., “It is difficult for X to control his/her anger”) (Law et al., 2008; Law et al., 2004). Although some people believe that ratings by others can be subject to bias, a “360” degree assessment can balance this bias by asking several people in different roles (like peers, subordinates, boss, supervisors and customers) to rate the person (Gardner & Stough, 2002).

One of the limitations in administering this alternative measure is that it is more expensive than either performance tests or self-report inventories. Furthermore, the interpretation of the scores also can be more complex as its results can be distorted by the politics of the social settings in which it occurs. Cherniss (2010b) contends that this may be one reason why there is less published research at this time on the psychometric properties of the leading multirater instruments. In another occasion, Wong & Peng (2012) argued that if emotional intelligence is believed as a kind of human ability, a definitive measure should be a true performance test rather than a subjective assessment by oneself or others.

2.5.2 Measures of mixed-models emotional intelligence

The measurement for mixed-models emotional intelligence tends to be associated with self-report measures. Among the well-known mixed-models emotional intelligence tests are the Emotional Competence Inventory (ECI; Boyatzis, Goleman & Hay/McBer, 1999), the Emotional Quotient Inventory (EQ-i; Bar-On, 1997), the Dulewicz & Higgs Emotional Intelligence Questionnaire (DHEIQ; Dulewicz & Higgs, 2001; Higgs & Dulewicz, 1999). An example of the ECI item that assesses an individual's perceived self-emotional competence is "I Act appropriately even in emotionally charged situations" (Smithfield, 2008).

Besides self-report, multi-rater reports of mixed-models emotional intelligence are also available in academic and professional arena. The Emotional Quotient Inventory (EQ-i; Bar-On, 1997), the Emotional Competence Inventory (ECI; Boyatzis et al., 1999) and the Group Emotional Competence (GEC; Wolff, 2006) are among the multi-rater tests that are based on the conceptualisation of mixed-models emotional intelligence. Generally, the item for multi-rater assessment is similar to its self-report assessment but is developed as a third party evaluation. For instance, in ECI multi-rater evaluation, each item is progressively scored from '... the behaviour is never shown' to the highest response indicating '... the behaviour is consistently shown by the individual'. A typical example of multi-rater item for self-awareness dimension of ECI

is "...Has a sense of humour about himself/herself" (Batista-Foguet, Boyatzis, Guillén, & Serlavós, 2008).

2.5.3 Measures of trait emotional intelligence

The *Trait Emotional Intelligence Questionnaires* (TEIQue; Petrides, & Furnham (2003) is the only scientific measurement instrument based exclusively on trait emotional intelligence theory. The TEIQue is available in both formats, self-report (Petrides, 2009b) and other-raters report (Petrides, Niven, & Mouskounti, 2006).

Similar to almost all measures of the mixed-models emotional intelligence, the trait emotional intelligence measure is also provided in both versions, namely the self-report and multi-rater report. The self-report trait emotional intelligence is assessed using the Trait Emotional Intelligence Questionnaire (TEIQue; Petrides & Furnham, 2003), meanwhile, the informant report of trait emotional intelligence is gauged using the Trait Emotional Intelligence Questionnaire - 360° (TEIQue - 360°; Petrides et al., 2006). Examples of items from TEIQue are "I often find it difficult to recognize what emotion I'm feeling" and "When someone offends me, I'm usually able to remain calm (Petrides & Furnham, 2003). On the other hand, a typical example for TEIQue - 360° is "[the participant] is capable of controlling his/her emotions" (Petrides et al., 2006).

2.6 The dominant performance-based measures for the ability-based emotional intelligence

As described earlier in Section 2.6, only a few performance-based measures of emotional intelligence are currently available. Among them are the Mayer-Salovey-Caruso Emotional Intelligence Test (MSCEIT; Mayer, Salovey & Caruso, (2002), Wong Emotional Intelligence Scale (WEIS; Wong et al., 2004), the Situational Test of Emotional Understanding (STEU), and the Situational Test of Emotional Management (STEM) (MacCann & Roberts, 2008). The norm of the MSCEIT has been derived from the American population (Brackett et al., 2011; Mayer et al., 2003; Mayer, Salovey, et al., 2008). Meanwhile, the WEIS has been empirically tested in Hong Kong (Wong et al., 2004), Taiwan (Wong, Wong & Law, 2007) and China (Wong et al., 2007), and the STEU and STEM has been validated on Australian population (MacCann & Roberts, 2008). Both the MSCEIT and WEIS capture all the four dimensions of emotional intelligence. In contrast, the STEU and STEM only capture the dimension of emotional understanding and emotional management respectively.

2.6.1 The MSCEIT: The most prominent measure of ability-based emotional intelligence

The Mayer-Salovey-Caruso Emotional Intelligence Test (MSCEIT; Mayer et al. 2002) is considered as the most prominent (Fiori & Antonakis, 2011; Parker et al., 2011) and comprehensive emotional intelligence test as it covers all aspects of emotion-related abilities including perception of emotion, use of emotion to facilitate thinking, understanding of emotion and regulation of emotion (Brackett et al., 2011). At the same time, although the popularity of emotional intelligence has caused fluctuating measures of emotional intelligence in the academic arena, the MSCEIT is considered the most widely used performance-based emotional intelligence test not only for psychologically-healthy people population (Libbrecht & Lievens, 2012), but also for psychologically-ill people population (Dawson, Kettler, Burton & Galletly, 2012; Lin, Wynn, Hellemann & Green, 2012; Tabak, Green, Wynn, Proudfit, Altshuler, & Horan, 2015).

Cherniss (2010b) argues that the MSCEIT seems to have the strongest support for its content validity above all other major emotional intelligence measures. The derivation of norms and the validity of this test have been tested empirically on the US population (Brackett et al., 2011; Mayer et al., 2003; Mayer, Salovey, et al., 2008). Notwithstanding being considered a comprehensive and widely used measure of

emotional intelligence, it is criticised mainly due to the “problem of the correct answer” mainly the scoring methods (MacCann & Roberts, 2008; MacCann, Roberts, Matthews & Zeidner, 2004; Maul, 2012b).

The MSCEIT has two different scoring methods, namely, consensus scoring and expert scoring. For consensus scoring, the correct answer is based on the choices made by the majority of those taking the test. The norms for consensus scoring were determined on the basis of response patterns from a sample (over 5000 people) from North America (Brackett et al., 2011; Mayer et al., 2003; Mayer, Salovey, et al., 2008). In contrast, in the second type of scoring the correct answer is determined by a group of emotion researchers. The expert norms scoring were obtained from 21 volunteer members of the International Society for Research on Emotion (ISRE) at their conference in 2000. However, these two scoring methods are almost perfectly correlated ($r = .91$) (Mayer et al., 2003).

Nevertheless, concerns about scoring are on-going. One might argue that if the emotional intelligence test is developed as an ability test, then it must have one objective answer, just like an IQ test (Wong & Peng, 2012). On the other hand, Maul (2012) suggests that the support for the adequacy of the scoring system does not seem sufficient. He has addressed his concern that if the answers are determined by the

consensus scoring, then this method allowed emotional intelligence theorists to bypass the valuable process of attempting to clearly eloquent how variation in emotional intelligence leads to variation in specific item responses. Murphy (2006) also disagreed with this scoring method and expressed “it is unclear whether a person who thinks about the emotional domain differently from experts or from the average of several peers is low on that ability or whether that person simply has a new (and perhaps better) way of thinking.” (p. 348).

However, pioneers of the MSCEIT defend that the scoring system is adequate as there is convergence between the expert group and the general sample as to the correct answers (Mayer et al., 2012). They argue that emotional information is a domain best modelled by fuzzy logic (or probabilistic computation). In this case, multiple conditions and more than one correct answer is possible. For instance, a statement that a person “is angry” can indicate a range of possible levels of anger depending upon the context, as well as possibility of different outcomes to such anger, such as to let the anger pass, to express it, or to reframe it. As a result, answers to emotional problems often involve a lack of certainty, and are dependent on the density of that emotion (“how much anger?”). In such an example, consensus across a group of people who have everyday language skills and who all experience emotions may be congruent to expert opinion (Mayer et al., 2012).

2.6.2 The WEIS as an alternative to the MSCEIT in Asian context:

Background of the measure

The Wong Emotional Intelligence Scale (WEIS; Wong et al., 2004) is a performance-based emotional intelligence test constructed based on the ability-based emotional intelligence model. This test is originally developed in Hong Kong and had been empirically tested on the Chinese population in Hong Kong (Wong et al., 2004), Taiwan (Wong, Wong & Law, 2007) and the Republic of China (Wong et al., 2007). The documented literature shows that no other validation studies conducted on other than Chinese population and other than these three countries. In general, the nature of WEIS is similar to the MSCEIT as both measures are grounded on ability-based emotional intelligence and developed through a performance-based test (i.e. multiple-choice questions) with objective scoring.

Although the MSCEIT is considered the most comprehensive performance-based test and is widely used in ability-based emotional intelligence researches (Brackett et al., 2011; Parker et al, 2011), this instrument may not be useful in the Asian context, particularly for Malaysia. The main reason is that cultural differences may influence scoring outcomes. Emotional expression can be perceived differently by different cultures. Cultural norms may affect the choice of right answers

in performance-based emotional intelligence test (Wong et al., 2004). For instance, the power distance between superior and subordinates in most Asian countries are larger than those of the United States (Hofstede, 1991). In this case, Asians accept and prefer a greater gap in power between superior and subordinates (Hofstede, 1991). Another typical example is Asians, particularly Malaysians who are trained to suppress their emotions especially when they are in public, while Westerners are taught to express their emotions (Wong et al., 2004). Thus, a non-reactive quiet response when one is scolded by his/her boss can be considered as a high emotional intelligence response in Malaysian culture, but possibly not in Western cultures. Accordingly, performance-based emotional intelligence tests developed in the West may not be applicable in Asian contexts.

In general, the present study sought to assess the construct validity of emotional intelligence, particularly the test measured by the WEIS. The WEIS has been selected over the MSCEIT because the MSCEIT has been developed in the West, and may not be practical in the Asian context due to cultural differences (Hofstede, 1991). The STEU and STEM on the other hand, were less preferable as they captured only two dimensions of emotional intelligence, namely emotional understanding and emotional management. Because the present study was conducted in the Malaysian context, the selection of the WEIS was deemed

appropriate as the test is purportedly developed to gauge the emotional intelligence of Asians. Furthermore, the test captures all the four dimensions of emotional intelligence, particularly self-emotional appraisal, other's emotional appraisal, regulation of emotion, and use of emotion to facilitate performance.

2.7 Research gaps and the remaining issues identified in the review

This review of the literature has a number of practical implications for future research and evaluation. First, it shows that ability-based emotional intelligence is in line with the cognitive intelligence framework and thus could be considered as the most superior conceptual model of emotional intelligence (Antonakis & Dietz, 2010; Cherniss, 2010b; Jordan, et al., 2010). Second, considering the meaningfulness of the test score derives from various type of emotional intelligence measures (performance-based test, self-report measure, multi-rater reports), the use of performance-based test could be more meaningful as it tallies with the conceptualization of emotional intelligence as a kind of cognitive ability (Mayer et al., 2003; Mayer, Roberts, et al., 2008). Third, although the literature shows that the Mayer-Salovey-Caruso Emotional Intelligence Test is considered as the most widely used performance-based test, it suffers in terms of scoring (MacCann & Roberts, 2008;

MacCann et al., 2004; Maul, 2012b) and applicability to the Malaysian context.

This literature review has also identified a few specific gaps in the existing psychometric issues of emotional intelligence research. It was found that there were still unresolved issues on the psychometric properties of the WEIS. Further, it revealed that this measure has been validated on the Chinese population in Hong Kong, Taiwan and the Republic of China and not yet in Malaysia or its neighbouring South East Asian counterparts. On another account, as the researcher sought to examine the validity and applicability of the WEIS in the Malaysian context, the gaps identified in this literature has guided the present work to formulate several research questions on the convergent validity, discriminant validity and the incremental validity of the emotional intelligence test as well as the examination of its place in the 'intelligence' taxonomy.

In terms of convergent validity, only two empirical researches investigated the convergent validity of the WEIS with cognitive intelligence. However, these studies utilised the Hong Kong Certificate Education Examination (HKCEE) as a proxy of cognitive intelligence (Wong et al., 2004; Wong et al., 2011) and it was reported that no published studies reported the relationship between the results of the

HKCEE and cognitive intelligence (Wong et al., 2004). In light of this, the current study attempts to replicate such validation study by (1) utilising an empirically valid and reliable IQ test to assess cognitive intelligence and (2) expanding the research by assessing the convergent validity of emotional intelligence with the existing major factors of intelligence that are fluid intelligence and crystallized intelligence.

In relation to the discriminant validity, two studies measured the discriminant validity between the WEIS and personality. These studies only captured the discriminant validity between the composite score of emotional intelligence and personality traits (Wong et al., 2004; Wong, Wong & Law, 2007). A study which is able to assess the discriminant validity between each of the emotional intelligence dimensions (SEA, OEA, RE and UE) and personality traits would be more meaningful as each of it may have different roles on each personality factor.

With regard to the incremental validity, the documented literature shows that the WEIS has been examined its incremental validity over the cognitive intelligence and personality in explaining life satisfaction (Wong et al., 2004), job performance (Wong et al., 2007), job satisfaction (Wong et al., 2004) and organisational commitment (Wong et al., 2007), but not yet on leadership skills and interpersonal relationships skills. In addition, the inclusion of trait emotional intelligence as a predictor together with

ability-based emotional intelligence, cognitive intelligence and personality may enlighten the issue of the incremental validity of ability-based emotional intelligence in explaining leadership and interpersonal relationships.

Finally, an issue also remains in accessing the place of emotional intelligence in the general intelligence taxonomy particularly in reference to fluid intelligence (gf) and crystallized intelligence (gc). A research has examined to validate the location of emotional intelligence within the structure of cognitive intelligence, and its relation to the fluid intelligence and crystallized intelligence factors (MacCann, 2010). This research chose emotional understanding and emotion management dimensions to represent emotional intelligence construct. Therefore, a study should be conducted to bridge this gap by replicating the study using an emotional intelligence test that covers all dimensions of emotional intelligence construct particularly the (1) appraisal/understanding of emotion in one's self; (2) appraisal/understanding of emotion in others; (3) regulation of emotion; and (4) use of emotion within the framework of cognitive intelligence theory.

2.8 Chapter summary and conclusion

A large portion of this chapter consists of a review of the relevant literature that has determined and guided the trajectory of this research. This literature review has yielded several important points that enhance our understanding on the multiple concepts of the emotional intelligence construct and clarify the cardinal questions that remain unanswered on the measurement issues of emotional intelligence. These findings were supported with the bibliometric analysis of the preferred conceptual model of emotional intelligence favoured by recent researches.

The conceptualisation of emotional intelligence as an ability and the use of performance-based tests to fit the cognitive intelligence framework has been amply demonstrated. Additionally, although the Mayer-Salovey-Caruso Emotional Intelligence Test (MSCEIT) is the most widely used and comprehensive measure of emotional intelligence, its applicability to the Malaysian context should be considered. Against this background, the Wong Emotional Intelligence Scale (WEIS) is an alternative to the MSCEIT, especially for the Malaysian context. However, the validity of the WEIS should be ensured prior to its application to another context.

Addressing these gaps calls for the validation of the emotional intelligence construct by; (1) examining the convergent validity of emotional intelligence with well-established cognitive intelligence tests,

(2) assessing the discriminant validity of emotional intelligence with the personality traits, particularly to examine the relationship between each emotional intelligence dimension and personality factors, (3) investigating the incremental validity of emotional intelligence to other related outcomes in different settings, and (4) validating the place of emotional intelligence in the existing factors of the intelligence taxonomy. Such considerations lead to a better understanding of the nature and implications of emotional intelligence. The following chapter discusses the development of the conceptual framework.

CHAPTER 3 – CONCEPTUAL FRAMEWORK

3.1 Chapter overview

Moving forward from the previous chapters that have provided an overview of the motivating factors for examining the psychometric properties and validity of emotional intelligence measures, this chapter proceeds with a discussion of the conceptual foundation for the current study. Section 3.2 briefly describes the need to conduct a validation study in order to establish a valid emotional intelligence construct. As the issues on the conceptualisation of emotional intelligence construct remain a debate, the first section (Section 3.3) discusses the proposed conceptual framework of emotional intelligence by offering an overview of the concept of emotional intelligence and its proposed relationship with other established related constructs such as cognitive intelligence, personality, leadership and positive interpersonal relationships. The inclusion of these related variables provides a basis in proposing the conceptual framework of the emotional intelligence construct and its associated outcomes. Section 3.4 summarises the proposed conceptual framework. Section 3.5 outlines the seven research questions of the thesis and their respective tentative hypotheses. The chapter concludes with the observation that refinement of the emotional intelligence construct could potentially address the main gaps in the literature.

3.2 Establishing a valid emotional intelligence concept: A need for a validation study

Based on the literature reviewed in the first two chapters, it can be concluded that there is a need to conduct a validation study in order to establish a valid emotional intelligence construct. Therefore, the main objective of this study is to measure the interrelationships between emotional intelligence and its related study variables. Establishing a valid emotional intelligence concept is important in order to justify its robustness and utility, and to advance the concept of ability-based emotional intelligence as a cornerstone of emotional intelligence research. The first chapter of this thesis highlighted that emotional intelligence construct requires various forms of validity evidence. As discussed earlier in Sections 1.4.2 and 1.4.3, the lack of evidence on the construct validity of emotional intelligence includes the factorial validity, convergent validity, discriminant validity and incremental validity⁷ (Nunnally & Bernstein, 1994).

In order to confirm the factor structure of emotional intelligence construct, its factorial validity will be examined. In general, factorial validity assesses

⁷ See Section 1.4.2 and 1.4.3 for the explanation on construct validity

the stability of the four-factor structure of emotional intelligence. In responding to the issue that emotional intelligence overlaps with other psychological constructs, the convergent and discriminant validity of emotional intelligence will be established. With regards to the interrelatedness of emotional intelligence and cognitive intelligence, convergent validity between these intelligences will be measured. Discriminant validity between emotional intelligence and personality will further be investigated to measure the distinctiveness of emotional intelligence from personality.

Finally, the incremental validity of emotional intelligence will be measured to assess the usefulness of the emotional intelligence construct in predicting relevant criterion variables. Leadership and interpersonal relationships were chosen as criterion variables as past studies indicated that emotional management plays an important role in effective leadership (Brackett et al., 2011; George, 2000) and interpersonal relations (Kerr et al., 2006; Mayer, Caruso, et al., 2000). See discussion on Section 3.3.5 for the relationship between emotional intelligence and these outcome variables. To examine this incremental validity, trait emotional intelligence will also be included in the model to show the incremental variance of ability-based emotional intelligence over the trait emotional intelligence in explaining the criterion variables.

3.3 Proposed conceptual framework of emotional intelligence

3.3.1 The concept of emotional intelligence: Emotional intelligence as an ability

In general, it is difficult to obtain a satisfactory justification or conceptual framework for the construct of emotional intelligence, because the concept of emotional intelligence remains subject to ongoing debate (Zeidner et al., 2008). However, recent researches showed that the ability model of emotional intelligence is superior to the mixed-model or trait emotional intelligence. Many researchers opine that if there is a future for emotional intelligence, it is based on the ability model (Antonakis & Dietz, 2010; Cherniss, 2010b; Jordan et al., 2010). This is a solid standpoint as the appropriateness and justification, claimed by the proponents of ability-based emotional intelligence contend that emotional intelligence should be conceptualized as a kind of human ability rather than eclectic traits of behavioural dispositions. This is because the ability-based emotional intelligence aligns itself with the traditional intelligence framework.

3.3.2 The dimensional structure of emotional intelligence

As stated in Section 2.3, the original definition of emotional intelligence was conceptualized as a set of interrelated abilities; ability to deal with emotion perception, emotion understanding, emotion facilitation, and emotion regulation (Mayer & Salovey, 1997; Salovey & Mayer, 1990).

Some researchers include the ability to understand others' emotions as one of the dimensions of emotional intelligence. For example, Wong & Law (2002) conceptualized emotional intelligence as interrelated abilities that consist of four dimensions: self-emotional appraisal, others' emotional appraisal, regulation of emotion, and use of emotion to facilitate performance (Wong & Law, 2002).

Since its emergence, emotional intelligence has been defined in various ways by researchers, but, Ciarrochi, Chan and Caputi (2000) argued that these definitions and uses "tend to be complementary rather than contradictory". Joseph and Newman (2010b) used Mayer and Salovey's (1997) definition of ability-based emotional intelligence in their analyses, but included only three of their four dimensions, namely emotion perception, emotion understanding, and emotion regulation. The dimension of emotion facilitation and other dimensions that may be captured by emotional intelligence measures other than the MSCEIT (Mayer et al., 2003) were not included in their analysis. In short, according to Wong & Peng (2012), although the exact dimensions are not the same among researchers, the differences are minimal.

As this study seeks to investigate the applicability of the Wong Emotional Intelligence Scale (WEIS; Wong & Law, 2004), the dimensions of emotional intelligence proposed by Wong and Law (2004) are observed.

Wong & Law (2004) adopted the integrated four-dimensional definition of emotional intelligence proposed by Davies et al., (1998) that was developed based on the definition of Mayer and Salovey (1997). Wong and Law (2004) chose this definition of emotional intelligence because it was proposed by Davies et al., (1998) after their comprehensive review and synthesis of the emotional intelligence literature. However, Davies et al., (1998) never developed their own emotional intelligence scale.

The four emotional intelligence dimensions that were outlined in the WEIS are:

(1) Appraisal and expression of emotion in one's self, which relates to an individual's ability to understand his/her deep emotions and to be able to express emotions naturally. People who have good ability in this area will sense and acknowledge their emotions better than others.

(2) Appraisal and recognition of emotion in others, which relates to an individual's ability to perceive and understand the emotions of the people around them. People who rate highly in this ability are very sensitive to the emotions of others as well as able to predict others' emotional responses.

(3) Regulation of emotion in one's self, which relates to the ability of a person to regulate his/her emotions, enabling a more rapid recovery from psychological distress. A person with high ability in this area would be able to return quickly to normal psychological states after rejoicing or being

upset. Such a person would also have better control of his/her emotions and would be less likely to lose his/her temper.

(4) Use of emotion to facilitate performance, which relates to the ability of a person to make use of emotions by directing them towards constructive activities and personal performance. A person who is competent in this emotional intelligence dimension would be able to encourage him/herself to do better continuously and to direct his/her emotions in positive and productive directions.

In addition, emotional intelligence is conceptualized as an innate ability, and as such must be viewed as a set of interrelated mental abilities that should demonstrate convergent validity with any cognitive intelligence test. As a kind of mental ability, it must be distinct from personality traits as personality refers to human preferences or dispositions to behave in certain ways. It does not reflect a component of intelligence. Thus, the emotional intelligence construct should demonstrate discriminant validity from the personality construct. In conclusion, the conceptualisation of emotional intelligence as a kind of cognitive ability should be correlated with IQ but different from personality.

3.3.3 Emotional intelligence and cognitive intelligence

3.3.3.1 Emotional intelligence involves cognitive process: Mayer and Salovey's perspective on the emotional intelligence concept

The pioneers of emotional intelligence argue that emotional intelligence is a kind of ability resembling other standard forms of intelligence (Mayer, Roberts, et al., 2008; Mayer & Salovey, 1997; Salovey and Mayer, 1990). This idea is derived from their definition of emotional intelligence as “the ability to monitor one’s own and others’ feelings and emotions, to discriminate among them and to use this information to guide one’s thinking and actions” (p. 189) (Salovey & Mayer, 1990). Mayer and Salovey (1997) argue that some individuals possess the ability to carry out sophisticated information processing of emotions to reason about and to use emotions as a guide to thinking and behaviour more effectively than others. They assert that the construct meets the traditional criteria for cognitive intelligence theory because all four dimensions (also referred to as “branches”) of emotional intelligence are comprised of four interrelated abilities that involve reasoning and processing emotion-related information.

The four dimensions of emotional intelligence are believed to resemble other standard forms of intelligence (Mayer, Roberts, et al., 2008; Mayer & Salovey, 1997; Mayer, Salovey, et al., 2008; Salovey & Mayer, 1990). In the first dimension, the ‘perception of emotion’ refers to the ability to identify and differentiate emotions in the self and others. Ability in this area

includes the ability to identify emotions precisely in physical states (including bodily expressions) and thoughts. In the second dimension, the 'use of emotion to facilitate thinking' includes the ability to harness emotions to facilitate cognitive processes such as problem solving, reasoning and interpersonal communication. The 'use of emotion' ability involves the ability to use emotions to prioritize thinking by directing attention to important information about other people or the environment.

The third dimension that refers to the 'understanding of emotions' covers a range of abilities such as comprehension of the language of emotions and understanding the antecedents of emotions. A basic ability for this dimension includes skill in labelling emotions accurately through language, as well as recognizing similarities and differences between emotion labels and emotions themselves. Finally, the last dimension, 'regulation of emotion', refers to the ability to modify or manage an emotional response in oneself and others, as well as the ability to manage a range of emotions while making decisions about the appropriateness or usefulness of an emotion in a given situation. The foundation of this dimension involves attending to and staying open to various feelings (Mayer, Roberts, et al., 2008; Mayer & Salovey, 1997; Mayer, Salovey, et al., 2008). In light of the above abilities, it is apparent that the Mayer and Salovey (1997) ability model of emotional intelligence involves cognitive process, particularly ability to perceive, understand, regulate and use of emotion to facilitate

effective thinking and action. It is observed that these four related abilities are comprehensive enough to explain the underlying factors of emotional intelligence construct.

3.3.3.2 Emotional intelligence and the Cattell-Horn and Carroll (CHC) model of cognitive intelligence

3.3.3.2a Overview of the CHC model of cognitive intelligence and its major domains: Fluid intelligence and crystallized intelligence domains

The history of the Cattell-Horn and Carroll (CHC) model of cognitive intelligence can be traced to the emergence of the concept of g (general intelligence) and its expansion to gf (fluid intelligence) and gc (crystallized intelligence). The concept of general intelligence (g) was formally coined by Charles Spearman, an English psychologist who argues that scores on all cognitive ability tests are positively correlated and this idea is known as the “positive manifold” nature of intelligence (Spearman, 1904). The “positive manifold” nature of intelligence taxonomy requires all intelligence factors to be positively intercorrelated to represent the general cognitive intelligence (Carroll, 1993; Spearman, 1904). Later, Raymond B. Cattell, Spearman’s student, expanded the concept of general intelligence ‘g’ by splitting it into two discrete factors, namely crystallized intelligence (gc) and fluid intelligence (gf) (Cattell, 1943, 1963). These two abilities work together to produce overall individual intelligence, and is known as the

Cattell-Horn *Gf- Gc* intelligence model. Crystallized intelligence (*gc*: acquired acculturated knowledge) assesses an individual's breadth and depth of general knowledge and knowledge of a culture such as verbal communication (Cattell, 1943, 1963; Flanagan & McGrew, 1998). Vocabulary tests and reading comprehension tests are considered good measures of *gc*. On the other hand, fluid intelligence (*gf*: innate reasoning ability) requires the ability to think logically, reason, form concepts and solve logical problems in novel situations like solving puzzles, mental arithmetic and any technical problems (Cattell, 1943, 1963, 1987).

Compared to other contemporary multidimensional ability models of intelligence, the *Gf-Gc* model is based on a more thorough network of validity evidence. In a review and comparison of *Gf-Gc* theory, Gardner's Theory of Multiple Intelligences and Sternberg's Triarchic Theory of intelligence, Messick (1992) criticized the latter two theories for their selective attention to certain forms of validity evidence. In his review, Messick inferred that *Gf-Gc* theory had the strongest network of validity evidence compared to other contemporary multiple human cognitive ability theories, and that multiple intelligence theories of Gardner and Sternberg should be evaluated through the *gf – gc* theoretical framework. At the same time, Carroll (1993) stated that the Cattell-Horn *Gf- Gc* model "appears to offer the most well- founded and reasonable approach to an acceptable theory of the structure of cognitive abilities" (Carroll, 1993, p.

62). Several prominent intelligence researchers also stated that models based on *Gf-Gc* theory (i.e., the Cattell-Horn and Carroll models) appear to provide useful frameworks for developing and evaluating intelligence tests (Carroll, 1997; Flanagan & McGrew, 1995, 1997; McGrew, 2009; Woodcock, 1990).

Within several years of existence, the Cattell-Horn *Gf-Gc* dichotomy was expanded with the identification of a few additional abilities. Over time, additional factors (like Visual Intelligence (*Gv*), Short-Term Acquisition and Retrieval (SAR or *Gsm*), Auditory Intelligence (*Ga*) etc.) were added to the model which now contained a total of 9 broad factors (Horn, 1985, 1991; Horn & Noll, 1997; McGrew, 2005). Although the theory continued to be called the 'extended *Gf-Gc* theory', the 9 broad abilities were treated as equal, and not part of any hierarchical structure (McGrew, 2009). In the 1990s, while Horn expanded his research on the factors of intelligence, Carroll (1993, 1997), another cognitive intelligence theorist, conducted an in-depth, comprehensive survey of factor-analytic studies on the factors of intelligence and identified factors similar to those in Cattell-Horn's model with fluid intelligence and crystallized intelligence as major factors of intelligence.

Based on these early researches on human cognitive intelligence, the "Cattell-Horn-Carroll" (CHC) theory of cognitive intelligence emerged in

1999 as a result of an amalgamation of Cattell-Horn's (Cattell, 1941; Horn, 1965) extended Gf-Gc theory and Carroll's (1993) three-stratum model of intelligence (as cited in Flanagan, McGrew & Ortiz, 2000). The most salient difference between the Cattell-Horn and Carroll's model is the level of stratum; while Cattell-Horn model has only two strata, Carroll's model has 3 strata or levels of abilities. For Cattell-Horn, stratum II refers to the 'broad abilities' (i.e. fluid intelligence, crystallized intelligence, visual intelligence, auditory intelligence, cognitive processing speed intelligence, etc) that are positively intercorrelated. Stratum I refers to the 'narrow abilities' composed of about 70 fairly specific abilities associated with each of the broad ability (Horn & Noll, 1997).

Conversely, Carroll's stratum I and stratum II are also similar to the Cattell-Horn model, but includes a stratum III ability, which is a higher-order general intelligence factor ('g' factor) (1993, 2003). In the CHC model of cognitive abilities, the general intelligence factor (g) is positioned at the apex of the hierarchy of the three-stratum model: stratum I (narrow abilities), stratum II (broad abilities) and stratum III (general intelligence) (Schneider & McGrew, 2012). The Cattell-Horn-Carroll (CHC) model of cognitive intelligence taxonomy is considered the most comprehensive and empirically supported framework available for understanding the structure of human cognitive abilities as it is grounded on empirical psychometrics theory of intelligence (McGrew, 2009, 2011).

3.3.3.2b The relationship between emotional intelligence and the gc-gf factors of intelligence

Roberts and his colleagues suggested that the concept of emotional intelligence has a place in the intelligence taxonomy (Roberts et al., 2001). They presumed that emotional intelligence can be regarded as a type of cognitive ability as it is positioned within the theory of crystallized (gc) and fluid (gf) intelligence (Cattell, 1971; Horn, 1988; Horn & Stankov, 1982), and it will constitute an additional aspect of (probably one or more primary dimensions of cognitive abilities) crystallized intelligence. This notion is proposed based on the idea that the expression, utilization and regulation of emotion develops through experience and social interaction, mostly in the same way as other psychological processes comprising gc (Davies et al., 1998). It is worth pointing out that these intelligences have a place within the traditional intelligence psychometric domain, as Carroll (1993) proposed that interpersonal intelligence is a specialized type of acquired knowledge (i.e. crystallized intelligence) that has its room in Carroll's intelligence taxonomic model.

In addition, the most recent study conducted by MacCann (2010) revealed that correlations between latent emotional intelligence (EI), crystallized intelligence (gc) and fluid intelligence (gf) factors clearly support the notion that emotional intelligence measures a kind of intelligence. MacCann

(2010) examined the factor structure analyses of these intelligences based on three factor structure models; (a) a one-factor model that subsumes emotional intelligence, gc and gf as one factor solution, (b) a two-factor model that consists of gf factor and a combined emotional intelligence /gc factor, and (c) a three factor model that consists of EI, gc and gf as three different factors. The results showed that the fit indices for the one-factor model were unacceptable, acceptable for two-factor model and good for the three-factor model. Further, it revealed that although the three-factor model fit the data better than the two-factor model, emotional intelligence and gc factors were highly correlated (MacCann, 2010). Thus, this finding suggested that emotional intelligence forms a latent factor distinct from gc and gf, although it is highly correlated with gc.

MacCann's findings (2010) and Roberts et al., (2001) presumption support Carroll's (1993) notion that interpersonal intelligence is a specialized type of acquired knowledge similar to crystallized intelligence (Gc). Furthermore, as emotional intelligence overlaps with interpersonal intelligence, it can be suggested that emotional intelligence also refers to a specialized type of acquired knowledge like crystallized intelligence (Gc). Similarly, the findings revealed by MacCann (2010) also converge with the idea proposed by Roberts et al., (2001) that emotional intelligence will constitute an additional aspect of (probably one or more dimensions of cognitive abilities) crystallized intelligence. At the same time, MacCann

(2010) also reported that emotional intelligence and gc factors show similar relationships with big five personality, relating only to openness (intellectualism). To this end, it is clear that ability-based emotional intelligence aligns itself within the Cattell-Horn-Carrol (CHC) model of cognitive intelligence as it maps onto crystallized intelligence (Gc) domain.

3.3.4 Emotional intelligence and personality

In general, personality refers to a pattern of relatively unique and stable characteristics that give both consistency and individuality to a person's behaviour (J. Feist & G. Feist, 2009). One of the well-known theories of personality is the Big Five theory of personality traits dominated by the work of Lewis Goldberg (1990) and Paul McCrae and Costa (1987; 1996). This theory postulates that there are five broad factors of human behavioural dispositions that provide a complete description of personality styles.

The five personality dimensions refer to O, C, E, A, N; Openness, Conscientiousness, Extraversion, Agreeableness, and Neuroticism traits. The first dimension, openness (sometimes called Intellect) includes traits such as being insightful, imaginative, curious, analytical, and intelligent (Goldberg, 1992; McCrae & Costa, 1996). Conscientiousness (also known as dependability) refers to traits associated with being organised, thorough, well planned, conscientious, and responsible, while extraversion

(sometimes called surgency) encompasses behavioural tendencies such as being talkative, energetic, extraverted, active, and assertive (Goldberg, 1992; McCrae & Costa, 1996). The agreeableness trait (also known as pleasantness) includes traits like being emphatic, sympathetic, cooperative, warm, agreeable, and trustful (Goldberg, 1992; McCrae & Costa, 1996). Finally, neuroticism (sometimes reversed and called emotional stability) captures traits such as tension, mood, anxiety, emotional instability, and discontent (Goldberg, 1992; McCrae & Costa, 1996).

Several studies suggested that emotional intelligence may have a minimal correlation with personality traits, however, the degree of relationship should not be too high to suggest its distinctiveness (Joseph & Newman, 2010a; Mayer, Salovey, et al., 2008). Based on the conceptual framework of emotional intelligence and personality, dimensions of emotional intelligence relate to personality factors. For instance, the dimension of neuroticism describes individuals who are emotional, angry, and anxious. This emotional instability trait conceptually overlaps with the emotional intelligence dimension of regulation of emotion (RE) (Joseph & Newman, 2010a). As previously mentioned in Section 3.3.2, regulation of emotion refers to the ability to manage emotions and to return quickly to normal psychological states after rejoicing or being upset (Wong & Law, 2002). The agreeableness trait which involves empathy and agreeableness may

overlap with the other's emotional appraisal dimension (OEA) of emotional intelligence (Joseph & Newman, 2010a). The dependability, planning, and organisation characteristics of the conscientiousness traits are similarly involved in the use of emotion dimension (UE) of emotional intelligence (Joseph & Newman, 2010a). In such a case, the use of the emotion dimension also involves planning positive emotions in facilitating performance. In conclusion, due to the nature of the emotional intelligence and personality constructs that share a portion of conceptual redundancy, it is suggested that emotional intelligence (and its dimensions) overlaps with personality (Cherniss, 2010b; Conte & Dean, 2006; Joseph & Newman, 2010a).

3.3.5. The relationship between emotional intelligence and its relevant outcome variables

To establish a valid and meaningful construct, a construct should add an incremental value to its related outcomes (Cohen & Swerdlick, 2005; Kaplan & Saccuzzo, 2009; Nunnally & Bernstein, 1994). As mentioned earlier in Section 3.2, leadership and interpersonal relationships were chosen as outcome variables as past studies indicated that emotional management is a key factor for effective leadership (Brackett et al., 2011; George, 2000) and interpersonal relations (Kerr et al., 2006; Mayer, Caruso, et al., 2000). Testing the incremental validity of emotional intelligence in predicting relevant outcomes is important because it can

legitimise and solidify the emotional intelligence field, and explain the usefulness of emotional intelligence construct.

3.3.5.1 Emotional intelligence and leadership

Past researches claimed that emotions play an important role in leadership (Antonakis et al., 2009; Brackett et al., 2011; Dasborough, 2006; George, 2000; Kerr et al., 2006; Salas, Driskell, & Hughs, 1996; Prati, Douglas, Ferris, Ammeter, & Buckley, 2003; Zhou & George, 2003). In general, leadership refers to a process of social interaction whereby the leader's ability to influence the behaviour of their followers can further influence the job outcomes or group performance (Humphrey, 2002; Pirola-Merlo, Hartel, Mann & Hirst, 2002). Humphrey (2002) also asserted that leadership is intrinsically an emotion-laden process, whereby an effective leader is able to recognise followers' emotional states, attempt to evoke emotions in teammates, and then seek to manage followers' emotional states accordingly. On the other hand, Pescosolido (2002) agreed that leaders are also managers of group emotion, as effective leaders can increase team solidarity and morale by developing shared emotional experiences. These claims have led to the question on the need for "emotional intelligence" in leadership, and whether leaders really need emotional intelligence to succeed.

The idea that leadership involves the emotional abilities of effective leaders and emotions of followers has been around since the early trait theories of leadership (George, 2000). In recent years, Dasborough (2006) demonstrated that leaders evoke emotional responses in employees in workplace settings. On account of these reasons, it is now widely accepted that leadership is an emotion-laden process, and a leader who can manage his/her own emotions and has empathy for others will be more effective in the workplace settings (Antonakis et al., 2009). In short, the capacity of leaders to understand, manage and influence the emotional climate of the followers can influence the performance outcomes.

According to George (2000), emotional abilities and effective leadership behaviours are interconnected. George explained how emotions play a central role in the leadership process, and how emotional intelligence contributes to the effectiveness of leaders by outlining five fundamental components of leadership effectiveness. George (2000) explained that an effective leader is able to: (1) develop collective goals and objectives; (2) instil in others a sense of appreciation and importance of work; (3) generate and maintain enthusiasm, confidence, optimism, cooperation, and trust; (4) encourage flexibility in decision making and change; and (5) establish and maintain meaningful identity for the organization. Based on these elements, it is clear that each element involves emotional aspects,

whereby leaders with high emotional intelligence may be better at achieving these outcomes. Therefore, it is observed that the leader's emotional intelligence would be more important than other competencies, especially when cognitive resources are constrained such as in highly stressful work situations.

Some researchers agree that emotional intelligence is a key determinant in an individual's ability to be socially effective (George, 2000; Mayer, Salovey, et al., 2000a) and is perceived as a key factor to effective leadership in leadership literature (Ashkanasy & Tse, 2000; Boal & Hooijberg, 2000; George, 2000; Kerr et al., 2006). Thus, the relationship approaches to leadership are inherently emotional. Further, Salovey, Bedell, Detweiler and Mayer (1999) found that individuals who scored high in the ability to perceive accurately, understand, and appraise others' emotions were better able to adapt to changes in their social environments and build supportive networks. This is true as high level of emotional intelligence might enable a leader to be better able to monitor how team members are feeling (Mayer, Caruso & Salovey, 1999), and may lead to smoother interactions with the team members. Therefore, emotional intelligence plays a significant role in effective social interaction, which will in turn lead to effective leadership and the achievement of collective goals. In light of the above, emotional intelligence is a meaningful predictor to leadership effectiveness as leadership involves an emotion-laden process.

In addition to emotional intelligence, past researches also revealed that personality, particularly extraversion and openness to experience has demonstrated predictive validity in predicting leadership (Judge & Bono, 2000; Lord, DeVader, & Alliger, 1986; McCrae & Costa, 1987; Ployhart, Lim & Chan, 2001; Strang & Kuhnert, 2009). Besides personality, general cognitive ability has empirically demonstrated its predictive validity in explaining leadership (Antonakis et al., 2009; Bass, 1990; 1997; Judge et al., 2004). Recent researches revealed that ability-based emotional intelligence alone has a predictive validity on leadership effectiveness (Antonakis et al., 2009; Brackett et al., 2011; Kerr et al., 2006). Similar to ability-based emotional intelligence, trait emotional intelligence alone has a predictive validity on leadership (Brown & Moshavi, 2005; Siegling, Nieleesen, & Petrides, 2014; Villanueva & Sanchez, 2007).

In reference to these findings, general intelligence and personality alone are established predictors to leadership. Likewise, emotional intelligence and trait emotional intelligence alone significantly predict leadership practices. However, no documented literature was found on the incremental validity of ability-based emotional intelligence (performance-based measure) while taking into account the potential influences of the cognitive intelligence, personality trait, ability-based emotional intelligence (self-report measure) and trait emotional intelligence in predicting

leadership. Therefore, the present work would be significant in bridging this gap by allowing all these predictors to predict the outcome variable concurrently in order to examine the contribution of each predictor to the outcome variable.

3.3.5.2 Emotional intelligence and interpersonal relationships skills

The construct of positive interpersonal relationships with others (Ryff & Keyes, 1995; Ryff & Singer, 2000) refers to the capability to have a satisfying and trusting relationship with others. These interpersonal relationships require the possession of social skill as it influences effective social interaction. Several researchers posit that emotional management skill is a key to an individual's ability to be socially effective and maintaining satisfying relationships (George, 2000; Kerr et al., 2006; Mayer, Caruso, et al., 2000).

At the organizational level, employees who score high on the ability to accurately perceive, understand and appraise others' emotions have smoother interactions and effective interpersonal relations with members of their work teams, and this effective social interaction will lead to effective leadership especially in achieving certain collective goals (Mayer, Salovey, et al., 2000a). On the other hand, in relation to social functioning, recent researches also revealed that emotional competence leads to higher level of perceived quality of social relationships (Kotsou, Nelis,

Gregoire & Mikolajczak, 2011; Lopes, Salovey & Strauss, 2003). Hence, an individual who has high score on emotional intelligence will demonstrate better positive interpersonal relationships with others as he/she is emotionally competent in maintaining effective social interaction.

As emotional competence is directly related to positive interpersonal relationships and effective social interaction (George, 2000; Kerr et al., 2006; Mayer, Caruso, et al., 2000; Mayer, Salovey, et al., 2000a), past research also suggested that cognitive intelligence is also a positive predictor to perceived positive interpersonal relationships (Lopes et al., 2003). This study revealed that positive interpersonal relationships require knowledge on understanding of emotions and interpersonal skills. Such knowledge also requires a certain level of cognitive ability.

Other than general mental ability, several studies found that personality, particularly the extraversion and conscientiousness dimensions are significantly related to positive interpersonal relationships (Kotsou et al., 2011; Lopes et al., 2003; Lopes et al., 2008). In addition, researches shown that both the ability-based emotional intelligence (Lopes et al., 2003) and trait emotional intelligence (Kotsou et al., 2011) alone have a predictive validity on positive interpersonal relationships with others. However, no studies were conducted on the incremental validity of ability-based emotional intelligence (performance-based measure) while taking

into account the potential influences of the cognitive intelligence, personality trait, ability-based emotional intelligence (self-report measure) and trait emotional intelligence in predicting positive interpersonal relationships. Considering these predictors (cognitive intelligence, personality trait, ability-based emotional intelligence [self-report and performance-based reports] and trait emotional intelligence) together as a set of predictors to an outcome variable is important in order to examine which predictor has more predictive power in explaining the outcome variable.

3.3.6 Trait emotional intelligence and its related outcomes

As mentioned earlier in Section 3.2, in examining the incremental validity of ability-based emotional intelligence, trait emotional intelligence will also be included in the regression model in order to show the incremental variance of ability-based emotional intelligence over the trait emotional intelligence in explaining the aforementioned criterion variables.

The conceptualization of trait emotional intelligence as a personality trait leads to a construct that lies wholly outside the taxonomy of human cognitive ability (Carroll, 1993). The proponents of trait emotional intelligence posit that trait emotional intelligence focuses on the affective aspects of personality and essentially concerns individual differences in people's self-perceptions of their emotional abilities (Cooper & Petrides,

2010; Petrides et al., 2010). Hence, as ability-based emotional intelligence concerns emotion-related cognitive abilities, the trait emotional intelligence concerns emotion-related dispositions and self-perceptions. As the conceptualization of these two constructs is different, it has also been supported by the empirical findings which revealed very low correlation between measures of trait emotional intelligence and ability-based emotional intelligence (O' Connor & Little, 2003; Warwick & Nettelbeck, 2004).

Similar to ability-based emotional intelligence, a substantial amount of research has revealed that trait emotional intelligence is a significant predictor of various outcomes like physical and mental health, workplace performance and social criteria. A number of studies for example have shown that trait emotional intelligence is significantly correlated with general health (Johnson, Batey & Holdsworth, 2009), inflammatory diseases (Costa, Petrides, & Tillman, 2014), depression (Petrides, Perez-Gonzalez & Furnham, 2007), anxiety (Dewaele & Furnham, 2008), mental well-being (Andrei, & Petrides, 2013), and life satisfaction (Koydemir, Simsek, Schutz & Tipandjan, 2013).

In relation to social functioning, other researchers found that trait emotional intelligence significantly accounted for the quality of social interactions and interpersonal relationships (Austin, Saklofske & Egan,

2005; Mavroveli, Petrides, Rieffe & Bakker, 2007; Nelis, Quoidbach, Hansenne, Kotsou, Weytens, & Dupuis, 2011; Smith, Heaven & Ciarrochi, 2008). A current meta-analysis study conducted by Malouff and his colleagues revealed that trait emotional intelligence was also significantly related to romantic relationship satisfaction (Malouff, Schutte & Thorsteinsson, 2014). At the organizational level, trait emotional intelligence demonstrated a positive relationship with leadership (Brown & Moshavi, 2005; Siegling et al., 2014; Villanueva & Sanchez, 2007), affective decision-making (Sevdalis, Petrides & Harvey, 2007) and work engagement (Akhtar, Boustani, Tsivrikos & Chamorro-Premuzic, 2015).

3.4 Summary of the proposed conceptual framework

The present research proposed that the concept of emotional intelligence may have considerable overlap with cognitive intelligence and personality. Based on past researches, it is perceived to map onto the crystallized intelligence factor of Carroll's (1993) intelligence taxonomic model (MacCann's findings, 2010; Roberts et al., 2001). Likewise, studies also suggested that the dimensions of emotional intelligence overlapped with neuroticism, agreeableness, and conscientiousness (Joseph & Newman, 2010a). However, the degree of shared variance between emotional intelligence and personality should remain minimal if one were to claim

that they are related but distinct constructs (Cohen & Swerdlick, 2005; Kaplan & Saccuzzo, 2009; Nunnally & Bernstein, 1994).

It can be concluded that the validation of the emotional intelligence construct should demonstrate evidence that the construct of emotional intelligence is valid. In obtaining this evidence, the concept of emotional intelligence should demonstrate evidence of convergent validity with cognitive intelligence, discriminant validity with personality traits, and incremental validity to its related outcomes over and above other established predictors to these outcomes.

3.5 Research questions and hypotheses

Given the above issues and influences, this study aims to examine the construct validity of emotional intelligence. Specifically, it seeks to investigate the convergent and discriminant validity of ability-based emotional intelligence as a new psychological construct as well as the incremental validity of ability-based emotional intelligence scores over measures of trait emotional intelligence, cognitive ability and Big Five personality traits in predicting leadership and positive interpersonal relationships. In addressing these issues, seven research questions and seven hypotheses were developed and investigated.

3.5.1 Research Question One (RQ1)

RQ1: To what extent does ability-based emotional intelligence demonstrate evidence of factorial validity in the Malaysian context?

H1: A four-factor structure of ability-based emotional intelligence is construct valid.

According to the instrument developer, the WLEIS gauges four dimensions of emotional intelligence construct: (1) Appraisal and expression of emotion in the self; (2) Appraisal and recognition of emotion in others; (3) Regulation of emotion in the self; and (4) Use of emotion to facilitate performance (Wong et al., 2004). They also asserted that these four factors are related.

3.5.2 Research Question Two (RQ2)

RQ 2: To what extent does ability-based emotional intelligence (performance-based measure) demonstrate evidence of convergent validity when correlated with self-report measure of ability-based emotional intelligence?

H2: The performance based measure of ability-based emotional intelligence demonstrates convergent validity with self-report measure of ability-based emotional intelligence.

The researcher hypothesizes that the performance-based WEIS demonstrates convergent validity with the self-report measure, the Wong & Long Emotional Intelligence Scale (WLEIS; Wong & Law, 2002). This hypothesis is formed as both of these instruments are based on ability-based emotional intelligence model and developed based on the same dimensional structures (SEA, OEA, RE and UE)

3.5.3 Research Question Three (RQ3)

RQ 3: To what extent does ability-based emotional intelligence demonstrate evidence of convergent validity when correlated with cognitive intelligence?

H3: Ability-based emotional intelligence demonstrates convergent validity with cognitive intelligence.

This hypothesis was developed based on the conceptualisation of emotional intelligence as an innate cognitive ability (Salovey & Mayer, 1990) and emotional intelligence theorists suggest that emotional intelligence should be moderately correlated with general intelligence (Mayer, Roberts, et al., 2008; Mayer & Salovey, 1997; Mayer, Salovey, et al., 2008).

3.5.4 Research Question Four (RQ4)

RQ 4: Where is the place of ability-based emotional intelligence in the “general intelligence” taxonomy: crystallized intelligence or fluid intelligence factor?

H4: Ability-based emotional intelligence maps onto the crystallized intelligence (gc) factor in the intelligence taxonomy.

This hypothesis was formulated based on Roberts et al., (2001) theoretical presumption and MacCann’s empirical findings (2010) that emotional intelligence develops in the same way as gc. Furthermore, MacCann’s study (2010) revealed that the emotional intelligence construct loaded stronger on gc as compared to gf.

3.5.5 Research Question Five (RQ5)

RQ 5: To what extent does ability-based emotional intelligence demonstrate evidence of discriminant validity when correlated with personality traits?

H5: Ability-based emotional intelligence demonstrates discriminant validity with personality traits.

Because the concept of emotional intelligence (ability-based emotional intelligence) deals with human cognitive ability (Salovey & Mayer, 1990) and personality deals with behavioural dispositions or traits (Goldberg,

1999), these two concepts were hypothesised to demonstrate discriminant validity. There might be a correlation between emotional intelligence and personality, however, the degree of relationship should be relatively small to suggest its distinctiveness (Joseph & Newman, 2010a)

3.5.6 Research Question Six (RQ6)

RQ6: To what extent does ability-based emotional intelligence (performance-based measure) demonstrate evidence of incremental validity over cognitive intelligence, personality traits, self-report measure of emotional intelligence and trait emotional intelligence in predicting leadership practices?

H6: Ability-based emotional intelligence (performance-based measure) demonstrates evidence of incremental validity over cognitive intelligence, personality traits, self-report measure of emotional intelligence and trait emotional intelligence in predicting leadership practices.

A documented literature examining the factors that influence leadership suggested that cognitive intelligence (Antonakis et al., 2009), personality (Strang & Kuhnert, 2009) and trait emotional intelligence (Brown & Moshavi, 2005) significantly influenced leadership. As leadership involves an emotion-laden process (Brackett et al., 2011), it was hypothesized that emotional intelligence (performance-based measure) adds significant incremental variance in explaining leadership practices, while taking into

account the potential influences of cognitive intelligence, personality traits, self-report measure of the emotional intelligence, and trait emotional intelligence. In addition, it was also hypothesized that the performance-based measure of emotional intelligence adds an additional incremental variance over the self-report measure in predicting leadership, as the pioneers of emotional intelligence agreed that the performance-based test is parallel to the theoretical development of emotional intelligence, which is regarded as a new kind of ability (Mayer, Salovey, et al., 2000a).

3.5.7 Research Question Seven (RQ7)

RQ7: To what extent does ability-based emotional intelligence (performance-based measure) demonstrate evidence of incremental validity over cognitive intelligence, personality traits, self-report measure of emotional intelligence and trait emotional intelligence in predicting positive interpersonal relationships with others?

H7: Ability-based emotional intelligence (performance-based measure) demonstrates evidence of incremental validity over cognitive intelligence, personality traits, self-report measure of emotional intelligence and trait emotional intelligence in predicting positive interpersonal relationships with others.

Previous researches reported that cognitive intelligence (Lopes et al., 2003), personality (Bracket, 2008), and trait emotional intelligence (Kotsou

et al., 2011) have a predictive validity on interpersonal relationships skills with others. As emotional competence is directly related to positive interpersonal relationships and effective social interaction (Kerr et al., 2006), it was hypothesized that emotional intelligence adds a significant incremental variance in explaining positive interpersonal relationships, while controlling the potential effects of other established predictors; namely cognitive intelligence, personality traits, and trait emotional intelligence.

3.6 Chapter summary and conclusion

This chapter discussed the related conceptual approaches that can guide research efforts in investigating the psychometric properties of the emotional intelligence construct. Having considered the importance of gathering construct-related validity evidence, this chapter examined the relationship between emotional intelligence and its related constructs in order to investigate the convergent, discriminant and incremental validity of emotional intelligence. On the basis of this study, a series of testable research questions and hypotheses have been formulated which underline the main aims of this thesis. As a large portion of this chapter has been given over to a discussion on the proposed conceptual framework, the following chapter outlines the research methodology applied throughout this study.

CHAPTER 4 – METHODOLOGY

4.1 Chapter overview

This chapter presents the research methodology used to examine the research questions and hypotheses discussed in Chapter 3. An overview of the studies (Study 1 and Study 2) is first discussed in Section 4.2. The research design and context of the study are further discussed in Sections 4.3 and 4.4. The sampling issues that describe the sampling frame, type, and strategy are then presented in the following sections: Section 4.5 to 4.7. This is followed by a description of the measures used in this study that consist of IQ test, performance-based test of emotional intelligence, self-report measure of emotional intelligence, personality inventory, trait emotional intelligence, leadership practices and the positive interpersonal relationships scales (Sections 4.8 and 4.9). The data collection procedures, ethical and sample size consideration are also presented in Section 4.9. In addition, description on the process of obtaining face validity evidence is also reported in this section (Section 4.9). The chapter ends with the summary of the rationale for the research design for both studies (Section 4.10).

4.2 An overview of the studies (Study 1 and Study 2)

This research consisted of two studies: study 1 represented a pilot study, while study 2 represented the main study. In general, the research methodology for both studies was similar. However, the two studies were slightly different in terms of (1) purpose, and (2) the number of study variables. The main objective of the pilot study was to explore the nomological network of the emotional intelligence construct (the inter-relationships of emotional intelligence with other related variables), while the main study aimed to confirm the inter-relationships between emotional intelligence and its related variables. The pilot study focused on five variables; emotional intelligence (performance-based measure), emotional intelligence (self-report measure), cognitive intelligence, personality and leadership practices. Meanwhile, the main study also concentrated on these five variables in addition to trait emotional intelligence and positive interpersonal relationships.

4.2.1 Study 1: Pilot study

Pilot study or pilot testing is sometimes referred to as the pre-study. It refers to a small-scale preliminary study carried out before large-scale quantitative research. It attempts to evaluate the feasibility, time, cost or adverse events to predict an appropriate sample size and improve the study design prior to conducting the main study (Cohen, Manion & Morrison, 2007; Hulley, Cummings, Browner, Grady, & Newman, 2006; Morrison 1993; Wilson & McLean, 1994). The objectives of a pilot study

may vary, either: to clarify the questionnaire items and layout, to check readability levels of the target audience, to gain feedback on the operationalization of the constructs, or some other objectives (Cohen, et al., 2007).

The purposes of this pilot study were manifold; the first objective was to check the time taken to complete the questionnaire. Second, it aimed to check the clarity of the questionnaire items, layout, and instructions. Third, it sought to gain feedback on the operationalization of the constructs and purposes of research, specifically to examine the nomological network of the emotional intelligence construct. (The description on examination of nomological network is elaborated in the upcoming chapter 5). The variables involved in the pilot study were emotional intelligence (performance-based and self-report measure), cognitive intelligence, personality, and leadership practices.

4.2.2 Study 2: Main study

The main study examined and validated the inter-relationships among study variables and ultimately sought to answer the seven research questions posed at the beginning of this thesis (See Section 3.5). Specifically, it sought to confirm the interrelationships between emotional intelligence and other related constructs such as cognitive intelligence, trait emotional intelligence, personality, leadership practices and positive

interpersonal relationships by demonstrating its convergent validity, discriminant validity and incremental validity.

4.3 Research design

The majority of the research questions developed in this thesis required an analysis of the conceptual relationships among the emotional intelligence construct and its related criterion and non-criterion variables. Given the nature of this thesis in accumulating construct validity evidence of an emotional intelligence scale, this thesis adopted a survey method of data collection, as a validation study requires a large number of sample size (Cohen et al., 2007; Cohen & Swerdlick, 2005; Hair, Black, Babin, Anderson, & Tatham, 2006; Kaplan & Saccuzo, 2009) (See Section 4.9.10 for the description on large sample size). In another occasion, Cohen et al., (2007) pointed out that the survey method is suitable for studies that seek to ascertain correlations (e.g. to determine if there is a relationship between learning styles and academic achievement). As this study requires a series of correlation-type analyses and relies on large-scale data, the adoption of survey method was deemed the most appropriate method in validating the emotional intelligence construct.

4.4 Research context and setting

With regards to the research context, undergraduate students were selected as the sample population. This group of people has yet to be sufficiently studied in the context of emotional intelligence. To date, most research has focused on the emotional intelligence of employees, professionals, practitioners, managers (Carmeli, Yitzhak-Halevy & Weisberg, 2009; Cavazotte, Moreno & Hickmann, 2012; Clarke, 2010; Gardner & Stough, 2002; Jordan & Troth, 2011; Kerr et al., 2006; Lam & O'Higgins, 2012; Leary, Reilly & Brown, 2009; Mandell & Pherwani, 2003; Mittal & Sindhu, 2012; Ramo, Saris & Boyatzis, 2009), school directors and teachers (Brackett, 2010; Kafetsios, Nezlek & Vassiou, 2011; Pena, Rey & Extremera, 2012) and customer service staff (Çekmecelioğlu, Günsel, & Ulutaş, 2012; Cage & Daus, 2006; Cage, Daus & Saul, 2004). The documented literature also revealed that there were several studies on emotional intelligence which have been conducted in Malaysia, however, these studies focused on the emotional intelligence of working professionals (Ishak, Piet, & Ridzauddin, 2010; Sani, Masrek, Sahid, & Nadzar, 2013) and none of the researchers studied the emotional intelligence of undergraduate students. Thus, little emotional intelligence research has focused on the emotional intelligence of tertiary students who constitute the future workforce (James, Bore & Zito, 2012).

Research on emotional intelligence of tertiary education students is significant as past studies revealed that in educational settings, emotions have been found to influence students' cognitive learning as well as teachers' instructional behaviour (Han & Johnson, 2012; Márquez, Martín, & Brackett, 2006; Pekrun, Frenzel, Goetz, & Perry 2007). Furthermore, other studies found that emotions not only influence students' cognitive learning, but also affected students' social competence (Han & Johnson, 2012; Márquez et al., 2006). Therefore, research on emotional intelligence of undergraduate students would be important, as researches reveal that emotional intelligence of the students are equally as important as emotional intelligence of professionals, managers, and employees.

It is worth highlighting that since its inception, the majority of research on emotional intelligence mushroomed in the field of industrial and organizational psychology, management and business administration. Emotional intelligence researchers widely studied the relationship between emotional intelligence and leadership as well as between emotional intelligence and job performance. While there is a wealth of research assessing the relationship between emotional intelligence and leadership practices of working professionals, relatively little research has addressed the relationship between emotional intelligence and the leadership practices of the future leaders (i.e. tertiary students) (Hong, Catano & Liao, 2011; Lopez-zafra, Garcia-Retamero & Martos, 2012). In light of this

lacuna in emotional intelligence research concerning the future professional workforce, an assessment of their levels and states of emotional intelligence is a strategic initiative to ascertain future work abilities and the levels and types of pressures the future professional workforce can manage.

4.5 Sampling frame

Prior to discussing sampling strategy, it is necessary to first identify the sampling frame or specify the target population. Specifying the target population is an important aspect in a research as it takes into consideration the purpose of the study, study design, and accessibility of potential participants (Coolican, 2004). To examine the level of emotional intelligence, IQ, personality types and its related outcomes, strategies were designed to select a study sample representative of undergraduate students in Malaysia.

As discussed earlier in Section 4.4, there is a paucity of research conducted on the emotional intelligence and leadership practices of tertiary students who constitute the future workforce as compared to other professional working groups (James et al., 2012). In addition, statistics provided by the Ministry of Higher Education Malaysia revealed that 32,000 of graduates remain unemployed and searching for employment

even after 6 months after graduating from university (Utusan Malaysia, 2010, June 30). The Minister of Higher Education Malaysia revealed that the graduates do not meet the demands of today's work place as they lack four essential soft skills, namely communication skills, leadership skills, creative thinking skills, as well as professional ethics. As leadership is perceived as an emotion-laden process (Antonakis et al., 2009), studies addressing the relationship between emotional intelligence and leadership practices of the future leaders (e.g., undergraduate students) is in high demand.

Students from the International Islamic University Malaysia (IIUM) were selected as the study population for two major reasons. Firstly, IIUM is the only premier public university in Malaysia that uses English as a medium of instruction. As most of the IQ tests are available in English, choosing a sample group proficient in English is only logical. Furthermore, IQ tests in Malay are almost non-existent. Only one well-established IQ test is available in Malay (Mohd Isa & Mohamed, 1995). It is the Malay version of the Wechsler Intelligence Scale for Children-Revised (WISC-R), which is suitable only for children. Similar to IQ tests, other measures involved in this study such as emotional intelligence tests, personality inventory, and leadership practices are also originally developed in English.

Secondly, the majority of IIUM students are of Malay ethnicity, whereas in other premier public universities the student population consists of a greater diversity of Malay, Chinese, Indian and other ethnic groups. According to AERA et al., (1999), standards to establish construct validity require the validation process of a measure to be on-going, with continuing efforts to establish the usefulness of the measure for specific populations and purposes. Therefore, the Malay ethnic group was chosen as a context of validation process in responding to these standards to examine the qualities of a specific group or population to yield representative and meaningful results (AERA et al., 1999).

4.6 Sampling type

The volunteer sampling method was adopted. Volunteer sampling is a type of non-probability sampling and in such a case, the prospective participants voluntarily offer themselves to participate (Cohen et al., 2007; Jupp, 2006). This type of sampling can be a convenient and inexpensive way of sampling. The reasoning behind this choice is based on the perceived difficulty to access respondents because the test is time consuming and pertains to their IQ, which can be considered a sensitive issue by some. As such, in some cases respondents are selected based on their interest in the subject from a particular unit/organization or those attending related courses (Black, 1999; Cohen, et al., 2007). Sometimes

this is inevitable as it is the only kind of sampling that is possible (Morrison, 2006). Similarly, volunteer sampling is a strategic and realistic approach to this kind of study given that it is time-consuming and a potentially sensitive issue.

4.7 Sampling strategy

After specifying the sampling frame and the sampling type, the researcher decided to collect the data during a semiformal 'credited co-curricular activity class'⁸ at IIUM. It is worth noting that each undergraduate student in IIUM is required to take one credited co-curricular subject for each semester. They are required to complete a total of six semesters of credited co-curricular subjects. The Credited Co-curricular Activity Centre (CCAC), IIUM manages all co-curricular courses. One of the main functions of the CCAC is to provide a platform or training ground for the students to continuously develop their leadership skills and talents

⁸ Each undergraduate student has to participate in a credited co-curricular activity for six semesters throughout their bachelor degree study. The students can choose which skill that they are interested in like archery skill, first aid skill, debating skill, photography skills and etc. The co-curriculum classes were held from Monday to Saturday and commenced from 5.00pm onwards for Monday to Thursday, 12.00noon onwards for Friday and the Saturday class begins at 8.00am onwards. Their involvement in this credited co-curriculum subject carries 0.5 credit hour per semester (Credited Co-curricular Activity Centre, Student Development Division, International Islamic University Malaysia, 2008).

(Credited Co-curricular Activity Centre, Student Development Division, International Islamic University Malaysia, 2008).

Prior to data collection, approval from the University of Nottingham Research Ethics Committee was obtained (See Appendix E for the approval letter). Having obtained approval from this committee, the researcher proceeded with further steps to obtain approval from the respective authority (Head of the CCAC). Because the data collection was conducted in an institution, the study requires the cooperation of a few levels of gatekeepers for the initial access to the respondents; (1) Head of the CCAC as a primary gatekeeper and (2) Chief instructor for particular skills area as a secondary gatekeeper. In this context, a gatekeeper refers to an authoritative person who has power and authority in giving permission to the researcher to access a particular group of individuals.

During the first stage, a formal letter was sent to the respective authority who was the primary gatekeeper, namely the Head of the CCAC, IIUM to request permission to conduct the study during co-curricular activity classes. The Head of the CCAC granted the permission and she further asked the researcher to seek the permission from the chief instructors from the respective skills areas (secondary gatekeeper). Having obtained the contact details of all chief instructors/instructors, the researcher then contacted them for their consent to be a voluntary gatekeeper. They were

contacted through phone or face-to-face meetings during the 'Induction Course for Co-curricular Instructors' which was held every semester. If the instructors were willing to be voluntary gatekeepers and permitted the researcher to assess their co-curriculum class for the study, the schedule for questionnaire administration was then arranged.

4.8 Study 1: Measures and procedures

4.8.1 Cognitive ability

The Shipley-2 intelligence test was used to measure respondents' general mental ability; crystallized intelligence and fluid intelligence (Shipley, Gruber, Martin & Klein, 2009). The nonverbal block patterns scale was used to assess respondents' reasoning ability that is fluid intelligence. The block patterns scale is composed of 12 multiple-choice items based on the well-known Koh's cube designs. The vocabulary scale was used to gauge respondents' crystallized intelligence. This scale consists of 40 items and each item requires the respondent to look at a target word and then choose from four options the word that is closest in meaning. Each test requires 10 minutes to complete (Shipley et al., 2009).

The vocabulary scale of Shipley-2 has good convergent validity with the vocabulary test of Wechsler Adult Intelligence Scale Third Edition (WAIS-III), with $r = .82$. Similarly, the block pattern scale of Shipley-2 has an

acceptable convergent validity with the block design test of Wechsler Adult Intelligence Scale Third Edition (WAIS-III), with $r = .64$ (Shipley et al., 2009).

In terms of scoring, both forms required objective scoring, meaning that if the respondents chose the correct choice for each question, then one point will be rewarded. Conversely, if the selected answer was wrong, then 0 point will be given. The answer was considered incorrect if the test-takers chose more than one answer (Shipley et al., 2009). Both the fluid intelligence and crystallized intelligence raw score were simply the sum of correct responses. The total raw score for fluid intelligence form was over 26, while the total raw score for crystallized intelligence form was over 40 (Shipley et al., 2009).

The Shipley-2 IQ test was selected for this study due to a few reasons: (1) this test captures the components (fluid intelligence and crystallized intelligence) that were utilized in this study, (2) it is practical to be used for this study as it is less time consuming as compared to other IQ tests that are lengthy and proprietary, (3) it can be administered in groups, and (4) it demonstrates good construct validity evidence.

4.8.2 Emotional intelligence (performance-based measure)

The respondents also completed a performance-based test of emotional intelligence, the Wong Emotional Intelligence Scale (WEIS; Wong et al., 2004). All of the items in the WEIS are developed based on the four ability dimensions of emotional intelligence: (1) Appraisal and expression of emotion in the self; (2) Appraisal and recognition of emotion in others; (3) Regulation of emotion and (4) Use of emotion to facilitate performance.

In general, this scale has two parts, the first part consists of 20 scenarios and respondents are forced to choose one answer that best reflects their likely reaction in each scenario. An example of the scenario and its possible behavioral responses is: *When a friend comes to you because s/he is not happy, you will: (A) Share his/her feeling. (B) Takes him/her to do something s/he likes* (Others' emotional appraisal). The correct option for each scenario has been identified by criterion-related validity tests in the initial validation study (Wong et al., 2004). If the respondents chose the correct choice for a scenario, then one point will be rewarded and vice versa.

The second part also consists of 20 ability pairs and respondents were forced to choose one out of the two types of abilities that best represent their strength. A typical example of the pairs is *ability to comprehend the rationale of complicated problems* versus *ability to understand others'*

emotions (Others' emotional appraisal). Similar to part A, if participants choose the emotional intelligence-related option for an ability pair, then one point will be awarded. As the scale consists of 40 items, the total score ranges from 0 to 40 and higher total score indicating a higher level of emotional intelligence.

Emotional intelligence researchers reported that the internal consistency reliability of the WEIS for the parent and student samples are .70 and .73 respectively (Foo, Efenbein, Tan & Aik, 2004). The WEIS has an acceptable convergent validity ($r = .55$) with the Wong and Law Emotional Intelligence Scale (WLEIS; Wong & Law, 2002), the ability-based emotional intelligence measure (Wong et al., 2004). The WLEIS is a self-report ability-based emotional intelligence measure that has the same dimensions as WEIS. (The reasons of choosing this performance-based emotional intelligence test for this study has been described earlier in Section 2.7.1)

4.8.3 Emotional intelligence (self-report measure)

Other than the WEIS, the respondents also rated their level of emotional intelligence by using the Wong and Law Emotional Intelligence Scale (WLEIS; Wong & Law, 2002). The WLEIS also gauges the same dimensions of the emotional intelligence construct as measured by WEIS, namely (1) Appraisal and expression of emotion in the self; (2) Appraisal

and recognition of emotion in others; (3) Regulation of emotion in the self; and (4) Use of emotion to facilitate performance. However, it should be noted that the WLEIS is a self-report measure or self-estimated scale that consists of 16 items and each factor consists of four items.

In this instrument, respondents were asked to indicate their level of agreement with a particular statement using a seven-point Likert scale, with (1) indicating strongly disagree and (7) indicating strongly agree. All of the items are positively-worded and an example of the item for 'self-emotional appraisal' dimension is "I have a good sense of why I have certain feelings most of the time". A sample item for 'others' emotional appraisal' dimension is "I have good understanding of the emotions of people around me".

Wong & Law (2002) reported that the reliability estimates (coefficient alphas) for the four dimensions of self-emotion appraisal, use of emotion, regulation of emotion, and emotion appraisal of others are .89, .88, .76, and .85, respectively. The WLEIS was chosen because it has several advantages over other popular measures of emotional intelligence including practical, short, publically available, a psychometrically sound measure of emotional intelligence and is ideal for use in much-needed empirical organization research (Joseph & Newman, 2010b). In contrast, most of the widely used emotional intelligence measures are proprietary (e.g., MSCEIT, EQ-i), lengthy and lack of validity evidence (Wong & Law,

2002). Furthermore, Joseph and Newman (2010b) revealed the evidence of usefulness of this scale as the WLEIS has been cited 82 times since 2002 based on the Social Science Citation Index database obtained in November 2009.

4.8.4 Personality

The Big Five Inventory (BFI-44; Benet-Martinez & John, 1998) was used to examine respondents' personality traits. The BFI-44 consisted of 44 items that measure Openness, Conscientiousness, Extraversion, Agreeableness and Neuroticism (O, C, E, A, N) based on a 5-point scale which was ranging from disagree strongly (1) to agree strongly (5). The items commenced with a pre-statement *I see myself as someone who...* A typical example of the items is *...prefers work that is routine* (conscientiousness dimension). Another example is *...remains calm in tense situations* (neuroticism dimension) (John & Srivastava, 1999).

This instrument was chosen because it provides a quick, reliable, and accurate measure of the five domains of personality and is particularly useful when time is limited and when global information on personality is needed (John & Srivastava, 1999). As the study involves several instruments to respond to, choosing a quick and reliable measure was deemed more practical and plausible. Benet-Martinez and John (1998)

reported alpha coefficients of .88, .84, .79, .82 and .81, respectively, for the aforementioned dimensions.

4.8.5 Leadership practices

The respondents also completed a self-report measure of leadership practices known as the Student Leadership Practices Inventory second edition (SLPI; Kouzes & Posner, 2005). The SLPI is a leadership tool designed specifically for college/university students and young people, and developed based on one of the most prominent and well regarded leadership frameworks for youth leadership (Kouzes & Posner, 2008). It looks at the specific behaviors and actions of students when they are at their personal best as leaders (Kouzes & Posner, 2008; Posner & Brodsky, 1992). These key behaviors are categorized into five leadership practices; (1) model the way; (2) inspire a shared vision; (3) challenge the process; (4) enable others to act and (5) encourage the heart. Each of these components is tapped through 6 items, making a total of 30 items.

In this instrument, respondents were asked to consider how frequently they engage in each of the behaviors using a five-point Likert-scale, with (1) indicating rarely or seldom and (5) indicating very frequently or almost always. An example of an item for the SLPI is “I describe to others in our team what we should be capable of accomplishing” (Inspire a shared vision dimension). Another example is “I make sure that people in our

team are creatively recognized for their contributions” (Encourage the heart dimension).

Identified as practices common to successful leaders in corporate, government, and not-for-profit organizations, these leadership practices and behaviors have been shown to correspond well to the developmental issues of importance for college students (Brodsky, 1988). On the other hand, the SLPI is a leadership assessment tool that helps students and young people measure their leadership competencies, while guiding them through the process of applying. Kouzes and Posner’s (2007, 2011) acclaimed five practices of exemplary student leadership model to real-life changes. This measure was selected because it was specifically developed to gauge the leadership practices of college students (Brodsky, 1988). Other leadership practice measures such as the Multifactor Leadership Questionnaire (MLQ: Bass & Avolio, 2004) are not tailored to specifically assess the leadership of college students. Other reasons were due to its psychometric soundness and practicality (Posner, 2004; 2010).

With regards to the psychometric properties of the SLPI, Cronbach’s alpha coefficients of internal reliability for each practice have been reported in the literature at 0.70 or greater (Posner, 2004). Another study conducted by Posner (2010) found that the SLPI has sound psychometric properties and validity for these five leadership practices and effectiveness has been

reported across a range of student sample populations. On the other hand, numerous researchers have successfully used a summative or composite measure of the five leadership practices to represent transformational leadership (e.g. Bell-Roundtree & Westbrook, 2001; Carless, Wearing, & Mann, 1994; Ferrara, 2008; Francisco, 2000).

4.8.6 Data collection procedures

Before administering the questionnaires, the researcher briefed the participants about the nature of the study and the questionnaires. The full identity of the researcher was revealed to the potential participants. The purpose and procedures of the research, and the potential benefits and costs of participating (e.g. expected duration), were fully explained to the prospective research participants at the outset. Prospective participants were informed that data collected is treated in the strictest confidence and will only be reported with anonymity. Written consent was not obtained from the participants as this study merely involves the completion of a questionnaire and the participation in this study is entirely voluntary. Furthermore, participants were asked to provide basic demographic details such as gender and age, and no other revealing identifications (e.g., name or student numbers) were requested. The chance that specific information is linked with specific participants is extremely low.

The participants were informed that their participation in this study is voluntary and they have the right to withdraw at any stage of the study. Although the handful of international students present in the class were informed that this study required only Malays, some requested to complete the questionnaires. To avoid bias, the researcher allowed them to participate in this study. However, their data were excluded in the analysis and they were made aware of this prior to data collection.

Upon completing the briefing on the background of the study, respondents were instructed to open the Shipley-2 IQ test and the author presented the instructions to answer this IQ test. First, the author provided an introduction to the Shipley-2 IQ test by saying:

You will start with two brief IQ tests. Please pay attention to when I tell you to begin and to stop. Each of the tests has its own instructions. When I tell you to start, read the instructions carefully and then start working on the test (Shipley et al., 2009). First, open up this Block Patterns Form (the author showed up the form which was in A3 size paper)

The author then provided a brief introduction on the Block Patterns scale (fluid intelligence component) by stating the following:

The form shows some block patterns. It is on two pages that face each other. Look at the example of the test item provided at the top

part of the form (The test administrator pointed out to the example). The instruction reads: "In this item, each pair of boxes shows two versions of the same design. Show, which blocks go in the grey squares to make these designs. For example, block C would complete this design. Fill in the bubble to choose your answer." Bear in your mind that you have to fill in only one bubble and you are not allowed to sketch or make any other marks on the page. You can do both pages without stopping. You will be given 10 minutes to complete this part. Ready? You may begin now.

The respondents were allocated 10 minutes to complete this section. The author instructed examinees to stop working after 10 minutes. The test administrator immediately collected these forms once the time ended. Next, the respondents were instructed to answer the vocabulary form (crystallized intelligence, IQ test) also within 10 minutes. When introducing the Vocabulary scale, the test administrator stated the following:

Next, open up this Vocabulary Form (the author showed up the form). This task is about word meanings. Look at an example of the test item provided at the top part of the form (The test administrator pointed out to the example). The instruction reads: "Circle the word that has the same meaning as the one written in capital letters". You are required to circle one definite answer only. Again, you will

be given 10 minutes to complete this part. Ready? You may begin now.

The test administrator began timing the test and instructed examinees to stop working after 10 minutes. The forms were then immediately collected.

In the last stage, the respondents were asked to complete emotional intelligence, personality, leadership practices and positive interpersonal relationships scale. No time limit was set for these inventories. However, the respondents generally took 35 to 40 minutes to complete these inventories. The test administrator was present throughout the session and on average, each session took place between 55-60 minutes. The participants were debriefed upon completion of the questionnaires. (See Sections 4.8 and 4.9 for a detailed description of all measures in this survey and Appendix C for the instruments).

4.8.7 Ethical considerations

In completing this research, all ethical guidelines were highly adhered to. The study protocols reported in this thesis have been reviewed and approved by the University of Nottingham Research Ethics Committee (See Appendix E for the approval letter). In addition, the permission to use questionnaire materials, which are not available in the public domain, was sought from the respective authors. For instance, the use of performance-based emotional intelligence test (WEIS) and its objective answer/scoring

key had been sought from the test developer, Professor Chi-Sum Wong prior to commencing the study. Similarly, the purchase of Shipley-2 IQ test from the Western Psychological Services (WPS Publisher), implies that the test user (researcher) has been granted permission to use this IQ test as the purchaser must indicate the purpose of purchasing this instrument during the transaction process. In addition to IQ tests, the Student Leadership Practices Inventory (SLPI) was also bought from the Jossey-Bass publisher thus granting permission for the researcher to use this instrument. As for the questionnaire materials available in the public domain, the researcher sought permissions from the test developers through electronic mail. Additionally, permission from the gatekeepers was also sought and the study protocols were clearly explained to them prior to the data collection.

All ethical considerations were observed during the data collection process. The nature of the study and the questionnaires, purpose and procedures of the research, and the potential benefits and costs of participating (e.g. the amount of their time involved), were fully explained to prospective research participants at the outset. The participants were informed that their participation in this study is voluntary and they are free to withdraw at any time. Written consent was not obtained from the participants as this study merely involves the completion of a questionnaire and participation in this study is entirely voluntary

(University of Nottingham Code of Research Conduct and Research Ethics, 2011). Furthermore, participants were requested to provide only basic demographic details such as gender and age, and no other revealing identification (e.g., name or student numbers) was requested. The chances that specific information is linked with specific participants are extremely low. The participants were debriefed upon completion of the questionnaire.

The respondents were assured of the confidentiality of their data before participating. Private information (such as individual age, gender etc.) will not be disclosed while releasing the findings of the study. The findings of the study will only be reported in the form of reports or presentations that include summary results and no individual result will be disclosed. The data will be kept confidential in accordance with the University of Nottingham Code of Research Conduct and Research Ethics (2011).

4.9 Study 2: Measures and procedures

In general, the measures used for studies one and two were similar (Shipley-2 IQ test, WEIS, WLEIS, Big Five inventory of personality and SLPI). However, study two employed two additional measures (TeiQ and RYff's psychological well-being measure) to capture trait emotional

intelligence and the positive interpersonal relationships construct respectively.

4.9.1 Cognitive ability

Similar to the instrument employed in Study 1 (See Section 4.8.1).

4.9.2 Emotional intelligence (performance-based measure)

Similar to the instrument employed in Study 1 (See Section 4.8.2).

4.9.3 Emotional intelligence (self-report measure)

Similar to the instrument employed in Study 1 (See Section 4.8.3).

4.9.4 Personality

Similar to the instrument employed in Study 1 (See Section 4.8.4).

4.9.5 Leadership practices

Similar to the instrument employed in Study 1 (See Section 4.8.5).

4.9.6 Trait emotional intelligence

To assess the score on trait emotional intelligence, the Trait Emotional Intelligence Questionnaire-Short Form (TEIQue-SF; Petrides, & Furnham, 2006) was used in this study. This instrument consists of 30 items that capture 6 factors such as (1) well-being, (2) self-control, (3) emotionality,

(4) sociability, (5) motivation and (4) adaptability. These six factors comprised of 15 specific facets such as adaptability, self-motivation, self-esteem, trait happiness, trait optimism, emotion regulation, stress management, empathy and many more.

The respondents responded to the statements by indicating their level of agreement with each statement on a 7-point Likert scale, ranging from 1 (completely disagree) to 7 (completely agree). Half of the items ($n = 15$) are positively worded and the remaining half ($n = 15$ items) are negatively worded. An example of positively-worded items for TEIQue-SF is “Expressing my emotions with words is not a problem for me”. On the other hand, a typical example of a negatively-worded item is “Many times, I can’t figure out what emotion I’m feeling”. The negatively-worded items were recoded before computing the total score of trait emotional intelligence (Petrides, 2009a, 2009b).

As there were only two versions of TEIQue; normal version and short version (Petrides, & Furnham, 2006), the short version was preferred for this study. This was due to time limitations given the nature of this study that involves several instruments. Although it is a short version, the reliability and validity of the items remained high and good. Petrides (2006) reported that the TEIQue-SF has a high level of internal consistency ($\alpha = .88$). The trait emotional intelligence questionnaire

demonstrated evidence of convergent validity with optimism ($r = .68$) and discriminant validity with cognitive ability ($r = .04$) (Mikolajczak, Luminet, Leroy & Roy, 2007).

4.9.7 Positive Interpersonal relationships.

The respondents also responded to the Positive Relations With Others subscale of Ryff's Psychological Well-Being (PWB) measure short version (Ryff, 1989; Ryff & Keyes, 1995). The Ryff's PWB scale⁹ is designed to measure positive aspects of psychological well-being along six dimensions: (1) autonomy – independence and self-determination; (2) environmental mastery – the ability to manage one's life; (3) personal growth – being open to new experiences; (4) positive relationships with others – having satisfying and high quality relationship; (5) purpose in life – believing that one's life is meaningful; and self-acceptance – a positive attitude towards oneself and one's past life (Ryff, 1989; Ryff & Keyes, 1995). The original version of Ryff's PWB scale consists of 84 items (14 items for each subscale) and the short version consists of 42 items (7 items for each subscale) (Ryff & Keyes, 1995). The original version of this

9

The Ryff's PWB scale has been extensively used in a variety of samples and settings. PWB items have been administered in large population-based samples such as the US National Survey of Families and Households (Sweet & Bumpass 1996), Midlife in the United States, (Brim, Ryff & Kessler, 2004), the Canadian Study of Health and Aging (Clarke, Marshall, Ryff & Wheaton, 2001), and the midlife study in the UK (Abbott, Ploubidis, Huppert, Kuh & Croudace, 2010).

measure consists of 14-items on Positive Relations with Others subscale, while the short version consists of 7-items.

Due to the time constraint, the short version, which consists of 7-items subscale, was used in this study. It is composed of seven statements that reflect positive and negative interactions with other people. A typical example of a positive interaction item is “I know that I can trust my friend, and they know that they can trust me”. The response format for all of the items comprised of six ordered categories labeled from strongly disagree (1) to strongly agree (6).

Because the original items of this subscale mapped onto ‘positive interpersonal relationships with others’ construct, the researcher amended four of the seven items to fit with the nature of the study that gauges ‘positive interpersonal relationships with friends’ construct. As almost all of the respondents resided on campus (International Islamic University Malaysia, 2011), friends were seen as a group of people that the students highly socialise with. Thus, the amendment of these items was deemed plausible in fitting the undergraduate context. The other three items were retained as they reflect positive interpersonal relationships with friends. The original items and the one amended are presented in Table 4.1 below:

Table 4.1: The original items and amended items of positive interpersonal relationships of the Ryff's Psychological Well-being scale (PWB).

No.	Original items	Amended items
1	I enjoy personal and mutual conversations with family members and friends	I enjoy personal and mutual conversations with friends
2	I don't have many people who want to listen when I need to talk	I don't have many friends who want to listen when I need to talk
3	Most people see me as loving and affectionate	Most of my friends see me as loving and affectionate
4	People would describe me as a giving person, willing to share my time with others	My friends would describe me as a giving person, willing to share my time with others

The internal consistency of this subscale is $\alpha = 0.89$ (Segrin & Taylor, 2007) and this subscale demonstrated convergent validity evidence with social functioning (Abbott et al., 2010) and negatively correlated with maladjustment (Ryff, 1989). Several researches have used this 'positive relations with others' subscale to gauge the positive interpersonal relationships aspect in social interactions research (Lopes et al., 2003; Lopes et al., 2005; Segrin & Taylor, 2007).

4.9.8 Data collection procedures

Study Two adopted similar procedures to those employed in Study One (See Section 4.8.6). However, for Study Two the author sought to confirm the respondents at the data collection in case they have participated in the preceding study. Around 2 % (n < 30) of the prospective respondents in Study Two participated in the preceding study (Study 1), hence, they were not allowed to participate in Study Two. The participants' participation in this study was entirely voluntary and the researcher faced almost no difficulties in recruitment, as the data collection was conducted during co-curricular class ¹⁰and the drop-out rates was very low, ranging from 0 to 7 % only.

4.9.9 Ethical considerations

The same ethical considerations were observed as in Study 1.

4.9.10 Sample size and statistical power consideration

It is a common guideline in any research design that a larger sample size generally produces more replicable and reliable results. Statisticians differ regarding what constitutes an optimum sample size. A simulation by Krejcie and Morgan (1970) revealed that once the data reached more than 380 (n= 380), it will then be saturated. Krejcie and Morgan also provided a

¹⁰ The maximum number of students for each co-curricular class is 35.

table that indicates the relationship between sample size and total population (see Appendix B for the table for determining the sample size). Figure 4.1 indicates that as the population increases, the sample size increases at a diminishing rate and remains relatively constant at slightly more than 380 cases (Krejcie & Morgan, 1970).

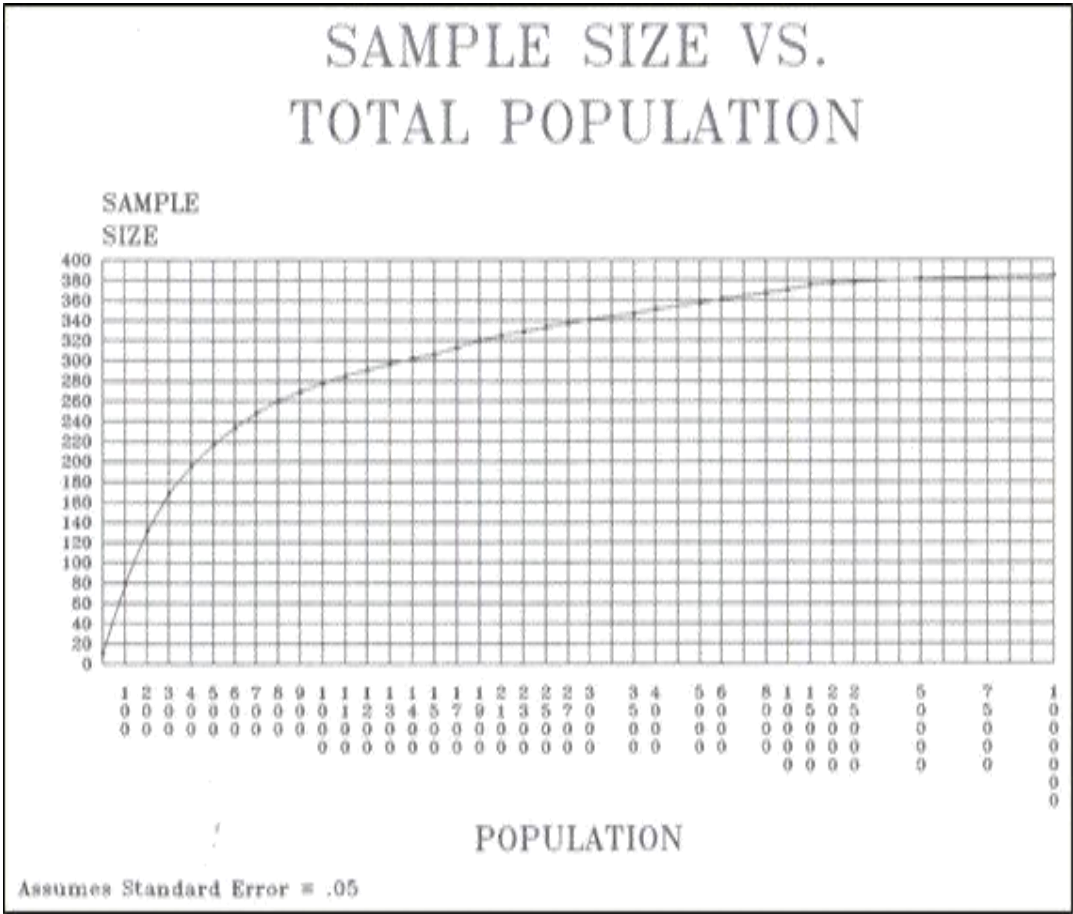


Figure 4.1: The relationship between sample size and total population (Taken from the original source Krejcie and Morgan (1970) page 609)

There are however a few rules of thumb concerning the formula to estimate sample size and statistical power in regression analyses. In multiple regression, “power” refers to a probability of detecting a statistical significant R^2 or a regression coefficient at a specified significance level for a specific sample size (Hair et al., 2006). Hair et al. proposed a table that illustrates the interplay among the sample size, the number of independent variables, and the significance level (α) chosen¹¹ (See Power Analysis table in Appendix B). The values written in Power Analysis table indicate the minimum R^2 that the specified sample size will detect as a statistically significant R^2 at the specified α level with a power (probability) of .80. An example of this issue is if one employs 5 independent variables, specifies a 0.5 significance level and is satisfied with detecting the R^2 80 percent of the time it occurs (corresponding to a power of .80), a sample of 100 ($n=100$) will detect R^2 values of 12 percent and greater. However, if the sample increases to 250 ($n=250$), then R^2 values of 5 percent will be detected, and further with a larger sample size ($n=500$), the R^2 values of 4 percent and above will be detected. Hence, based on Hair’s et al (2006) statistical power and sample size table, a larger sample size is required to detect a small effect size (R^2 values).

¹¹ Source: SOLO Power Analysis, BMDP Statistical Software, Inc. [2] taken from Hair et al., (2006)

On another occasion, Tabachnick and Fidell (2007) recommended a minimum sample size of $50 + 8m$ where m is the number of predictors. In this case, with five predictors for example, one may need a sample size of $50+40=90$. At the same time, Field (2009) asserts that although a sample size of 80 will be sufficient for regression analyses, a larger sample size (at least 600 cases) is required to detect a small effect size. In addition, with regard to the sample size requirement for survey study, Cohen et al., (2007) emphasizes that a survey study must consist of at least 100 respondents ($n=100$).

Similar to regression analysis or other multivariate approaches, SEM also requires a large sample. The most common SEM estimation procedure is Maximum Likelihood Estimation (MLE) (Hair et al, 2006). Hair et al. stated that the simulation studies suggest that under ideal conditions, MLE provides valid and stable results with sample sizes as small as 50. Under less than ideal conditions, a sample size of 200 is recommended to provide a sound basis for estimation. A sample size of larger than 400 ($n>400$) is considered as large sample size (Hair et al, 2006).

At the same time, Hair et al. (2006) mentioned that although it is still true that a larger sample size generally produce more stable solutions, it has been shown that sample size requirements must be made based on a set

of factors. In such a case, the minimum sample sizes are offered based on model complexity and basic measurement model characteristics. For example, if the model contains five or fewer constructs, each with more than three items (observed variables), and with high items communality (.6 or higher) then a minimum of 100 sample is required. If the model contains seven or fewer constructs, lower communality (below .45), and/or multiple under identified (fewer than three items) constructs, then a minimum of 300 sample is required. However, a minimum of 500 samples is required if the model has a large number of constructs, some with lower communalities, and/or having fewer than three measured items (Hair et al, 2006).

Hence, this survey study, with a total of sample size of 710 ($n = 710$), exceeds the sample size requirement suggested by Cohen et al. (2007), Field (2009), Hair et al. (2006), Krejcie and Morgan (1970) and Tabachnick and Fidell (2007).

4.9.11 Obtaining face validity evidence

Face validity or surface validity refers to a judgement on how relevant the test items appear to be. Stated another way, if a test definitely appears to measure what it supposes to measure “on the face of it,” it could be said to be high in face validity (Cohen & Swerdlick, 2005). For instance, a personality test labelled ‘extraversion’, with items that ask respondents

whether they have acted in an extraverted or introverted way in particular situations, may be perceived by respondents as a highly face-valid test. On the other hand, an item that asks respondents whether they like to talk about political issues may be perceived as a test with low face validity. Judgements about face validity are frequently thought of from the perspective of the test-taker, not the test user.

Face validity is not really a validity at all as it does not offer evidence on psychometric soundness, but, it is deemed important in testing (Cohen & Swerdlick, 2005; Kaplan & Saccuzo, 2009). Psychometricians assert that it is crucial to have a test that 'looks like' it is valid because these appearances can give confidence and motivate test takers to do their best because they can see the test is relevant (Cohen & Swerdlick, 2005; Kaplan & Saccuzo, 2009).

Prior to data collection, the instruments were distributed to several prospective respondents for their opinions on the relevancy of the measures of a given construct (e.g., emotional intelligence, personality, leadership practices, positive interpersonal relationships, and trait emotional intelligence). The face validity of the instruments was obtained from the participants of Induction Course for Student Leaders programme

(i-Lead programme)¹². The face validity evidence were obtained from twelve respondents (n = 12) who voluntarily participated in this pre-testing study (n = 12). They were from various years of study (first year to fourth year). This face validity process gauges if the instrument looks like it will measure what it is supposed to measure? The reviewers agreed that all of the items are relevant to each of its respective construct.

4.10 Summary of rationale for research design and analysis for both studies

By way of summary, the present study employed purely quantitative research in the form of survey research. The data were collected from undergraduate students from one public university during their co-curricular activity class on a voluntary basis. The survey design is deemed appropriate as the nature of this study involves multiple measures of psychological constructs such as IQ, personality traits, trait emotional intelligence, interpersonal relationships to gather evidence on the validity of the emotional intelligence construct. The data were investigated using a series of statistical techniques, including item fit, reliability, confirmatory factor analysis, correlation, and regression models. To examine the construct validity of emotional intelligence, statistical softwares such as

¹²This programme is a semesterly programme for the current student leaders/potential leaders for particular clubs/societies

Rasch WINSTEPS, Structural Equation Modelling AMOS, and Statistical Package for Social Science (SPSS) were regarded as appropriate for the intended purposes of the research and as such were adopted.

4.11 Chapter summary and conclusions

The chapter highlighted the practical issues in conducting the present work including research design, context, sampling issues, and data collection procedures. A large portion of the chapter was given over to an explanation of the measures utilized in this study, particularly on the domains, nature of the scales, and its psychometric properties. In addition, the procedures taken to ensure that ethical issues were fully observed have been presented and discussed. The chapter concludes with the rationale for the research design and analysis. The next chapter continues to report the findings of the pilot study which aimed to explore the nomological network of emotional intelligence construct.

CHAPTER 5 – RESULTS OF THE PILOT STUDY: EXPLORING THE NOMOLOGICAL NETWORK OF EMOTIONAL INTELLIGENCE CONSTRUCT

5.1 Chapter overview

The chapter explains the first phase of the study (Study 1) and primarily focuses on the nomological network (inter-relationships) of emotional intelligence with other theoretically-related constructs (cognitive intelligence, personality, and leadership practices). As elaborated earlier in Section 4.2.1, the purposes of this pilot study were threefold. It sought to (1) check the time taken to complete the questionnaire, (2) check the clarity of the questionnaire items, layout, and instructions, and (3) explore the nomological network of the emotional intelligence construct. In Section 5.2, the chapter provides the essential background for establishing a nomological network of the emotional intelligence construct. Further, it reports the findings of these inter-relationships (emotional intelligence with its theoretically-related constructs) by demonstrating how well the emotional intelligence measures fit lawfully into a network of expected relationships (Section 5.3). The chapter concludes with a discussion of the findings and limitations of Study 1.

5.2 The nomological network: Relationships among constructs

The adequacy of a construct as a valid and useful construct can be obtained by exploring empirically the relationship of a particular construct with other related constructs (Nunnally & Bernstein, 1994). The interrelationships among these constructs are known as the nomological network (See Figure 5.1). The concept of nomological network was introduced by Lee Cronbach and Paul Meehl in 1955. The term "nomological" is derived from Greek and essentially means "lawful". Accordingly, the nomological network is referred to as the "lawful network" (Cronbach & Meehl, 1955). Any evidence that a measure sufficiently defines a construct should derive from its determination of the degree of its lawful fit into a network of expected relationships. Figure 5.1 shows an illustration of the nomological fit of the XYZ construct with its related A, B, and C constructs.

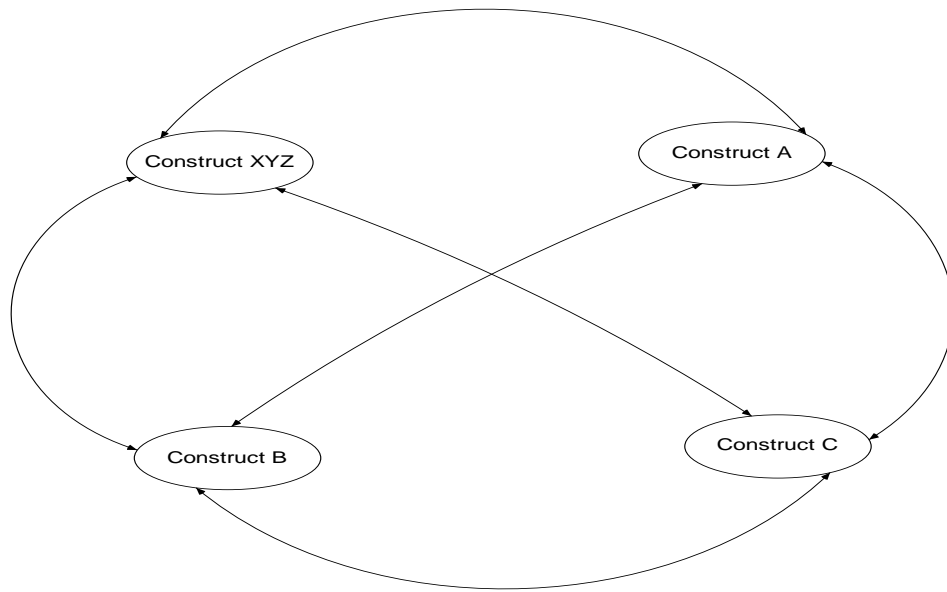


Figure 5.1: An illustration of the nomological fit of the XYZ construct with its theoretically related of A, B, and C constructs.

The purpose of establishing a nomological network is to gain immutable proof that the supposed measure(s) of the construct *behave as expected* (Nunnally & Bernstein, 1994). Philosophically, Cronbach and Meehl (1955) emphasize that if one wants to establish the construct validity of the XYZ construct for example, one should develop a nomological network for its measure. According to Trochim and Donnelly (2007), this network should include a theoretical framework of what one is trying to measure, empirical evidence on how one is going to measure the construct (i.e. the domains or dimensions captured by that construct), and specification of the links between this construct and its theoretically related constructs.

In such a case, the degree of construct validity reveals the extent to which the supposed measure meets theoretical expectations. Nunnally and Bernstein (1994) explain that in determining construct validity, a measure must fit a theory about the construct, but, in order to apply this evidence, one must accept that the theory is true. Cronbach and Meehl (1955) postulate that establishing nomological network is important in accumulating validity evidence, as linking the conceptual/theoretical realm of one construct with other constructs is central to construct validity. This is because to understand the “usefulness” and “meaningfulness” of a construct, one should be able to elaborate the nomological network in which it occurs.

The basic principle in adding a new construct or relation to a theory is that it must create laws (nomologicals) confirmed by observation (Trochim & Donnelly, 2007). In other words, in order to clarify what something is or means, at least some of the laws in the network should be set forth. Finally, Cronbach & Meehl (1955) argue that the nomological network serves as a theoretical foundation for construct validity. Without exploring a nomological network of a construct, then the development of theoretical framework may be baseless.

As a nomological network does not provide a practical and usable methodology for actually examining construct validity, the next phase in

the empirical examination of the construct validity of particular variables is the methodological approach to construct validity, which specifically investigates the convergent, discriminant, and incremental validity of a construct with its related constructs (Cronbach & Meehl, 1955).

5.3 The current investigation: Exploring the nomological network of the emotional intelligence construct

5.3.1 The nomological network of the emotional intelligence construct

As discussed earlier in Section 4.2, Study 1 seeks to link the conceptual framework of emotional intelligence with other theoretically-related constructs as a means to establish its nomological network. Establishing a nomological network for emotional intelligence is necessary given the recent criticism of its conceptualisation (Brackett et al., 2011; Cherniss, 2010b; Joseph & Newman, 2010b; Libbrecht & Lievens, 2012; Matthews et al., 2012; Parker et al, 2011; Siegling et al.,2012) and measurement (Cherniss, 2010b; Fiori & Antonkis, 2011; Harms & Crede, 2010;b Martin & Thomas, 2011; Matthews et al., 2012; Maul 2012a; Sharma et al., 2013). For instance, some researchers argue that the construct of emotional intelligence overlap with certain personality traits (Cherniss, 2010b; Harms & Crede, 2010b; Joseph & Newman, 2010a; Siegling et al.,2012). Therefore, there is a pressing need to establish a nomological

network of emotional intelligence in order to link the conceptual framework of emotional intelligence with other theoretically-related constructs.

The nomological network of emotional intelligence established in this study consisted of emotional intelligence (both the performance-based and self-report measure), cognitive intelligence, personality, and leadership. These variables were included in the nomological network of emotional intelligence because past studies suggested emotional intelligence is conceptually related to these established constructs. As discussed earlier in Section 3.2, emotional intelligence theorists argue that emotional intelligence is a new type of ability resembling other standard forms of intelligence (Mayer, Roberts, et al., 2008; Mayer & Salovey, 1997; Salovey & Mayer, 1990); as such, it should theoretically be related to cognitive intelligence. Past studies highlighted that some dimensions of emotional intelligence overlap with particular personality traits (Conte & Dean, 2006; Joseph & Newman, 2010a).

There is ample evidence that leadership involves emotional abilities of effective leaders in managing the emotions of followers (Antonakis et al., 2009; Brackett et al., 2011; Dasborough, 2006; George, 2000; Kerr et al., 2006; Salas et al., 1996; Prati et al., 2003); Zhou & George, 2003). Thus, leadership was also included in this network. Meanwhile, both measures of emotional intelligence (performance-based and self-report measure)

were included in the network in order to investigate the lawful network between the purported measures. Figure 5.2 illustrates the nomological network of emotional intelligence with its theoretically related constructs and measures.

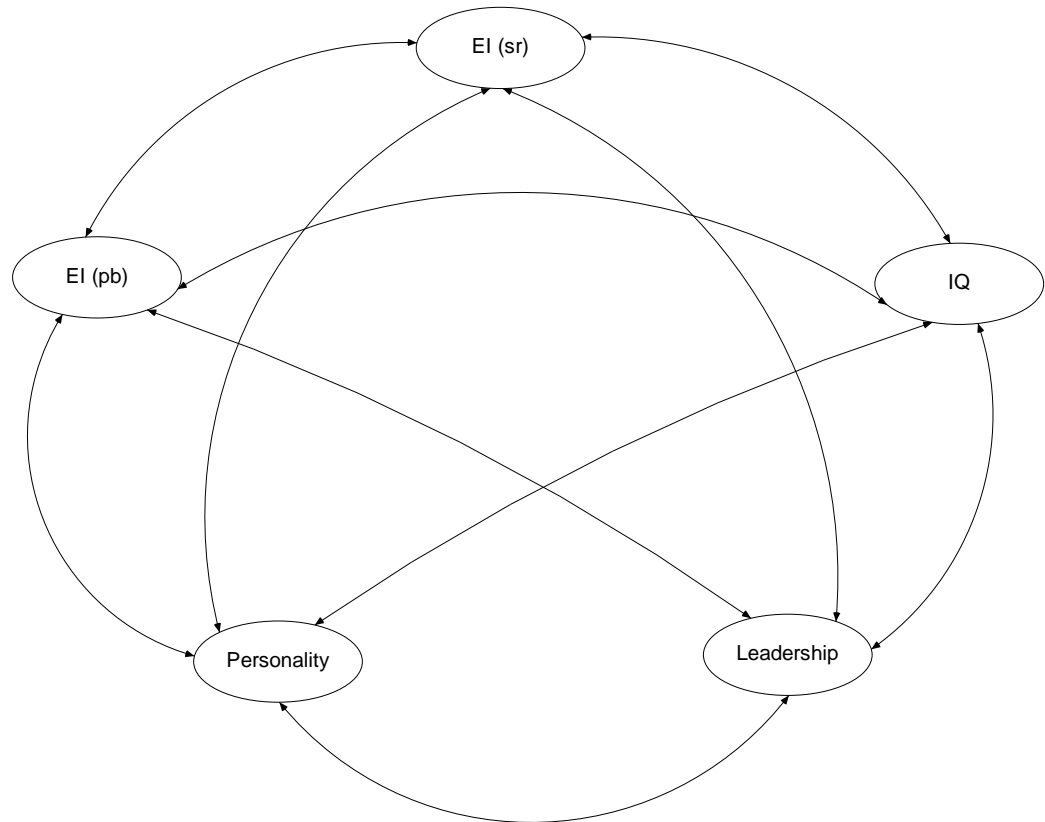


Figure 5.2: The nomological network of emotional intelligence (performance-based and self-report measure) with its theoretically related constructs, namely IQ, personality and leadership.

5.3.2 Statistical analysis and results

5.3.2.1 Brief overview of the collected data

In general, 543 data ($n = 543$) were collected in Study 1. However, out of this number, 241 cases ($n = 241$) were removed due to incomplete responses. Cases were removed if the missing data came from study variables (i.e. personality, leadership etc.), however, they were retained if the missing data came from demographic information only. The remaining cases yielded a total of 302 ($n = 302$) and therefore, the sample size for study 1 consisted of 302 data.

5.3.2.2 Results

Correlational analyses were conducted to examine how well the related constructs or measures “go together” (intercorrelate) empirically (Nunnally & Bernstein, 1994). However, following Nunnally and Bernstein’s (1994) advice, the ‘internal consistency’ for each construct was demonstrated prior to conducting correlational analyses. The internal consistency refers to the reliability of scores obtained by the same persons when they are reevaluated with the same test under different occasions (Anastasi & Urbina, 1997). Statisticians agreed that the cut-off value for acceptable reliability is .70 (Field, 2009; Pallant, 2007).

Cronbach's alpha reliability coefficients for all study variables were obtained for this purpose. Results showed that the reliability of the emotional intelligence (performance-based measure) was deemed untenable with a Cronbach's alpha .613. This low Cronbach's alpha indicated that the construct could have several weak items. According to Green & Salkind, (2005), the items that have point biserial correlation which is less than .20 would be considered as weak items as they are not internally consistent with the measured construct. These weak items were identified and removed. After removing the weak items (point biserial correlation < .20), the reliability coefficient increased to .703. The weak items consisted of item SEA 1a, OEA 2a, OEA 5a, RE 2a, RE 3a, RE 4a, UE 3a, UE 4a and UE 5a (See appendix C2 for the items). It is worth noting that these weak items were from Part A items of the WEIS (scenario). The reliability coefficient of the self-report measure of emotional intelligence was deemed good (Cronbach $\alpha > .70$) according to Green & Salkind, (2005), with Cronbach $\alpha = .875$.

With regards to personality traits, the reliability coefficient for conscientiousness (Cronbach $\alpha = .745$) and neuroticism (Cronbach $\alpha = .794$) were also good. For the openness trait, the initial reliability coefficient was .561, however, after deleting the weak items (Open 7, Open 9 and Open 10), the Cronbach's alpha improved to .747. Similar to openness, the initial reliability coefficient for extraversion trait was .699,

however, the reliability coefficient improved to .717 after removing an unreliable item (item Extra 6). Likewise, the reliability coefficient of agreeableness trait improved from .697 to .705 after removing two weak items, namely item Agree 1 and Agree 6 (See appendix C3 for the items).

At the same time, the internal consistency of the IQ and leadership construct were also satisfactorily reliable with a Cronbach's alpha of .804 and .928 respectively. In addition to examining the reliability of the constructs, the normality of the data distribution was checked by examining the degree of skewness and kurtosis. Hair et al, (2006), if the skewness and kurtosis value is within the range of -1 to +1 (regardless the sign), the data distribution is considered to be normal. Results revealed that the skewness and kurtosis for all study variables were normal (within the range of -1 to +1), hence, no violation was observed (Field, 2009; Pallant, 2007). Descriptive statistics, skewness, kurtosis and the reliability coefficient for all measured constructs are reported in Table 5.1.

Table 5.1: The descriptive statistics and the reliability coefficient of the measured constructs

	Constructs	M	SD	Skewness	Kurtosis	Cronbach's alpha
1	El (performance-based measure)	21.606	4.272	0.697	0.274	.703
2	El (self-report measure)	84.212	11.937	0.346	0.379	.875
3	Cognitive intelligence	39.457	7.090	0.600	0.188	.804
4	Openness	26.414	4.066	0.345	0.392	.747
5	Conscientiousness	29.020	4.923	0.12	0.491	.745
6	Extraversion	21.964	4.466	0.303	0.425	.717
7	Agreeableness	27.682	3.887	0.720	0.538	.705
8	Neuroticism	23.891	5.372	-0.180	-0.029	.794
9	Leadership	114.450	14.625	0.249	0.177	.928

Results from the Pearson product-moment correlations coefficient indicated that the construct of emotional intelligence (performance-based) was positively and significantly related to the self-report measure of emotional intelligence ($r = .174$, $p < .001$), leadership practices ($r = .201$, $p < .001$), and personality traits, particularly with conscientiousness ($r = .158$, $p < .001$) and agreeableness ($r = .229$, $p < .001$). These correlation results are presented in Table 5.2 below. There was also a significant negative relationship between emotional intelligence and cognitive intelligence (IQ); the negative association between these two constructs

was unanticipated. (A plausible explanation for this result is discussed in Section 5.3.3). However, the self-report measure of emotional intelligence was positively related to cognitive intelligence, although the relationship was not significant.

Table 5.2: The correlation analysis between emotional intelligence and its theoretically-related constructs

	Pb.EI	Sr.EI	IQ	Lead	Open	Consci	Ext	Agree	Neu
PB.EI	-								
SR.EI	.174**	-							
IQ	-.225**	.021	-						
Lead	.201**	.510**	.054	-					
Open	.014	.445**	.126*	.510**	-				
Cons	.158**	.469**	-.068	.497**	.367**	-			
Extra	.074	.255**	.02	.325**	.204**	.388**	-		
Agree	.229**	.384**	.096	.310**	.227**	.274**	.121*	-	
Neu	-.082	-.350**	-.024	-.265**	-.161**	-.423**	-.378**	-.268**	-

** Correlation is significant at the 0.01 level (2-tailed)

* Correlation is significant at the 0.05 level (2-tailed).

Notes: PB.EI = performance-based test of emotional intelligence; SR.EI = self-report measure of emotional intelligence; IQ = cognitive intelligence test; Lead = leadership; Open = openness; Cons = conscientiousness; Extra = extraversion; Agree = agreeableness; Neu = neuroticism

5.3.3 Discussions

As elaborated earlier in Section 4.2.1, the purposes of this pilot study were threefold. It sought to (1) check the time taken to complete the questionnaire, (2) check the clarity of the questionnaire items, layout, and instructions, and (3) explore the nomological network of the emotional intelligence construct. In relation to questionnaire administration, the survey sessions took place within 45 to 50 minutes. With regards to the questionnaire items, design, and instructions, the respondents gave positive feedback and were generally satisfied with the layout and readability of the instruments.

In addition, the exploration of the nomological network of emotional intelligence and its theoretically related constructs showed that emotional intelligence (performance-based measure) positively and significantly related to the self-report emotional intelligence measure, leadership practices, and personality, particularly conscientiousness and agreeableness, but was significantly negatively related to cognitive intelligence. However, emotional intelligence as measured by the self-report measure, positively correlated with cognitive intelligence, albeit the relationship was not significant. Both measures of emotional intelligence (performance-based and self-report measures) were also positively and significantly related. Hence, it can be inferred that emotional intelligence (performance-based measure) did not behave as expected when

correlated with cognitive intelligence, but the network between emotional intelligence and other related constructs was nomological as the measure of the construct (performance-based test) did behave as expected.

Results show that the emotional intelligence measure (performance-based) unlawfully fitted into a network of expected relationships. This raises questions regarding its suitability in measuring and defining the emotional intelligence construct. As the ability-based emotional intelligence is conceptualised as an innate intelligence, it should have positive association with cognitive intelligence (Mayer & Salovey, 1997; Mayer, Salovey, et al., 2008; Salovey & Mayer, 1990). However, as the purpose of this pilot study was to explore the nomological network between emotional intelligence and cognitive intelligence, personality and leadership practices, the relationship among these constructs were further confirmed and validated in Study 2 (Main study). Furthermore, establishing a nomological network is considered as an initial step or a philosophical foundation to establish validity. The construct validation process should be further investigated through other validity evidence such as convergent, discriminant, and incremental validity (Cronbach & Meehl, 1955; Nunnally & Bernstein, 1994).

5.3.4 Limitations of Study 1

Among the limitations of this pilot study was that it only covered the relationships between emotional intelligence and cognitive intelligence, personality, and leadership practices. Study 2 extended this study by examining the relationship between emotional intelligence and other constructs such as trait emotional intelligence and positive interpersonal relationships. Second, the purpose of this pilot study was to explore a network of expected relationships among the theoretically related constructs. As the main purpose of the study was to take an initial step to establish its nomological network, the plausible explanations on the expected and unexpected relationships between emotional intelligence and its related constructs are more fully explained in Study 2, which sought to confirm these inter-relationships.¹³

5.4 Chapter summary and conclusions

¹³ The relationship between emotional and cognitive intelligence is discussed in Chapter 8 (A plausible explanation on the unanticipated relationship between emotional and cognitive intelligence is also verified and discussed in this chapter). Next, the relationship between emotional intelligence and personality is elaborated in Chapter 9. Meanwhile, the link between emotional intelligence and its related outcomes (leadership practices and interpersonal relationships) is discussed in Chapter 10.

This chapter explored the nomological network of the emotional intelligence construct. The findings revealed that emotional intelligence (performance-based measure) fitted lawfully into a network of expected positive relationships with personality traits and leadership. However, emotional intelligence did not fit lawfully into a network when correlated with cognitive intelligence. As Study 1 was exploratory in nature, the findings of this nomological network were further confirmed in Study 2 by investigating its convergent, discriminant, and incremental validity. The following chapter presents the results of the preliminary analyses of study variables.

CHAPTER 6 – PRELIMINARY ANALYSES OF STUDY VARIABLES

6.1 Chapter overview

Having discussed the key issues to be tackled (Chapter 1), reviewed the previous attempts to investigate these issues (Chapter 2), developed the research questions (Chapter 3), outlined the research methodology (Chapter 4), and discussed the findings obtained from the pilot study (Chapter 5), what follows is the preliminary analyses of the study variables for the main study. This chapter proceeds with data screening and assessment of item fit. The characteristics of the study respondents are first discussed in Section 6.2, followed by the description on data analyses procedures (Section 6.3) and data screening (Section 6.4). The chapter then proceeds with the preliminary analyses, particularly the assessment of item fit for all study variables and concludes with the correlation analyses among study variables (Section 6.5 to 6.9).

6.2 Characteristics of the study respondents

Data were collected from 710 undergraduate students ($n = 710$) registered at a public Malaysian university. The demographic information of the respondents is provided for the entire sample in Table 6.1.

Table 6.1: Demographic information of the respondents (n = 710)

	Characteristics	N	%
1.	Age		
	19	20	2.8
	20	173	24.4
	21	175	24.6
	22	191	26.9
	23	61	8.6
	24	20	2.8
	25	3	.4
	26	2	.3
	Missing data	65	9.2
	Mean (SD)	21.28	1.192
2.	Gender		
	Male	282	39.8
	Female	427	60.1
	Missing data	1	.1
3.	Kulliyah*		
	Human Sciences	245	34.5
	Islamic Revealed Knowledge	93	13.1
	Economics and Management Sciences	83	11.7
	Education	34	4.8
	Laws	41	5.8
	Information & Communication Technology	44	6.2
	Architecture & Environmental Design	36	5.1

Characteristics	n	%
Engineering	103	14.5
Others	22	3.1
Missing data	9	1.3
4. Level of study		
1st year	290	40.8
2nd year	180	25.4
3rd year	199	28.0
4th year	37	5.2
5th year	2	.2
Missing data	2	.3

*Kulliyah refers to faculty

The age of the respondents ranged from 19 to 26 years ($M = 21.28$, $SD = 1.192$). However, 65 respondents did not report their age. The respondents consisted of 39.8% male students ($n = 282$) and 60.1% females ($n = 427$). Meanwhile, one of the respondents did not indicate their gender. In addition, the sample comprised students from various faculties (human sciences, economics and management sciences, engineering, law, and etc.) (See Table 6.1). It is worth noting that all of the respondents were ethnic Malay.

6.3 Data analysis procedures

The whole dataset was analysed for descriptive statistics, exploratory data analysis, correlations, and multiple regression analyses by using SPSS software version 20, with alpha level set at .01 ($\alpha = .01$). Because the Rasch Measurement Model (WINSTEPS version 3.72.3) is suitable in assessing item fit of ability test and attainment test (Bond & Fox, 2007), the cognitive intelligence and emotional intelligence test were also subjected to Rasch WINSTEPS. In addition to SPSS and Rasch, Structural Equation Modelling (SEM) with AMOS (version 16) was utilised to test the measurement model and item fit for most of the study variables and to test the hypotheses for certain research questions. For SEM, AMOS (Analysis of Moment Structures) programme was chosen over other SEM tools as it is more user-friendly, and superior in graphical interface (Hair et al., 2006). This is because AMOS is the first SEM programme to use a graphical interface for all functions thereby removing the need for researchers to use syntax commands or computer codes.

6.4 Data screening

6.4.1 Brief overview of the collected data

Initially, a total of 1232 responses ($n = 1232$) were collected. Out of this number, 483 ($n = 483$) were incomplete and 23 of the respondents were international students. Data were considered incomplete if there were missing cells for the study variables (i.e. personality, leadership etc.),

however, if the missing data came from demographic information, such cases were retained. As mentioned in Section 4.9.8 (Data collection procedures), international students were informed that their responses will be excluded from the study. The incomplete responses and the responses received from the international students were excluded from the study (n = 506). Thus, the remaining dataset yielded a total of 726 (n = 726) participants. (Section 6.5.3 will further explain about the outliers and the final number of cases included in this study).

6.4.2 Examination of data entry errors

Upon completion of the data entry, the accuracy of the data was checked through descriptive and frequency analyses using SPSS. This consistency checks were performed to ensure the accuracy of the computerised data file against the original questionnaires. An examination of the means, standard deviations, and minimum and maximum values for each variable were performed to determine any values that fall outside the possible range. This showed that a minimal number of data were out-of-range responses for some of the variables (As in the case if the Likert scale ranges from 1 to 5, but the score was 55, for example). Errors in the data-entry were predominantly typographical errors or keystroke mistakes, and these errors were checked against the original data from the paper materials and corrected accordingly in the SPSS data file.

After being assured that the data were free from error, the total scores of each scale were calculated in SPSS using the scoring procedures described for each measure. At the same time, approximately 1% of the scores for each scale was also calculated manually and the syntax commands were carefully double-checked to ensure the precision of the scoring process. No scoring errors were detected in the dataset.

6.4.3 Missing data

Although incomplete responses were removed from the dataset, the dataset was screened once again upon completion of data entry to ensure that there were no missing cells in the data. Screening results showed that there were no missing data for the study variables, but there were several missing data for demographic variables such as age, gender, faculty and level of study. However, these missing data did not constitute a central problem in the subsequent analyses as they were not measured as a unit of analysis.

6.5 Preliminary data analyses

6.5.1 Assessing the assumption of normality

Exploratory Data Analyses (EDA) were conducted to examine the extent to which the requirements of the statistical tests that a researcher is planning to use are met (Morgan, Leech, Gloeckner & Barrett, 2004).

According to Field (2009), exploratory data analyses are important prior to doing any statistical analyses (e.g: t-test, ANOVA, correlation etc.) especially parametric statistical techniques to ensure it is against any violation of the assumptions made by the individual test. A crucial requirement for accurate statistical analyses is to fulfil the assumption of normality. Many statistical analyses assume that the distribution of the scores on the dependent variable is 'normal'. Normal is used to describe a symmetrical, bell shaped curve, which has the greatest frequency of scores in the middle, with smaller frequencies towards the extremes (Gravetter & Wallnau, 2005).

There are several ways to assess the normality of the data distribution through EDA. It can be assessed to some extent by looking at the degree of skewness and kurtosis (Fah & Hoon, 2009; Field, 2009). Field (2009) recommends that examination of the skewness and kurtosis statistics are more appropriate for evaluating normality of variables with a large number of observations (200 or more) rather than calculating their significance using either the Kolmogorov-Smirnov or Shapiro-Wilk tests. The main reason for calculating skewness and kurtosis values is because large samples tend to yield relatively small standard errors and, as a result, normality tests can easily detect statistically significant but unimportant deviations from normality (Field, 2009).

The EDA was performed on this dataset prior to conducting parametric tests in order to gain some information concerning the normality/distribution of the scores, mainly the skewness and kurtosis. Pallant (2007) asserts that the skewness value provides an indication of the symmetry of the distribution, while kurtosis provides information about the 'peakedness' of the distribution. If the distribution is perfectly normal, the skewness and kurtosis value will be 0 (rather an uncommon occurrence in the social sciences field). According to Hair et al. (2006), if the skewness and kurtosis value is within the range of -1 to +1 (regardless the sign), the data distribution is considered to be normal. Table 6.2 shows the descriptive statistics, skewness and kurtosis for the study variables. It reveals that the skewness and kurtosis for all study variables are normal. Hence, this dataset satisfied the normality assumption based on the degree of skewness and kurtosis.

Table 6.2: Descriptive statistics and Exploratory Data Analysis (EDA) of study variables (n = 710)

Variables	M	SD	<u>Skewness</u>		<u>Kurtosis</u>	
			Statistic	Std. Error	Statistic	Std. Error
Predictor variables						
1. EI (performance-based measure)	12.561	3.109	-.496	.092	-.212	.183
2. EI (self-report measure)	73.820	10.561	-.517	.092	.810	.183
3. Trait emotional intelligence	80.142	11.990	.283	.092	.175	.183
4. IQ	28.506	6.543	-.464	.092	-.256	.183
5. Personality: Openness	14.661	2.594	-.357	.092	.437	.183
6. Personality: Conscientiousness	10.294	3.213	.253	.092	-.166	.183
7. Personality: Extraversion	11.170	3.192	.396	.092	.163	.183
8. Personality: Agreeableness	16.270	2.113	-.395	.092	.598	.183
9. Personality: Neuroticism	14.542	3.351	-.509	.092	-.072	.183

Variables	M	SD	Skewness		Kurtosis	
			Statistic	Std. Error	Statistic	Std. Error
Outcome variables						
1. Leadership practices	65.527	7.940	-.203	.092	.106	.183
2. Interpersonal relationships	21.406	5.153	-.184	.092	-.956	.183

6.5.2 Assessing the assumption of 'absence of multicollinearity'

In general, multicollinearity exists when there is a high correlation ($r > .9$) among the predictors in a regression model (Pallant, 2007). A correlation analysis was conducted and showed that no variables were highly correlated with each other to suggest multicollinearity. Other than examining the correlation values, the Variance Inflation Factor (VIF) and tolerance statistics were also examined for all variables through regression analyses. As suggested by Field (2009), a VIF value greater than 10 and a tolerance value less than .2 indicate a serious collinearity problem (Field, 2009). Examination of these statistics showed that the VIF values were all less than 10 (VIF = 1.057 to 1.759) and the tolerance scores were all well above .2 (tolerance = .568 to .946), suggesting no evidence for multicollinearity.

6.5.3 Assessing the assumptions of no outliers and no influential cases

In examining outliers¹⁴, it is possible to look at whether certain cases¹⁵ exert undue influence over the parameters of the model. This evaluation can help to determine whether the regression model is stable across the sample, or whether it is biased by a few influential cases (Field, 2009). One of the residual statistics that can be used to assess the influence of a particular case is by looking at the Mahalanobis distances, which assess the distance of cases from the mean(s) of the predictor variables(s) (Field, 2009; Tabachnik & Fidell, 2007).

The value of mahalanobis distances for all cases were obtained and compared with its critical value. With 9 predictors, the critical value for evaluating the Mahalanobis distance value is 27.88 (Tabachnick & Fidell, 2007). Any value larger than the critical value indicates the existence of 'multivariate outliers'. In this dataset, 16 cases exceeded the critical value of 27.88, thus suggesting the presence of multivariate outliers (Pallant, 2007). These cases (n = 16) were therefore removed from the study and the remaining dataset resulted in 710 (n = 710) participants. This value (n = 710) was the final number of cases included in this study.

¹⁴ Outliers refer to "cases with such extreme values on one variable (univariate outlier) or a combination of scores on two or more variables (multivariate outlier) that they distort statistics" (Tabachnik & Fidell, 2007, p. 72).

¹⁵ In this context, case refers to the respondent's response

6.6 Overview on the assessment of item fit and measurement model for all study variables

Prior to assessing the interrelationships (e.g. structural relationships) among the latent variables of interest, examination of item fit and measurement model ¹⁶ viability (model fit) must be established (Awang, 2013; Brown, 2006; Byrne, 2010). Researchers should examine item fit and model fit for all constructs involved before modelling their interrelationships because should poor fit indices arise in a structural model¹⁷, it is more likely that it stems from misspecifications in the measurement model (i.e., the manner in which the observed items/indicators are related to its latent construct) than from the structural model that specifies the interrelationships of certain constructs. This is because in most cases there are usually more things that can go wrong in the measurement

¹⁶ Measurement model is a SEM model that deals with a concept and specifies (1) the number of items/indicators that underlie its factor, and (2) how these factors are related to make up a construct. For instance, for emotional intelligence construct, it has four factors (self-emotional appraisal, others' emotional appraisal, regulation of emotion and use of emotion), and each factor consists of several items. It is the first step to do before completing 'structural model' analysis.

¹⁷ Structural model is a SEM model that specifies the relationships among latent variables/constructs. For example, a structural model to assess the relationship between income (predictor), length of service (predictor) and job satisfaction (outcome).

model than in the structural model (i.e., misspecified factor loadings, weak item loading) (Brown, 2006; Byrne, 2010). Hence, the measurement model for each construct must first be established before assessing their interrelationships (structural model).

6.6.1 Model estimation: Goodness-of-fit indices (GOF)

The measurement model for all constructs (polytomous data) in this study was subjected to the Confirmatory Factor Analysis, and conducted through SEM AMOS. Confirmatory Factor Analysis (CFA) was preferred to Exploratory Factor Analysis (EFA) because CFA is used to provide a confirmatory test of our measurement theory, while EFA is used to explore the theory (Hair et al., 2006; Tabachnick & Fidell, 2007). The distinctive feature of EFA is that EFA explores the data, and the factors are derived from statistical results, not from theory. This means the researcher runs the software and lets the underlying pattern of the data determine the factor structure. In contrast, CFA is used to confirm or validate how well our theoretical specification of the factors matches reality (actual data), instead of allowing the statistical method to determine the number of factors and loadings as in EFA (Hair et al., 2006; Tabachnick & Fidell, 2007). In this study, CFA was preferred as it enables us to either “confirm” or “reject” our preconceived theory.

In assessing the adequacy and fit of the hypothesized model (measurement model), a number of criteria can be investigated based on the Goodness-of-fit (GOF) indices. The GOF compares the theory to reality by assessing the similarity of the estimated covariance matrix (theory) to reality (the observed covariance matrix) (Hair et al., 2006; Tabachnick & Fidell, 2007).

Hair et al. (2006) provide guidelines in assessing the adequacy of the hypothesized model and suggest the use of multiple indices to provide evidence of model fit. A researcher should report at least one absolute index and one incremental fit index, in addition to the χ^2 value and the associated degrees of freedom. Therefore, reporting the χ^2 value and degree of freedom (df), the CFI and the RMSEA will usually provide sufficient information to evaluate a model fit. The description on each of these categories of fit indices are discussed in the following paragraphs.

The first category refers to the absolute fit indices. This index provides the most basic evaluation of how well a researcher's theory (model) fits the sample data and the most fundamental absolute fit index is the χ^2 statistic (along with its degree of freedom and significance level) (Hair et al., 2006). A non-significant χ^2 statistic is desirable as the researcher is looking for no differences between matrices (i.e. low χ^2 value) to support the model as representative of the data.

However, this χ^2 test is sensitive to sample size and the number of indicators/items. Large sample size or large number of items (increased model complexity) will make it more difficult for the model to achieve a statistically non-significant GOF. Kline, (2011) asserts that once the sample size reaches 300 ($n \geq 300$), the tendency to get a non-significant χ^2 statistic is very low. Hence, for large sample size ($n > 350$), if the chi-square test is significant ($p < .05$), it is acceptable (Kline, 2011). Therefore, the resulting p-value is less meaningful as sample size becomes large or the number of observed items becomes large. For this reason, other GOF indices were also assessed to reflect the different facets of model fit.

Other than χ^2 , Normed chi-square, RMSEA and SRMR are also used to assess absolute fit indices. The normed chi-square is widely used to assesses the overall model fit (Hair et al., 2006). This index is a simple ratio of χ^2 to the degrees of freedom for a model. The χ^2 :df ratios on the order of 5:1 or less are associated with an acceptable fitting model, while the χ^2 :df ratios of 3:1 or less indicated a better-fitting model (Hair et al., 2006).

Another category of indices refers to the incremental fit indices. The incremental fit indices examines how well the estimated model fits relative to some alternative baseline model. The comparative Fit Index (CFI) is one of the most widely reported for the incremental fit indices. It is also

known as the goodness-of-fit index. CFI values range from 0 to 1 and values near 1 are highly desirable. Generally, a cut-off value of .90 or larger indicates acceptable fit (Awang, 2013; Bentler & Bonett, 1980; Brown, 2006; Hair et al., 2006). On the other hand, a CFI value equals to or larger than .95 indicates good fit to the data (Awang, 2013; Brown, 2006; Byrne, 2010; Hair et al., 2006; Hu & Bentler, 1999).

The last category of fit indices are known as noncentrality-based indices. This category of indices is sometimes known as badness-of-fit measures. The root mean square error of approximation (RMSEA) is one of the indices that falls in this category. It evaluates whether a model is a close fit to the data. A lower RMSEA value represents better fit while a higher value represents a worse fit. A cut-off value of .08 and below seems to be the general consensus at present in indicating an adequate fit (Brown, 2006), whereas a value less than .05 indicate a good model fit (Awang, 2013; Brown, 2006; Hair et al., 2006).

Following Hair et al.'s (2006) recommendations, using three to four fit indices provides adequate evidence of model fit. In reporting the GOF, at least one absolute fit index and one incremental fit index should be reported, in addition to the χ^2 value and degrees of freedom. In such a case, reporting the χ^2 value and df, CFI and RMSEA will usually provide sufficient unique information to evaluate a model (Hair et al., 2006). Thus,

multiple fit indices will be used in this study (χ^2 value, normed χ^2 , CFI and RMSEA) to assess a model's goodness-of-fit.

In addition to the overall model fit, loading estimates should be examined in order to ensure that all of the items/indicators are statistically significant and practically meaningful to the construct. The minimum criterion for loading estimates is to ensure that the critical ratio (C.R.) for each item higher than 1.96 to indicate that the item is statistically significant (Byrne, 2010). Conversely, another additional criterion is to ensure that standardised factor loadings (standardised regression weights using AMOS terminology) of each item/indicator reach the minimum cut-off value (Hair et al., 2006). Statisticians suggest that standardised factor loadings larger than .40 are deemed 'acceptable', and .70 and above are 'ideal' to indicate that the items are good and practically relevant to the construct (Awang, 2013; Hair et al., 2006).

In conclusion, the measurement model applied throughout this study will consider two measurement issues: (1) overall model fit and (2) loading estimates. For the overall model fit, the minimum cut-off value for an adequate model is CFI larger than .90 and RMSEA smaller than .08, while a good model fit should have CFI larger than .95 and RMSEA smaller than .06. Meanwhile, for the loading estimates, it should have a significant CR and the value should be at least .40 ($L > .40$) to indicate its

meaningfulness to the construct. Table 6.3 shows a summary of fit indices and the recommended criteria.

Table 6.3: The recommended criteria in assessing fit indices for SEM models

Fit index	Recommended criteria
Chi-square statistic (χ^2) df P	<ul style="list-style-type: none"> • Chi-square value should not be significant if there is a good model fit (Byrne, 2010)
Normed χ^2	<ul style="list-style-type: none"> • Good model fit: Normed χ^2 less than 2.0 (Hair et al., 2006) • Adequate model fit: Normed χ^2 value between 2.0 and 5.0 (Hair et al., 2006)
CFI	<ul style="list-style-type: none"> • Good model fit: CFI equal or above .95 (Byrne, 2006, 2010; Hu & Bentler, 1999). • Adequate model fit: CFI value between .90 and .95 (Bentler & Bonett, 1980; Brown, 2006).
RMSEA	<ul style="list-style-type: none"> • Good model fit: RMSEA less than or equal to .06 (Byrne, 2006, 2010). • Adequate model fit: RMSEA less than or equal to .08 (Brown, 2006; Byrne, 2010; Schumacker & Lomax, 2004).

6.7 Assessment of item fit for polytomous data

6.7.1 Model assessment

In general, most of the variables used in this study (personality, trait emotional intelligence, self-report emotional intelligence and etc.) were classified as polytomous data. Polytomous data consisted of items that have an acceptable range of answers (i.e. Likert scale instrument) (Bond & Fox, 2007). The assessment of item fit for these polytomous data were gained from the measurement model and tested through confirmatory factor analysis (CFA) using Maximum Likelihood estimation (MLE). As discussed in Section 6.6.1, two measurement issues were observed throughout the analysis; (1) the goodness-of-fit indices and (2) the loading estimates.

6.7.2 Respecification of measurement model: Post Hoc analyses of model assessment

In case the measurement model needs revision to improve its model or item fit (as indicated by the goodness-of-fit indices and loading estimates), two issues may be considered in respecifying the measurement model : (1) Modification indices and (2) significance loading estimates. The modification indices were checked as they may suggest some ways to further improve the model or perhaps address specific problems that were not sufficiently revealed by the goodness-of-fit indices (Hair et al., 2006).

The Modification Indices (MI) or residual analyses (post hoc revisions to a fitted model) generally show evidence of misfit in the model.

On the basis of this rationale, path coefficients (between an item to another item or between an item to another factor) associated with the largest MI were scrutinised. In such a case, the MI revealed the error covariance, particularly the pairing of error terms associated with certain items that are highly overlapping or related (Byrne, 2006, 2010). For instance, large MI between item A and item P may suggest that both items are highly related, in other words, they are measuring the same thing. One of the solutions to this issue is to delete either one of the items (choose to delete the one with the lowest loading first), and re-run the analysis (Awang, 2013). After respecifying the model (deleting one of these items), the goodness-of-fit indices should improve.

The second class of problems concerns the significance of factor loadings. As stated earlier in Section 6.6.1, all items should be statistically significant to represent the construct. To be a significant item/indicator, the critical ratio (C.R.) for each item should be higher than 1.96 (C.R. > 1.96) to indicate that the item is statistically significant to the construct (Byrne, 2010). In addition to critical ratio, the standardised factor loadings also should reach the minimum cut-off value of .40 to indicate that the items are good and practically relevant to the construct (Hair et al., 2006). Both,

critical ratio and the standardised factor loading can be examined through Regression Weights output. In such a case, any items with the critical ratio lower than 1.96, or loading estimates lower than .40 should be considered for deletion. In most cases, removing this non-significant indicator will cause improvement to the model fit (Byrne, 2010; Hair et al., 2006).

To conclude, respecifications of the measurement model were made based on the suggestions given by (1) modification indices and (2) Regression Weights output. Items would be considered for deletion if they were (1) overlapping with other items (as suggested by the Modification Indices) or (2) had a non-significant factor loading (as suggested by the Regression Weights).

6.7.3 Personality

As the measured personality scale consists of five distinct personality traits, the investigation of item fit and measurement model of these traits (openness, conscientiousness, extraversion, agreeableness and neuroticism) were conducted independently. These traits consist of 10, 9, 8, 9 and 8 items respectively. (See Appendix C for the personality items).

6.7.3.1 Openness

The measurement model of the Openness scale was composed of 10 items with a single latent factor. The goodness-of-fit indices indicated that

the initial hypothesized model has a poor model fit, $\chi^2 (35) = 274.969$, $p = .000$, $\chi^2/df = 7.856$, CFI = .789 and RMSEA = .098.

Hence, the model was revised in order to obtain the measurement model with the best fit. As stated in Section 6.7, the revision process was made based on the suggestions given by the Modification Indices (MI) and Regression Weights output. The revision process of the model includes the deletion of items Open 2, Open 6, Open 7, Open 8, Open 9 and Open 10 (See Appendix C3 for the Openness items).

The final revised model showed a remarkable improvement from a poor model fit to a good model fit. The goodness-of-fit indices indicated that the final revised model is the most parsimonious model to represent the data, with $\chi^2 (2, N = 710) = 16.063$, $p = .007$, $\chi^2/df = 3.213$, CFI = .981 and RMSEA = .056. The goodness-of-fit indices of the Openness trait and its parameter estimates are provided in Table 6.4.

Table 6.4: The measurement model of 'Openness' trait: Fit statistics

Factor	Item	Std L	CR	P	Cronbach's α
Openness	Open 1	.65			.780
	Open 3	.51	9.936	***	
	Open 5	.66	11.445	***	
	Open 8	.61	11.163	***	
<u>Goodness-of-fit indices</u>					
χ^2	Df	P	χ^2 / df	CFI	RMSEA
16.063	2	.007	.3.213	.981	.056

* The first item for each subscale was set to 1.00. All factor loadings were significant at $p < .001$.

With regard to item fit, all of the remaining items (Open 1, Open 3, Open 5 and Open 8) had a Critical Ratio greater than 1.96 ($CR > +1.96$) indicating that they were significant indicators of the construct (Byrne, 2010). The loading estimates for all of the items were also larger than .5 signifying that they were satisfactorily related to the construct (Hair et al., 2006). Therefore, these items (Open 1, Open 3, Open 5 and Open 8) will be used to represent Openness trait in succeeding analyses.

6.7.3.2 Conscientiousness

The measurement model of conscientiousness consists of 9 items. The fit indices indicated that the hypothesized model poorly fit the data, $\chi^2 (27) = 546.018$, $p = .000$, $\chi^2/df = 20.223$, CFI = .585 and RMSEA = .165. Therefore, the model was respecified and the CFA was reanalysed.

In respecifying the measurement model, a few weak items were removed including items Cons 2, Cons 4, Cons 5, Cons 6 and Cons 9 (See Appendix C3 for the Conscientiousness items). The result of the revised model suggested a good fit for the CFA model. The final model was good and sufficiently fit the data; $\chi^2 (2) = 8.236$, $p = .016$, $\chi^2/df = 4.118$, CFI = .988 and RMSEA = .066. The final model of the Conscientiousness and its parameter estimates are provided in Table 6.5.

Table 6.5: The measurement model of 'Conscientiousness' trait: Fit statistics

Factor	Item	Std L	CR	P	Cronbach's α
Conscientiousness	Cons 1	.58			.821
	Cons 3	.64	11.014	***	
	Cons 7	.69	11.268	***	
	Cons 8	.59	10.629	***	
<u>Goodness-of-fit indices</u>					
χ^2	Df	P	χ^2 /df	CFI	RMSEA
8.236	2	.016	4.118	.988	.066

* The first item for each subscale was set to 1.00. All factor loadings were significant at $p < .001$.

Examination of the loadings showed that these four items; Cons 1, Cons 3, Cons 7 and Cons 8 were significant indicators of the construct (Byrne,

2010; Hair et al., 2006). Thus, Conscientiousness is represented by items Cons 1, Cons 3, Cons 7 and Cons 8 in further structural analyses.

6.7.3.3 Extraversion

The measurement model of extraversion consists of 8 items and similar to other personality traits, this trait is a unidimensional trait. The CFA result did not support the adequacy of the model, thus yielded a poor model fit, $\chi^2(20) = 231.681$, $p = .000$, $\chi^2/df = 11.584$, CFI = .796 and RMSEA = .122.

The model was revised and non-significant items (item Ext 1, Ext 4, Ext 6 and Ext 8) were removed (See Appendix C3 for the Extraversion items). Result of the respecified model yielded a better result with an acceptable model fit; $\chi^2(2, N = 710) = 8.643$, $p = .013$, $\chi^2/df = 4.322$, CFI = .991 and RMSEA = .068. The final respecified model of the Extraversion and its parameter estimates are provided in Table 6.6.

Table 6.6: The measurement model of 'Extraversion' traits: Fit statistics

Factor	Item	Std L	CR	P	Cronbach's α
Extraversion	Ext 1	.70			.714
	Ext 4	.63	14.202	***	
	Ext 6	.83	15.609	***	
	Ext 8	.51	11.684	***	
<u>Goodness-of-fit indices</u>					
χ^2	Df	P	χ^2 / df	CFI	RMSEA
8.643	2	.013	4.322	.991	.068

* The first item for each subscale was set to 1.00. All factor loadings were significant at $p < .001$.

The assessment of item significance showed that the remaining items (Ext 1, Ext 4, Ext 6 and Ext 8) were satisfactorily related to the construct (Byrne, 2010; Hair et al., 2006). Hence, these items (Ext 1, Ext 4, Ext 6 and Ext 8) will represent the Extraversion trait in the succeeding analyses (See Appendix C3 for the Extraversion items).

6.7.3.4 Agreeableness

The measurement model of Agreeableness consisted of 9 items that map onto one single factor. The overall model fit indicated that the hypothesized measurement model was inadequate and poorly fit the data, $\chi^2 (27) = 219.643$, $p = .000$, $\chi^2/df = 8.135$, CFI = .728 and RMSEA = .100.

Hence, the model was modified and reanalysed. The modification process suggested the exclusion of item Agr 2, Agr 4, Agr 7 and Agr 9 (See Appendix C3 for the Agreeableness items). Following these suggestions, the modified model reflected good model fit: $\chi^2 (2) = 11.328$, $p = .515$, $\chi^2/df = 2.664$, CFI = .956 and RMSEA = .054. See Table 6.7 for the results of the final model of Agreeableness trait.

Table 6.7: The measurement model of 'Agreeableness' trait: Fit statistics

Factor	Item	Std L	CR	P	Cronbach's α
Agreeableness	Agr 2	.51			.713
	Agr 4	.50	7.526	***	
	Agr 7	.59	7.841	***	
	Agr 9	.51	7.588	***	
Goodness-of-fit indices					
χ^2	Df	P	χ^2 /df	CFI	RMSEA
11.328	2	.515	2.664	.956	.064

* The first item for each subscale was set to 1.00. All factor loadings were significant at $p < .001$.

The loading estimates showed that these four items; Agr 2, Agr 4, Agr 7 and Agr 9 were significant indicators to the construct (Byrne, 2010; Hair et al., 2006). Thus, Agreeableness will be represented by item Agr 2, Agr 4, Agr 7 and Agr 9 for further structural analysis.

6.7.3.5 Neuroticism

The measurement model of conscientiousness was represented by 8 measured items that converge to its single dimension. The goodness-of-fit indices did not suggest an acceptable fit for the CFA model, with χ^2 (20) = 482.490, $p = .000$, $\chi^2/df = 24.125$, CFI = .708 and RMSEA = .181. Therefore, the model was revised in order to achieve an acceptable fit.

During model modifications, a few weak and redundant items were deleted including item Neu 1, Neu 2, Neu 5, and Neu 7 (See Appendix C3 for the Neuroticism items). The final modified model suggested a good fit for the CFA model; χ^2 (2) = 4.474, $p = .107$, $\chi^2/df = 2.237$, CFI = .997 and RMSEA = .042. Results of the final model of neuroticism and its parameter estimates are provided in Table 6.8.

Table 6.8: The measurement model of 'Neuroticism' trait: Fit statistics

Factor	Item	Std L	CR	P	Cronbach's α
Neuroticism	p14	.69			.776
	p19	.69	15.327	***	
	p29	.51	11.750	***	
	p39	.84	16.201	***	
Goodness-of-fit indices					
χ^2	Df	P	χ^2/df	CFI	RMSEA
4.474	2	.107	2.237	.997	.042

* The first item for each subscale was set to 1.00. All factor loadings were significant at $p < .001$.

The standardized factor loadings showed that these four items; Neu 3, Neu 4, Neu 6, and Neu 8 were significant indicators to the construct ($L > .50$) (Byrne, 2010; Hair et al., 2006). In such a case, Neuroticism will be represented by items Neu 3, Neu 4, Neu 6, and Neu 8 for further analyses

6.7.4 Trait emotional intelligence

In general, this construct will be used to answer H6 and H7. The specified measurement model consists of six latent factors: emotionality (8 items), self-control (7 items), sociability (6 items), well-being (6 items), motivation (2 items) and adaptability (2 items) that represent trait emotional intelligence construct.

Based on the several goodness-of-fit criteria, the result revealed that the hypothesized model (model 1) was inadequate and indicated poor model fit with $\chi^2(390) = 2938.614$, $p = .000$, $\chi^2/df = 7.535$, CFI = .562 and RMSEA = .096. These fit indices suggested a great need for improvement of the measurement model. The model was therefore revised and the CFA was reanalysed.

Based on the suggestions provided by the modification indices, the specification of the model was restructured. First, in terms of the confirmed factors, emotionality and self-control factor were retained, but, the sociability, well-being, motivation and the adaptability factors were

merged into a single factor as their correlations were higher than .9 ($r > .9$) indicating that they were measuring the same components (the researcher named this new combined factor as 'psychological and social well-being' as the retained items reflected this quality). Second, several unfit items were excluded in the final revised model: items T1, T6, T7, T9 T10, T13, T16, T19, T20, T21, T26, T28 and T30 (See Appendix C4 for the trait emotional intelligence items).

Following these suggestions, the modified model reflected sufficient and good model fit: $\chi^2 (101) = 240.304$, $p = .000$, $\chi^2/df = 2.379$, CFI = .952 and RMSEA = .044. The final modified model of the trait emotional intelligence and its parameter estimates are provided in Table 6.9.

Table 6.9: The measurement model of 'Trait Emotional Intelligence':
Goodness-of-fit statistics and its parameter estimates

Factor	Item	Std L	CR	P	Cronbach's α
Emotionality	T8	.57			.874
	T13	.60	8.817	***	
	T16	.55	7.730	***	
	T28	.63	8.971	***	
	T5	.56	8.546	***	
	T12	.61	8.856	***	
	T14	.53	9.197	***	
Self-control	T4	.70			.729
	T7	.66	13.373	***	
	T15	.54	11.497	***	
PSWB	T6	.72			.794
	T11	.69	12.802	***	
	T21	.65	15.518	***	
	T9	.64	15.195	***	
	T24	.71	16.873	***	
	T3	.67	16.003	***	

Relationships among the factors	
Emo ↔ SC	.31
Emo ↔ PSWB	.22
SC ↔ PSWB	.77

Goodness-of-fit indices					
χ^2	Df	P	χ^2 / df	CFI	RMSEA
240.304	101	.000	2.379	.952	.044

*PSWB = Psychological and social well-being; Emo = Emotionality; SC = Self-control

* The first item for each subscale was set to 1.00. All factor loadings were significant at $p < .001$.

For the final revised model, an examination of the parameter estimates revealed that all items were satisfactorily good and related to trait emotional intelligence as their Critical Ratio values were significant and loadings were larger than .50 (Byrne, 2010; Hair et al., 2006). In summary, 17 items and its 3 related factors were retained to represent the trait emotional intelligence construct for further analyses particularly in responding to H7 and H8.

6.7.5 Leadership practices

In general, this construct will be used to answer H6. The specified measurement model of leadership practices comprises of five factors: (1) Modelling the way; (2) Inspiring a shared vision; (3) Challenging the process; (4) Enabling others to act; and (5) Encouraging the heart. Each factor consists of 6 items.

The results from the goodness-of-fit indices, particularly CFI, did not support the adequacy of the model and yielded an unacceptable model fit model with $\chi^2 (395) = 1546.440$, $p = .000$, $\chi^2/df = 3.915$, CFI = .857 and RMSEA = .064. The measurement model was therefore revised.

During the post-hoc model modification, a few misspecified and unfit items were excluded in the final revised model including item Model 1, Model 3, Challenge 2, Enable 1, Encourage 5 and Encourage 6 (See Appendix C5

for the leadership practices items). After respecifying the model, the result suggested an adequate fit for the CFA model. The final model was acceptable and sufficiently fitted the data; χ^2 (242) = 801.534, $p = .000$, $\chi^2/df = 3.312$, CFI = .911 and RMSEA = .057. The final model of the leadership practices and its parameter estimates are provided in Table 6.10.

Table 6.10: The measurement model of ‘Leadership practices’: Goodness-of-fit statistics and its parameter estimates

Factor	Item	Std L	CR	P	Cronbach's α
Model	M2	.59			.721
	M4	.61	12.308	***	
	M5	.66	12.983	***	
	M6	.65	12.878	***	
Inspire	I1	.60			.811
	I2	.71	14.941	***	
	I3	.77	15.772	***	
	I4	.72	15.010	***	
	I5	.68	14.462	***	
	I6	.64	13.829	***	
Challenge	C1	.61			.784
	C3	.60	12.963	***	
	C4	.58	12.656	***	
	C5	.74	15.067	***	
	C6	.69	14.466	***	

Factor	Item	Std L	CR	P	Cronbach's α
Enable	Ena2	.54			.776
	Ena3	.64	11.811	***	
	Ena4	.71	12.554	***	
	Ena5	.69	12.324	***	
	Ena6	.66	12.024	***	
Encourage	Ec1	.62			.742
	Ec2	.75	15.034	***	
	Ec3	.77	15.327	***	
	Ec4	.60	12.818	***	

Relationships among the factors

Model ↔ Inspire	.80
Model ↔ Enable	.33
Model ↔ Encourage	.47
Inspire ↔ Challenge	.83
Inspire ↔ Enable	.37
Inspire ↔ Encourage	.49
Challenge ↔ Enable	.43
Challenge ↔ Encourage	.51
Enable ↔ Encourage	.71

Goodness-of-fit indices

χ^2	Df	P	χ^2 /df	CFI	RMSEA
801.534	242	.000	3.312	.911	.057

* Model = Modelling the way; Inspire = Inspiring a shared vision; Enable: Enabling others to act; Encourage = Encouraging the heart

* The first item for each subscale was set to 1.00. All factor loadings were significant at $p < .001$.

The assessment of item significance (based on Critical Ratio and loadings) showed that all items in the final revised model were significant items to represent the leadership (Byrne, 2010; Hair et al., 2006). Hence,

these 24 reliable items will be used to represent the leadership practices construct in the succeeding analyses, particularly in responding to H6.

6.7.6 Positive interpersonal relationships

The measurement model of positive interpersonal relationships scale was composed of 7 items with a single latent factor. The goodness-of-fit criteria indicated that the initial hypothesized model was not adequate and indicated poor model fit, with $\chi^2 (14) = 369.502$, $p = .000$, $\chi^2/df = 26.393$, CFI = .889 and RMSEA = .189.

Hence, the model was revised in order to obtain the measurement model with the best fit. The revision process included the deletion of items IPR 6 and IPR 7 (See Appendix C6 for the interpersonal relationships items). The final revised model showed a remarkable improvement from one with poor model fit to good model fit, with $\chi^2 (5, N = 710) = .7.665$, $p = .176$, $\chi^2/df = 1.533$, CFI = .999 and RMSEA = .027. The goodness-of-fit indices of the interpersonal relationships and its parameter estimates are provided in Table 6.11.

Table 6.11: The measurement model of 'Positive Interpersonal Relationships': Goodness-of-fit statistics and its parameter estimates

Factor	Item	Std L	CR	P	Cronbach's α
IPR	ipr1	.79			.872
	ipr2	.83	24.311	***	
	ipr3	.85	24.933	***	
	ipr4	.82	23.719	***	
	ipr5	.71	19.936	***	
Goodness-of-fit indices					
χ^2	Df	P	χ^2 /df	CFI	RMSEA
7.665	5	.176	1.533	.999	.027

*IPR = Positive Interpersonal Relationships

* The first item for each subscale was set to 1.00. All factor loadings were significant at $p < .001$.

With regards to the item fit, all of the remaining items (IPR 1, IPR 2, IPR 3, IPR 4 and IPR 5) were satisfactorily good to represent the construct (Byrne, 2006, 2010; Hair et al., 2006). Therefore, these items (IPR 1, IPR 2, IPR 3, IPR 4 and IPR 5) will be used to represent positive interpersonal relationships construct in the succeeding analyses.

6.7.7 Emotional intelligence (self-report measure)

Prior to conducting analyses for H2, H6 and H7, the measurement model of the WLEIS was evaluated through CFA to assess the adequacy of the overall model and its item fit. The hypothesized measurement model consists of four factors (self-emotional appraisal (SEA), others' emotional

appraisal (OEA), regulation of emotion (RE) and use of emotion (UE), and each factor consists of four items. See Table 6.12.

Based on the several goodness-of-fit criteria, the CFA result showed that the measurement model was satisfactorily adequate indicating an acceptable model fit, $\chi^2 (98) = 416.971$, $p = .000$, $\chi^2/df = 4.255$, CFI = .950 and RMSEA = .068. The measurement model of the WLEIS and its parameter estimates are provided in Table 6.12.

Table 6.12: The measurement model of 'self-report measure of Emotional Intelligence': Goodness-of-fit indices and its parameter estimates

Factor	Item	Std L	CR	P	Cronbach's α
SEA	SEA1	.62			.776
	SEA2	.87	17.115	***	
	SEA3	.84	16.950	***	
	SEA4	.59	13.123	***	
OEA	OEA1	.78			.783
	OEA2	.85	22.508	***	
	OEA3	.62	16.102	***	
	OEA4	.82	21.756	***	
RE	RE1	.85			.845
	RE2	.89	30.182	***	
	RE3	.76	23.611	***	
	RE4	.87	29.119	***	
UE	UE1	.75			.826
	UE2	.83	21.968	***	
	UE3	.82	21.706	***	
	UE4	.82	21.608	***	

Relationships among the factors	
SEA ↔ OEA	.35
SEA ↔ RE	.41
SEA ↔ UE	.52
OEA ↔ RE	.31
RE ↔ UE	.39
OEA ↔ UE	.29

Goodness-of-fit indices					
χ^2	Df	P	χ^2/df	CFI	RMSEA
416.971	98	.000	4.255	.950	.068

* SEA = self-emotional appraisal; OEA = others' emotional intelligence; UE = use of emotion; RE = regulation of emotion.

* The first item for each subscale was set to 1.00. All factor loadings were significant at $p < .001$.

All of the items were significant indicators of the construct as most of the loadings were larger than .7 (Byrne, 2010; Hair et al., 2006) Hence, further analyses utilizing this construct will retain all of the 16 items that make up its four factors (See Appendix C1 for the self-report measure of emotional intelligence items).

6.8 Assessment of item fit for dichotomous data

Because the data from the Shipley-2 IQ test and Wong performance-based emotional intelligence test were dichotomously scored, it was exposed to Rasch Measurement Model (WINSTEPS) software to assess the item fit and the reliability of the instrument (Bond & Fox, 2007). The use of Rasch for this instrument was deemed appropriate as Rasch is suitable in assessing the psychometric properties of ability tests, and it can also deal with dichotomous data, regardless of the number of items (Bond & Fox, 2007).

By using WINSTEPS, the validity of test items were assessed through 'item polarity' output. Item polarity denotes the extent to which test items are working in the same direction to define the measured construct. It is indicated by the point-measure correlation coefficient. The zero and negative values indicate that items or respondents are working in the

wrong direction, while the positive values indicate that the items were working in the same direction to measure construct. In such a case, a relatively high positive value is desired for item polarity (Linacre, 2010a).

In addition to the direction of correlation coefficient (positive and negative direction), the degree of the correlation coefficient value should also reach a minimum cut-off value. Bond and Fox (2007) assert that the dichotomous data should reach .20 ($r > .20$) as a low correlation coefficient signified that the items were minimally related to the construct and these items were not effectively discriminating between persons with high ability and those with low ability.

With regards to the reliability of the items, it was evaluated through the reliability index which is conceptually similar to the Cronbach's alpha. It indicates the extent to which a different set of items measuring the same construct would reproduce the observed person scores (Bond & Fox, 2007; Hula, Doyle, McNeil & Mikolic, 2006).

6.8.1 Cognitive intelligence

As the crystallized intelligence and fluid intelligence will be treated as an independent construct in the succeeding analyses, the measurement model for gc and gf were assessed independently (Bond & Fox, 2007).

6.8.1.1 Fluid intelligence

All of the items composing the fluid intelligence factor ($n = 26$) were included in this measurement model, and the validity of test items were assessed through item polarity output.

Table 6.13 shows the point measure correlation (PTMEA CORR) for the 26 items. The output table shows that all of the items had a positive point measure correlation coefficient indicating that all of them were working in the same direction to measure fluid intelligence. Nonetheless, 7 items had a point measure correlation below 0.2 (ranging from .08 - .19). The low correlation coefficient signified that these items (GF1, GF2, GF3, GF4, GF5, GF6 and GF7) were minimally related to the construct (Bond & Fox, 2007). Out of 26 items, only 19 were good indicators of fluid intelligence.

The reliability of these items was good as the reliability coefficient was .91 (Pallant, 2007). In conclusion, these 19 items will be used to represent fluid intelligence in succeeding analyses.

Table 6.13: Item polarity statistics of the fluid intelligence measurement model: Point-measure correlation order

Number	Item	Point-Measure Correlation
1	GF5	.08
2	GF2	.11
3	GF4	.12
4	GF1	.13
5	GF6	.14
6	GF3	.16
7	GF7	.19
8	GF8	.24
9	GF10	.27
10	GF9	.30
11	GF22	.39
12	GF12	.42
13	GF18	.44
14	GF13	.47
15	GF11	.47
16	GF14	.48
17	GF26	.51
18	GF17	.55
19	GF25	.56
20	GF15	.58
21	GF16	.59
22	GF23	.59
23	GF19	.62
24	GF21	.62
25	GF20	.63
26	GF24	.66

6.8.1.2 *Crystallized intelligence*

Similar to fluid intelligence, all items composing crystallized intelligence (n = 40) were also subjected to the Rasch measurement model. Table 6.14 shows the point measure correlation (PTMEA CORR) for the crystallized intelligence items. The output table shows that 1 of the items (item C1) had a negative correlation indicating that the item was not defining the measured construct in the same direction as other items. Meanwhile, all other items showed a positive point measure correlation coefficient, but 16 of them (including item C1) were below 0.2 (ranging from .08 - .19). The low correlation coefficient signified that these items were minimally related to the construct (Bond & Fox, 2007).

With regards to the reliability of these items, it showed that these 24 items were highly reliable with the reliability coefficient value equal to .91 (Pallant, 2007). Hence, crystallized intelligence will be represented by these good items for further analyses.

Table 6.14: Item polarity statistics of the crystallized intelligence measurement model: Point-measure correlation order

Number	Item	Point-Measure Correlation
1	C1	-.02
2	C38	.01
3	C26	.02
4	C40	.06
5	C38	.07
6	C34	.08
7	C35	.10
8	C39	.11
9	C28	.12
10	C36	.14
11	C30	.15
12	C33	.17
13	C32	.18
14	C37	.19
15	C31	.19
16	C40	.19
17	C24	.20
18	C25	.21
19	C16	.22
20	C18	.22
21	C29	.23
22	C21	.23
23	C7	.28
24	C10	.29
25	C19	.29
26	C15	.30
27	C27	.30
28	C14	.30
29	C12	.31
30	C23	.32

Number	Item	Point-Measure Correlation
31	C17	.32
32	C11	.35
33	C20	.36
34	C22	.40
35	C5	.40
36	C2	.42
37	C6	.43
38	C8	.43
39	C13	.44
40	C9	.46

6.8.2 Emotional intelligence (performance-based measure)

All of the items that make up the performance-based emotional intelligence (n = 40) were included in this measurement model, and the item fit and item reliability were further evaluated.

Table 6.15 shows the point measure correlation (PTMEA CORR) for the 40 items: 20 items for part A and another 20 items for part B. The output shows that only one item (A.U1) exhibited a negative point measure correlation (-.01). It indicates that the item was not defining the measured construct in the same direction as other items. All other items had a positive point measure correlation, indicating that they were working in the same direction to measure emotional intelligence construct. Nonetheless, 14 out of 40 items have a point measure correlation coefficient below .20 (ranging from .08 - .19). The low correlation coefficient signified that these

items were minimally related to the construct. It was observed that all of these weak items ($n = 14$) came from part A (scenarios). Hence, it can be inferred that the majority of the items from part A of the WEIS were not a good indicator of the emotional intelligence construct. (See Appendix C2 for the performance-based measure of emotional intelligence items).

In terms of the reliability of the measured items, it showed that this instrument was satisfactorily reliable with the Cronbach's alpha for 'item reliability' of .89 (Pallant, 2007) after deleting all of the weak items.

Table 6.15: Item polarity statistics of the emotional intelligence (performance-based measure) measurement model: Point-measure correlation order

Number	Item	Point-Measure Correlation
1	A.Use1	-.01
2	A.Use5	.03
3	A.Others4	.06
4	A.Regu4	.09
5	A.Others5	.09
6	A.Others2	.11
7	A.Use3	.11
8	A.Use2	.12
9	A.Regu1	.14
10	A.Self1	.15
11	A.Regu5	.16
12	A.Others3	.17
13	A.Self4	.17
14	A.Regu3	.19
15	A.Self3	.20
16	A.Regu2	.20
17	A.Others1	.21
18	B.Others9	.22
19	A.Self2	.22
20	A.Self5	.24
21	B.Regu9	.24
22	B.Others7	.25
23	A.Use4	.27
24	B.Others6	.29
25	B.Regu10	.30
26	B.Use6	.30
27	B.Use7	.31
28	B.Self7	.32
29	B.Self6	.32
30	B.Regu7	.33

Number	Item	Point-Measure Correlation
31	B.Regu6	.33
32	B.Use9	.33
33	B.Use8	.38
34	B.Self9	.38
35	B.Use10	.42
36	B.Self8	.42
37	B.Others8	.43
38	B.Self10	.44
39	B.Others10	.45
40	B.Regu8	.49

6.9 Correlations among study variables

As described earlier in Section 6.3, the data were examined using descriptive statistics to explore the distribution of the sample prior to hypotheses testing. In the next stage, correlational analyses were performed using Pearson's correlation coefficient to determine the nature and strength of the relationships between emotional intelligence and all theoretically-related study variables. The results presented in Table 6.16 show that the emotional intelligence (performance-based measure) significantly correlated with some of the predictor variables (such as the self-report measure of emotional intelligence, trait emotional intelligence, conscientiousness, and agreeableness). With the exception of IQ, correlations among emotional intelligence and other study variables were in the expected directions with most of the relationships ranging from small to moderate.

Table 6.16: Correlations among study variables

Variables	1	2	3	4	5	6	7	8	9	10	11
1 EI (PB)	-										
2 EI (SR)	.200**	-									
3 TEI	.135**	.544**	-								
4 IQ	-.169**	.019	.118**	-							
5 Open	.057	.425**	.415**	.084*	-						
6 Consci	.117**	.263**	.289**	.130**	.119**	-					
7 Extra	.022	.071	.242**	.030	.044	.260**	-				
8 Agree	.132**	.392**	.425**	.041	.279**	.037	-.053	-			
9 Neuro	-.043	-.171**	-.304**	.023	-.074*	-.522**	-.449**	-.025	-		
10 Lead	.153**	.491**	.501**	.013	.489**	.237**	.146**	.328**	-.134**	-	
11 IPR	.216**	.394**	.341**	.016	.281**	.199**	.058	.227**	-.115**	.540**	-

Note:

** Correlation is significant at the 0.01 level (2-tailed).

* Correlation is significant at the 0.05 level (2-tailed).

EI = emotional intelligence, PB = Performance-based test, SR = self-report measure, Open = openness, Consci = conscientiousness; Extra = extraversion; Agree = agreeableness; Neuro = neuroticism, Lead = Leadership, IPR = interpersonal relationships

6.10 Chapter summary and conclusions

This chapter discussed the preliminary analyses performed prior to hypothesis-testing. It reported the characteristics of the study respondents, data analyses procedures and the exploratory data analyses. More specifically, it has presented the assessment of item fit or 'measurement model' (an AMOS terminology for assessment of item fit) for all study variables. This preliminary assessment is crucial as it assesses the psychometric soundness of each scale. Having established the psychometric reliability of the proposed instruments, the forthcoming chapters (chapters 7, 8, 9 and 10) proceed to test the research hypotheses, namely examining the relationships between emotional intelligence and its theoretically related constructs and outcomes.

CHAPTER 7 – TOWARD CLARIFICATION OF A CONCEPT: WHAT DOES EMOTIONAL INTELLIGENCE MEASURE?

7.1 Chapter overview

This chapter presents findings that respond to a compelling need to define the emotional intelligence construct in a coherent manner. The factorial validity of emotional intelligence is described through an examination of its underlying factors. Although the main focus of the study is to assess the factorial validity of a performance-based emotional intelligence test, the factorial validity of the self-report measure of emotional intelligence was also tested in order to achieve a clear and workable definition of the construct. Sections 7.3 and 7.4 present the findings of the factorial validity and convergent validity of these two purported measures. The major findings are then discussed, interpreted and synthesised in light of the study's hypotheses, literature review, and operational definition in Section 7.5. The chapter concludes with a summary of the discussion and considers how these findings answer two of the seven research questions posed earlier in Chapter 3.

7.2 Introduction

Hypothesis 1 proposed to gather evidence on the internal factor structure of emotional intelligence. As described earlier in Section 1.4, confirming factorial validity of a particular construct is important in testing construct validity as factorial validity aims to confirm the conceptual framework of a construct. Factorial validity assess how well the internal factor structures represent the emotional intelligence construct, specifically, it examines whether the measured items map onto to their respective factors in order to assess whether the four underlying factors (SEA: Self-emotional appraisal, OEA: other's emotional appraisal, RE: regulation of emotion: and UE: use of emotion) confirm to the operationalized definition of the emotional intelligence construct (Gignac, 2010; Hair et. al., 2006; Nunnally & Bernstein, 1994).

According to Byrne, (2010) and Hair et al., (2006), to examine the factorial validity of a construct, it is more appropriate to cross-validate its factorial validity with another independent sample. Hair et al. (2006) emphasized that cross-validation of the factorial validity of a particular construct is necessary as it can provide meaningful insights on the stability, viability and consistency of the factor structure across two samples in a given population. Assessing stability and consistency of the factor structure means that if the factor structure of a particular construct is going to be examined on another sample group in a given population, then it will yield the same factor solution. Therefore, in confirming the factor structure of a

particular construct, it is advised to cross-validate it with more than one sample group in order to ensure that the hypothesized factors remain stable, viable and consistent across a number of sample groups (Byrne, 2010, Hair et al., 2006). Following the procedures outlined by the statisticians, the data (n = 710) were divided into 2 groups in order to cross-validate the factorial validity of the emotional intelligence construct (Byrne, 2010, Hair et al., 2006). Samples were grouped based on the identity number of the respondents. Samples with odd ID numbers¹⁸ were classified as group 1, while samples with even ID numbers were classified as group 2. With a total of 710 cases, both groups consisted of 355 (n= 355) respondents.

As stated at the beginning of this chapter (Section 7.1), one of the main aims of the present study is to examine the factorial validity of emotional intelligence as assessed by the performance-based test. However, in addition to the evaluation of the factor structure of performance-based emotional intelligence test, the factor structure of the self-report measure of emotional intelligence was also investigated in order to cross-examine the congruence of both measures in capturing the operational definition of emotional intelligence. Examining the underlying factors of multiple measures of emotional intelligence is necessary to cross-check the

¹⁸ ID number refers to identity number for each case/respondent

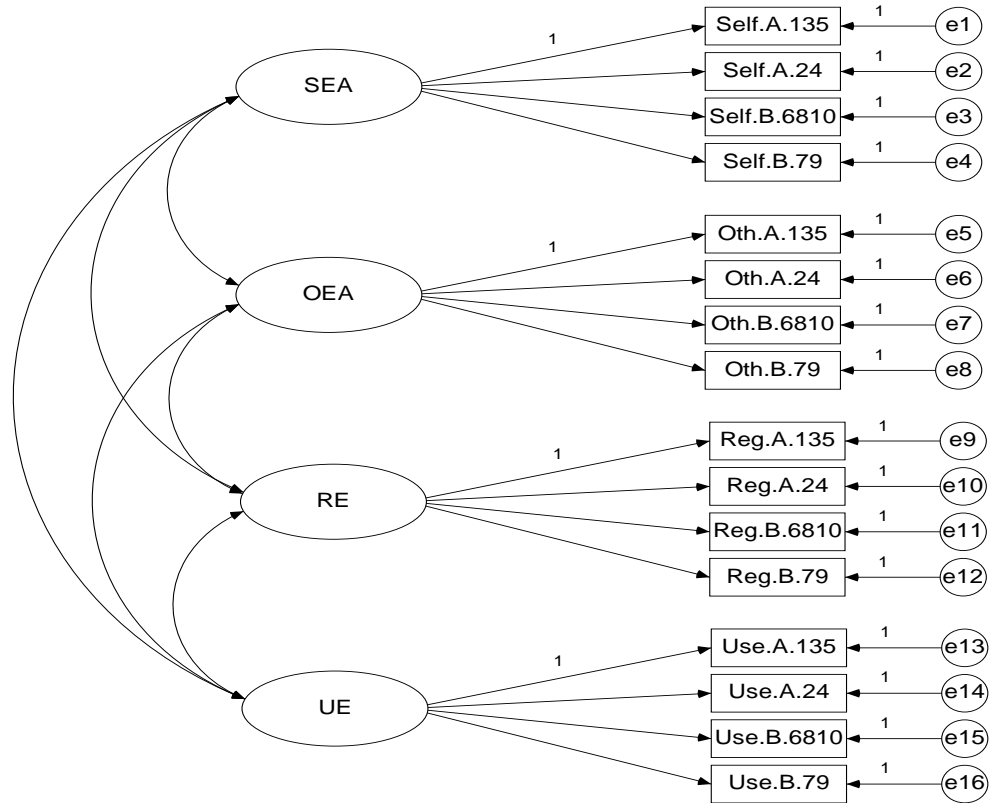
stability and consistency of the underlying factors, and thus provide concrete evidence for the meaning of emotional intelligence (Cherniss, 2010b, Hair et al., 2006).

7.3 Results of H1: Factorial validity of the ability-based emotional intelligence

H1: A four-factor structure of ability-based emotional intelligence is construct valid.

7.3.1 Description of the hypothesized model for a performance-based measure of emotional intelligence and the target groups

The hypothesized factor structure of emotional intelligence is presented in Figure 7.1; the ovals represent latent factors, rectangles represent the measured items and the small circles represent the error terms. (See Appendix C2 for the full statement of the items)



Note: SEA = Self-emotional appraisal; OEA = other's emotional appraisal; RE = regulation of emotion; UE = use of emotion

Figure 7.1: The hypothesized model of the four-factor structure of emotional intelligence construct (performance-based measure)

The measurement model of performance-based emotional intelligence consisted of item parcelled indicators¹⁹ rather than single item indicators. Parcelling the items was necessary because the data were binary/dichotomous and consisted of a large number of items (40 items)

¹⁹ Item parcelled indicator refers to an indicator which comprised of combination of two or three items which mapped onto the same factor. For example, in SEA factor, there were a few indicators that were made up from SEA item parcels. See Figure 7.1.

that made up four factors. A measurement model with 40 binary items is considered overly complex due to the number of parameters (i.e. 40 item loadings, 4 factor variances, 6 factor covariances and 40 error variances require 90 parameter estimates), and the confirmatory factor analysis tends to produce non-positive definite covariance matrices, making the analysis invertible (Brown, 2006). Kline (2011) asserted that solution inadmissibility²⁰ can occur if the model is over parameterized (too many parameters) therefore resulting in failure of iterative estimation in CFA. Therefore, parcelling of items where the full set of items (e.g., 20 items for a construct) is parcelled into a small number of composite indicators (e.g., four composite indicators of five items each), can reduce model complexity (Brown, 2006; Hair et al., 2006; Kline, 2011).

A method for parcelling items is to group items based on rational grounds such as parcelling items that share similar content or belong to the same factor (Kline, 2011). In the measurement model of emotional intelligence construct, the item parcels comprised of combination of two or three items which mapped onto the same factor; as each factor consists of 10 items, the item parcel for each factor was made up of four composite indicators (See Figure 7.1 at page 259). For example, 'self-emotional appraisal'

²⁰ Solution inadmissibility is a terminology in structural equation modelling (SEM) output produced to indicate that the analysis cannot be run if the model is over parameterized (too many parameters) or under parameterized (insufficient parameters).

factor consisted of 4 composite indicators: (1) indicator 1 consisted of items SEA1, SEA3 and SEA5 from Part A; (2) indicator 2 consisted of items SEA2, and SEA4 from Part A; (3) indicator 3 consisted of items SEA1, SEA3 and SEA5 from part B; and (4) indicator 4 consisted of items SEA2, and SEA4 from Part B. The same process of item parcelling was also applied to other factors, namely OEA, RE, and UE. The hypothesized model is presented in Figure 7.1 (See Appendix C2 for the items).

The measurement model of ability-based emotional intelligence (WEIS) was evaluated using SEM with AMOS software (version 16) through confirmatory factor analysis (CFA). CFA is a statistical tool in SEM used to confirm factor structures that underlie a particular construct (Byrne, 2010; Kline, 2011; Tabachnick & Fidel, 2007). Maximum Likelihood Estimation (MLE) was employed to assess the adequacy of the model as the parcels are generally treated as continuous data (Kline, 2011). A four-factor model of emotional intelligence construct comprising (1) self-emotional appraisal, (2) others' emotional appraisal, (3) regulation of emotion and (4) use of emotion factor was hypothesized. Each factor consisted of four composite indicators. As postulated by emotional intelligence researchers, the four factors were related (Mayer & Salovey, 1997; Wong & Law, 2002). Thus, the four factors were hypothesized to covary with one another and were allowed to correlate in this model. See Figure 7.1 at page 259 for the hypothesized model. According to Hair et al., (2006), to cross-validate the

factor structure of a particular construct, the hypothesized measurement model must be the same across the groups, hence the measurement model proposed for groups 1 and 2 were similar.

7.3.2 CFA on the hypothesized model for performance-based measure of emotional intelligence

7.3.2.1 CFA on the hypothesized model (Model 1a) for group 1

The CFA results showed no adequate support for the hypothesized model (model 1a), $\chi^2 (98) = 162.775$, $p = .000$, $\chi^2/df = 1.661$, CFI = .832 and RMSEA = .043 (See Figure 7.2 at page 263 for the CFA results). The hypothesized model was poor and insufficiently fitted the data because the CFI was smaller than .9 (Bentler, 1990; Hair et al., 2006). Furthermore, an examination of the Standardized Regression Weights or loading estimates showed that half of the items had a Critical Ratio smaller than 1.96 ($CR < +1.96$) indicating that they were not significant indicators of the construct (Byrne, 2010). The goodness-of-fit indices of the hypothesized model (Model 1a) of the WEIS and its standardized parameter estimates are provided in Figure 7.2. (See Appendix C2 for the full statement of the items)

Chi-square= 162.775

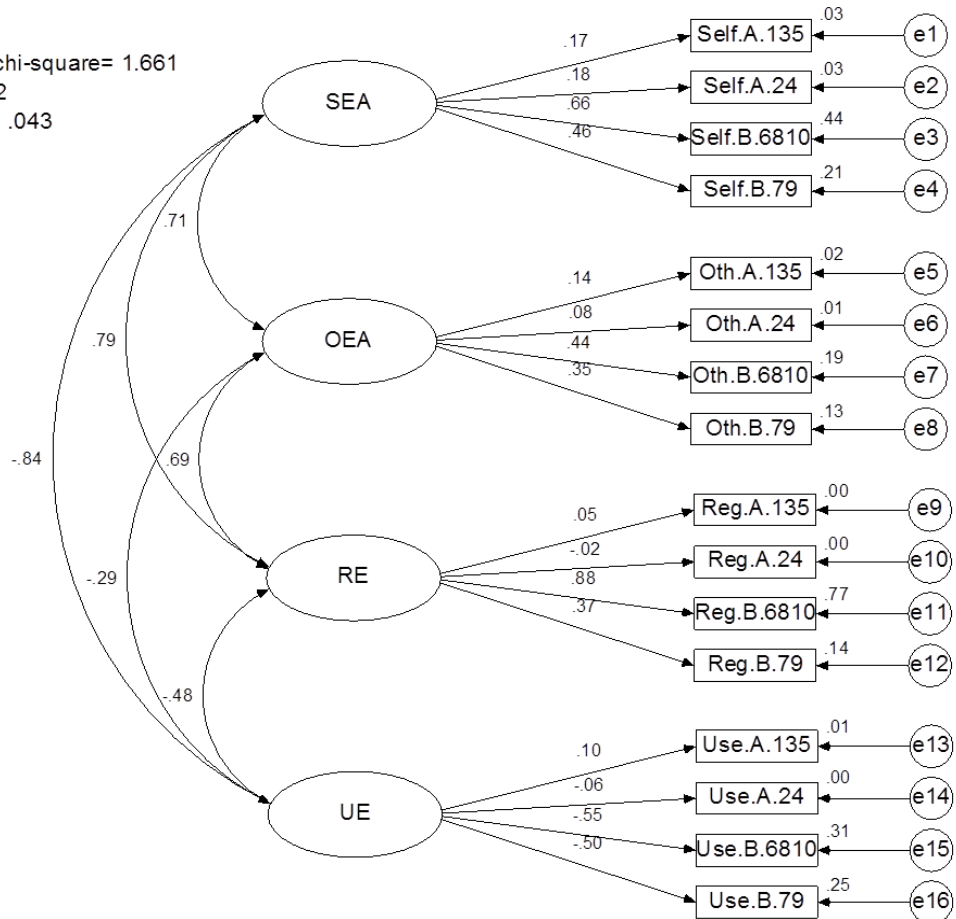
df= 98

p= .000

Normed chi-square= 1.661

CFI= .832

RMSEA= .043



Note: SEA = Self-emotional appraisal; OEA = other's emotional appraisal; RE = regulation of emotion; UE = use of emotion

Figure 7.2: Results for the hypothesized model of the four-factor structure of emotional intelligence (performance-based measure) for group 1

Post-hoc model modifications were performed in an attempt to develop a model with improved fit and parsimony. On the basis of standardized regression weights, the model was revised by deleting the non-significant indicators. It is worth highlighting that most of the non-significant indicators

were from Part A item parcels which were derived from scenario-based items. (See Section 7.5 for the discussion on the non-significant indicators)

7.3.2.2 CFA on the final revised model (Model 1b) for group 1

According to the standard of procedures for the post-hoc model modifications, unimportant indicators should be deleted one after another and the model should be respecified (Byrne, 2010; Tabachnick & Fidell, 2007). Therefore, the non-significant indicators were deleted at this stage and the model was revised (see Section 6.7.2 for the procedures of post-hoc model modification). The final revised model resulted in the hypothesized four-factor solution which was similar to the initial hypothesized model, nonetheless, the number of indicators were reduced to two indicators per factor. These two indicators were the item parcels retained from Part B of the WEIS which centered on ability pair items.

The fit indices showed that the final revised model resulted in a model with improved fit and a more parsimonious model after non-insignificant indicators were dropped, with $\chi^2 (14, N = 355) = 41.002$, $p = .000$, $\chi^2/df = 2.929$, CFI = .919 and RMSEA = .074 (See Figure 7.3 below for the results of the final revised model). Model 1b showed improved fit in comparison to Model 1a as fit indices, particularly the CFI, improved from a poor model fit (CFI = .832) to an acceptable model fit (CFI = .919) (Hair

et al., 2006; Tabachnick & Fidell, 2007). The normed chi-square ($\chi^2/df < 5.0$) suggested an acceptable fit for the CFA model (Bentler, 1990; Hair et al., 2006). The RMSEA ($\leq .08$) suggested an acceptable fit to the data (Byrne, 2010; Tabachnick & Fidell, 2007). These indices indicated that the model has an acceptable fit, thus, this final revised model appeared to fit the data sufficiently. The final revised model (Model 1b), including significant coefficients in standardized form is illustrated in Figure 7.3.

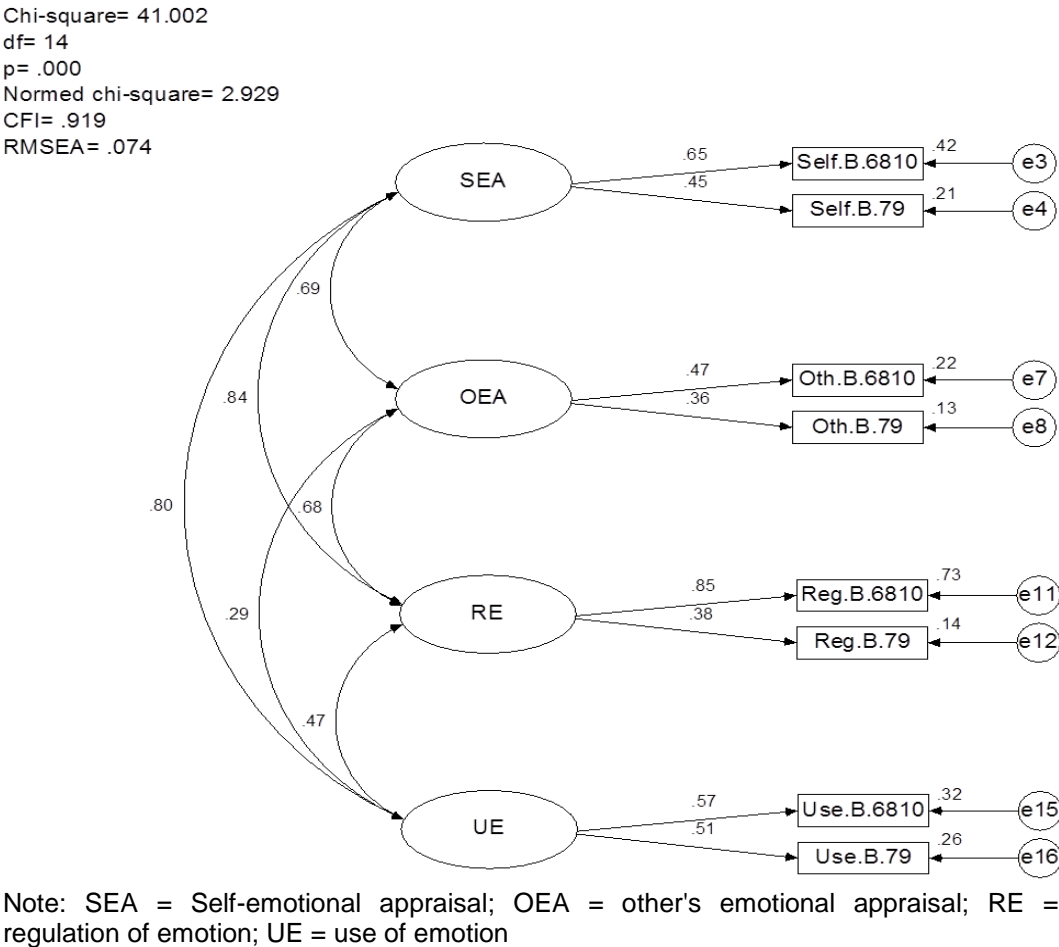


Figure 7.3: Results for the final revised model of the four-factor structure of emotional intelligence (performance-based measure) for group 1

In addition to the evaluation of model fit, other diagnostic measures such as loading estimates were examined. Assessment of loading estimates showed that Critical Ratio values for all indicators were larger than 1.96 ($CR > +1.96$), indicating that they were significant indicators of the emotional intelligence construct (Byrne, 2010). The loading estimates for all indicators were ranging from .36 to .85. According to Hair et al., (2006), although the loading estimate is lower than .40, it does not appear to cause problems if the CR is larger than 1.96 and the overall model fit particularly the χ^2/df , CFI and RMSEA remained high. Hence, although loading estimates for two indicators fell below the preferred loading cut-off of .40, they were retained in the model, as the critical ratio showed that they were significant indicators ($CR > +1.96$) and the fit indices (χ^2/df , CFI and RMSEA) were good. Furthermore, leaving the model with one indicator per factor will cause problems with model identification and lead to an under identified model (Hair et al., 2006).

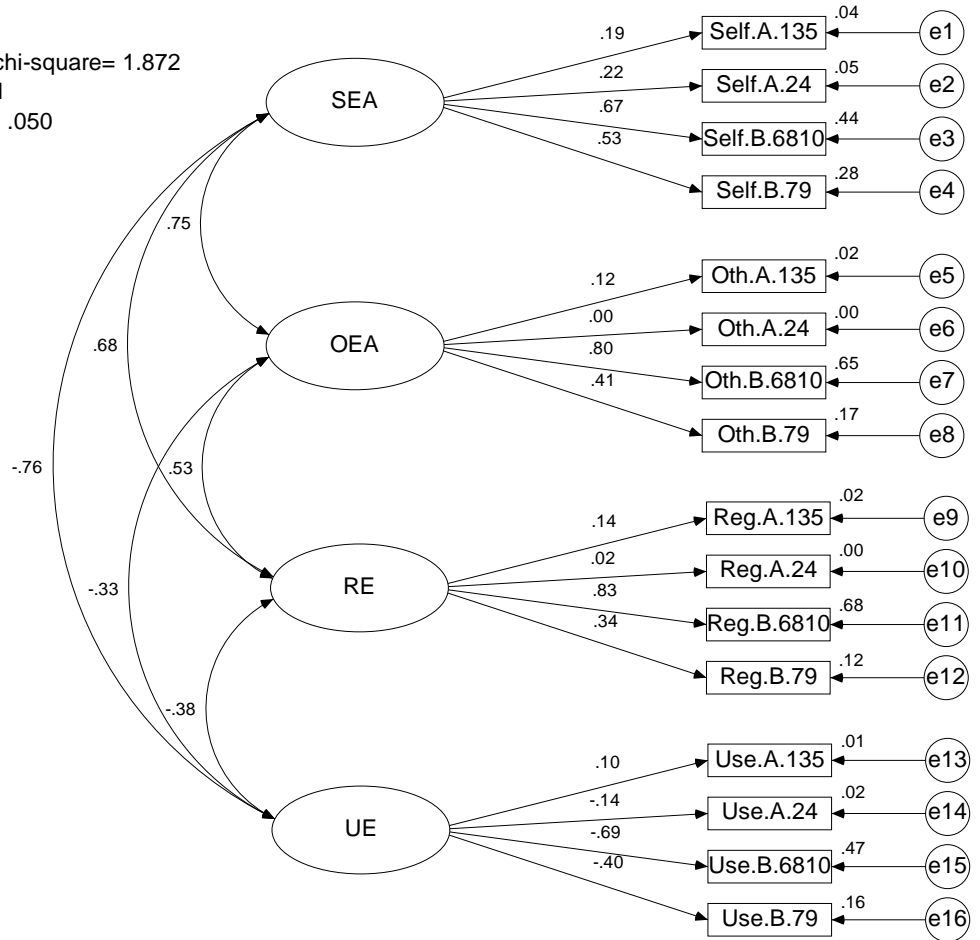
With respect to the relationship among the factors, the path coefficients revealed that the four factors were significantly related, with r values ranging from .29 to .84. Hence, most of the factors were moderately to strongly correlated. In conclusion, the CFA result for group 1 supported the four-factor structure of the performance-based emotional intelligence

test, however, only item parcels from Part B of the WEIS were retained in the final model.

7.3.2.3 CFA on the hypothesized model (Model 2a) for group 2

Similar to the result obtained from group 1, sufficient support was not found for the hypothesized model (Model 2a) for group 2 with, $\chi^2 (98) = 183.481$, $p = .000$, $\chi^2/df = 1.872$, CFI = .821 and RMSEA = .050 (See Figure 7.4 below). This result indicated that the hypothesized model had poor fit and did not adequately fit the data because the CFI was smaller than .9 (Bentler, 1990; Hair et al., 2006). Moreover, investigation of the Standardized Regression Weights showed that some of the indicators had a Critical Ratio smaller than 1.96 ($CR < +1.96$) which signified that they did not significantly represent the construct (Byrne, 2010). The goodness-of-fit indices for hypothesized model (Model 2a) for the performance-based measure of emotional intelligence (WEIS) for group 2 and its standardised parameter estimates are provided in Figure 7.4 below. (See Appendix C2 for the full statement of the items).

Chi-square= 183.481
 df= 98
 p= .000
 Normed chi-square= 1.872
 CFI= .821
 RMSEA= .050



Note: SEA = Self-emotional appraisal; OEA = other's emotional appraisal; RE = regulation of emotion; UE = use of emotion

Figure 7.4: Results for the hypothesized model of the four-factor structure of emotional intelligence (performance-based measure) for group 2

Post-hoc model modifications were conducted in an attempt to produce a model with improved fit and possibly more parsimonious model. Based on the suggestions proposed by the Standardized Regression Weights output, the model was revised by dropping the non-significant indicators.

In this model, most of the non-significant indicators were from Part A item parcels which centered on scenario-based items.

7.3.2.4 CFA on the final revised model (Model 2b) for group 2

As discussed earlier in Sections 6.7.2 and 7.3.2.2, unimportant indicators (indicators with low loading estimate) were dropped and the models were re-estimated in this post-hoc model modifications stage (Byrne, 2010; Tabachnick & Fidell, 2007). The obtained final revised model was similar to the initial hypothesized model; albeit with only two indicators per factor retained. These two indicators consisted of composite items derived from Part B item parcels of the WEIS, which were ability pair items.

The goodness-of-fit indices revealed that the final revised model appeared to have improved fit and was a more parsimonious model for the data, with χ^2 (14, N = 355) = 32.715, $p = .003$, $\chi^2/df = 2.337$, CFI = .951 and RMSEA = .061 (See Figure 7.5 below). Model 2b exhibited improved fit compared to the initial hypothesised model (Model 2a) as fit indices, particularly the CFI, improved from a poor fit (CFI = .821) to a good fit (CFI = .951) (Hair et al., 2006; Tabachnick & Fidell, 2007). Other fit indices such as normed chi-square (< 5.0) (Bentler, 1990; Hair et al., 2006) and RMSEA ($\leq .06$) (Byrne, 2010; Tabachnick & Fidell, 2007) also suggested an acceptable fit for the CFA model. Hence, the final revised model appeared to be an adequate fit to the data. This revised model (Model 2b),

including its significant coefficients in standardized form is illustrated in Figure 7.5 below. (See Appendix C2 for the full statement of the items).

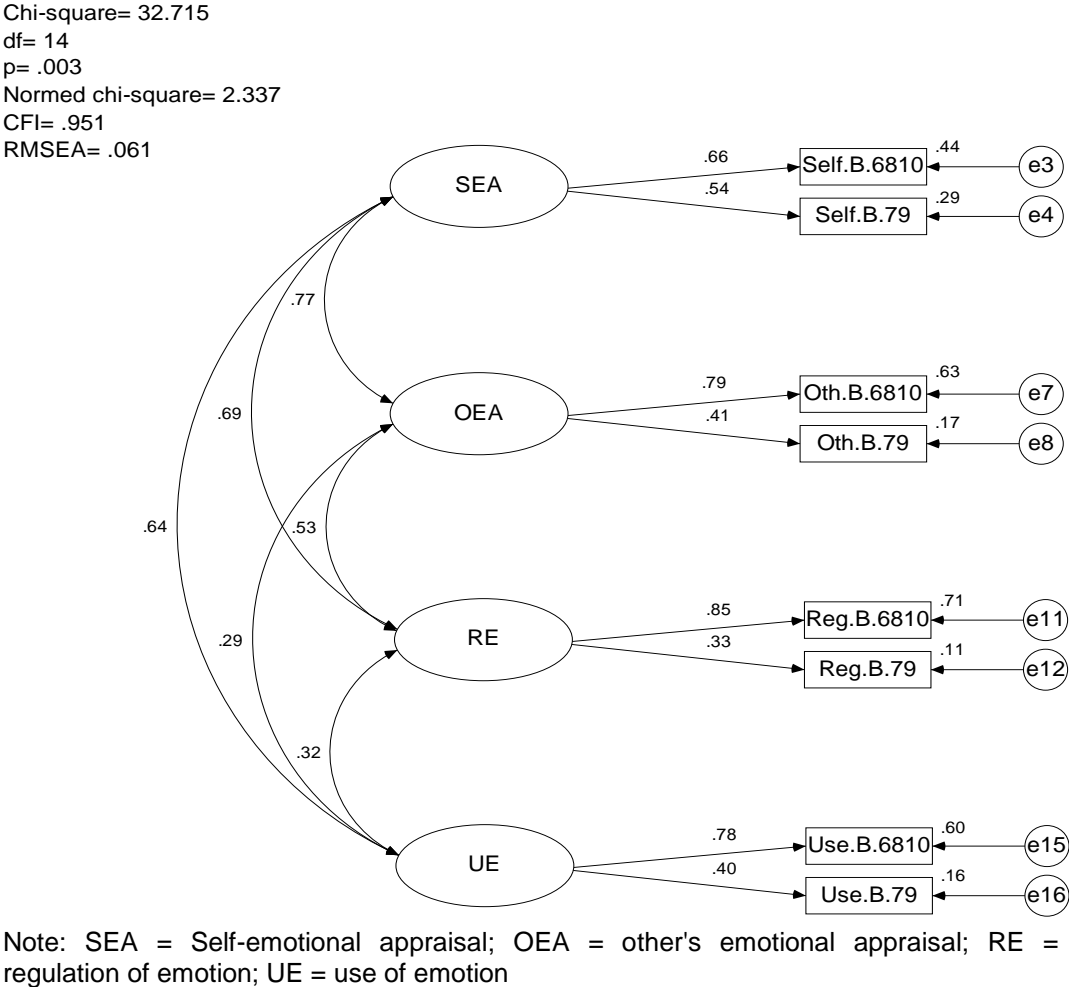


Figure 7.5: Results for the final revised model of the four-factor structure of emotional intelligence (performance-based measure) for group 2

Additionally, an investigation of the standardised loading estimates showed that Critical Ratio values for all indicators were larger than 1.96 (CR > +1.96), indicating that they were significant indicators of the

emotional intelligence construct (Byrne, 2010). The loading estimates for all indicators were ranging from .33 to .85. Although the loading estimates for one indicator (items parcel of Reg.B.79) fell below the preferred loading cut-off of .40, it was retained as the CR showed that it was a significant indicator and the overall model fit indices (χ^2/df , CFI and RMSEA) remained high (Hair et al., 2006). Once again, leaving the model with one indicator per factor is likely to result in problems with model estimation and thus, lead to an under identified model (Hair et al., 2006).

With respect to the relationship among the factors, path coefficients revealed that the four factors were significantly related with the r values ranging from .29 to .77. Thus, the degree of the relationship among the factors was ranging from moderate to strong correlation (Cohen, 2009). In summary, the CFA result for group 2 also provided support for the four latent factors of the performance-based emotional intelligence test; albeit, only Part B item parcels were retained in the final revised model.

Finally, the comparison of CFA results of these two groups (group 1 and 2) was assessed through chi-square difference to measure the equality of model fits (Brown, 2006; Byrne, 2010). Chi-square difference can be used to statistically compare whether the fit indices of the evaluated models are equal (Brown, 2006). The chi-square difference of the two groups/models was compared manually from the critical values of the chi-square

distribution table obtained from Owen (1962). Results showed that the chi-square difference from the two models (models from Group 1 and 2) was not significant as the chi-square change [$\Delta\chi^2$ (df = 14) = 8.287] was smaller than the critical value of 31.319 at alpha .005 (See Table 7.1). Therefore, it can be concluded that the parameters of a factor model are the same for group 1 and group 2.

Table 7.1: Results of the chi-square difference for the two CFA groups of performance-based emotional intelligence test

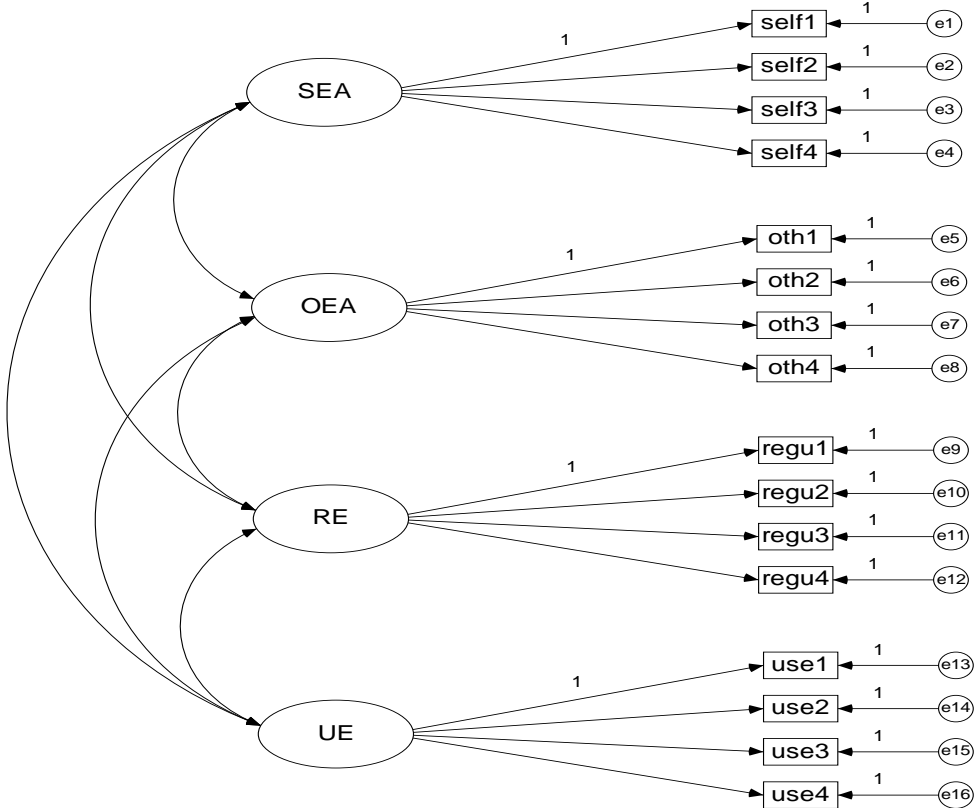
Measure	Model	Chi-square	Critical value*	Chi-square change
Performance-based emotional intelligence	Group 1	41.002	31.319	8.287
	Group 2	32.715		

* Critical value was derived at alpha = .005

7.3.3 Description on the hypothesized model for the self-report measure of emotional intelligence and the target groups

Similar to the analysis conducted for the performance-based emotional intelligence test, the analysis of the factor structure of self-report emotional intelligence was also conducted on two independent groups; group 1 and group 2 (the same group used to assess the factor structure of performance-based test) in order to cross-validate and confirm the stability of its factor structure. Confirmatory factor analysis (CFA) with Maximum

Likelihood Estimation (MLE) was employed to assess the adequacy of the model. A four-factor model of emotional intelligence construct (SEA:self-emotional appraisal, OEA:others' emotional appraisal, RE:regulation of emotion and UE:understanding of emotion) was hypothesized. Each factor consisted of four items. The four factors were hypothesized to covary with one another, and hence, were allowed to correlate in this hypothesized model (See Figure 7.6 below). (See Appendix C1 for the items).

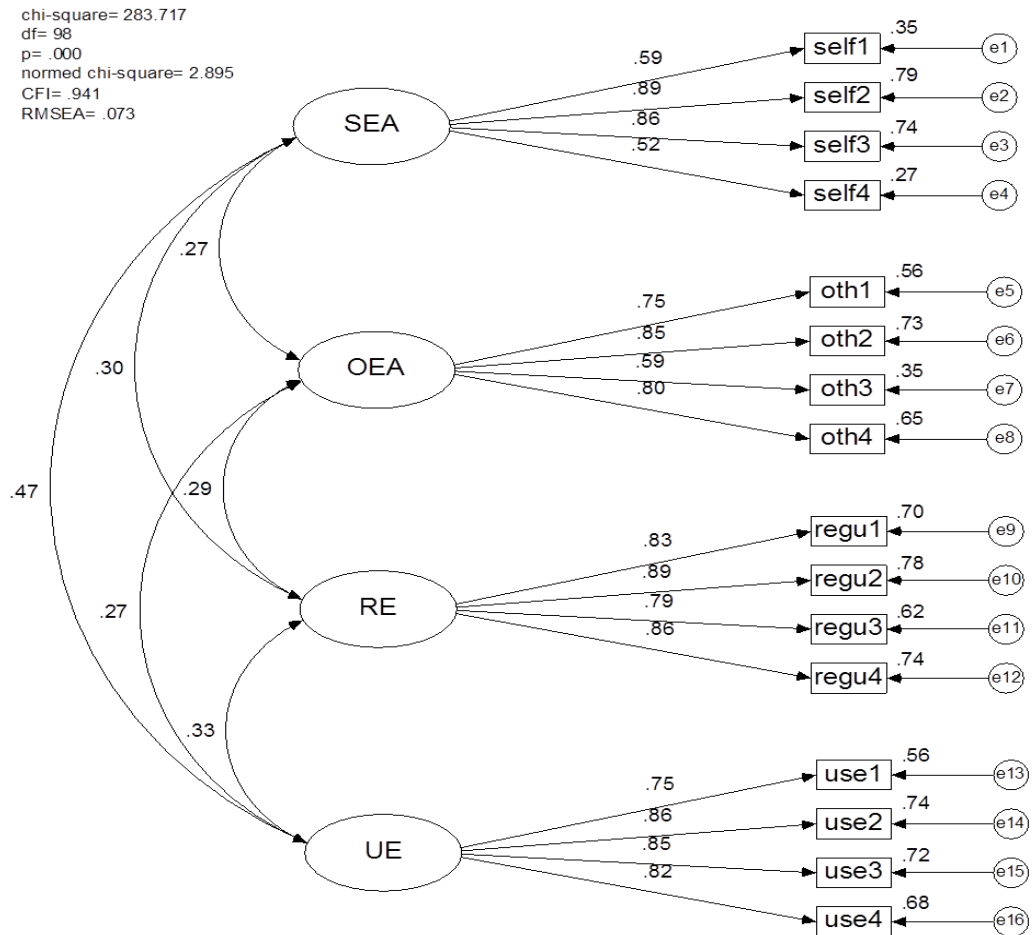


Note: SEA = Self-emotional appraisal; OEA = other's emotional appraisal; RE = regulation of emotion; UE = use of emotion

Figure 7.6: The hypothesized model on the four-factor structure of the emotional intelligence construct (self-report measure)

7.3.3.1 CFA on the hypothesized model (Model 3) for group 1

Based on several goodness-of-fit criteria, results revealed that the hypothesized model (model 3) was satisfactorily adequate and indicated acceptable model fit with $\chi^2 (98) = 283.717$, $p = .000$, $\chi^2/df = 2.895$, CFI = .941 and RMSEA = .073. The hypothesized model was shown to sufficiently fit the data based on a number of goodness-of-fit indices such as normed chi-square ($\chi^2/df < .50$) (Bentler, 1990; Hair et al., 2006), CFI (CFI > .90) (Bentler, 1990; Hair et al., 2006), and RMSEA (RMSEA < .08) (Byrne, 2010; Hair et al., 2006). The hypothesized model (Model 3), including its significant coefficients in standardized form is illustrated in Figure 7.7. (See Appendix C1 for the full statement of the items).



Note: SEA = Self-emotional appraisal; OEA = other's emotional appraisal; RE = regulation of emotion; UE = use of emotion

Figure 7.7: Results for the hypothesized model of the four-factor structure of emotional intelligence (self-report measure) for group 1

Investigation of the Standardized Regression Weights revealed that all items were significant indicators of the emotional intelligence construct with Critical Ratio values greater than 1.96 ($CR > +1.96$) (Byrne, 2010). The loading estimates for all items were good as most of the values were larger than .70 (with only two items had $L < .70$) signifying that the items

were satisfactorily related to the construct (Awang, 2013; Hair et al., 2006).

The four factors were significantly related, with their path coefficients value (r value) ranging from .27 to .47. Hence, factors were said to be minimally ($r > .01$) to moderately ($r > .30$ to $.50$) correlated with each other (Cohen, 2009). Therefore, the CFA result for Model 3 suggested no further need for model modification as: (1) the overall model fit revealed that the hypothesized model was satisfactorily adequate and achieved acceptable model fit, (2) the loading estimates showed that the items were significant, with majority of items were good indicators of the construct and (3) path estimates also revealed that the four factors of emotional intelligence construct were significantly inter-correlated as suggested by the theory. In conclusion, the CFA result for group 1 validated the four-factor structure of the self-report measure of the emotional intelligence test.

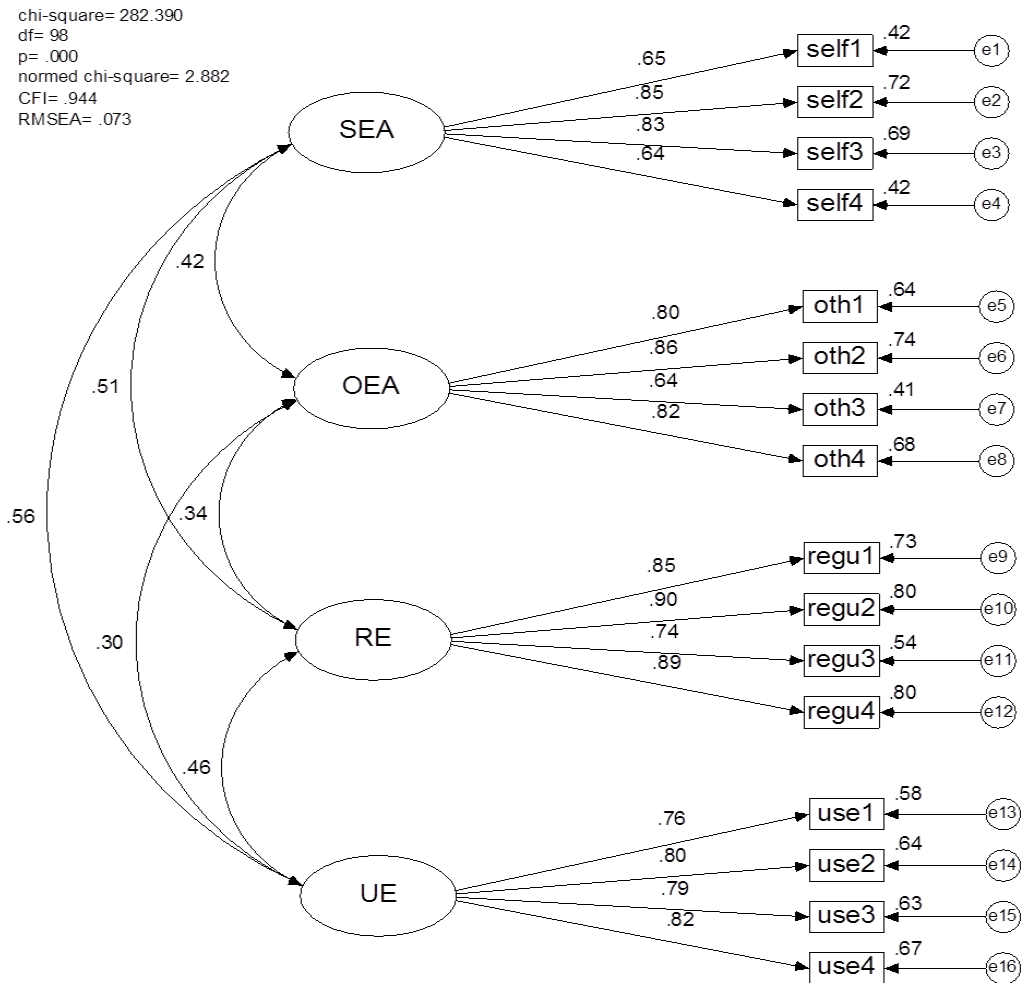
7.3.3.2 CFA on the hypothesized model (Model 4) for group 2

Similar to the findings obtained from the model tested in group 1, the CFA result for group 2 also yielded a result akin to its cross-validated group.

The goodness-of-fit criteria revealed that the hypothesized model for group 2 (Model 4) was satisfactorily adequate and achieved acceptable model fit with $\chi^2 (98) = 282.390$, $p = .000$, $\chi^2/df = 2.882$, CFI = .944 and RMSEA = .073. Hence, the hypothesized model adequately fitted the data

based on a number of fit indices such as χ^2/df , CFI and RMSEA (Bentler, 1990; Byrne, 2010; Hair et al., 2006). The hypothesized model (Model 4), including its significant coefficients in standardized form is illustrated in Figure 7.8. (See Appendix C1 for the full statement of the items).

An examination of the parameter estimates revealed that all items had Critical Ratio values (CR) >1.96 , indicating that they were significant indicators of the emotional intelligence construct (Byrne, 2010). In relation to the loading estimates, the item loadings for group 2, however, were better than those in group 1. This is because all items in this model had loading estimates larger than .60 ($L > .60$) with majority of items having loading estimates greater than .70. Thus, loading estimates (standardized factor loadings) for all of the items were larger than .60, signifying that the items were good and related to the construct (Hair et al., 2006).



Note: SEA = Self-emotional appraisal; OEA = other's emotional appraisal; RE = regulation of emotion; UE = use of emotion

Figure 7.8: Results for the hypothesized model of the four-factor structure of emotional intelligence (self-report measure) for group 2

Additionally, support was also found for the interrelationships between the four factors. The path coefficient between the factors ranged from .30 to .56 signifying that the factors were either moderately ($r > .30$) or strongly ($r > .50$) intercorrelated (Cohen, 2009). Therefore, as adequate support was found for Model 4, no further post-hoc model modification was deemed

necessary as: (1) the overall model fit indicated that the hypothesized model was satisfactorily adequate; (2) the loading estimates showed that the items were significant and reflected that most of them were ideal indicators of the construct and (3) the path estimates also revealed that the four factors of emotional intelligence construct were significantly correlated as suggested by the theory. In conclusion, the CFA result for group 2 supported the four-factor structure of the self-report measure of the emotional intelligence.

Finally, the comparison of CFA results of these two groups (group 1 and 2) was assessed through chi-square difference ²¹ to measure the equality of model fits (Brown, 2006; Byrne, 2010). Results indicated that there was a non-significant chi-square difference between the two models (models from Group 1 and 2) as the chi-square change [$\Delta\chi^2$ (df = 98) = 1.327] was smaller than the critical value of 128.299 at alpha .005 (See Table 7.2). It is justifiable then to conclude that the parameters of a factor model are the same for group 1 and group 2.

²¹ See Section 7.3.2.4 for the explanation on measuring the equality of parameters of a factor model of two groups through chi-square difference

Table 7.2: Results of the chi-square difference for the two CFA groups of self-report measure of emotional intelligence

Measure	Model	chi-square	Critical value*	chi-square change
self-report measure of	Group 1	283.717	128.299	1.327
emotional intelligence	Group 2	282.390		

* Critical value was derived at alpha = .005

7.3.4 Summary of results pertaining to H1

With regard to the CFA results on the factor structure of emotional intelligence as assessed by the performance-based test, support was not found for the initial hypothesized model for both groups (group 1 and group 2) as overall model fit was poor. The residual analysis indicated that both models had to be revised and non-significant indicators were thus removed. After dropping low-loading indicators out, the final revised model showed adequate support for the four-factor structure of emotional intelligence in both groups. The indicators from Part A item parcels were all non-significant and ultimately removed from the model, with only indicators from Part B item parcels remained in both final revised models. It can be inferred that the final revised models from group 1 and 2 provided support for the four-factor structure of emotional intelligence construct as captured by the performance-based test.

On the other hand, adequate support was found for the four-factor structure of emotional intelligence as assessed by the self-report measure. The overall model fit showed that the initial hypothesized model fitted the data and exhibited an acceptable model fit for both groups. Moreover, the loading estimates also showed that the items were good indicators of the construct and significantly related to the construct, with majority of the loading estimates higher than .70. The adequacy of the model fit was consistent across both groups, and thus no post-hoc model re-estimation was required.

Therefore, the obtained results showed that the CFA supported the four-factor structure of emotional intelligence as measured by performance-based and self-report measure. Nevertheless, a number of low-loading indicators for the performance-based measure were dropped, while none of the indicators from the self-report measure were omitted.

7.4 Results of H2: Convergent validity of performance-based and self-report measures of emotional intelligence

H2: The performance-based measure of ability-based emotional intelligence demonstrates convergent validity with self-report measure of ability-based emotional intelligence.

Hypothesis 2 sought to demonstrate evidence on the degree to which the performance-based measure and self-report measures of emotional intelligence converge to measure the same construct. Psychometricians assert that validity of a measure could be assessed by comparing it to measures of the same concept developed through other methods (Cohen & Swerdlick, 2005; Kaplan & Saccuzo, 2009). Assessing the convergent validity of multiple measures is important because Nunnally & Bernstein (1994) assert that any particular measure can be thought of as having construct validity if the result obtained from it correlates with other measures that assess the same domain.

Investigating the convergent validity of multiple emotional intelligence measures is necessary as there exist multiple measures of emotional intelligence (i.e., performance-based test, self-report measure etc.). Furthermore, recent researchers argue that the current emotional intelligence tests are lacking of construct validity (Cherniss, 2010b; Libbrecht & Lievens, 2012; Martin & Thomas, 2011; Matthews et al., 2012; Maul 2012; Siegling et al., 2012). As the performance-based and self-report measures are based on the same conceptual framework, that is ability-based emotional intelligence construct, it was hypothesized that both measures demonstrate evidence of convergent validity.

Pearson's r was conducted to assess the convergent validity between the performance-based measure of emotional intelligence and self-report measure of emotional intelligence (Cohen & Swerdlick, 2005; Kaplan & Saccuzzo, 2009). Kaplan and Saccuzzo, (2009) assert that in practice, particularly in social sciences research, validity coefficients larger than .60 are rare, and Cohen (2009) states that correlation coefficient of .50 and above are deemed as strong, and correlation coefficient of .30 and above as moderate correlation.

In this study, the performance-based measure of emotional intelligence was significantly related to its counterpart self-report measure ($r = .200$, $p < 0.01$), albeit the validity coefficient value was relatively small in order to suggest good convergent validity. The relationships among the dimensions of emotional intelligence from both purported measures were further scrutinized to evaluate their degree of conceptual relatedness. Findings revealed that there was a small, but significant correlation between the performance-based and self-report measures of emotional intelligence with reference to the following dimensions; others' emotional appraisal ($r = .291$, $p < .01$), regulation of emotion ($r = .252$, $p < .01$), and use of emotion ($r = .274$, $p < .01$). However, there was no significant relationship between the self-emotional appraisal dimension ($r = .056$, $p > .05$) of these two measures (Refer to Table 7.3).

Table 7.3: Correlation analysis between the performance-based and self-report measures of emotional intelligence

	1	2	3	4	5	6	7	8	9	10
1 Pb.EI	-									
2 Pb.SEA	.786**	-								
3 Pb.OEA	.768**	.467**	-							
4 Pb.RE.	.727**	.423**	.350**	-						
5 Pb.UE.	.349**	.369**	.167**	.243**	-					
6 SR.EI	.200**	.113**	.090*	.147**	.179**	-				
7 SR.SEA	.071	.056	.057	.036	.095*	.756**	-			
8 SR.OEA	.265**	.187**	.291**	.141**	.041	.606**	.328**	-		
9 SR.RE	.156**	.086*	.034	.252**	.056	.687**	.341**	.282**	-	
10 SR.UE	.030	.024	-.061	.015	.274**	.767**	.458**	.254**	.328**	-

Notes:

Pb = Performance-based; SR = Self-report; EI = emotional intelligence; SEA = self-emotional appraisal; OEA = others' emotional intelligence; UE = use of emotion; RE = regulation of emotion

** $p < 0.01$; * $p < 0.05$

7.4.1 Summary of results pertaining to H2

In view of these findings, the correlational analyses did not support the hypothesized convergent validity between performance-based and self-report measure of emotional intelligence, as the strength of relationship between these two measures was relatively small. Results also revealed

that there was no convergent validity between dimensions of self-emotional appraisal for the two purported measures. In relation to other dimensions of emotional intelligence such as other's emotional appraisal, regulation of emotion, and use of emotion, findings showed that the same dimensions for the performance-based and self-report measure were only minimally related.

7.5 Discussion: The concept of emotional intelligence and its purported measures

This chapter highlighted the operational definition of the concept of ability-based emotional intelligence. Although the main focus of this work was to gather evidence on the validity of emotional intelligence as measured by the performance-based test, the same statistical analyses were also performed on the self-report measure in order to evaluate the usefulness of both measures in operationalizing the same construct. The aim of the following discussion is twofold: (1) to evaluate the dimensions that underlie the emotional intelligence construct; and (2) to scrutinize the congruence of the performance-based measure and self-report measure in operationalizing the concept of ability-based emotional intelligence.

7.5.1 H1: Factorial validity of emotional intelligence

The adequacy and validity of the proposed four-factor structure of emotional intelligence (SEA, OEA, RE and UE) was tested using CFA on two independent groups in order to confirm the stability of its factor structure. An iterative revision and modification of the four-factor model resulted in the verification of the four-factor structure of emotional intelligence across the two groups, however, only Part B item parcels indicators were retained in the final revised model. The result indicated that all Part A item parcels were non-significant and did not satisfactorily represent the construct. These findings were consistent with the findings obtained from the preliminary analysis on the assessment of item fit for the WEIS (See Section 6.8.2). The pre-evaluation of item fit performed using Rasch WINSTEPS showed that 14 out of 20 items from Part A of the WEIS were considered unfit. Thus, the deletion of all Part A item parcels from the emotional intelligence measurement model was consistent with the preliminary analysis. In summary, the final revised models of the performance-based emotional intelligence scale showed support for the adequacy of the model and confirmed the four-factor structure of emotional intelligence construct, albeit with a fewer number of items than originally expected. H1 can therefore be said to be supported.

Four factors that were observed to underlie the emotional intelligence construct were (1) self-emotional appraisal (SEA); (2) other's emotional

appraisal (OEA); (3) regulation of emotion (RE); and (4) use of emotion (UE). Thus, the current study confirmed the concept of emotional intelligence with its four underlying factors as proposed by the emotional intelligence researchers who developed the WEIS (Wong et al., 2004).

Findings however should be interpreted with caution as not all of the items/indicators were retained in the final revised model. As all of the items from Part A were weak, these items were removed in the final model. An example of item from Part A (scenarios) of the WEIS was: *Your supervisor assigns a task that is not included in your job responsibility and you do not have any interest in doing it. You will: (A) Persuade yourself that the task is not that bad and perform the task. (B) Tell your boss that you don't like the task and ask him to find some other suitable person to do the task.* (Self-emotional appraisal). Therefore, only items from Part B were retained in the succeeding structural analyses. A typical example of the pairs is *ability to comprehend the rationale of complicated problems* versus *ability to understand others' emotions* (Others' emotional appraisal). (See appendix C2 for all of the WEIS items).

The weak items may indicate that they are not a good indicator to their respective underlying factors and thus, do not significantly represent the latent construct (Bond & Fox, 2007; Hair et al., 2006; Nunnally & Bernstein, 1994). In terms of the interrelationship among the items, the

weak items reflect that they are less related to other measured items (AERA et al., 1999). In other words, the unfit items may indicate that they do not measure what they are intended to measure. Based on the present findings, it can be inferred that these weak items do not measure the intended operational definition of emotional intelligence. If a weak item is intended to measure 'regulation of emotion', it indicates that this item does not represent the intended factor of 'regulation of emotion'.

Nevertheless, it was observed that all items from Part A contain the emotion-related abilities. For instance, an example of item from Part A (scenario based item) of the WEIS was: *When a friend comes to you because s/he is not happy, you will: (A) Share his/her feeling. (B) Takes him/her to do something s/he likes* (Others' emotional appraisal). According to AERA et al., (1999), validation process of a measure should be on-going, with continuing efforts to establish the usefulness of the measure for specific populations and purposes. This is because particular test or items may be suitable in one context, but not in other contexts (Byrne, 2010; Hair et al., 2006; Kline, 2011; Tabachnick & Fidell, 2007). For example, not all IQ tests or items developed in the west, are suitable for Malaysian population (Mohd Isa & Mohamed, 1995). Most of the Part A items indicated low loading estimates to represent the emotional intelligence construct, however, a thorough inspection of the items showed that all items contain the emotion-related abilities. These results may

indicate that these items which were scenario-based items may not be applicable to the Malaysian context. Therefore, the present findings may suggest that only Part B items of the WEIS which were centred on ability-pairs items were suitable for the Malaysian context.

However, one of the delimitations of this study is it aimed to assess the internal factor structure of emotional intelligence and the use of CFA is limited to the assessment of factor structure and to examine the usefulness and meaningfulness of each item, it can be best studied through another assessment theory that is 'Item Response Theory' (IRT) (Bond & Fox, 2007; Kunnan, 1998). Because no documented literature was found on the empirical studies of the factorial validity of this performance-based emotional intelligence test (WEIS), this thesis presents an opportunity for advancing the validation of this emotional intelligence construct especially in confirming the factor structure of emotional intelligence, and further seeks to explain the applicability of this measure in the Malaysian context. Furthermore, AERA et al., (1999), assert that a validation study on a different population would help to verify the measure's utility beyond that of the test developers' setting. Therefore, this thesis responded to the AERA et al.,'s (1999) call to accumulate evidence on the construct validity and utility of of this measure.

The current work also could be one of the early attempts to offer a significant advancement in the area as current researchers argue that the stability of factor structure of emotional intelligence construct has not been well investigated in emotional intelligence research (Cherniss, 2010b; Maul, 2011, 2012; Sharma et al. 2013; Van Rooy et al., 2010). In proposing a new construct, securing the underlying factors would be the most important initial step as it will delineate the operationalized definition of particular construct (Gignac, 2010; Hair et. al., 2006; Nunally & Bernstein, 1994). Thus, establishing factorial validity is important in endorsing a specific operational definition of the emotional intelligence construct.

Although some of the items from the WEIS particularly the Part A items were omitted from this study, it should not be cause for concern. This is because the goodness-of-fit indices obtained from the final revised model indicated that the model had a good fit, and the remaining indicators/items were significant to represent the emotional intelligence construct. As described by Hair et al., (2006) and Tabachnick and Fidell (2007), although the weak items should be deleted from the measurement model, it is not cause for concern provided that the fit indices in the final revised model remained high and the loading estimates of the remaining items were good. Furthermore, one should not assume that all of the items that are useful in certain context, also remain useful in another context (AERA

et al., 1999; Byrne, 2010; Hair et al., 2006, Kline, 2011; Nunally & Bernstein, 1994; Tabachnick & Fidell, 2007).

The concept of emotional intelligence measured through the self-report measure also confirmed the four-factor structure of emotional intelligence (SEA, OEA, RE and UE). This finding added empirical support for the validation studies of the four-factor structure of self-report measure of emotional intelligence (as measured by the WLEIS) conducted in China (Law, Wong, Huang & Li, 2008), Europe (Libbrecht, Lievens & Schollaert, 2010), Hong Kong (Wong & Law, 2002), Korea (Fukuda, Saklofske, Tamaoka & Lim, 2012) and Turkey (Aslan & Erkus, 2008). Confirmatory factor analysis (CFA) results from these studies indicated that the WLEIS consistently yielded a four-factor solution across China, Europe, Hong Kong, Korea and Turkey. The present findings were consistent with the studies conducted in these countries and thereby demonstrating that the WLEIS has sound psychometric properties.

Accumulating evidence of construct validity by examining internal factor structure is important because the factor structure of a construct/test can indicate the degree to which the underlying factors conform to expectations of the conceptual framework of emotional intelligence upon which a test is built. The present findings confirmed that the four-factor structure of ability-based emotional intelligence was construct-valid. It

implies that the construct of emotional intelligence is operationalized through these four factors; SEA, OEA, RE and UE. Moreover, both the performance-based and self-report measures revealed that these internal factor structures were consistent across measures.

7.5.2 H2: Convergent validity of the performance-based and self-report measure of emotional intelligence

The performance-based and self-report measures of emotional intelligence were hypothesized to be related as both were developed within the conceptual framework of ability-based emotional intelligence. The pattern of correlations observed among these different emotional intelligence measures, however, raise concerns on this issue as results showed that both measures were only minimally related. The same dimensions (other's emotional appraisal, regulation of emotion and use of emotion) captured by these two measures also showed that they were minimally related. Conversely, it was found that the relationship between the self-emotional appraisal dimension gauged by these purported measures was not significant. The low correlation between these purported measures may suggest that they are somewhat independent. As the degree of the relationship between these two measures was relatively small, therefore, Hypothesis 2 was not supported.

A study conducted by Wong et al., (2004) showed that the performance-based emotional intelligence (measured by WEIS) was moderately related ($r = .55, p < .01$) to the self-report emotional intelligence (measured by the WLEIS), and thus inconsistent with the present finding. Their study sample however, consisted of a mixed group of life insurance agents and undergraduate students. Therefore, these findings present a compelling need to replicate the study in other contexts in order to have greater clarity on the pattern of correlations among the purported measures.

In their commentary, Van Rooy et al. (2010) stated that a plausible explanation for the low correlation among currently available measures conceptualizing emotional intelligence as an ability is that the self-report measure of ability-based emotional intelligence does not measure a person's actual ability. Meanwhile, some researchers suggested that if emotional intelligence is measured through a subjective evaluation method such as self-report, then it is not a viable position because self-report questions only tap into self-perceptions rather than into abilities (Cote, 2010; Van Rooy et al., 2010). Moreover, intelligence researchers also agreed that people are notoriously bad in estimating their own performance on ability tests and self-reporting their mental abilities (Dunning, Johnson, Ehrlinger & Kruger, 2003; Mabe & West, 1982). People are not able to self estimate their cognitive abilities or intelligence level precisely. Consequently, it can be inferred that self-rated emotional

intelligence may not be a good proxy measure to gauge ability-based emotional intelligence test. It is therefore understandable why the convergent validity between the performance-based and self-report measure is lacking. In conclusion, the present results showed no convergent validity between self-report and performance-based measures of emotional intelligence because the self-report measure is believed to measure self-perceptions, rather than actual abilities.

7.5.3 Summary of the discussion

The derived construct, identified as an ability to (1) comprehend one's own emotion; (2) comprehend others' emotion; (3) regulation of emotion; and (4) use of emotion, clarified the meaning of 'emotional *intelligence*', thus providing a specific operational definition of the construct. However, the empirical findings showed lack of convergent validity among purported measures of emotional intelligence, thus suggesting that they were independent. Taking these findings together, it can be concluded that the concept of emotional intelligence is concrete and clearly explains its four underlying factors. However, when it comes to the measurement issue, the performance-based measure and self-report measures appear to be independent.

It was observed that both the performance-based and self-report measures of emotional intelligence confirmed the four-factor structures of

emotional intelligence (SEA, OEA, RE and UE), thus making emotional intelligence with a four underlying factor a construct valid. As described earlier in Section 7.2, all of the items for self-report measure were retained and several items for the performance-based measure were excluded in the final measurement model due to low loading estimates. However, in the final model of the performance-based measure, the fit indices remained high suggesting that the final revised model (with the deletion of some weak items) had a better fit, adequately represented the data and confirmed the four underlying dimensions of emotional intelligence. Although several items of the performance-based measure of emotional intelligence were omitted in the final revised measurement model, the robustness of the measure remained high as the fit indices (χ^2/df , CFI, and RMSEA) indicated that the model has a good fit and the remaining items were significant indicators to represent the emotional intelligence construct (Bentler, 1990; Hair et al., 2006).

7.6 Chapter summary and conclusion

This chapter has presented empirical findings on the construct of emotional intelligence and its underlying factors. More specifically, it has presented the results of statistical tests performed on the data to answer the research questions developed at the initial stages of the research programme. The first research question seeks to confirm the validity of the

four-factor structure of emotional intelligence construct. The CFA results confirmed the four-factor structure of emotional intelligence for both types of measurement: performance-based and self-report measure. However, results showed that the four-factor structure of emotional intelligence was more stable and viable with the self-report measure. The second research question asks to what extent the performance-based measure and self-report measure of emotional intelligence demonstrate evidence of convergent validity. The correlation analysis result showed that there was a lack of convergent validity among the purported measures of emotional intelligence. Having presented (1) the concept and the underlying dimensions of emotional intelligence construct and (2) the pattern of correlations observed among different emotional intelligence measures, the next chapter proceeds to explain the concept of emotional intelligence within the framework of cognitive intelligence.

CHAPTER 8 – EMOTIONAL INTELLIGENCE AND COGNITIVE INTELLIGENCE: THE INTERRELATEDNESS

8.1 Chapter overview

Having discussed the underlying factors of emotional intelligence, this chapter continues to present the findings on the intersection between emotional intelligence and cognitive intelligence. As emotional intelligence is conceptually defined as a kind of new intelligence, it is expected that it has considerable overlap with cognitive intelligence. Section 8.3 presents the results from an examination of the convergent validity between emotional intelligence and IQ (Hypothesis 3), while Section 8.4 highlights the place of emotional intelligence in the intelligence taxonomy (Hypothesis 4). This is followed by the discussion of the results in light of the literature review and operational definition (Section 8.5). The chapter concludes with some plausible explanations of the results in light of the current research questions and theoretical approach.

8.2 Introduction

Both hypotheses 3 and 4 were developed to examine the interrelatedness of emotional intelligence and cognitive intelligence. Hypothesis 3 sought to provide evidence on the convergent validity between emotional

intelligence and cognitive intelligence in order for emotional intelligence to be classified as a form of 'intelligence'. Hypothesis 4 on the other hand, sought to confirm the place of emotional intelligence in the 'intelligence' taxonomy, particularly in reference to fluid intelligence (gf) and crystallized intelligence (gc) (As discussed earlier in Sections 3.3.3.2 and 3.5.4).

As stated earlier in the previous chapter, convergent validity refers to the degree to which an assessment/construct is related to what it should theoretically be related to (Cohen & Swerdlick, 2005; Kaplan & Saccuzo, 2009). In this case, as the pioneers of emotional intelligence construct conceptualize emotional intelligence as a kind of intelligence, it must show convergent validity with other cognitive intelligence tests (Mayer & Salovey, 1997; Salovey & Mayer, 1990). Examining the interrelatedness of emotional intelligence and cognitive intelligence is vital to advance the field of emotional intelligence research as MacCann (2010) argued that while there is a diversity of emotional intelligence tests, still little research has been done on the convergent validity between emotional intelligence and cognitive intelligence especially in examining the interrelatedness of emotional intelligence with the major domains of intelligence (i.e. crystallized intelligence and fluid intelligence).

As emotional intelligence is conceptualised as a form of intelligence, it was hypothesized that the composite score of emotional intelligence will be

positively correlated with cognitive intelligence with at least moderate strength of relationship (Carroll, 1993; Mayer & Salovey, 1997; Mayer, Salovey, et al., 2000b). Although Mayer & Salovey (1997) did not specify the way emotional intelligence relates to the intelligence factors (i.e. gf and gc), MacCann (2010) reported that emotional intelligence develops in the same way as gc and loaded more strongly on gc as compared to gf (See Section 3.3.3 for the discussion on the relationship between emotional intelligence and cognitive intelligence).

Pearson correlations were conducted to respond to Hypothesis 3, particularly to assess the degree of the relationship between these two latent constructs and their major dimensions (Cohen & Swerdlick, 2005; Kaplan & Saccuzzo, 2009; Nunnally & Bernstein, 1994). As described earlier in Section 7.4, the correlation coefficients of .30 and .50 and above indicate a moderate and strong degree of relationship respectively (Cohen, 2009). In addition to correlational analyses, confirmatory factor analysis was performed to respond to Hypothesis 4 particularly to delineate the place of emotional intelligence in the 'intelligence' taxonomy.

8.3 Results of H3: Convergent validity between emotional and cognitive intelligence

H3: Ability-based emotional intelligence demonstrates convergent validity with cognitive intelligence.

The correlational analyses results revealed that emotional intelligence was significantly related to IQ ($r = -.169$, $p < 0.01$), gf ($r = -.159$, $p < 0.01$) and gc ($r = -.118$, $p < 0.01$), albeit the validity coefficient values were not strong enough to suggest convergent validity among the constructs (See Table 8.1 at page 301). The degree of relationships among these constructs were small (Cohen, 2009) and in a negative direction. Nonetheless, the negative associations between emotional intelligence and g, gf and gc were unanticipated (Potential explanations for these findings are discussed in the discussion below).

Relationships among emotional intelligence and IQ dimensions were further investigated to evaluate the strength of the relationship (See Table 8.1). Results revealed that there was a low, negative, but significant correlation between emotional intelligence markers and dimensions of IQ (r ranging from $-.112$ to $-.136$, $p < .01$) with the exception of the 'regulation of emotion' marker. Regulation of emotion was also weakly and negatively correlated to IQ ($r = -.057$, $p > 0.01$) although the relationship was not significant. Negative relationships were also found between the dimensions of emotional intelligence (SEA, OEA, RE and UE) and those of IQ (gc and gf). All emotional intelligence dimensions were negatively

and significantly correlated with IQ dimensions with the r-values ranging from -.084 to -.136, with the exception of the relationship between self-emotional appraisal and gc ($r = -.067, p > 0.01$), and the regulation of emotion and gc ($r = -.002, p > 0.01$). The relationship between self-emotional appraisal and gc, as well as regulation of emotion and gc were not significant, but the direction of these relationships were also negative.

Table 8.1: The correlations among emotional intelligence and IQ, and their respective dimensions

	1	2	3	4	5	6	7	8
1 EI	-							
2 SEA	.786**	-						
3 OEA	.768**	.467**	-					
4 RE	.727**	.423**	.350**	-				
5 UE	.349**	.369**	.167**	.243**	-			
6 IQ	-.169**	-.115**	-.138**	-.057	-.161**	-		
7 Gf	-.159**	-.119**	-.112**	-.084*	-.131**	.863**	-	
8 Gc	-.118**	-.067	-.118**	-.002	-.136**	.787**	.368**	-

Notes: ** $p < 0.01$; * $p < 0.05$

EI = emotional intelligence (composite score); SEA = self-emotional appraisal; OEA = others' emotional intelligence; UE = use of emotion; RE = regulation of emotion; IQ = intelligence quotient (composite score); GF = fluid intelligence; GC = crystallized intelligence.

8.3.1 Summary of results pertaining to H3

These findings signified that there was a small, but significant correlation between the composite score of emotional intelligence and IQ. On the one hand, all of the emotional intelligence dimensions were minimally but significantly correlated with *gf*. On the other hand, only 'other's emotional appraisal' and 'use of emotion dimensions' were significantly correlated with *gc*, and both indicated a low correlation. Nevertheless, these results were unanticipated, as all the relationships between emotional intelligence and IQ, and their respective dimensions were negatively related. As previously mentioned, it was hypothesized that emotional intelligence would be positively correlated with IQ (Carroll, 1993; Mayer & Salovey, 1997). Therefore, it can be inferred that the present findings were not consistent with the hypothesized result. Plausible explanations for these findings are discussed in the discussion part: Section 8.5.

8.4 Results of H4: The place of emotional intelligence in the 'intelligence' taxonomy

H4: Ability-based emotional intelligence maps onto the crystallized intelligence (gc) factor in the intelligence taxonomy.

Hypothesis 4 was developed to confirm the place of emotional intelligence in the 'intelligence' taxonomy, particularly in reference to fluid intelligence (gf) and crystallized intelligence (gc) (As discussed earlier in Sections 3.3.3.2 and 3.5.4). Two models were proposed in an attempt to delineate the place of emotional intelligence in the intelligence taxonomy. See Figure 8.1 for the illustration.

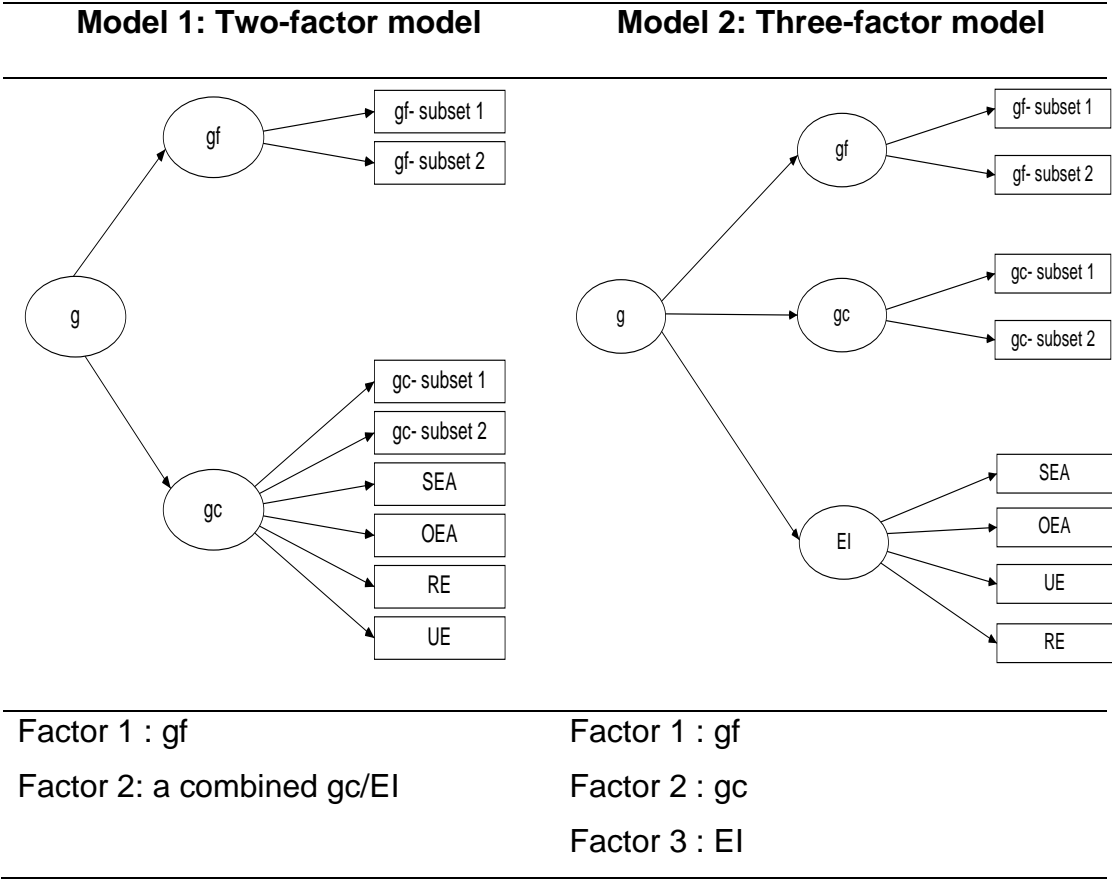


Figure 8.1: Hierarchical confirmatory factor analysis of the two competing models of intelligence

8.4.1 Locating emotional intelligence in the intelligence taxonomy: The hypothesized models

As illustrated in Figure 8.1, Model 1 depicts a two-factor model, whereby the first factor was represented by *gf* and the second factor was represented by a combined *gc/EI* factor. The indicators for *gf* were *gf*-subset 1 and *gf*-subset 2. *Gf*-subset 1 consisted of odd item parcels (composite score of item 1, 3, 5, and etc.), conversely, *gf*-subset 2 consisted of even item parcels (Hair et al., 2006). The two-factor model of intelligence was developed based on Roberts et al.'s (2001) theoretical idea and MacCann's (2010) empirical findings that emotional intelligence develops in the same way as *gc* (See Sections 3.2.2.2 and 3.4.4 for the further discussion).

In Model 1, the second factor was represented by six indicators. They were (1) *gc*-subset 1 (odd items parcel); (2) *gc*-subset 2 (even items parcel); (3) self-emotional appraisal (SEA); (4) others' emotional appraisal (OEA); (5) regulation of emotion (RE); and (6) understanding of emotion (UE). The *g* factor was located at the apex of the intelligence structure to represent the latent construct of general intelligence as postulated by the Cattell-Horn-Carroll (CHC) model of intelligence (See Figure 8.1 as illustrated above). As discussed earlier in Section 3.2.2.2, according to the CHC model of cognitive abilities, the general intelligence factor (*g*) is positioned at the apex of the hierarchy of the three-stratum model: stratum

I (narrow abilities), stratum II (broad abilities) and stratum III (general intelligence) (McGrew, 2009, 2011; Schneider & McGrew, 2012).

Model 2 proposed a three-factor model comprising of (1) emotional intelligence, (2) fluid intelligence and (3) crystallized intelligence (See Figure 8.1). Factor 1 was represented by gf, factor 2 by gc, and factor 3 by emotional intelligence. Similar to Model 1, the indicators for gf and gc consisted of subset 1 (odd item parcels) and subset 2 (even item parcels) respectively. Likewise, indicators for EI included its four dimensions; SEA, OEA, RE, and UE. Similar to Model 1, latent general intelligence (g) was also located at the peak of the intelligence taxonomy hierarchy (McGrew, 2009, 2011; Schneider & McGrew, 2012). A three-factor model of intelligence was proposed based on MacCann's study (2010) which asserts that emotional intelligence is related to g, but distinct from gf and gc .(As discussed earlier in Sections 3.2.2.2 and 3.4.4).

8.4.2 Evaluation of model fit for the two-factor model of intelligence

The measurement model (Model 1) was tested through hierarchical confirmatory factor analysis using Structural Equation Modelling AMOS with Maximum Likelihood Estimation (MLE) assessment of model fit. The goodness-of-fit indices revealed that Model 1 indicated a poor model fit, χ^2 (19) = 450.250, $p = .000$, $\chi^2/df = 23.697$, CFI = .727 and RMSEA = .179 (See Figure 8.2 below). Model 1 failed to fit the data based on a number of

fit indices. For example, the normed chi-square ($\chi^2/df > 5.0$) suggested an inadequate fit of the overall model (Bentler, 1990; Hair et al., 2006; Marsh & Hocevar, 1985). The CFI ($< .90$) and RMSEA ($> .08$) suggested an unacceptable fit to the data (Hu & Bentler, 1999; Tabachnick & Fidell, 2007). Hence, the two-factor model of intelligence failed to meet the criteria required for acceptable model fit.

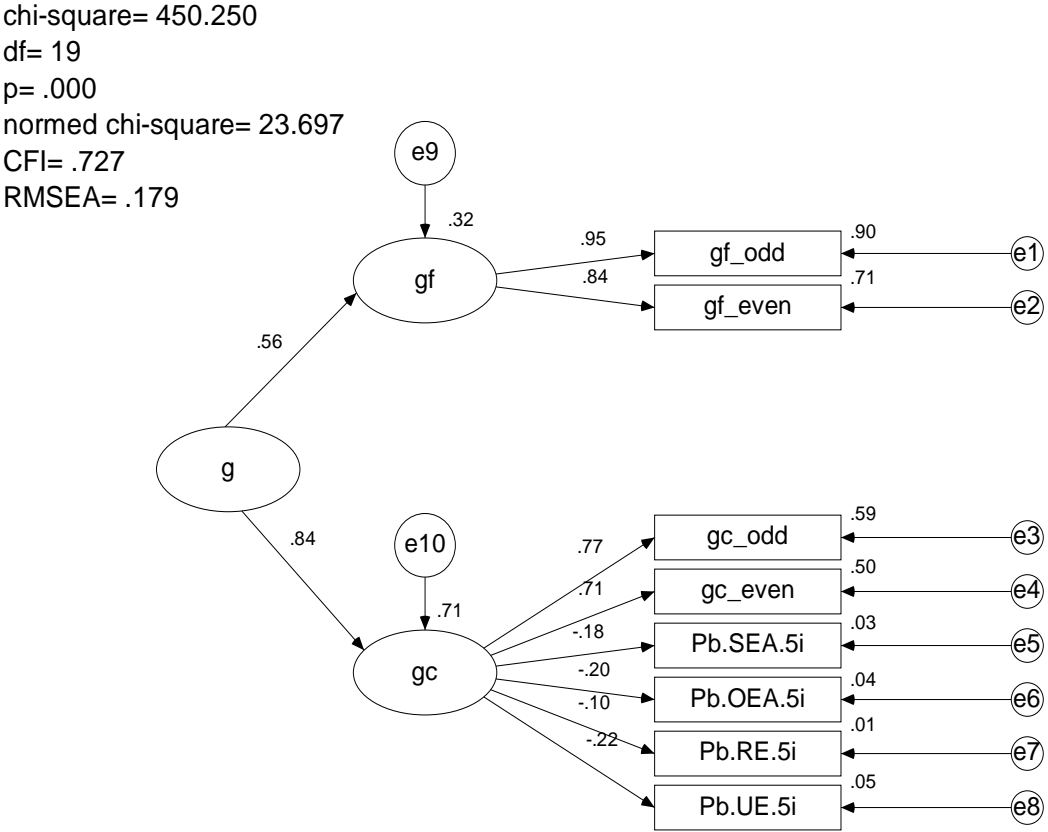


Figure 8.2: Result of the hierarchical confirmatory factor analysis for the two-factor model of intelligence

8.4.3 Evaluation of model fit for the three-factor model of intelligence

Similar to Model 1, hierarchical confirmatory factor analysis (CFA) was performed to assess the overall fit of Model 2. Based on the several goodness-of-fit criteria, the findings indicated that Model 2 showed superior model fit compared to Model 1 with $\chi^2 (17) = 39.291$, $p = .002$, $\chi^2/df = 2.311$, CFI = .986 and RMSEA = .043 (See Figure 8.3 below). The three-factor model of intelligence adequately fit the data and was a more parsimonious model based on a number of goodness-of-fit indices such as normed chi-square ($\chi^2/df < .50$) (Hair et al., 2006), CFI (CFI > .90) (Bentler, 1990), and RMSEA (RMSEA < .08) (Byrne, 2010).

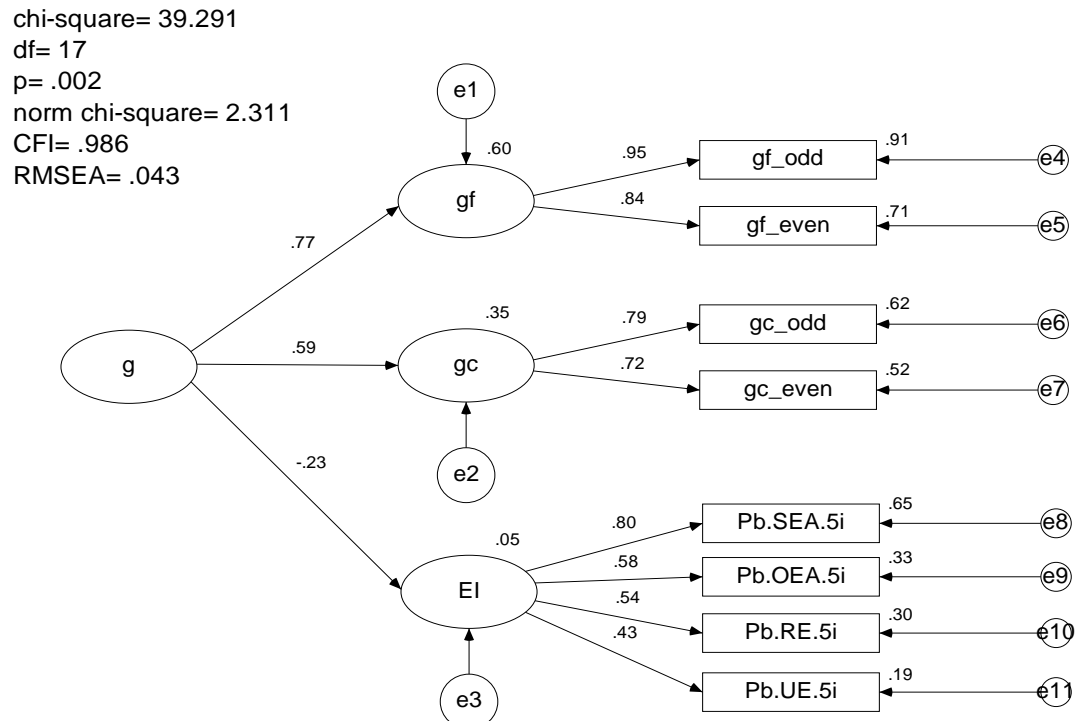


Figure 8.3: Result of the hierarchical confirmatory factor analysis for the three-factor model of intelligence

An investigation of the loading estimates (standardized factor loadings) revealed that the loadings for all of the indicators were larger than .5, (except UE indicator) signifying that the indicators were good indicators of the construct and significantly related to the construct (Hair et al., 2006). In addition to loading estimates, Hair et al., (2006) assert that the path coefficient between the factors and the latent construct must be larger than .2 in order to demonstrate significant relationship. It was observed that the path coefficient between g and gf ($r = .77$), g and gc ($r = .59$) and, g and emotional intelligence ($r = -.23$) were all significant as the values were larger than .20 (Hair et al., 2006; Kline, 2011). Hence, results suggested that gf, gc and emotional intelligence were significantly related to g, although the negative relationship between emotional intelligence and g was unanticipated. (Potential explanations for this finding are discussed in Section 8.5).

8.4.4 Summary of results pertaining to H4

In summary, it can be inferred that the overall model fit for the three-factor model of intelligence was better than the two-factor model of intelligence. The three-factor model which comprised of gf, gc and emotional intelligence factor showed good fit with the data. Conversely, the two-factor model which comprised of gf, and a combined gc/EI factor failed to meet the criteria for acceptable model fit.

8.5 Discussion: Failing to account for ‘intelligence’ in emotional intelligence

8.5.1 H3: Convergent validity between emotional intelligence and cognitive intelligence

The correlational analyses result showed that emotional intelligence was only minimally related to g ($r = -.155, p < 0.01$). Nevertheless, the direction of the correlation between emotional intelligence and IQ was in the negative direction and opposed the “positive manifold” nature of intelligence. As mentioned earlier in Section 3.2.2, the “positive manifold” nature of intelligence taxonomy requires all intelligence factors to be positively intercorrelated to represent the general cognitive intelligence (Carroll, 1993). Furthermore, intelligence researchers assert that for a new construct to be considered a standard intelligence construct, it must fulfil two main criteria; (1) it must involve cognitive processes and consist of mental abilities and (2) the abilities must meet certain correlational criteria, such as correlated with other major factors of intelligence (Carroll, 1993; Fancher, 1985; Mayer et al., 1999). As the present finding found that emotional intelligence was not positively correlated with cognitive intelligence, it can be concluded that emotional intelligence construct as measured by the WEIS, showed no evidence of convergent validity with g , gf and gc . Hence, Hypothesis 3 was not supported.

A study conducted by Wong, Wong & Peng (2011) also revealed that emotional intelligence was negatively related to HKCEE; Hong Kong Certificate Education Examination (a proxy to cognitive intelligence) albeit the relationship was not significant ($r = -.11, p > .05$). An earlier research conducted by Wong et al. (2004) showed that emotional intelligence was positively related to HKCEE although the relationship was not significant ($r = .07, p > .05$). Therefore, the present findings can be said to be consistent with the earlier study conducted by Wong et al. (2011), which suggested that emotional intelligence is negatively related to IQ.

A possible explanation as to why the WEIS failed to support Hypothesis 3 may be due to issues related to measurement, such as the case where a test may measure something different from what it was originally intended to measure (Cohen & Swerdlick, 2005; Kaplan & Saccuzzo, 2009; Nunnally & Bernstein, 1994). The WEIS was supposed to measure the latent construct of emotional intelligence that concerns the ability to process emotion-related information and to use this information to guide one's thinking, behaviour and action for better life adjustment. Nevertheless, the findings were against the expected direction posed by the CHC theory of cognitive intelligence. Results suggested that the WEIS may contain a non-ability component rather than ability component as findings showed that the direction of the relationship between cognitive

intelligence and emotional intelligence was negative. (Further explanations on the measurement-related issues of this instrument are discussed in Section 8.5)

8.5.2 H4: The place of emotional intelligence in the 'intelligence' taxonomy

Fit indices from the hierarchical CFA result indicated unacceptable fit for the two-factor model (gf and a combined gc/EI) and good fit for the three-factor model (gf, gc and EI). These results suggested that emotional intelligence measures a kind of intelligence that is distinct from gf and gc. However, because the relationship between emotional intelligence and g was in the opposite direction ($r = -.23$), the idea that emotional intelligence assesses a 'new' intelligence was rejected as it was against the "positive manifold" nature of intelligence taxonomy (Carroll, 1993). Carroll (1993) further detailed that for a putative new intelligence to be considered as a new domain of cognitive intelligence, it should show positive association with existing intelligence factors, but, should not highly overlap with them. Therefore, Hypothesis 4 was rejected.

Psychometricians assert that the most appropriate inference one could make about if the relationship of two theoretically related constructs (i.e. cognitive intelligence and emotional intelligence) is negative or inconsistent with each other is that the measure lacks of construct validity in measuring a particular theoretical concept (Carmines & Zeller, 1979;

Cronbach & Meehl, 1955). In other words, an inverse relationship suggests that the measure does not measure the construct of interest that it intends to measure (Cohen & Swerdlick, 2005; Kaplan & Saccuzzo, 2009; Nunnally & Bernstein, 1994). In a commentary, Cote (2010) pointed out that the lack of convergent validity among purported measures usually suggests serious problems with at least one of the two theoretically related measures. This means that one of the measures may not be measuring what it intended to measure. In this case findings proposed that there is a possibility of measuring a construct using improper measures, which indicated that either emotional intelligence measure or cognitive intelligence measure is problematic.

To investigate the possible flaws of these two focal measures (cognitive intelligence and emotional intelligence), the relationships among the indicators and its latent construct were critically examined based on parameter estimates observed from the model fit (see Figure 7.3) in order to gauge the strength of both measures. It was observed that gf indicators strongly converged on its underlying gf factor as loading estimates for both indicators were larger than .80 (Awang, 2013; Hair et al., 2006); (1) for gf odd indicators, $L = .95$, and (2) for the gc even indicators, $L = .84$. Meanwhile, the gc indicators also strongly converged on its underlying crystallized intelligence factor as loading estimates for both indicators

were larger than .70 (Awang, 2013; Hair et al., 2006); (1) for the gc odd indicator, $L = .79$, and (2) for gc even indicator, $L = .72$.

In contrast to gf and gc factor loadings, loading estimates for emotional intelligence were deemed acceptable, but, were not as strong as those observed in gc and gf. For cognitive intelligence factors, all of the loading estimates were larger than .7, however, most of the loadings of emotional intelligence indicators were larger than .4. Statisticians assert that loading estimates larger than .4 are acceptable, and loadings which are larger than .6 are ideal (Hair et al., 2006). Results showed that loading estimates for the emotional intelligence indicators were as follows; (1) $L = .84$ for SEA, (2) $L = .58$ for OEA, (3) $L = .54$ for RE, and (4) $L = .43$ for UE. With regard to the degree of relationship between gf, gc, and emotional intelligence with its latent construct, g, results also indicated that emotional intelligence was only minimally related to g (emotional intelligence \rightarrow g = -.23). However, gf (gf \rightarrow g = .77) and gc (gc \rightarrow g = .59) were strongly related to g (Cohen, 2009). As mentioned at the beginning of this section, the negative relationship between emotional intelligence and g also contradicted the theory of “positive manifold” nature of intelligence taxonomy that requires a positive relationship between scores on all ability tests (Carroll, 1993).

From these findings, it can be inferred that the construct of cognitive intelligence (IQ) represented by gf and gc factors demonstrated evidence for good construct validity, while the construct of emotional intelligence showed inferior construct validity. Up to this point, the emotional intelligence construct cannot be considered as an intelligence construct as it was negatively and weakly related to cognitive intelligence (emotional intelligence \rightarrow g = -.23). Furthermore, the inverse relationship between emotional intelligence and cognitive intelligence indicated that it was against the positive interrelationships nature of the taxonomy of cognitive intelligence.

In light of these results, it was suggested that a lack of convergent validity between cognitive intelligence and emotional intelligence was due to lack of construct validity of the emotional intelligence measure. As discussed earlier at the beginning of this section, based on the parameter estimates of hierarchical CFA, the construct validity of cognitive intelligence imposed no problem to the present study as both of its factor (gc and gf) were positively and significantly related to g. In contrast, emotional intelligence was negatively related to g. Hence, the negative relationship between cognitive intelligence and emotional intelligence was bound to occur due to the lack of construct validity of emotional intelligence measure, as the cognitive intelligence test showed no problem on its construct validity. Furthermore, to date, the validation of cognitive intelligence theory has

been conducted for over 100 years (Cherniss, Extein, Goleman, & Weissberg, 2006; Lubinski, 2004; Sternberg, 2002).

Cherniss (2010b) in his commentary affirmed that the problem of lack of construct validity is not unique to the emotional intelligence construct. He argued that the concept of cognitive intelligence has taken more than 10 decades to achieve a mutual consensus on the concept and validate the construct, yet controversy about the concept and the validity of general intelligence remains even today. Neisser et al., 1996, (p. 77) stated that, “Scientific research rarely begins with fully agreed definitions, though it may eventually lead to them”. Therefore, the lack of construct validity of emotional intelligence should not be cause for consternation as emotional intelligence researchers asserted that the construct validation of emotional intelligence is still in its infancy, with only approximately around 20 years of research under its belt (Antonakis et al., 2009; Cherniss, 2010b; Mayer, Salovey, et al., 2000a; Van Rooy et al., 2005), instead it should be considered as a stepping stone for further refinement of the construct.

8.5.3 Summary of the discussion

The analyses of the results have answered and clarified the third and fourth objectives of the study. These findings showed no support for the interrelatedness of cognitive and emotional intelligence because (1) there was no convergent validity between these two theoretically related

constructs and (2) emotional intelligence has no place in the intelligence taxonomy. This indicates that the measure of emotional intelligence (WEIS) failed to take 'intelligence' in emotional intelligence seriously. Therefore, the concept of emotional intelligence as measured by the Wong Emotional Intelligence Scale could not legitimately be considered as a new putative cognitive intelligence factor.

As previously mentioned in Section 2.8, these empirical findings can be one of the early attempts to bridge the gap on the examination of emotional intelligence construct from the cognitive intelligence framework. There was only one study which assessed the relationship between emotional intelligence, crystallized intelligence and fluid intelligence, however, this study only employed emotional understanding and emotional management dimensions to represent the emotional intelligence construct (MacCann, 2010).

Additionally, as these findings showed no support for the association of emotional intelligence with *g*, *gc* and *gf*, it refuted the expectation that the WEIS is an intelligence test (in this case a test would be expected to positively correlate to some extent with both *gc* and *gf*). Therefore, it can be concluded that the credence of the psychometric properties of the emotional intelligence test, particularly the WEIS, remains an unresolved

issue, and thus should not be considered as a measure of pure human cognitive intelligence.

8.6 Chapter summary and conclusion

As discussed earlier in the preceding chapters, emotional intelligence researchers postulated that ability-based emotional intelligence is considered a new kind of intelligence. This chapter has addressed this issue by providing empirical findings on the convergent validity between emotional and cognitive intelligence, and confirming the place of emotional intelligence in the intelligence taxonomy. The results showed that there was no meeting point or relatedness between emotional and cognitive intelligence. Having described the degree of relatedness between these intelligence constructs, the next chapter proceeds to demonstrate the distinction of emotional intelligence from personality traits.

CHAPTER 9 – EMOTIONAL INTELLIGENCE AND PERSONALITY

TRAITS: THE CONCEPTUAL DISTINCTION

9.1 Chapter overview

Having presented the empirical findings on the conceptual overlap between emotional intelligence and cognitive intelligence in Chapter 8, this chapter discusses the conceptual distinction between emotional intelligence and personality traits. Sections 9.3 and 9.4 present the results on tests of discriminant validity between emotional intelligence and the Big Five personality traits (O, C, E, A, N; openness, conscientiousness, extraversion, agreeableness, and neuroticism). In addition to the relationship between emotional intelligence and personality factors, the chapter also highlights the relationship between each of the emotional intelligence facets and personality. The chapter concludes with a discussion and synthesis of the results based on the conceptual frameworks of both emotional intelligence and personality. The discussion specifically examines the possibility of having a minimal shared variance between emotional intelligence facets and personality traits.

9.2 Introduction

Hypothesis 5 aimed to gather construct validity related evidence, particularly the discriminant validity on the extent to which the emotional intelligence construct differs from the personality construct. Discriminant validity assesses whether concepts or measures that are supposed to be unrelated are, in fact, unrelated (Cohen & Swerdlick, 2005; Kaplan & Saccuzo, 2009). According to Joseph & Newman (2010a), one of the crucial limitations of emotional intelligence research is lack of sufficient evidence that emotional intelligence construct is different from older, more established psychological construct, particularly personality. Therefore, examining the discriminant validity of emotional intelligence and personality is important as recent researchers argue that the current emotional intelligence measures highly overlap with personality measures (Harms & Crede, 2010b; Joseph & Newman, 2010a, 2010b; Sharma et al., 2013; Zeidner et al., 2008).

However, it was observed that most of these critiques were made based on studies that employed either mixed-models of emotional intelligence or trait emotional intelligence measures. For example, Bar-On (2004) found that emotional intelligence as measured by the Bar-On's EQ-I test (mixed-model emotional intelligence) exhibits correlations of around -0.80 with neuroticism. In a study conducted by Petrides and his colleagues, it was found that emotional intelligence (as measured by trait emotional intelligence measure) strongly correlated with neuroticism, with an r of = -

.66 (Petrides, et al., 2010). Because the MSCEIT was considered as a predominant and widely used measure of an ability-based emotional intelligence (Libbrecht & Lievens, 2012; Parker et al., 2011), review of the literature showed that none of the critiques on this conceptual overlap pointed to the MSCEIT. (See discussion on the MSCEIT in Section 2.6). As there is a trifling number of ability-based emotional intelligence measures, therefore, there is a need to examine the discriminant validity of the WEIS and personality because the WEIS was also conceptualized based on the ability-based emotional intelligence. (See discussion on the WEIS in Section 2.7.2).

As the concept of emotional intelligence (ability-based emotional intelligence) deals with human cognitive ability (Salovey & Mayer, 1990) and personality deals with behavioural dispositions or traits (Goldberg, 1999), emotional intelligence (ability-based emotional intelligence) was hypothesized as being distinct from personality. The proponents of ability-based emotional intelligence argue that emotional intelligence may exhibit small correlations with personality traits, however, the degree of relationship should not be high as high correlation may indicate that the two purported measures are measuring the same concept. (Joseph & Newman, 2010a; Mayer, Salovey, et al., 2008). Given the current controversies, demonstrating a discriminant validity of emotional intelligence from personality is needed to clarify the usefulness of

emotional intelligence concept as a new construct in the field of psychology.

A correlational analysis using Pearson's r was conducted to assess the degree of relationship between the two latent constructs (Cohen & Swerdlick, 2005; Kaplan & Saccuzzo, 2009; Nunnally & Bernstein, 1994), specifically the relationship between emotional intelligence and each of the personality traits (openness, conscientiousness, extraversion, agreeableness, and neuroticism). It was hypothesized that emotional intelligence may exhibit small correlation with personality²².

9.3 Results of H5: Discriminant validity between emotional intelligence and personality

H5: Ability-based emotional intelligence demonstrates discriminant validity with personality traits.

To test this hypothesis, five sub-hypotheses were developed to capture the degree of relationships between emotional intelligence and the five

²² As stated earlier in Section 8.2, Cohen (2009) asserted that a correlation coefficient of .30 and above indicated a moderate strength of relationship, while a correlation coefficient of .50 and above indicated strong degree of relationship.

personality traits of openness (H5a), conscientiousness (H5b), extraversion (H5c), agreeableness (H5d) and neuroticism (H5e).

H5a: Discriminant validity between emotional intelligence and 'openness'

The study found that emotional intelligence positively correlated with the openness trait, with $r = .057$, and $p > .01$, (see Table 9.1). Nonetheless, the relationship was small and non-significant (Cohen, 2009). Hence, this finding indicated that emotional intelligence and openness were distinct, and as such, provided support for the discriminant validity of emotional intelligence from openness. With regards to emotional intelligence facets, all of them were not significantly correlated with openness (r values were ranging from .001 to .087, $p > .01$).

Table 9.1: Correlational analyses between emotional intelligence and personality traits

	1	2	3	4	5	6	7	8	9	10
1 EI	-									
2 Op	.057	-								
3 Con	.117**	.107**	-							
4 Ext	.022	.061	.260**	-						
5 Agr	.132**	.274**	.044	-.057	-					
6 Neu	-.043	-.096*	-.522**	-.449**	-.070	-				
7 SEA	.787**	-.001	.042	-.008	.085*	.044	-			
8 OEA	.708**	.014	.013	.009	.107**	-.005	.467**	-		
9 RE	.696**	.087*	.088*	.033	.172**	-.085*	.423**	.350**	-	
10 UE	.643**	.027	.181**	.027	.054	-.073	.369**	.167**	.243**	-

** p < 0.01; * p < 0.05

Notes: EI = emotional intelligence; SEA = self-emotional appraisal; OEA = others' emotional intelligence; UE = use of emotion; RE = regulation of emotion; Op = openness, Con = conscientiousness; Ext = extraversion; Agr = agreeableness; Neu = neuroticism.²³

H5b: Discriminant validity between emotional intelligence and 'conscientiousness'

The correlational analysis also indicated that emotional intelligence was positively correlated with conscientiousness ($r = .117$, $p < .01$) (See Table 9.1). The relationship was small and significant (Cohen, 2009). This

²³ Reliability of these scales are stated in chapter 6 (See Sections 6.7 and 6.8)

indicated that these two constructs were significantly correlated, but the strength of relationship was not high enough to suggest redundancy. This is evidence for the discriminant validity between emotional intelligence and conscientiousness. All the emotional intelligence facets were minimally correlated with conscientiousness (r values were ranging from .013 to .181). Only the use of emotion facets ($r = .181$, $p < .01$) were significantly correlated with conscientiousness.

H5c: Discriminant validity between emotional intelligence and 'extraversion'

Emotional intelligence and extraversion were minimally and positively correlated, with $r = .022$, $p > .01$, (Cohen, 2009), but, this relationship was non-significant (See Table 9.1). Hence, the obtained result suggested that the concept of emotional intelligence and extraversion were distinct, and there was discriminant validity between emotional intelligence and extraversion. All of the emotional intelligence facets were not significantly correlated with extraversion (r values were ranging from .008 to .033, $p > .01$).

H5d: Discriminant validity between emotional intelligence and 'agreeableness'

There was a significant positive correlation between emotional intelligence and agreeableness, with, $r = .132$, $p < .01$ (see Table 9.1). According to

Cohen (2009), this value of correlation coefficient ($r < .30$) indicates a small degree of relationship. Thus, it can be inferred that the correlational analysis supported the discriminant validity of emotional intelligence and agreeableness. The results also indicated that all of the emotional intelligence facets were minimally correlated with agreeableness (r values were ranging from .054 to .172), and that relationships were significant for all emotional intelligence facets, with the exception of 'use of emotion' and 'self-emotional appraisal' facet. The relationship between the regulation of emotion facet and agreeableness ($r = .172$, $p < .01$) was significantly higher than those of 'other's emotional appraisal' facet ($r = .107$, $p < .01$).

H5e: Discriminant validity between emotional intelligence and 'neuroticism'

In contrast to other personality traits, emotional intelligence and neuroticism were negatively related (see Table 9.1), and the relationship was small and non-significant, with $r = -.043$, and $p > .01$, (Cohen, 2009). The correlations indicated that these two constructs were distinct, thus, the discriminant validity between emotional intelligence and neuroticism was also demonstrated. In relation to emotional intelligence facets, all facets were not significantly correlated with neuroticism (r values were ranging from .005 to .085 and $p > .01$).

9.4 Summary of results pertaining to H5

In conclusion, the present results revealed that there were small correlations between emotional intelligence and each of the personality traits such as openness, conscientiousness, extraversion, agreeableness, and neuroticism. All of the personality traits positively related to emotional intelligence except neuroticism. And only conscientiousness and agreeableness showed a significant correlation with emotional intelligence, while the correlation between emotional intelligence and other traits were non-significant.

9.5 Discussion: The distinctiveness of emotional intelligence from personality

The correlational analyses denoted that conscientiousness and agreeableness were minimally yet significantly correlated with emotional intelligence. Openness, extraversion and neuroticism were also minimally correlated with emotional intelligence, albeit their correlations were not significant. Additionally, all of the emotional intelligence facets (SEA, OEA, RE and UE) were minimally related to openness, conscientiousness, extraversion, agreeableness, and neuroticism. Based on these findings, the construct of emotional intelligence can be said to be distinct and unique from personality. The results supported the hypothesized discriminant validity between emotional intelligence and each of the

personality traits. Therefore, H5a, H5b, H5c, H5d and H5e were supported.

In addition, the present study suggests that emotional intelligence has strong discriminant validity from personality traits. According to Joseph and Newman (2010a), the degree of discriminant validity can be thought of as a continuum from weak discriminant validity to strong discriminant validity. It is deemed weak discriminant validity if the emotional intelligence construct shares close to half variance with personality traits (Joseph & Newman, 2010a). As the findings of the present study showed that emotional intelligence was minimally related to all of the personality traits (r values were ranging from .022 to .136), this implies that there was a strong evidence of discriminant validity between emotional intelligence and the Big Five personality traits.

Most of the discriminant validity findings obtained from this study were consistent with those reported by Wong et al., (2004). Wong and colleagues found that emotional intelligence as measured by the performance-based test (WEIS), was not significantly related to openness and extraversion, but, was significantly related to conscientiousness and agreeableness with a moderate correlation; $r = .40$, $p < .01$ for the conscientiousness, and $r = .43$, $p < .01$ for the agreeableness (Wong et al., 2004). With regard to neuroticism, the result reported by Wong et al.

(2004) indicated that emotional intelligence was minimally but significantly related to neuroticism. The present study also found a small correlation between emotional intelligence and neuroticism; however, the relationship was not significant. Thus, the small degree of relationship between emotional intelligence and personality suggests that emotional intelligence does not overlap with personality.

The results of this study showed that emotional intelligence was minimally but significantly related to conscientiousness, indicating that emotional intelligence overlapped slightly with this trait. The relationship between conscientiousness and use of emotion facet was also significantly higher than other emotional intelligence facets. An overlap between conscientiousness and emotional intelligence ($r = .117, p < .01$), especially between conscientiousness and the use of emotion facet ($r = .181, p < .01$) is reflected in the operational definition of conscientiousness. Conscientiousness is associated with dependability, organisation, persistence, thorough planning and dependency to plan (Barrick & Mount, 1991; John, Nauman & Soto, 2008; McCrae & Costa, 1987). Meanwhile, the use of emotion facet involves planning the use of positive emotions to facilitate performance (Wong & Law, 2002). Thus, it can be suggested that the use of the emotion facet of emotional intelligence maps onto the adherence to plans component of conscientiousness, which suggests that

individuals who have high score on conscientiousness tend to be able to plan or use their positive emotions to enhance their performance.

Likewise, emotional intelligence was also minimally but significantly correlated with agreeableness ($r = .136, p < .01$), with the regulation of emotion facet showing the strongest relationship with agreeableness ($r = .172, p < .01$). An explanation for this finding is manifested in the classic definition of agreeableness. Agreeableness is related to being courteous, trusting, flexible, cooperative, good-natured, forgiving, and tolerant (Barrick & Mount, 1991; John et al., 2008). The regulation of emotion facet on the other hand refers to one's ability to manage emotions and to return quickly to normal psychological states after rejoicing or being upset (Wong & Law, 2002). Hence, it can be inferred that the regulation of emotion facet slightly overlaps with a tendency toward being flexible, good-natured, and tolerant found in the agreeableness personality trait.

Because there are no empirical studies of the discriminant validity between emotional intelligence facets (SEA, OEA, RE, and UE) and personality (utilising the WEIS), the current work is an early attempt to offer a significant advancement in the area. The present study is important as it may pave the way for future research to critically investigate how emotion-related abilities relate to the personality traits. For example, further research should examine in what ways regulation of emotion

abilities relate to conscientiousness. Investigating the ways emotional intelligence facets relate to personality is necessary because both of these elements play a role in coping with the social and emotional demands of daily life (Humphrey, Pollack, Hawver, & Story, 2011; MacCann & Roberts, 2008).

In light of the evidence presented, support was found for the discriminant validity between emotional intelligence and all of the personality traits. Although these findings rely on a particular measure of emotional intelligence (performance-based test), the obtained results ultimately lend support for the theoretical construct validity of emotional intelligence as defined by Salovey and Mayer (1990). Salovey and Mayer argued that emotional intelligence is a kind of intelligence and it is different from personality traits. By conducting correlational analyses at the emotional intelligence facet level also, results revealed that all four of the emotional intelligence facets were distinct from personality traits.

Therefore, these findings have disputed claims made by some researchers that emotional intelligence pioneers have simply reinvented the wheel rather than introducing a novel construct (Harms & Crede, 2010b; Joseph & Newman, 2010a, Newman et al., 2010; Roberts, Matthew & Zeidner, 2010). For example, Joseph & Newman, (2010a) assert that it has been speculated that emotional intelligence (and its

subfacets) are redundant with well-known concepts of Big Five personality traits and raised a question “Are emotional intelligence researchers simply reinventing the wheel?” (p. 673). The findings that emotional intelligence showed strong discriminant validity from personality traits speak to the claims that emotional intelligence is a relabeling of personality. Thus, it can be concluded that emotional intelligence is not simply a re-labelling of the Big Five personality traits; instead, it is conceptually distinct from personality traits.

9.6 Chapter summary and conclusion

This chapter has highlighted the discriminant validity between emotional intelligence and personality factors. More specifically, it has assessed the degree of inter-relatedness between emotional intelligence and openness, conscientiousness, extraversion, agreeableness, and neuroticism. Findings supported Hypothesis 5 which predicted that emotional intelligence was indeed distinct from personality traits and thereby rejecting the claims that emotional intelligence greatly overlaps with personality. Having presented the convergent and discriminant validity of emotional intelligence with its theoretically related construct, the following chapter continues to examine the incremental validity of emotional intelligence in explaining various outcomes.

CHAPTER 10 – THE LINK BETWEEN EMOTIONAL INTELLIGENCE AND ITS RELATED OUTCOMES

10.1 Chapter overview

Having discussed the underlying dimensions of emotional intelligence (Chapter 7), assessed the interrelatedness between emotional intelligence and cognitive intelligence (Chapter 8), and investigated the distinctiveness of emotional intelligence and the Big Five personality traits (Chapter 9), what follows is an examination of the relationship between emotional intelligence and its related criterion variables. This chapter examines the incremental validity of emotional intelligence in predicting leadership practices (Section 10.3) and positive interpersonal relationships (Section 10.4). The chapter concludes with a discussion which rationalises the incremental variance of certain emotional intelligence facets (as measured by the performance-based test) in predicting outcomes while controlling for personality traits, a self-report measure of emotional intelligence, and trait emotional intelligence (Section 10.5).

10.2 Introduction

Hypotheses 6 and 7 aimed to determine how well the ability-based emotional intelligence (performance-based measure) predicted leadership

practices and positive interpersonal relationships, by taking into account the potential influences of (1) personality traits, (2) cognitive intelligence (3) ability-based emotional intelligence (self-report measure), and (4) trait emotional intelligence. In general, the predictors for both hypotheses were similar. However, Hypothesis 6 examined leadership practices as an outcome variable, while Hypothesis 7 investigated positive interpersonal relationships as an outcome variable.

In examining the usefulness of a particular construct/test, establishing incremental validity is important as it will examine the gain in validity resulting from adding a new predictor to the existing predictors in predicting particular outcome variable (Cohen & Swerdlick, 2005; Kaplan & Saccuzo, 2009). In other words, incremental validity investigates whether the new predictor (performance-based emotional intelligence) is able to add a significant incremental variance in predicting the outcome variables (leadership practices and positive interpersonal relationships) while controlling the potential overlapping effect with other established predictors (IQ, personality, self-report emotional intelligence and trait emotional intelligence).

Emotional intelligence researchers argue that if emotional intelligence is truly a valid, useful and meaningful construct, then it should provide an incremental validity to its related outcomes (such as job performance,

leadership, social functioning, life satisfaction and etc.) above and over the older, more established predictors such as cognitive intelligence and personality (Harms & Crede, 2010b; Mayer, Salovey, et al., 2008; Zeidner et al., 2008). As there is a relative paucity of information regarding the incremental validity of emotional intelligence over cognitive intelligence and the Big Five personality traits (Harms & Crede, 2010b), attesting its incremental validity is necessary to establish another piece of evidence on the validity of emotional intelligence construct.

To test this hypothesis, first, a preliminary investigation of the correlations between predictors and student leadership practices was conducted (Tabachnick and Fidell, 2007). Second, a hierarchical multiple regression analysis (MRA) was conducted to test whether emotional intelligence added significant incremental variance to leadership practices (Field, 2009; Green & Salkind, 2005; Pallant, 2007). Finally, semi-partial correlations were calculated between emotional intelligence and the outcome variable after controlling for established predictors; cognitive intelligence, personality, self-report measure of emotional intelligence, and trait emotional intelligence (Hunsley & Meyer, 2003). Semi-partial correlations were computed because according to Hunter and Schmidt (2004), sole reliance on the interpretation of ΔR^2 “leads to severe underestimates of the practical and theoretical significance of relationships between variables (p. 190)”. Semi-partial r refers to the square root of the

R^2 change (Hunsley & Meyer, 2003). Hunter and Schmidt asserted that interpretation of the semi-partial r is a more meaningful measure of a predictor variable's contribution. Psychometricians posited that in applying hierarchical regression for social and behavioural sciences research, when a number of predictors are entered before the final step, small increments to the change in R^2 do not necessarily indicate a lack of meaningful contribution to prediction of the criterion, particularly when there is considerable conceptual overlap (Ahadi & Deiner, 1989; Hunsley & Meyer, 2003) (See Section 10.5.1 for further explanation on semi-partial r).

10.3 Results of H6: Incremental validity of emotional intelligence in explaining leadership practices

H6: Ability-based emotional intelligence (performance-based measure) demonstrates evidence of incremental validity over cognitive intelligence, personality traits, self-report measure of emotional intelligence and trait emotional intelligence in predicting leadership practices.

The regression model consisted of four predictors and one criterion variable (leadership). The baseline models (personality traits, self-report emotional intelligence, and trait emotional intelligence) were entered as independent variables, then the focal emotional intelligence (performance-based) was entered into the equation (the incremental model) and the R^2

changes were examined. The predictors were entered in blocks in the following order: Step 1 (block 1) : personality traits, namely openness, conscientiousness, extraversion, agreeableness, and neuroticism; Step 2 (block 2) : self-report measure of emotional intelligence, namely SEA, OEA, RE, and UE; step 3 (block 3) : trait emotional intelligence, namely emotionality, self-control, and also psychological and social well-being; and Step 4 (block 4) : performance-based measure of emotional intelligence, namely SEA, OEA, RE, and UE.

According to psychometricians and statisticians, the new measure/construct that one wants to validate should be entered in the final step as one wants to examine the incremental validity of that new measure over other established measures/construct (Cohen & Swerdlick, 2005; Field, 2009; Hair et al., 2006). Therefore, the performance-based emotional intelligence was entered as the last block in the regression equation. The incremental variance of the performance-based emotional intelligence was examined by looking at the significant ΔF . If the addition of performance-based emotional intelligence to the regression model resulted in a significant ΔF , then it may indicate that the performance-based emotional intelligence significantly add incremental variance to the measured outcome.

In this regression model, personality, self-report emotional intelligence and trait emotional intelligence were controlled because the documented literature revealed that these predictors significantly related to leadership. As the term incremental validity is used to describe the gain in validity resulting from adding new predictor to existing predictors of particular criterion variable (Cohen & Swerdlick, 2005; Kaplan & Saccuzo, 2009), it was expected that the addition of performance-based emotional intelligence (new measure/predictor) would improve the variance explained of the outcome variable upon existing predictors.

As stated earlier in Section 3.2, past studies found that personality, particularly extraversion and openness to experience were related to leadership (Judge & Bono, 2000; Lord, DeVader, & Alliger, 1986; McCrae & Costa, 1987; Ployhart, Lim & Chan, 2001; Strang & Kuhnert, 2009). Besides personality, a number of researches revealed that ability-based emotional intelligence also related to the leadership effectiveness (Antonakis et al., 2009; Brackett et al., 2011; Kerr et al., 2006). Similar to ability-based emotional intelligence, trait emotional intelligence was also found to be related to leadership (Brown & Moshavi, 2005; Villanueva & Sanchez, 2007). (See discussion in Section 3.2 for the relationship between personality, emotional intelligence and trait emotional intelligence and leadership). The leadership practices was chosen as an outcome variable because review of the literature revealed that leadership involves

emotion-laden process (Antonakis et al., 2009; Humphrey, 2002; Kerr et al., 2006; Zhou & George, 2003) (As elaborated earlier in Section 3.3.5.1).

10.3.1 Preliminary investigation of the correlation between the predictors and leadership practices

Following Tabachnick and Fidell's (2007) standard of procedure, the correlation between the predictors and the student leadership practices was examined prior to the regression analyses to ensure that all of the predictors were significantly related to the outcome variable before including them in the regression model. The correlation analysis found that all of the predictors were significantly correlated to leadership practices, except IQ ($r = .013$, $p = .738$) (see Table 10.1 at page 339). Therefore, IQ was not included in the regression model as it showed no significant relationship with the leadership practices.

In addition to correlation, the existence of outliers were also scrutinised by examining the Mahalanobis distance, and no outliers among the cases were identified (see Section 6.4 for further details on data screening). Similarly, no multicollinearity in the dataset was found, as there were no extremely high correlations ($R > .85$) among the predictors (Field, 2009). The assumption of independent errors in the regression equation was also acceptable (Durbin-Watson test statistics for leadership practices = 1.982).

Table 10.1: Correlations between the predictors and the outcomes: leadership and interpersonal relationships

Variables	1	2	3	4	5	6	7	8	9	10	11
1 EI (PB)	-										
2 EI (SR)	.200**	-									
3 TEI	.135**	.544**	-								
4 IQ	-.169**	.019	.118**	-							
5 Open	.057	.425**	.415**	.084*	-						
6 Consci	.117**	.263**	.289**	.130**	.119**	-					
7 Extra	.022	.071	.242**	.030	.044	.260**	-				
8 Agree	.132**	.392**	.425**	.041	.279**	.037	-.053	-			
9 Neuro	-.043	-.171**	-.304**	.023	-.074*	-.522**	-.449**	-.025	-		
10 Lead	.153**	.491**	.501**	.013	.489**	.237**	.146**	.328**	-.134**	-	
11 Positive IPR	.216**	.394**	.341**	.016	.281**	.199**	.058	.227**	-.115**	.540**	-

Note:

** Correlation is significant at the 0.01 level (2-tailed).

* Correlation is significant at the 0.05 level (2-tailed).

EI = emotional intelligence, PB = Performance-based test, SR = self-report measure, Open = openness, Consci = conscientiousness; Extra = extraversion; Agree = agreeableness; Neuro = neuroticism, Lead = Leadership, Positive IPR = Positive interpersonal relationships

10.3.2 Regression analyses predicting the leadership practices

The regression analyses showed that a significant effect of emotional intelligence (performance-based measure) on leadership practices was obtained after controlling for personality traits, emotional intelligence (self-report measure), and trait emotional intelligence. Table 10.2 displays these results.

Table 10.2: Regression analyses predicting the leadership practices

Predictor	R ²	Adjusted R ²	Change statistics			Coefficient		Semi-partial r
			Δ R ²	Δ F	Sig Δ F	β	p	
Step 1								
Personality	.307	.302	.307	62.408	.000			.554
Openness						.241**	.000	
Conscientiousness						.076**	.036	
Extraversion						.075**	.027	
Agreeableness						.094**	.006	
Neuroticism						.062	.109	
Step 2								
EI (self-report measure)	.382	.374	.075	21.142	.000			.274
SEA						.028	.428	
OEA						.083**	.017	
RE						.010	.796	
UE						.159**	.000	

Predictor	R ²	Adjusted R ²	Change statistics			Coefficient		Semi-partial r
			Δ R ²	Δ F	Sig Δ F	β	p	
Step 3								
Trait emotional intelligence	.409	.399	.027	10.578	.000			.164
Emotionality						.046	.153	
Self-control						.042	.318	
Psychological and social well-being						.181**	.000	
Step 4								
EI (performance-based measure)	.421	.407	.012	3.585	.007			.110
SEA						.027	.452	
OEA						.025	.480	
RE						.028	.407	
UE						.117**	.000	

Notes:

EI = emotional intelligence; SEA = self-emotional appraisal; OEA = others' emotional intelligence; UE = use of emotion; RE = regulation of emotion

**denotes significant at p < .001 level.

*denotes significant at p < .05 level.

In step 1, result indicated that personality traits significantly predicted student leadership practices (Model 1: R = .554, R² = .307, Adjusted R² = .302, ΔF (5, 704) = 62.41, p = .000). An investigation of the standardised beta coefficients (β) for the MRA model was further scrutinized to investigate which personality factors made a significant contribution in explaining the variance in leadership practices across individuals. The

coefficient output table was examined and a significant positive relationship between openness and leadership practices ($\beta = .241$, $p = .000$) and agreeableness and leadership practices ($\beta = .094$, $p = .006$) were obtained when the effects of other predictors were held constant.

After entering the self-report measure of emotional intelligence in step 2, a significant increment in R^2 was observed which revealed that this predictor significantly predicted leadership while controlling the personality traits (Model 2: $R = .618$, $R^2 = .382$, Adjusted $R^2 = .374$, $\Delta F (4, 700) = 21.142$, $p = .000$). The standardised beta coefficients (β) results revealed that there was a significant positive relationship between the self-report measure of emotional intelligence, particularly the use of emotion facet and leadership practices ($\beta = .159$, $p = .000$).

In step 3, the addition of trait emotional intelligence to the regression equation also resulted in a significant increment in R^2 (Model 3: $R = .639$, $R^2 = .409$, Adjusted $R^2 = .399$, $\Delta F (3, 697) = 10.578$, $p = .000$) while controlling for personality traits and self-report measure of emotional intelligence. The beta coefficient results showed that there was a significant positive relationship between the 'psychological and social well-being' facet and leadership ($\beta = .181$, $p = .000$).

In step 4, the performance-based measure of emotional intelligence was entered and result indicated that it significantly added an incremental variance to the prediction of leadership practices over and above personality, self-report measure of emotional intelligence, and trait emotional intelligence (Model 4: $R = .649$, $R^2 = .421$, Adjusted $R^2 = .407$, $\Delta F(4, 693) = 3.585$, $p = .007$). With the significant ΔF , the ΔR^2 of .012 indicated that performance-based measure of emotional intelligence added a significant incremental variance in leadership practices (Field, 2009). In the final model, the beta coefficient (β) results revealed that only the 'use of emotion' facet had a significant positive relationship with leadership ($\beta = .117$, $p = .000$) when the effects of other predictors were held constant.

Taken as a whole, results of this study suggested that performance-based measure of emotional intelligence represents an important construct in predicting a significant amount of unique variance in leadership practices beyond that accounted for the Big Five personality traits, self-report measure of emotional intelligence, and trait emotional intelligence. Results also revealed that openness, conscientiousness, extraversion, agreeableness, the self-emotional appraisal of self-report emotional intelligence, use of emotion facet of self-report emotional intelligence, 'psychological and social well-being' facet of trait emotional intelligence, and use of emotion facet of performance-based emotional intelligence

significantly predicted the student leadership practices when the effects of other predictors were held constant. Hence, 'use of emotion' facet of performance-based emotional intelligence significantly predicted the leadership practices.

10.4 Results of H7: Incremental validity of emotional intelligence in explaining positive interpersonal relationships with peers

H7: Ability-based emotional intelligence (performance-based measure) demonstrates evidence of incremental validity over cognitive intelligence, personality traits, self-report measure of emotional intelligence and trait emotional intelligence in predicting positive interpersonal relationships with peers.

Similar to the previous regression model, this regression model also consisted of 4 predictors and 1 criterion variable of positive interpersonal relationships. The predictors for this regression model were similar to the previous model, however, the outcome variable was changed to positive interpersonal relationships. The baseline models (personality traits, self-report emotional intelligence, and trait emotional intelligence) were entered first as independent variables into the equation (incremental model), followed by the focal emotional intelligence (performance-based)

and the R^2 changes were examined. (See Section 10.3 for the details of each step and block).

In this regression model, the personality, self-report emotional intelligence and trait emotional intelligence were controlled because the documented literature revealed that these predictors significantly related to interpersonal relationships. For example, several studies found that personality, particularly the extraversion and conscientiousness dimension are significantly related to positive interpersonal relationships (Kotsou et al., 2011; Lopes et al., 2003). A meta-analysis conducted by Malouff and his colleagues also indicated that personality traits are significantly related to the relationship satisfaction of intimate partners (Malouff, Thorsteinsson, Schutte, Bhullar, Rooke, 2010). Past researches also revealed that both the ability-based emotional intelligence (Lopes et al., 2003) and trait emotional intelligence (Kotsou et al., 2011) are significantly related to positive interpersonal relationships with others. Because all of these predictors are significantly related to the measured outcome, it was hypothesized that the addition of focal emotional intelligence (performance-based) to the regression model will add a significant incremental variance to the positive interpersonal relationships. As discussed earlier in Sections 3.3.5.2, positive interpersonal relationships was selected as an outcome variable because the documented literature pointed out that emotional management skill is one of the key factors in

maintaining satisfying relationships (George, 2000; Kerr et al., 2006; Mayer, Caruso, et al., 2000).

10.4.1 Preliminary investigation of the correlation between the predictors and the positive interpersonal relationships with peers

The correlation result showed that all of the predictors were significantly correlated to the positive interpersonal relationships, except IQ ($r = .016$, $p = .663$) (see Table 10.1 at page 339). Hence, IQ was not included in the regression model (Tabachnick & Fidell, 2007). As discussed earlier in the preliminary analyses of the study variables (Section 10.2), no outliers and multicollinearity existed in this dataset. The assumption of independent errors in this regression equation was also deemed acceptable (Durbin-Watson test statistics for positive interpersonal relationships = 1.862).

10.4.2 Regression analyses predicting the positive interpersonal relationships with peers

The MRA result showed that a significant effect of emotional intelligence (performance-based measure) on the positive interpersonal relations with peers was obtained after controlling personality traits, emotional intelligence (self-report measure), and trait emotional intelligence. Table 10.3 displays these findings.

Table 10.3: Regression analyses predicting the positive interpersonal relationships with peers

Predictor	R ²	Adjusted R ²	Change statistics			Coefficient		Semi-partial r
			Δ R ²	Δ F	Sig Δ F	β	p	
Step 1								
Personality	.131	.125	.131	21.166	.000			.362
Openness						.115**	.004	
Conscientiousness						.077	.068	
Extraversion						.006	.882	
Agreeableness						.041	.299	
Neuroticism						.022	.628	
Step 2								
EI (self-report measure)	.186	.175	.055	11.816	.000			.235
SEA						.075	.064	
OEA						.065	.104	
RE						.083	.057	
UE						.092*	.046	
Step 3								
Trait emotional intelligence	.196	.182	.010	2.854	.036			.100
Emotionality						.075*	.044	
Self-control						.040	.421	
Psychological & social well-being						.047	.386	

Predictor	R ²	Adjusted R ²	Change statistics			Coefficient		Semi-partial r
			Δ R ²	Δ F	Sig Δ F	β	p	
Step 4								
EI (performance-based measure)	.215	.197	.019	4.214	.002			.138
SEA						.003	.937	
OEA						.068	.095	
RE						.049	.216	
UE						.088*	.024	

Notes:

EI = emotional intelligence; SEA = self-emotional appraisal; OEA = others' emotional intelligence; UE = use of emotion; RE = regulation of emotion

**denotes significant at p < .01 level.

*denotes significant at p < .05 level.

In step 1, personality traits significantly predicted positive interpersonal relationships (Model 1: R = .361, R² = .131, Adjusted R² = .125, ΔF (5, 704) = 21.166, p = .000). An investigation of the standardised beta coefficients (β) for the MRA model was further scrutinized to investigate which personality traits made a significant contribution in explaining the variance in positive interpersonal relationships across individuals. Result indicated that only openness had a significant positive relationship with the positive interpersonal relationships (β = .115, p = .004).

After entering the self-report measure of emotional intelligence in step 2, a significant increment in R^2 was observed (Model 2: $R = .431$, $R^2 = .186$, Adjusted $R^2 = .175$, $\Delta F (4, 700) = 11.816$, $p = .000$). Results revealed that there was a significant positive relationship between the self-report measure of emotional intelligence and positive interpersonal relationships.

In step 3, the addition of trait emotional intelligence variables to the regression equation resulted in a non-significant increment in R^2 . (Model 3: $R = .442$, $R^2 = .196$, Adjusted $R^2 = .182$, $\Delta F (3, 697) = 2.854$, $p = .036$ at $\alpha .01$).

In step 4, the performance-based measure of emotional intelligence was entered and result showed that the addition of the performance-based measure of emotional intelligence significantly added an incremental variance to the prediction of positive interpersonal relationships above and beyond personality, self-report measure of emotional intelligence and trait emotional intelligence (Model 4: $R = .463$, $R^2 = .215$, Adjusted $R^2 = .197$, $\Delta F (4, 693) = 4.214$, $p = .002$). With the significant ΔF , result indicated that emotional intelligence (performance-based measure) added a significant incremental variance in positive interpersonal relationships with friends.

Therefore, the regression results suggested that emotional intelligence (performance-based measure) represents an important construct in

predicting a statistically significant amount of unique variance in positive interpersonal relationships beyond that accounted for the Big Five personality traits, self-report measure of emotional intelligence and trait emotional intelligence.

10.5 Discussion: Emotional intelligence (performance-based test) explains a significant increment of variance to important outcomes

The hierarchical MRA results revealed that emotional intelligence as currently measured (performance-based measure) explained a significant incremental variance in outcome variables; leadership practices and positive interpersonal relationships. These findings suggested that emotional intelligence represents an important construct in predicting a significant amount of unique variance in social/emotional functioning related outcomes beyond that accounted for personality, self-report emotional intelligence, and trait emotional intelligence. The findings supported the hypothesized incremental validity of emotional intelligence in explaining the leadership practices and positive interpersonal relationships. Therefore, Hypotheses 6 and 7 were supported.

Results of the study also revealed that IQ was not a significant predictor to both criterion variables; leadership practices and positive interpersonal relationships. The present findings were inconsistent with the past studies

which indicated that IQ was a significant predictor to leadership (Antonakis et al., 2009; Bass, 1990; 1997; Judge et al., 2004) and perceived positive interpersonal relationships (Lopes et al., 2003). However, these studies which found that IQ was a significant predictor to leadership were conducted on working adults (Antonakis et al., 2009; Bass, 1990; 1997; Judge et al., 2004). A plausible explanation for this non-significant relationship between IQ and the outcome variables could be due to the less dispersion of the range of IQ scores for undergraduate students.

According to Rossen and Kranzler (2009), when the samples consisted of university students' samples, range restriction on cognitive ability (IQ) among the university samples most likely explains this outcome because the students enrolled in university tend to have almost similar level of IQ scores. These results are comparable to a study with a similar sample group (university students) conducted by Rossen and Kranzler (2009). Rossen and Kranzler (2009) found that the amount of variance explained by the general cognitive ability for outcome variables including academic achievement, psychological well-being, positive relations with others, and alcohol use were generally low and almost non-existent.

This study is among the earliest attempts to address the relative paucity of information regarding the incremental validity of emotional intelligence over the Big Five personality traits and cognitive intelligence (Antonakis &

Dietz, 2010; Fiori & Antonakis, 2012; Harms & Crede, 2010b; Martin & Thomas, 2011). The present study contributes to emotional intelligence research by taking into consideration the potential overlapping effect of multiple emotional intelligence theories (ability-based emotional intelligence and trait emotional intelligence) and measures (performance-based and self-report measure) in predicting important outcomes. It is deemed necessary to include these competing measures in a regression model as it will indicate whether each of these tests predict important outcome beyond what can be predicted by other related-measures and well-studied personality traits. In light of this lacuna, the attempt of this study to include multiple relevant predictors was seen as a stepping stone to bridge this gap.

10.5.1 Incremental validity of emotional intelligence in explaining leadership practices

The findings of the study indicated that after controlling for personality, self-report measure of emotional intelligence, and trait emotional intelligence, emotional intelligence, as measured by the performance-based test contributed statistically significantly to the prediction of leadership practices. Although the amount of variance accounted for this outcome variable was only 1.2 % ($R^2 = .012$), it is worth noting that an examination of incremental validity poses an exceptionally stringent

research design (Hunsley & Meyer, 2003). As stated earlier in Section 10.2, semi-partial r was computed to examine predictor's important contribution to the prediction of leadership practices.

Hunsley and Meyer (2003) provided an appropriate interpretation in evaluating the meaningfulness of incremental predictive validity and the semi-partial r . In such a case, Hunsley and Meyer (2003) asserted that a semi-partial r of 0.15–0.20 on the third step and a semi-partial r of .10 and above for the fourth step, represent an important contribution to prediction while taking into account the shared variance between predictor variables. Nunnally and Bernstein (1994) observed that R increments are generally small by the third step (and all subsequent ones) of an equation. As emotional intelligence was entered after the five dimensions of personality in the first step, self-report emotional intelligence in the second, trait emotional intelligence in the third and performance-based emotional intelligence in the fourth, semi-partial r of 0.11 for leadership practices can be interpreted as a meaningful predictor (See Table 10.1 for the results of semi-partial r).

On the other hand, Cohen (2009) also suggested an alternative magnitude for interpreting the contribution of a predictor in a hierarchical MRA or the effect size. According to Cohen (2009), a “large” effect in the social sciences researches explains 25% ($R^2 = .25$ or semi-partial $r = .50$ and

above) of the variance in the dependent variable, a “medium” effect explains about 9% ($R^2 = .09$ or semi-partial $r = .30$ and above), and a “small” effect about 1% ($R^2 = .01$ or semi-partial $r = .10$ and above). Based on the Cohen’s (2009) effect size “interpretation,” the results suggested that emotional intelligence as measured by the performance-based test ($R^2 = .012$ and semi-partial $r = .11$) explained a significant yet small amount of additional variance on the criterion variable (leadership practices) beyond that explained by personality, self-report measure of emotional intelligence, and trait emotional intelligence.

In addition, it was observed that only use of the emotion facet significantly predicted the leadership practices. Use of emotion to facilitate the performance dimension refers to the ability of a person to utilise emotions by directing them towards constructive activities and productive performance (Wong & Law, 2002). A person competent in this dimension of emotional intelligence is capable of continuous self-advancement and to direct his/her emotions in positive and productive directions. Thus, it was suggested that emotionally intelligent leaders are good in using their emotions to facilitate thinking, process information, and make wise decisions in improving both personal and team performance.

The present findings identified the ability to use emotion to facilitate performance as the most consistent predictor of leadership. These results

were consistent with Cote, Lopes, Salovey and Miners's study (2010). Cote et al. (2010) found that ability to use emotions in addition to ability to understand emotions predicted leadership emergence above and beyond the personality traits and cognitive intelligence. Nonetheless, they assessed the emotional intelligence using the MSCEIT, another performance-based test for ability-based emotional intelligence. Although, the ability to understand emotions of the WEIS (performance-based test) was not a significant predictor of the criterion variable, the incremental validity of the self-report measure of emotional intelligence (WLEIS), showed that both the ability to use emotions to facilitate performance and the ability to understand the emotions of others were significant predictors to the leadership practices. As such, additional research is needed to determine the implications of these findings and to advance understanding on the role of emotional intelligence in enhancing leadership practices. Walter et al., (2012) stated that to date, Cote's (2010) study was the only empirical study that controlled the established predictors (cognitive intelligence and personality) in predicting leadership.

The results supported the notion that leadership effectiveness requires a degree of emotional intelligence and emotionally intelligent leaders are more likely to emerge as effective leaders (Kerr et al., 2006; Rajah, Song & Arvey, 2011; Walter, Cole & Humphrey, 2011). As postulated by Humphrey (2008), an emotionally intelligent leader who can effectively use

and manage emotions would be able to positively influence feelings and address the concerns of their followers with greater proficiency. With the skilful management of followers' feelings, followers' job performance is enhanced through the encouragement of positive and optimistic feelings and this situation will further provide inspirations for both; leader and followers to enhance their performance (Bono & Ilies, 2006; Humphrey, 2008; Prati et al., 2003). Rajah et al. (2011) also highlighted the dual role of 'use of emotions' in leadership to facilitate self-performance and to manage the emotions of team members.

In summary, these findings are in line with the theoretical foundation of leadership practices that describe leadership as an "emotion laden process" (George, 2000, p. 1046). Based on this theory, emotions are important for leadership and wise decision making. Emotional intelligence is expected to influence leadership by enabling leaders to more effectively manage their own and their followers' emotions (George, 2000; Humphrey et al., 2008; Law et al., 2008). The findings of this study also supported Antonakis et al.'s, (2009) conclusion that the skills associated with the use of emotions may prove to be of utmost importance for leaders. From this result and the early research of Cote et al. (2010), it is plausible to conclude that emotional intelligence has the potential to contribute to leadership. Therefore, these findings signify that a link between emotional

intelligence and leadership does exist, and thus, enhancing emotional intelligence may result in the enhancement of leadership practices.

10.5.2 Incremental validity of emotional intelligence in explaining positive interpersonal relationships

Similar to Hypothesis 6, the findings obtained for hypothesis 7 also indicated that emotional intelligence as measured by the performance-based test significantly contributed to the prediction of positive interpersonal relationships with peers after controlling for personality, self-report measure of emotional intelligence and trait emotional intelligence. It implied that all of the predictors (personality and self-report measure of emotional intelligence) except trait emotional intelligence significantly predicted the outcome, and the inclusion of emotional intelligence (performance-based measure) to the existing model also indicated that the performance-based measure of emotional intelligence still able to significantly predict the outcome, while the potential effects of other predictors were controlled for. The amount of variance accounted for this outcome variable was 1.2 % ($R^2 = .012$), and examination of the effect size implied that this R^2 value which is equivalent to semi-partial r of .11 signified a small effect to the positive social relationships with peers. (See Section 10.5.1 for the explanation of effect size and semi-partial r)

Thus, emotional intelligence (measured through performance-based test), was observed to be a stable, significant predictor of perceived interpersonal relations with peers. It is apparent that emotional intelligence is useful to facilitate thinking by directing attention to important information about the environment or other people (Brackett, et al., 2011; Mayer & Salovey, 1997). The pioneers of emotional intelligence assert that certain moods may create mind-sets that are better suited for certain tasks (Mayer & Salovey, 1997), and thus emotionally intelligent people can utilise pleasant feelings more effectively, and in this case to facilitate their interpersonal communications in socialising with peers. Therefore, the role of emotional intelligence in facilitating a satisfying and trusting relationship with peers is vital.

The present findings were consistent with the previous study conducted by Rossen and Kranzler (2009) on the relationship between emotional intelligence and social competence. Rossen and Krazler (2009) found that emotional intelligence (measured through the MSCEIT) demonstrated a significant, yet small incremental validity over the cognitive intelligence and personality, in explaining social competence. In line with the intelligence principles outlined by the American Psychological Association Public Affairs Office (1996) that intelligence measures are judged according to their ability to predict theoretically related behavioural outcomes, the present study revealed that emotional intelligence

(performance-based measure) was associated with the ability to establish functional relationships. In conclusion, the notion that emotional intelligence is an important variable for understanding social adaptation was supported (Lopes et al., 2003).

10.5.3 Summary of the discussion

The findings obtained from Hypothesis 6 and 7 indicated that emotional intelligence plays a crucial role in facilitating leadership effectiveness and satisfying interpersonal relationship with peers. The pioneers of emotional intelligence assert that the emotionally intelligent people are able to utilise pleasant feelings most effectively to facilitate productive performances and human daily activities (Mayer & Salovey, 1997). In leadership, this ability enables the leaders to use their emotions to facilitate thinking, process information, and make wise decisions in improving both personal and team performance. Meanwhile, in interpersonal relationships, emotional intelligence is very useful to facilitate the interpersonal communications in socialising with peers. Thus, it can be concluded that emotional intelligence may prove to be of utmost importance for leaders as well as individuals to adapt a better life. Nonetheless, this incremental validity chapter is limited to adaptive behaviour outcomes only, and may not be suitable to generalise these results to other maladaptive behaviour outcomes such as stress, substance abuse and burnout.

10.6 Chapter summary and conclusion

This chapter has reported the result on the link between emotional intelligence and its related outcomes. More specifically, it has presented the results on the incremental validity of emotional intelligence (performance-based measure) in predicting 2 important outcomes; leadership practices (sixth research question) and positive interpersonal relationships with peers (seventh research question) while controlling the potential effects of personality, self-report measure of emotional intelligence and trait emotional intelligence. Results of hierarchical regression revealed that emotional intelligence added a significant incremental variance on both outcomes; leadership practices and positive interpersonal relations with peers. Having presented the results of the underlying factors of emotional intelligence (chapter 7), the meeting point between emotional intelligence and cognitive intelligence (Chapter 8), the distinctiveness of emotional intelligence and the Big Five personality traits (Chapter 9) and the link between emotional intelligence and its related outcomes (Chapter 10), the following chapter provides a general comprehensive discussion of the significant results obtained in both study 1 and 2 of the research. It also elaborates the implications of these findings on future research.

CHAPTER 11 – GENERAL DISCUSSION, IMPLICATIONS AND FUTURE RESEARCH

11.1 Chapter overview

This chapter focuses on the general discussion and implications of the findings as well as future direction of emotional intelligence research. The chapter begins by summarising the research findings (Section 11.2), which are based around the seven research questions and the conceptual framework elaborated in Chapter 3. It proceeds by discussing the implications of these findings for conceptualisation, measurement, methodology, and practical utility of the emotional intelligence construct in Sections 11.3 to 11.6. The chapter concludes by reflecting on the need to clarify the conceptualisation and develop a useful measure to gauge emotional intelligence scores. To this end, it highlights the call for future research specifically in accumulating the validity evidence of this controversial construct that would extend the work of this thesis (Section 11.7).

11.2 Summary of research findings and general discussion

As discussed earlier in Chapter 2, different operational definitions of emotional intelligence gave rise to controversy over the conceptualisation

of emotional intelligence. Researchers argue that these multifaceted construct namely (1) ability-based emotional intelligence, (2) mixed-model emotional intelligence and (3) trait emotional intelligence should be studied separately (Cherniss, 2010b; Harms & Crede, 2010b). Out of these three models, review of the literature (see Sections 2.2 to 2.4) showed preference towards ability-based emotional intelligence as its conceptual framework is clearly operationalised: the ability to carry out accurate reasoning about emotions and the ability to use emotions and emotional knowledge to enhance thought (Mayer, Salovey, et al., 2008) and it aligns itself with the framework of human cognitive intelligence (Antonakis & Dietz, 2010; Cherniss, 2010b; Jordan et al., 2010; Walter, et al., 2012). The bibliometric analysis from the Web of Knowledge research database (for publication in year 2012) also revealed that most of the emotional intelligence articles favour to the ability-based emotional intelligence model (see Section 2.4).

The findings from study 1 (the pilot study) provided preliminary evidence on the nomological network of the emotional intelligence construct. It revealed that emotional intelligence (the focal emotional intelligence that was based on the performance-based measure) fitted into a network of expected relationships with other theoretically related constructs, such as personality, self-report measure of emotional intelligence, trait emotional intelligence, and leadership practices except cognitive intelligence. It was

observed that the focal emotional intelligence positively and significantly related to these constructs, but negatively and significantly related to IQ. The results from Study 2 confirmed these interrelationships.

Study 2 reported that: 1) the construct of emotional intelligence with four underlying factors was valid and viable; (2) the focal emotional intelligence demonstrated no convergent validity with cognitive intelligence, and the findings also showed that it has no place in the intelligence taxonomy; (3) emotional intelligence demonstrated evidence of discriminant validity with personality, and (4) emotional intelligence explained a significant increment of variance to important outcomes. Each of these points is discussed in detail in the following sections.

11.2.1: Is emotional intelligence a new ability? Emotional intelligence is not a putative new ability

According to intelligence researchers, for a construct to be considered a standard intelligence construct, it must fulfil a few criteria such as: (1) it must involve a cognitive process and consist of mental abilities and, (2) the abilities must meet certain correlational criteria, such as correlating with other major factors of intelligence (Carroll, 1993; Fancher, 1985; Mayer, et al., 1999).

Emotional intelligence is operationalised by the WEIS as an intelligence construct consisting of four interrelated abilities; self-emotional appraisal (SEA), other's emotional appraisal (OEA), regulation of emotion (RE) and use of emotion to facilitate performance (UE) (Wong et al., 2004). As predicted, the present study confirmed that emotional intelligence consisted of four interrelated abilities; SEA, OEA, RE and UE. The confirmatory factor analysis results from both performance-based and self-report measures of emotional intelligence revealed that these four-factor structures were consistent across different measures, and thus congruent with the construct's theoretical underpinnings (Wong et al., 2004). Therefore, the construct of emotional intelligence with four underlying factors was considered valid, stable and viable.

However, results from the convergent validity (See Chapter 8) showed that emotional intelligence has no convergent validity with cognitive intelligence. Contrary to expectations, it indicated that emotional intelligence significantly and negatively correlated with cognitive intelligence. The negative relationship between emotional intelligence and cognitive intelligence was against the "positive manifold" nature of intelligence. As postulated by the cognitive intelligence theorist, in demonstrating the "positive manifold" of nature intelligence, all of the intelligence factors are required to be positively intercorrelated to denote the general intelligence construct (Carroll, 1993). Therefore, findings of

this study lead to an inference that emotional intelligence has no place in the intelligence taxonomy.

The negative relationship between emotional intelligence and cognitive intelligence suggests a problem (lack of construct validity) with at least one of the measures and the possibility of measuring the constructs using improper measures (Carmines & Zeller, 1979; Cote, 2010; Cronbach & Meehl, 1955). An examination of the construct validity (viability of the factor structures) for both measures indicated that the construct of cognitive intelligence was viable and demonstrated satisfactorily good evidence on its construct validity. Conversely, the results obtained from the construct validity of emotional intelligence indicated that the construct of emotional intelligence showed insufficient evidence on its construct validity and failed to represent a domain of general intelligence because the relationship between emotional intelligence and g was in the opposite direction. In summary, the construct of emotional intelligence (as measured by the WEIS) cannot be regarded as a putative new ability because it does not meet the positive correlational criteria, especially when correlating with other major domains of intelligence (Carroll, 1993; Fancher, 1985; Mayer, et al., 1999).

11.2.2: Is emotional intelligence a renowned personality? Emotional intelligence is distinct from personality traits

The construct overlap issues surrounding emotional intelligence and personality traits raised an issue that emotional intelligence theorists are simply reinventing the wheel by relabeling the established construct of personality as emotional intelligence (Cherniss, 2010b; Harms & Crede, 2010b; Joseph & Newman, 2010a). This is one of the remaining issues in emotional intelligence research and the strength of the relationship between emotional intelligence and the older, more established psychological construct such as personality speaks to the conceptualisation of emotional intelligence as a domain of intelligence. Psychometricians agreed that for a new construct to be considered a valid, useful and scientifically legitimate construct, it should not be highly correlated with other established constructs although they might be theoretically related (Cohen & Swerdlick, 2005; Kaplan & Saccuzzo, 2009; Nunnally, & Bernstein 1994).

The results obtained from this study revealed that emotional intelligence was distinct from personality traits, as it showed a small yet significant degree of association with personality traits. The degree of the relationship between the focal emotional intelligence and the Big Five personality traits (openness, conscientiousness, extraversion, agreeableness and neuroticism) were ranged from .022 to .136. Likewise, the degree of the

relationship between emotional intelligence facets (SEA, OEA, RE and UE) and personality factors were also small (r was ranging from .001 to .181). These findings rejected the notion that this newly minted construct (emotional intelligence) is a relabeling of renowned personality traits. Therefore, it can be inferred that ability-based emotional intelligence is theoretically significantly related to personality, but it remains unique and distinct from the established construct of personality.

A review of the literature revealed that the claims on the construct overlap between emotional intelligence and personality were made based on the mixed-model emotional intelligence measures (such as Bar-on EQ-i scale). For instance, one study found that the degree of the relationship between emotional intelligence (Bar-On EQ-i) and the Big Five personality factors ranged from .75 to .79 (Grubb & McDaniel, 2007). Because the content of the mixed-model emotional intelligence construct covers various traits such as empathy, assertiveness, and optimism (Bar-On, 2004; Goleman, 1998b), the high overlap between this construct and personality should not be surprising. Nevertheless, the present study indicated that the construct of emotional intelligence that is grounded on the ability-based emotional intelligence model is uniquely distinct from the personality construct and thus, it might be a potential psychological construct requiring further study.

11.2.3: Emotional intelligence explains a significant incremental variance in predicting the outcomes

Another controversial issue of emotional intelligence involves the purported link between emotional intelligence and important socio-emotional functioning outcomes. This controversy raises the question if we really need emotional intelligence for better personal, social, academic and workplace success (Antonakis, et al., 2009). To respond to this controversy, it is first important to look at the variance explained by emotional intelligence when correlated with other criterion variables, and further to test whether emotional intelligence remains predictive when the established predictors such as cognitive intelligence and personality are controlled. Furthermore, as elucidated by the AERA et al., (1999), for a construct to be considered useful and legitimate, it must have a validity increment to the purported outcome variables when the effect of other established predictors are controlled for.

The research findings indicated that after controlling for personality, self-report measure of emotional intelligence and trait emotional intelligence, the focal emotional intelligence which is measured by the performance-based test added a significant (albeit small) incremental variance on leadership practices and positive interpersonal relationships. Taken as a whole, the results of this study suggest that emotional intelligence

represents an important construct in predicting a statistically significant amount of unique variance in a range of outcomes related to social/emotional functioning beyond that accounted for in the personality, self-report measure of emotional intelligence and trait emotional intelligence. These incremental validity evidence suggest that emotional intelligence may have some novel contents over the other established predictors in explaining the outcomes.

Across the four facets of emotional intelligence, only the 'use of emotion to facilitate performance' facet is significantly linked to leadership practices. This finding suggests that the 'use of emotional ability' is a key determinant for effective leadership practices. Based on the obtained results, the possibility that training in the use of emotion ability to facilitate thinking and performance might help people to interact with others and lead the followers effectively. In conclusion, the obtained incremental validity results showed promise of explaining how attending to emotions can help individuals in enhancing socio-emotional functioning in everyday life.

11.2.4: Conclusion: The construct of emotional intelligence requires more validity evidence

As elucidated in the present findings, the validity evidence of the emotional intelligence construct has not been fulfilled and it seems that the

impetus to establish the “EQ” factor as important as the IQ factor needs more work in refining the construct and establishing validity evidence. The goal to establish emotional intelligence as a major factor of intelligence has yet to be attained, as the present result indicated that the purported construct failed to measure intelligence thereby revealing that the emotional intelligence construct does not contain ability components. Nonetheless, this newly established construct has proved its worth as a unique construct as it is found to be distinct from personality factors and adds a significant unique additional variance in predicting outcomes. Taken together, the data presented in this research call for further refinement of the emotional intelligence construct and improvement of the measurements.

11.3 Conceptual implications

As described earlier in Chapter 2, the ability-based emotional intelligence model proposed by the pioneers of emotional intelligence (Salovey & Mayer, 1990) serves as a general conceptual framework for the present work. Review of the literature (see Chapters 2 and 3) suggest that the construct of emotional intelligence is best operationalized as a set of mental abilities involving emotion-based problem solving measured through performance assessment tools. Preferring ability model makes it possible to both develop valid performance-based test and examine the

extent to which the construct explains unique variance to a person's everyday behavior. This ability-based emotional intelligence model (together with the reviews in Chapters 2 and 3) provides a broad overview of the potential criterion and non-criterion relationships between emotional intelligence and its theoretically-related constructs (cognitive intelligence and personality traits) and related outcomes (leadership practices and interpersonal relationships); suggests what variables ought to be investigated in gaining validity evidence of emotional intelligence construct; and helps to form the basis on which the research questions were developed.

The present findings indicated that emotional intelligence is a multidimensional construct consisting of four related dimensions: self-emotional appraisal, others' emotional appraisal, regulation of emotion and use of emotion. These interrelated abilities are presumed to involve cognitive processes and thus, resemble cognitive intelligence. A potential concern about this concept, however, is that although it provides an empirical support for the viability of these four-dimensional structures, its empirical findings fail to support its convergent validity with cognitive intelligence. Cote (2010) in his commentary asserts that failing to take 'intelligence' in emotional intelligence seriously explains the possibility of the problems with the lack of convergent validity among purported measures. Because the concept of cognitive ability is rarely called into

question and the validation of the cognitive intelligence construct has been examined for more than 100 years (Cherniss, 2010b), and the measurement showed a good fit of the measurement model of cognitive intelligence (see the results presented in Chapter 8), it is suggested that the measure of emotional intelligence is the source of problem for the lack of convergent validity between emotional intelligence and cognitive intelligence.

Similarly, the current results also revealed that the performance-based and self-report measures of ability-based emotional intelligence do not correlate with each other. The lack of convergent validity between these purported measures of emotional intelligence suggests a problem with at least one of these measures rather than with the concept of emotional intelligence (Carmines & Zeller, 1979; Cote, 2010; Cronbach & Meehl, 1955). Recent researches suggested that the convergent validity between self-report and performance-based measures of emotional intelligence might be poor because the items in self-report measure tap into self-perceptions rather than into actual performances or abilities (Cote, 2010; Van Rooy et al., 2010) (See the discussion presented in Section 7.5.2). As stated earlier in Chapter 2, the concept of ability-based emotional intelligence is clearly defined and operationalized as the ability to be involved in sophisticated information processing about one's own emotions and those of others along with the ability to use this information

to enhance thinking and behaviour (Mayer, Roberts, et al., 2008; Mayer, Salovey, et al., 2008). Hence, the lack of convergent validity between purported emotional intelligence measures should motivate researchers to develop better measures of emotional intelligence rather than question the validity of the construct.

The findings that emotional intelligence is distinct from personality traits provides support for Salovey and Mayer's (1990) conceptual assertion that emotional intelligence does not overlap with the existing construct, i.e. personality as claimed by the opponents of emotional intelligence. Therefore, this research demonstrates the empirical utility and meaningfulness of the ability-based emotional intelligence construct in explaining its influence on its related outcomes. Emotional intelligence researchers also emphasize the need for more research examining the incremental validity of emotional intelligence over the cognitive intelligence and personality in predicting particular outcomes (Harms & Crede, 2010a, 2010b; Mayer, Salovey, et al., 2008; Zeidner, et al., 2008). The present study addressed this need and revealed that emotional intelligence demonstrated evidence of incremental validity in predicting outcomes; leadership and positive interpersonal relationships.

In summary, at the level it is pitched, the validity of emotional intelligence construct tested in this thesis showed that the emotional intelligence

construct has a potential to be a significant psychological construct due to its distinctiveness from personality traits and usefulness in explaining outcome variables. Although research on emotional intelligence is in its incipient stages, a lesson can be learned thus far is promising: emotional intelligence contributes to important life outcomes and it gives the idea that this ability can be learned (Brackett et al. 2011). Over the next few decades, the field will be moving forward if the researchers and practitioners continue to revise emotional intelligence theory, improve assessments, conduct sufficient validation studies, and create professional development programmes.

11.4 Measurement implications

At a measurement level, a few implications arise from the research findings. First, the reviews of conceptualisation and measurements in Chapters 2 and 3 highlight the different operational definitions available to conceptualise the construct of emotional intelligence, and it reveals that these different conceptualisations tend to give rise to different types of measurement. For example, the proponents of ability-based emotional intelligence emphasise the meaningfulness of performance-based test (for example, MSCEIT; Mayer et al. 2002), while the proponents of mixed model emotional intelligence and trait emotional intelligence focus on the usefulness of self-report and multi-rater report for the measurement of

emotional intelligence (for example, EQ-i; Bar-On, 1997 and TEIQue; Petrides, & Furnham, 2003). These measures all have advantages and disadvantages, but it is again argued that the performance-based test could be preferable as it is in line with the conceptualisation of emotional intelligence as a kind of cognitive intelligence and thus, this test is presumed to be akin to the IQ test (Mayer et al., 2003; Mayer, Roberts, et al., 2008).

Second, the present findings offer an opportunity to challenge the validity and usefulness of the validated instrument, i.e. WEIS. Supposedly, an emotional intelligence measure purports to measure the cognitive ability related to processing emotion-related information (Mayer et al. 2002), however, results suggest that this instrument does not measure abilities, as it has an inverse relationship with general intelligence, as well as with its major domains such as fluid intelligence (gf) and crystallized intelligence (gc). Therefore, it is recommended that future studies which intend to employ this instrument should reconsider their intentions given its failure to reflect an intelligence test.

The present work also suggests that future research on ability-based emotional intelligence should focus on the development of a valid and reliable performance-based emotional intelligence test that captures both gc (Davies et al., 1998; MacCann, 2010; MacCann, Pearce & Roberts,

2011; Roberts, Matthews & Zeidner, 2001) and *g* (Farely & Austin, 2007; MacCann, 2010), in order that it may be represented as an intelligence test. As discussed earlier in Section 3.3.3.2, crystallized intelligence deals with variation in what people have learned, such as the abilities to master historical facts and the meaning of words (Carroll, 1993; Cattell, 1943). Conversely, fluid intelligence refers to variation in how people adapt to new situations, such as the abilities to perform mathematical operations and inductive reasoning (Carroll, 1993; Cattell, 1943). In such a case, to measure crystallized emotional abilities, one may include knowledge on perceiving and understanding one's own emotions and those of others, while fluid emotional abilities may include the ability to identify emotions in a face or facial expression (based on a picture).

Third, recent research also highlights that there is a dearth of broad bandwidth measures of performance-based emotional intelligence (Sharma et al., 2013), and calls for a fully operationalized measurement of the ability-based emotional intelligence construct (Maul, 2012a). To date, the MSCEIT and the WEIS are the only broad-bandwidth ability-based emotional intelligence measures (performance-based measure) that cover all dimensions of the emotional intelligence construct, hence, the existence of a wider range of measures would allow the development of the ability-based emotional intelligence construct. However, similar to the WEIS, the psychometric properties and scoring methods of the MSCEIT

have also been the subject of controversy (Maul 2011, 2012a; Mayer, Salovey & Caruso, 2004; Zeidner, et al., 2008).

Two performance-based emotional intelligence tests that recently emerged were Situational Test of Emotional Understanding (STEU) and Situational Test of Emotional Management (STEM), however, emotional intelligence was narrowly constituted in these measures as they only capture 'emotional understanding' and 'emotional management' respectively (MacCann & Roberts, 2008). Ideally, future measures for emotional intelligence should consider marker tests from all four branches of emotional intelligence: self-emotional appraisal, others' emotional appraisal, regulation of emotion and use of emotion dimensions.

Finally, it is suggested that a strategy for investigating the status of emotional intelligence as an intelligence construct is to call for a well-established information-processing approach to psychometric intelligence. As an analogy, if emotional intelligence is indeed an intelligence, then, it is expected to be linked by a specific emotional information-processing ability such as encoding facial emotion (Matthews, et al., 2012). Thus, any validation studies should focus on whether emotional intelligence measures reliably differentiate between low and high-performing groups on particular criteria whereby people with high emotional intelligence

would be able to process emotional contents more efficiently than those who have low emotional intelligence.

11.5 Practical implications

From a practical point of view, several implications arise. The findings that the emotional intelligence demonstrated incremental validity in predicting leadership practices and perceived interpersonal relationships competence, highlighted in Chapter 10, may infer that training or intervention programmes aimed to enhance emotional intelligence might be meaningful as it adds incremental value to human adaptation especially to social-emotional functioning. The link between emotional intelligence and life outcomes may suggest that teaching emotional knowledge may give value to human behaviour. Within this context, it is suggested that individuals who have high scores of emotional intelligence tend to better adapt to social-emotional functioning than persons of lower emotional intelligence.

As described earlier in Section 1.5, since its emergence, training programmes aimed to producing emotionally intelligent persons have mushroomed in recent years (Clarke, 2010; Desiree, et al., 2012; Durlak, et al., 2011; Jahangard et al., 2012; Min & Peng, 2012). However, its practical utility calls into question as the trainings are grounded on

ambiguous conceptual foundation, lack of methodological rationale and employ a miscellany of strategies with ambiguous psychological bases. Based on the literature reviewed in this study, the ability-based emotional intelligence is superior than the mixed-model emotional intelligence and trait emotional intelligence as its conceptual framework is precisely defined and operationalized within the context of cognitive intelligence (Antonakis & Dietz, 2010; Brackett et al., 2011; Cherniss, 2010b; Jordan, et al., 2010). Meanwhile, it also indicated that the performance-based measure of emotional intelligence should be preferable than other methods as it is believed as being akin to the cognitive intelligence test (Mayer et al., 2003; Mayer, Roberts, et al., 2008). Therefore, it is suggested that intervention programmes in helping individuals to become more emotionally intelligent should favour the ability-based emotional intelligence and employ the performance-based measures of emotional intelligence. However, because the validity of emotional intelligence measures remains controversial, this problem needs to be recognised and acted upon by emotional intelligence researchers.

Goleman in his popular book 'Emotional intelligence' (1995a) highlighted on the possible social benefits of training emotional intelligence, by arguing that training emotional intelligence might be a remedy for all manner of social ills such as criminality, delinquency and the breakdown of community values. A recent review and meta-analysis showed that

such trainings aimed to enhance social-emotional functioning are effective in improving social and emotional skills, social behaviours, attitudes and even academic achievement (Durlak, et al., 2011). As the present study showed that emotional intelligence particularly the 'use of emotion to facilitate performance' dimension significantly contributes to the leadership practices and interpersonal relationships competence with peers (See Chapter 10), training programme aimed to convey this emotional knowledge and further enhance the ability to harness emotion to facilitate cognitive activities (i.e. reasoning, decision making, interpersonal communication etc.) might be given priority over other emotion-related abilities such as understanding or regulation of emotion.

Another practical implication highlights the applicability of the WEIS in the Malaysian context as it is one of the objectives of the present study. As the findings of the study showed that emotional intelligence demonstrated no convergent validity with the cognitive intelligence (See Chapter 8), the intention to adopt this measure to the Malaysian population should not be continued. This study calls future research to develop a valid and reliable emotional intelligence measure which is practical to the Malaysian context. As emphasized by the AERA et al., (1999), such standards require the validation process of a measure to be ongoing, with continuing efforts to establish the usefulness of the measure for specific population and purposes.

11.6 Towards strengthening the theory and measurement of emotional intelligence: issues and suggestions for future research

Based on the findings obtained from this study, there are a few issues which warrant attention for future research direction. First, it involves the preference of emotional intelligence model. As pointed out in the literature reviewed in Chapter 2, the conceptualisation of emotional intelligence has generated lack of agreement concerning definitions and models of emotional intelligence. Based on the 3 emotional intelligence models that emerged (ability-based emotional intelligence, mixed-model emotional intelligence and trait emotional intelligence), the documented literature showed preference toward ability-based emotional intelligence and the researchers envision that if there is a future for emotional intelligence, it is grounded on ability model because it aligns itself with the existing frameworks of intelligence (Antonakis & Dietz, 2010; Brackett et al., 2011; Cherniss, 2010b; Jordan et al, 2010; Mayer, Roberts, et al., 2008; Mayer, Salovey, et al., 2008; Walter et al., 2012).

Researchers assert that the concept of emotional intelligence in the mixed model and trait model are ambiguous as they highly overlap with the established personality models to suggest something new for science (Antonakis & Dietz, 2010; Cherniss, 2010b; Joseph & Newman, 2010b;

Newman, et al., 2010; Zeidner et al., 2008). Furthermore, based on the bibliometric analysis discussed in Section 2.5, it revealed that recent publications (published in year 2012) showed a strong preference for ability model as most of the articles conceptualised emotional intelligence from the ability approach. Thus, it is proposed that future research on emotional intelligence should commit firmly to the ability-based emotional intelligence.

Second, although the present study revealed that the WEIS consisted of four viable factor structures, it remains uncertain whether the characterisation of its factor structure would hold for other different settings or contexts. In addition, similar to other researches, this research analyses the construct and factors of emotional intelligence as a unit of analysis, therefore, additional validation of the instrument is recommended by focusing on the item level analysis. Furthermore, results of the confirmatory factor analysis presented in Chapter 7 revealed that some of the items are not a good indicator to the emotional intelligence construct. Further advance analysis such as Item Response Theory (IRT) might be employed to focus on the usefulness of each item response (Maul, 2012a). Thus, by assessing the item response analysis, additional normative information regarding the instrument's psychometric properties could be derived.

Finally, it is suggested that research on emotional intelligence should focus more on the role of context that moderates the relationship between emotional intelligence and human effective functioning. In this regards, some researchers suggest that the link between emotional intelligence and its performance outcomes might be stronger in some situations than in others. Similarly, the same person will act more emotionally intelligent in certain situations over the others (Jordan et al., 2010; Newman, Joseph & MacCann, 2010). For instance, studies should focus on predicting success across jobs that require low emotional labor and high emotional labor and to identify which occupations that require high emotional intelligence and vice versa (i.e. customer service officer versus computer technician). Accordingly, the role of context is vital as certain work settings may encourage more emotionally intelligent behaviours than the others. Hence, it is desirable that prospective studies in this area consider both emotionally intelligent people as well as emotionally intelligent context.

11.7 Limitations of the study

In order to fully consider the potential implications of this study, there are several limitations that must be addressed. First, this study investigates the construct validity of a performance-based test, the Wong Emotional Intelligence Scale (WEIS), and this test developed within the framework of the ability-based emotional intelligence model. From the outset, it is

important to note that a number of conceptualisations of emotional intelligence exist (ability-based emotional intelligence, mixed-model emotional intelligence and trait emotional intelligence) (Matthews, Zeidner & Roberts, 2007). As such, it may not be appropriate to generalise the results to other measures of emotional intelligence which are not based on ability conceptualisation. In addition, the present study sample consisted of solely ethnic Malay Malaysian undergraduates. The findings of the study should be interpreted within the boundaries of the stated contexts.

Second, this study aimed to assess the internal factor structure of emotional intelligence and the use of CFA is limited to the assessment of factor structure and to examine the usefulness and meaningfulness of each item, it can be best studied through another assessment theory that is 'Item Response Theory' (IRT) (Bond & Fox, 2007; Kunnan, 1998). Further advance analysis such as Item Response Theory (IRT) might be employed to focus on the usefulness of each item response (Maul, 2012a). Hence, by conducting the item response analysis, additional normative information regarding the instrument's psychometric properties could be derived. However, because no documented literature was found on the empirical studies of the factorial validity of this performance-based emotional intelligence test (WEIS), this thesis presents an opportunity for advancing the validation of this emotional intelligence construct especially in confirming the factor structure of emotional intelligence, and further

seeks to explain the applicability of this measure in the Malaysian context. Furthermore, AERA et al., (1999), assert that a validation study on a different population would help to verify the measure's utility beyond that of the test developers' setting. Therefore, this thesis responded to the AERA et al.,'s (1999) call to accumulate evidence on the construct validity and utility of of this measure.

Third, it involves the issue of the validity of the emotional intelligence instrument used in this thesis. In the present work, only convergent, divergent, and incremental validity were assessed, and it is not yet clear whether this instrument will correlate well with other existing ability-based emotional intelligence measures, mainly the performance-based measures such as the Mayer, Salovey and Caruso Emotional Intelligence Test (MSCEIT; Mayer et al. 2002), Situational Test of Emotional Management (STEM) and Situational Test of Emotional Understanding (STEU) (MacCann & Roberts, 2008). A possible improvement that could be useful to elucidate the extent of the instrument's utility is to compare it with other ability-based emotional intelligence measures to further assess its non criterion-related validity. Another validity evidence such as content validity may also be assessed to measure the validity of item content.

Finally, this study only focuses on the link between emotional intelligence and positive outcome variables such as leadership and positive

interpersonal relationships. Research on the relationship between emotional intelligence and other negative outcomes such as stress, burnout, depression or other maladaptive behaviours might be of interest as well. Furthermore, as the emotion theorists argue that emotions serve as an important aspect of human social functioning (Ekman, 1973; Keltner & Haidt, 2001), it is expected that emotional intelligence might predict a wider range of outcomes either at home, school or workplace. This study is limited to normal human being population only and future research also can be expanded to other than normal human being population such as psychiatric patients, intellectually gifted individuals and other different groups so that such research can help psychologists to better understand the meaningfulness and usefulness of the emotional intelligence concept. Therefore, it would be motivating to further evaluate the full potential of emotional intelligence in forecasting its various outcomes by testing it using a different study population and a wider variety of research settings.

11.8 Chapter summary and conclusions

This thesis has gathered empirical validity evidence of the construct of emotional intelligence and further highlighted on the needs to accumulate more validity evidence of emotional intelligence measures. In doing so, the thesis contributed to the existing body of emotional intelligence research by demonstrating that the relationship between emotional intelligence and

cognitive intelligence measures was fragile, despite its ability to explain various outcome variables. Furthermore, this thesis also has responded to a call in investigating the fit of emotional intelligence into a comprehensive taxonomy of human mental abilities. While a majority of researches investigated the predictive validity of emotional intelligence and its related outcome per se, this thesis has presented the incremental validity of the performance-based emotional intelligence measure over the self-report measure of emotional intelligence, personality and trait emotional intelligence. In this regard, the current work has presented evidence to challenge the psychometric properties, usefulness and practicality of the current emotional intelligence measures.

Additionally, this thesis contributed to the emotional intelligence studies and aided to bridge the gaps between the emotional intelligence, cognitive intelligence, personality and applied psychology literature. The conceptual framework proposed in this thesis which was centered on ability-based emotional intelligence model was selected based on a thorough review of the literature and bibliometric analysis. Continuing this tradition, future research in emotional intelligence must commit firmly to the ability-based emotional intelligence and attempt to consolidate the performance-based emotional intelligence measures to move forward toward useful and practical development of this relatively new field. It is intended that this thesis will provide useful information for an in-depth understanding of the

relationship between emotional intelligence and its theoretically-related construct as well as its link with the human performance and functioning. Therefore, it is expected that the present study will lay a solid groundwork in advancing this emotional intelligence field.

REFERENCES

- Abbott, R. A., Ploubidis, G. B., Huppert, F. A, Kuh, D., & Croudace, T. J. (2010). An evaluation of the precision of measurement of Ryff's psychological well-being scales in a population sample. *Social Indicators Research, 97*(3), 357–373.
doi:10.1007/s11205-009-9506-x
- Abd. Majid Mohd Isa, & Othman Mohamed. (1995). Appraising intellectual giftedness using the Malay version of WISC-R. *Pertanika Journal Social Sciences and Humanities, 3*(2), 119–124.
- Ahadi, S., & Deiner, E. (1989). Multiple determinants and effect size. *Journal of Personality and Social Psychology, 56*(3), 398–406.
- Akhtar, R., Boustani, L., Tsvirikos, D., & Chamorro-Premuzic, T. (2015). The engageable personality: Personality and trait EI as predictors of work engagement. *Personality and Individual Differences, 73*, 44–49. doi:10.1016/j.paid.2014.08.040
- American Educational Research Association (AERA), American Psychological Association (APA) & National Council on Measurement in Education (NCME). (1999). *Standards for educational and psychological testing*. Washington: AERA Publications Sales.
- American Psychological Association Public Affairs Office. (1996).

- Intelligence: Knowns and unknowns. *American Psychologist*, 51(2), 77–101.
- Anastasi, A. & Urbina, S. (1997). *Psychological Testing*. (7th ed.). New Jersey: Prentice Hall.
- Andrei, F., & Petrides, K. V. (2013). Trait emotional intelligence and somatic complaints with reference to positive and negative mood. *Psihologija*, 46(1), 5–15.
- Antonakis, J., & Dietz, J. (2010). Emotional intelligence: On definitions, neuroscience, and marshmallows. *Industrial and Organizational Psychology*, 3(2), 165–170.
- Antonakis, J., Ashkanasy, N.M., & Dasborough, M.T. (2009). Does leadership need emotional intelligence? *The Leadership Quarterly*, 20(2), 247–261.
- Ashkanasy, N. M., & Dasborough, M. T. (2003). Emotional awareness and emotional intelligence in leadership teaching. *Journal of Education for Business*, 79(1), 18–22.
- Ashkanasy, N.M. & Tse, B. (2000). Transformational leadership as management of emotion: a conceptual review, in Ashkanasy, N., Hartel, C.E.J. and Zerbe, W.J. (Eds), *Emotions in the Workplace: Research, Theory, and Practice*, Quorum Books, Westport, CT, 221-35.
- Aslan, S., & Erkus, A. (2008). Measurement of emotional intelligence: Validity and reliability studies of two scales. *World Applied*

Sciences Journal, 4(3), 430-438.

Augusto-Landa, J.M., Pulido-Martos, M. & Lopez-Zafra, E. (2011) Does perceived emotional intelligence and optimism/pessimism predict psychological well-being?. *Journal of Happiness Study*, 12(3), 463-474.

Austin, E. J., Saklofske, D. H., & Egan, V. (2005). Personality, well-being and health correlates of trait emotional intelligence. *Personality and Individual Differences*, 38(3), 547–558.

doi:10.1016/j.paid.2004.05.009

Awang, Z. (2013). *Structural equation modelling using Amos graphic*. Shah Alam: UiTM Press.

Bande, B., Fernández-ferrín, P., Varela, J. A., & Jaramillo, F. (2015).

Emotions and salesperson propensity to leave : The effects of emotional intelligence and resilience. *Industrial Marketing*

Management, 44, 142–153. doi:10.1016/j.indmarman.2014.10.011

Bar-On, R. (1997). *Bar-On emotional quotient inventory: Technical manual*. Toronto: Multi-Health Systems.

Bar-On, R. (2004). The Bar-On emotional quotient inventory (EQ-1):

Rationale, description and summary of psychometric properties.

In G. Geher (Ed.), *Measuring emotional intelligence: Common ground and controversy* (pp. 111-142). Hauppauge, NY: Nova

Science Publishers.

Bar-On, R. (2006). The Bar-On model of emotional-social intelligence

(ESI). *Psicothema*, 18, supl., 13-25. Model overview retrieved from the *Consortium for Research on Emotional Intelligence in Organizations* website.

<http://www.eiconsortium.org/measures/eqi.html>

- Barrick, M. R., & Mount, M. K. (1991). The Big Five personality dimensions and job performance: A meta-analysis. *Personnel Psychology*, 44(1), 1-26.
- Bass, B. M. (1990). *Bass and Stogdill's handbook of leadership* (3rd ed.). New York: Free Press.
- Bass, B. M. (1997). Personal selling and transactional/transformational leadership. *Journal of Personal Selling and Sales Management*, 17(3), 19-28.
- Bass, B.M., & Avolio, B. (2004). *Multifactor leadership questionnaire 3rd edition: Manual and sample set*. Redwood City: Mind Garden.
- Batista-Foguet, J. M., Boyatzis, R. E., Guillén Ramo, L. & Serlavós, R. (2008). Assessing emotional intelligence competencies in two global context. In Emmerling, R.J., Shanwal, V. K. & Mandal, M.K. (Eds.), *Emotional intelligence: Theoretical and cultural perspectives* (pp. 89-114). New York: Nova Science Publishers.
- Bellis, De Nicola (2009). *Bibliometrics and citation analysis: From the science citation index to cybermetrics*. USA: Scarecrow Press.
- Bell-Roundtree, C.V. & Westbrook, J. (2001). Manager behavior: Positive influence outcomes of global job satisfaction and

- organizational commitment attitudes. *American Society for Engineering Management National Conference*, Huntsville, AL, October 11-13, 319-24.
- Benet-Martinez, V., & John, O. P. (1998). Los Cinco Grandes across cultures and ethnic groups: Multitrait multimethod analyses of the Big Five in Spanish and English. *Journal of Personality and Social Psychology*, 75(3), 729-750.
- Bentler, P. M. (1990). Comparative fit indexes in structural models. *Psychological Bulletin*, 107(2), 238-246.
- Bentler, P. M., & Bonett, D. G. (1980). Significance tests and goodness of fit in the analysis of covariance structures. *Psychological Bulletin*, 88(3), 588-606.
- Black, T. R. (1999). *Doing quantitative in the social sciences*. London: Sage.
- Boal, K.B., & Hooijberg, R. (2000). Strategic leadership research: moving on. *The Leadership Quarterly Yearly Review of Leadership*, 11(4), 515-50.
- Bond, T.G., & Fox, M.F. (2007). *Applying the Rasch model. Fundamental measurement in the human sciences*. (2nd ed.). USA: Routledge.
- Boyatzis, R. E., Goleman, D., & Hay/McBer. (1999). *Emotional competence inventory*. Boston: HayGroup.
- Boyatzis, R., Goleman, D., & Rhee, K. (2000). Clustering competence in

emotional intelligence: Insights from the emotional competence inventory (ECI). In R. Bar-On & J. D. A. Parker (Eds.): *Handbook of emotional intelligence* (pp. 343-362). San Francisco: Jossey-Bass.

Brackett, M. A. (2010). Emotion-regulation ability, burnout, and job satisfaction among British secondary-school teachers.

Psychology in the School, 47(4), 406–417. doi:10.1002/pits

Brackett, M. A., Rivers, S. E., Shiffman, S., Lerner, N., & Salovey, P.

(2006). Relating emotional abilities to social functioning: A comparison of self-report and performance measures of emotional intelligence. *Journal of Personality and Social Psychology*, 91(4), 780–795. doi:10.1037/0022-3514.91.4.780

Psychology, 91(4), 780–795. doi:10.1037/0022-3514.91.4.780

Brackett, M. A., Rivers, S. E., & Salovey, P. (2011). Emotional intelligence : Implications for personal, social, academic , and workplace success. *Social and Personality Psychology Compass*, 5(1), 88–103.

Bratton, V. K., Dodd, N. G., & Brown, F. W. (2011). The impact of emotional intelligence on accuracy of self-awareness and leadership performance. *Leadership & Organization Development Journal*, 32(2), 127–149. doi:10.1108/01437731111112971

Journal, 32(2), 127–149. doi:10.1108/01437731111112971

Bridgman, P. W. (1927). *The logic of modern physics*. New York: Macmillan.

Brim, O., Ryff, C. D., & Kessler, R. C. (2004). *How healthy are*

we?. Chicago: The University of Chicago Press.

- Brodsky, B. (1988). *Development of a modified version of the leadership practices inventory for use with college students*. (Unpublished master's thesis). San Jose State University, San Jose, CA.
- Brown, T. A. (2006). *Confirmatory factor analysis for applied research*. New York: The Guilford Press.
- Brown, F.W., & Moshavi, D. (2005). Transformational leadership and emotional intelligence: A potential pathway for an increased understanding of interpersonal influence. *Journal of Organizational Behavior*, 26(7), 867-871.
- Byrne, B.M. (2006). *Structural equation modeling with EQS* (2nd ed.). New Jersey: Lawrence Erlbaum Associates.
- Byrne, B. M. (2010). *Structural equation modeling with Amos* (2nd ed.). New York: Routledge.
- Cage, T., & Daus, C. S. (2006). *An examination of emotional intelligence and retail performance*. Presentation at the 21st Annual Conference of the Society for Industrial and Organizational Psychology. Dallas, TX, May.
- Cage, T., Daus, C. S., & Saul, K. (2004). *An examination of emotional skill, job satisfaction, and retail performance*. Paper submitted to the 19th Annual Society for Industrial/Organizational Psychology, as part of the symposium.

- Carless, S.A., Wearing, A.J., & Mann, L. (1994). *Transformational leadership: does it make a difference?* Paper presented at the 3rd Western Academy of Management International Conference, Brisbane, July 11-13.
- Carmeli, A., & Josman, Z. E. (2006). The relationship among emotional intelligence, task performance, and organizational citizenship behaviours. *Human Performance, 19*(4), 403-419.
- Carmeli, A., Yitzhak-Halevy, M., & Weisberg, J. (2009). The relationship between emotional intelligence and psychological wellbeing. *Journal of Managerial Psychology, 24*(1), 66–78.
doi:10.1108/02683940910922546
- Carroll, J. B. (1993). *Human cognitive abilities: A survey of factor analytic studies*. New York: Cambridge University Press.
- Carroll, J. B. (1997). The three-stratum theory of cognitive abilities. In D. P. Flanagan, J. L. Genshaft, & P. L. Harrison (Eds.), *Contemporary intellectual assessment: Theories, tests and issues* (pp. 122–130). New York: Guilford Press.
- Carroll, J. B. (2003). The higher stratum structure of cognitive abilities: Current evidence supports g and about ten broad factors. In H. Nyborg (Ed.). *The scientific study of general intelligence: Tribute to Arthur R. Jensen*. New York: Pergamon.
- Cattell, R. B. (1943). The measurement of adult intelligence. *Psychological Bulletin, 40*(3), 153-193.

- Cattell, R. B. (1963). Theory of fluid and crystallized intelligence: A critical experiment. *Journal of Educational Psychology*, 54(1), 1–22.
- Cattell, R. B. (1971). *Abilities: Their structure, growth, and measurement*. Boston: Houghton Mifflin.
- Cattell, R. B. (1987). *Intelligence: Its structure, growth and action*. Amsterdam: North-Holland.
- Cavazotte, F., Moreno, V., & Hickmann, M. (2012). Effects of leader intelligence, personality and emotional intelligence on transformational leadership and managerial performance. *The Leadership Quarterly*, 23(3), 443–455.
doi:10.1016/j.leaqua.2011.10.003
- Çekmecelioğlu, H. G., Günsel, A., & Ulutaş, T. (2012). Effects of emotional intelligence on job satisfaction: an empirical study on call center employees. *Procedia - Social and Behavioral Sciences*, 58, 363–369. doi:10.1016/j.sbspro.2012.09.1012
- Cherniss, C. (2010a). Emotional intelligence: New insights and further clarifications. *Industrial and Organizational Psychology*, 3(2), 183–191.
- Cherniss, C. (2010b). Emotional intelligence: Toward clarification of a concept. *Industrial and Organizational Psychology*, 3(2), 110–126.
- Cherniss, C., Extein, M., Goleman, D., & Weissberg, R. P. (2006). Emotional intelligence: What does the research really indicate? *Educational Psychologist*, 41(4), 239-245.

- Ciarrochi, J. V., Chan, A. Y. C., & Caputi, P. (2000). A critical evaluation of the emotional intelligence construct. *Personality and Individual Differences, 28*(3): 539–561.
- Clarke, N. (2010). The impact of a training programme designed to target the emotional intelligence abilities of project managers. *International Journal of Project Management, 28*(5), 461–468.
doi:10.1016/j.ijproman.2009.08.004
- Clarke, P. J., Marshall, V. W., Ryff, C. D., & Wheaton, B. (2001). Measuring psychological well-being in the Canadian Study of Health and Aging. *International Psychogeriatrics, 13*(1), 79–90.
- Cohen, J. W. (2009). *Statistical power analysis for the behavioural sciences*. (2nd ed.). Hillsdale, New Jersey: Lawrence Erlbaum Associates.
- Cohen, A., & Abedallah, M. (2015). The mediating role of burnout on the relationship of emotional intelligence and self-efficacy with OCB and performance. *Management Research Review, 38*(1), 2–28.
doi:10.1108/MRR-10-2013-0238
- Cohen, L., Manion, L., & Morrison, K. (2007). *Research methods in education* (6th ed.). New York: Routledge.
- Cohen, R. J., & Swerdik, M. E. (2005). *Psychological testing and assessment: An introduction to tests and measurement* (6th ed.). New York: Mc Graw Hill.

- Conte, J. M., & Dean, M. A. (2006). Can emotional intelligence be measured? In K. R. Murphy (Ed.), *A critique of emotional intelligence* (pp. 59–80). Mahwah, NJ: Erlbaum.
- Coolican, H. (2004). *Research methods and statistics in psychology* (4th ed.) London: Hodder & Stoughton.
- Cooper, A., & Petrides, K. V. (2010). A psychometric analysis of the Trait Emotional Intelligence Questionnaire-Short Form (TEIQue-SF) using item response theory. *Journal of personality assessment*, 92(5), 449–57. doi:10.1080/00223891.2010.497426
- Costa, A., & Faria, L. (2015). The impact of emotional intelligence on academic achievement : A longitudinal study in Portuguese secondary school. *Learning and Individual Differences*, 37, 38–47. doi:10.1016/j.lindif.2014.11.011
- Costa, S., Petrides, K. V., & Tillman, T. (2014). Trait emotional intelligence and inflammatory diseases. *Psychology, Health and Medicine*, 19(2), 180–189.
- Cote, S., Lopes, P. N., Salovey, P., & Miners, C. T. H. (2010). Emotional intelligence and leadership emergence in small groups. *Leadership Quarterly*, 21(3), 496–508. doi:10.1016/j.leaqua.2010.03.012
- Co-curricular Activity Centre, Student Development Division, International Islamic University Malaysia. (2008). *The Credited Co-curricular Activity Manual*. Kuala Lumpur, KL: IIUM Press

- Cronbach, L. J., & Meehl, P. E. (1955). Construct validity in psychological tests. *Psychological Bulletin*, 52(4), 281–302.
- Curci, A., Lanciano, T., Soleti, E., & Zammuner, V. L. (2014). Construct Validity of the Italian Version of the Mayer – Salovey – Caruso Emotional Intelligence Test Construct Validity of the Italian Version of the Mayer – Salovey – Caruso Emotional, (April), 37–41. doi:10.1080/00223891.2013.778272
- Dasborough, M. T. (2006). Cognitive asymmetry in employee emotional reactions to leadership behaviors. *The Leadership Quarterly*, 17(2), 163–178.
- Daus, C. S., & Ashkanasy, N. M. (2003). Will the real emotional intelligence please stand up? On deconstructing the emotional intelligence “debate. *The Industrial–Organizational Psychologist*, 41(2), 69–72.
- Davies, M., Stankov, L., & Roberts, R. D. (1998). Emotional intelligence: In search of an elusive construct. *Journal of Personality and Social Psychology*, 75(4), 989–1015.
- Dawson, S., Kettler, L., Burton, C., & Galletly, C. (2012). Do people with schizophrenia lack emotional intelligence? *Schizophrenia Research And Treatment*, doi:10.1155/2012/495174
- Desiree, R.A., Jose, S.M., Rosario, C., Raquel, P. & Pablo, B.F. (2012). Can an emotional intelligence program improve adolescents' psychosocial adjustment? Results from the intemo project. *Social*

Behavior and Personality: An International Journal, 4(8), 1373-1379.

Dewaele, J., & Furnham, A. (2008). Effects of trait emotional intelligence and sociobiographical variables on communicative anxiety and foreign language anxiety among adult multilinguals : A review and empirical. *Language Learning*, 58(4), 911–960.

Di Fabio, a., & Kenny, M. E. (2015). The contributions of emotional intelligence and social support for adaptive career progress among Italian youth. *Journal of Career Development*, 42(1), 48–59.
doi:10.1177/0894845314533420

Dulewicz, S. V., & Higgs, M. J. (2001). *El general and general 360 user guide*. Windsor: NFER-Nelson.

Dunning, D., Johnson, K., Ehrlinger, J., & Kruger, J. (2003). Why people fail to recognize their own incompetence. *Current Directions in Psychological Science*, 12(3), 83–87.

Durlak, J. A., Weissberg, R. P., Dymnicki, A. B., Taylor, R. D., & Schellinger, K. B. (2011). The impact of enhancing students' social and emotional learning: A meta-analysis of school-based universal interventions. *Child Development*, 82(1), 405–432.

Elfenbein, H. A. (2008). Emotion in organizations: A review and theoretical integration. In J. P. Walsh & A. P. Brief (Eds.), *Academy of Management Annals* (Vol. 1, pp. 315–386). New

York, NY: Erlbaum.

Elias, M. J., & Weissberg, R. (2000). Primary prevention: Educational approaches to enhance social and emotional learning. *Journal of School Health, 70*(5), 186–190.

Fah, L. Y. & Hoon, K.C. (2009). *Introduction to statistical analysis in social sciences research*. Malaysia: Venton Publishing.

Fancher, R. E. (1985). *The intelligence men: Makers of the IQ controversy*. New York, NY: Norton.

Farrelly, D., & Austin, E. J. (2007). Ability EI as an intelligence? Associations of the MSCEIT with performance on emotion processing and social tasks and with cognitive ability. *Cognition and Emotion, 21*(5), 1043–1063.

Feist, J., & Feist, G. J. (2009). *Theories of personality* (7th ed.). California: McGraw-Hill.

Ferrara, L.R. (2008). *Relationship of work experience to clinical and leadership competence of advanced practice nursing students*. (Unpublished doctoral dissertation). University of Phoenix, Phoenix, AZ.

Field, A. (2009). *Discovering statistics using SPSS* (3rd ed.). London: Sage Publications.

Fiori, M., & Antonakis, J. (2011). The ability model of emotional intelligence: Searching for valid measures. *Personality and Individual Differences, 50*(3), 329–334.

doi:10.1016/j.paid.2010.10.010

Fiori, M., & Antonakis, J. (2012). Selective attention to emotional stimuli:

What IQ and openness do, and emotional intelligence does not.

Intelligence, 40(3), 245–254. doi:10.1016/j.intell.2012.02.004

Fisher, C. D., & Ashkanasy, N. M. (2000). The emerging role of emotions

in work life: An introduction. *Journal of Organizational Behavior*,

21(1), 123–129.

Flanagan, D. P., & McGrew, K. S. (1995). The field of intellectual

assessment: A current perspective. *The School Psychologist*,

49(1), 14.

Flanagan, D. P., & McGrew, K. S. (1997). A cross-battery approach to

assessing and interpreting cognitive abilities: Narrowing the gap

between practice and cognitive science. In D. P., Flanagan, J. L.,

Genshaft, & P. L., Harrison (Eds.), *Contemporary intellectual*

assessment: Theories, tests and issues (pp. 314–325). New York:

Guilford Press.

Flanagan, D. P., & McGrew, K. S. (1998). Interpreting intelligence tests

from contemporary Gf-Gc theory: Joint confirmatory factor

analysis of the WJ-R and KAIT in a non-white sample. *Journal of*

School Psychology, 36(2), 151–182.

Flanagan, D. P., McGrew, K. S., & Ortiz, S. O. (2000). The Wechsler

Intelligence Scales and Gf-Gc theory. A contemporary approach

to interpretation. Boston. Allyn & Bacon.

- Foo, M. D., Elfenbein, H. A., Tan, H. H., & Aik, V. C. (2004). Emotional intelligence and negotiation: The tension between creating and claiming value. *The International Journal of Conflict Management*, 15(4), 411–429.
- Fox, S., & Spector, P. E. (2000). Relations of emotional intelligence, practical intelligence, general intelligence, and trait affectivity with interview outcomes: It's not all just 'G'. *Journal of Organizational Behavior*, 21(2), 203–220.
- Francisco, M.J. (2000). *Transformational leader behaviors: Its impact on follower satisfaction, trust, commitment, and organizational citizenship behaviors*. (Unpublished Master's thesis). Ateneo de Manila University, Manila.
- Fukuda, E., Saklofske, D.H., Tamaoka, K., & Lim, H. (2012). Factor structure of the Korean version of Wong and Law emotional intelligence scale. *Assessment*, 19(1), 3-7.
- Gardner, H. (1983). *Frames of mind: The theory of multiple intelligences*. New York: Basic Books.
- Gardner, L., & Stough, C. (2002). Examining the relationship between leadership and emotional intelligence in senior level managers. *Leadership and Organization Development Journal*, 23(2), 68-78.
- George, J. M. (2000). Emotions and leadership: The role of emotional intelligence. *Human Relations*, 53(8), 1027–1055.
- Gibbs, N. (1995). What's your EQ. *Time*, 60–68.

- Gignac, G. E. (2005). Evaluating the MSCEIT V2.0 via CFA: Comment on Mayer et al. (2003). *Emotion, 5*(2), 233–235.
- Gignac, G. E. (2008). *Genos Emotional Intelligence Inventory: Technical Manual*. Sydney, NSW. Genos Press.
- Gignac, G. E. (2010). On a nomenclature for emotional intelligence research. *Industrial and Organizational Psychology, 3*(2), 131–135.
- Gil-Olarte, P., Palomera Martin, R., & Brackett, M. A. (2006). Relating emotional intelligence to social competence and academic achievement in high school students. *Psicothema, 18*(1), 118–123.
- Gohm, C. L. (2004). Moving forward with emotional intelligence. *Psychological Inquiry, 15*, 222–227.
- Goldberg, L. R. (1990). An alternative "Description of personality": The Big-Five factor structure. *Journal of Personality and Social Psychology, 59*(6), 1216–1229.
- Goldberg, L. R. (1992). The development of markers for the big-five factor structure. *Psychological Assessment, 4*(1), 26–42.
- Goldberg, L. R. (1999). The International Personality Item Pool (IPIP). Retrieved from <http://ipip.ori.org/ipip/>
- Goleman, D. (1995a). *Emotional intelligence*. New York: Bantam Books.
- Goleman, D. (1995b). *Emotional intelligence: Why it can matter more than IQ?* New York: Bantam Books.

- Goleman, D. (1998). *Working with emotional intelligence*. New York: Bantam Books.
- Goleman, D. (2006). *Social intelligence*. New York: Bantam.
- Gravetter, F.J. & Wallnau, L.B. (2005). *Essentials of Statistics for The Behavioural Sciences*. USA: Thomson Learning.
- Green, S.B. & Salkind, N.J. (2005). *Using SPSS for windows & macintosh* (5th ed.). New Jersey: Pearson Prentice Hall.
- Hair Jr., J. F., Black, W. C., Babin, B. J., Anderson, R. E., & Tatham, R. L. (2006). *Multivariate data analysis* (6th Ed.). Upper Saddle River, New Jersey: Pearson-Prentice Hall.
- Han, H., & Johnson, S. D. (2012). Relationship between students' emotional intelligence, social bond, and interactions in online learning. *Educational Technology & Society*, 15 (1), 78–89.
- Harms, P. D., & Crede, M. (2010a). Emotional intelligence and transformational and transactional leadership: A meta-analysis. *Journal of Leadership & Organizational Studies*, 17(1), 5–17.
- Harms, P. D., & Crede, M. (2010b). Remaining issues in emotional intelligence research: Construct overlap, method artifacts, and lack of incremental validity. *Industrial and Organizational Psychology*, 3(2), 154-158.
- Haslam, N. & Kashima, Y. (2010). The rise and rise of social psychology in Asia: A bibliometric analysis. *Asian Journal of Social Psychology*, 3(3), 202–207.

- Hatcher, L. (1994). *A step-by-step approach to using the SAS system for factor analysis and structural equation modeling*. Cary, NC: SAS Publishing.
- Hedlund, J., & Sternberg, R. J. (2000). Too many intelligences? Integrating social, emotional, and practical intelligence. In R. Bar-On, & J. Parker (Eds). *The Handbook of Emotional Intelligence: Theory, development, assessment, and application at home, school, and in the workplace* (pp. 136-167). San Francisco, CA: Jossey-Bass Inc.
- Higgs, M. J., & Dulewicz, S. V. (1999). *Making sense of emotional intelligence*. Windsor: NFER-Nelson.
- Higgs, M., & Dulewicz, V. (2014). The International Journal of Human Antecedents of well-being : a study to examine the extent to which personality and emotional intelligence contribute to well-being. *The International Journal of Human Resource Management*, 25(5), 718–735. doi:10.1080/09585192.2013.815253
- Hilgard, H. R. (1980). The trilogy of mind: cognition, affection, and conation. *Journal of History Behavioural Science*, 16(2), 107-17.
- Hoang, D., Kaur, J. & Menczer, F. (2010). Crowdsourcing Scholarly Data, *Proceedings of the WebSci10: Extending the Frontiers of Society On-Line*. Raleigh, NC: USA
- Hofstede, G. (1991). *Cultures and organizations: Software of the mind*. London: McGraw-Hill.

- Hong, Y., Catano, V. M., & Liao, H. (2011). Leader emergence: The role of emotional intelligence and motivation to lead. *Leadership & Organization Development Journal*, 32(4), 320–343.
doi:10.1108/01437731111134625
- Horn, J. L. (1985). Remodeling old models of intelligence. In B. B. Wolman (Ed.), *Handbook of intelligence* (pp. 267–300). New York: John Wiley.
- Horn, J. L. (1988). Thinking about human abilities. In J. R. Nesselroade & B. Cattell (Eds.), *Handbook of multivariate experimental psychology* (2nd ed., pp. 645–685). New York: Plenum.
- Horn, J. L. (1991). Measurement of intellectual capabilities: A review of theory. In K. S. McGrew, J. K. Werder, & R. W. Woodcock (Eds.), *Woodcock-Johnson technical manual* (pp. 197–232). Chicago: Riverside.
- Horn, J. L., & Noll, J. (1997). Human cognition capabilities: *Gf-Gc* theory. In D. P. Flanagan, J. L. Genshaft, & P. L. Harrison (Eds.), *Contemporary intellectual assessment: Theories, tests, and issues* (pp. 53–91). New York: Guilford.
- Horn, J. L., & Stankov, L. (1982). Auditory and visual factors of intelligence. *Intelligence*, 6(2), 165–185.
- Hu, L., & Bentler, P. M. (1999). Cut off criteria for fit indexes in covariance structure analysis: Conventional criteria versus new alternatives. *Structural Equation Modeling*, 6(1), 1-55.

- Hula, W., Doyle, P. J., McNeil, M. R. Mikolic, J. M. (2006). Rasch Modeling of Revised Token Test Performance: Validity and Sensitivity of Change. *Journal of Speech, Language, and Hearing Research, 49*(1), 27-46.
- Humphrey, R.H. (2002). The many faces of emotional leadership. *The Leadership Quarterly, 13*(5), 493-504.
- Humphrey, R. H., Pollack, J. M., Hawver, T. H., & Story, P. A. (2011). The relation between emotional intelligence and job performance : A meta-analysis. *Journal of Organizational Behavior, 32*(5), 788–818. doi:10.1002/job
- Hunsley, J., & Meyer, G. J. (2003). The incremental validity of psychological testing and assessment: conceptual, methodological, and statistical issues. *Psychological assessment, 15*(4), 446–55. doi:10.1037/1040-3590.15.4.446
- Hunter, J. E., & Schmidt, F. L. (2004). *Methods of meta-analysis: Correcting error and bias in research findings* (2nd ed.). CA, Sage: Thousand Oaks.
- International Islamic University Malaysia. (2011). *Annual Report 2011*. Kuala Lumpur, KL: IIUM Press
- Isfandyari-Moghaddam, A., Hasanzadeh, M., & Ghayoori, Z. (2012). A study of factors affecting research productivity of Iranian women in ISI. *Scientometrics, 159*–172. doi:10.1007/s11192-011-0585-5

Ishak, N. M., Piet, I., & Ridzauddin, R. (2010). Emotional intelligence of Malaysian teachers: a comparative study on teachers in daily and residential schools. *Procedia - Social and Behavioral Sciences*, (9), 604–612.

Jahangard, L., Haghghi, M., Bajoghli, H., Ahmadpanah, M., Ghaleiha, A., Zarrabian, M. K., & Brand, S. (2012). Training emotional intelligence improves both emotional intelligence and depressive symptoms in inpatients with borderline personality disorder and depression. *International Journal of Psychiatry in Clinical Practice*, 16(3), 197–204. doi:10.3109/13651501.2012.687454

James, C., Bore, M., & Zito, S. (2012). Emotional intelligence and personality as predictors of psychological well-being. *Journal of Psychoeducational Assessment*, 30(4), 425–438.

doi:10.1177/0734282912449448

Joan Manuel Batista, Richard E. & Boyatzis, L. G. (2006). Assessing emotional intelligence competencies in two global contexts, 1–41.

John, O. P., & Srivastava, S. (1999). The big five trait taxonomy: History, measurement, and theoretical perspectives. In L. A. Pervin & O.P. John (Eds.), *Handbook of personality: Theory and research* (2nd ed., pp. 102–138). New York, NY, USA: Guilford Press; USA.

John, O. P., Naumann, L. P., & Soto, C. J. (2008). Paradigm Shift to the Integrative Big-Five Trait Taxonomy: History, Measurement, and Conceptual Issues. In O. P. John, R. W. Robins, & L. A. Pervin

(Eds.), *Handbook of personality: Theory and research* (pp. 114-158). New York, NY: Guilford Press.

Johnson, S. J., Batey, M., & Holdsworth, L. (2009). Personality and health: The mediating role of trait emotional intelligence and work locus of control. *Personality and Individual Differences, 47*(5), 470–475.

Jordan, P. J., Ashkanasy, N. M., Härtel, C. E. J., & Hooper, G. S. (2002). Workgroup emotional intelligence scale development and relationship to team process effectiveness and goal focus. *Human Resource Management Review, 12*(2), 195–214.

Jordan, P. J., Dasborough, M. T., Daus, C. S., & Ashkanasy, N. M. (2010). A call to context. *Industrial and Organizational Psychology, 3*(2), 145–148.

Jordan, P. J., & Troth, A. (2011). Emotional intelligence and leader member exchange: The relationship with employee turnover intentions and job satisfaction. *Leadership & Organization Development Journal, 32*(3), 260–280.

doi:10.1108/01437731111123915

Joseph, D. L., & Newman, D. A. (2010a). Discriminant validity of self-reported emotional intelligence: A multitrait-multi source study. *Educational and Psychological Measurement, 70*(4), 672–694.

Joseph, D. L., & Newman, D. A. (2010b). Emotional intelligence: An integrative meta-analysis and cascading model. *Journal of*

- Applied Psychology*, 95(1), 54-78.
- Judge, T. A., & Bono, J. E. (2000). Five-factor model of personality and transformational leadership. *Journal of Applied Psychology*, 85(5), 751–765.
- Judge, T., Colbert, A. E., & Ilies, R. (2004). Intelligence and leadership: A quantitative review and test of theoretical propositions. *Journal of Applied Psychology*, 89(3), 542–552.
- Jupp, V. (2006). *The SAGE dictionary of social research methods*. London: SAGE Publications.
- Kafetsios, K., Nezlek, J. B., & Vassiou, A. (2011). A multilevel analysis of relationships between leaders' and subordinates' emotional intelligence and emotional outcomes. *Journal of Applied Social Psychology*, 41(5), 1121–1144.
doi:10.1111/j.1559-1816.2011.00750.x
- Kaplan, R. M., & Saccuzzo, D. P. (2009). *Psychological testing principles, applications, and issues*. (7th ed.). Belmont, CA.: Wadsworth.
- Kaplan, S., Cortina, J., & Ruark, G. (2010). Oops. . . . We did it again: industrial organizational's focus on emotional intelligence instead of on its relationships to work outcomes. *Industrial and Organizational Psychology: Perspectives on Science and Practice*, 3(2), 171–177.

- Keele, S. M., & Bell, R. C. (2008). The factorial validity of emotional intelligence. An unresolved issue. *Personality & Individual Differences, 44*(2), 487–500.
- Kerr, R., Garvin, J., Heaton, N., & Boyle, E., (2006). Emotional intelligence and leadership effectiveness. *Leadership & Organization Development Journal, 27*(4), 265 – 279.
- Kline, R. B. (2011). *Principles and practice of structural equation modeling*. New York: Guilford Press.
- Kotsou, I., Nelis, D., Grégoire, J., & Mikolajczak, M. (2011). Emotional plasticity: Conditions and effects of improving emotional competence in adulthood. *The Journal of applied psychology, 96*(4), 827–39. doi:10.1037/a0023047
- Kouzes, J. M., & Posner, B. Z. (2002). *The leadership practices inventory: Theory and evidence behind the five practices of exemplary leaders*. Retrieved from The Leadership Challenge website: www.leadershipchallenge.com on November 06, 2011.
- Kouzes, B.Z. (2005). *The student leadership practices inventory*. Jossey-Bass/Pfeiffer, San Francisco, CA.
- Kouzes, J. M., & Posner, B. Z. (2007). *The leadership challenge* (4th ed.). San Francisco: Jossey-Bass.
- Kouzes, J.M., & Posner, B.Z. (2008). *The Student Leadership Challenge*, Jossey-Bass/Wiley, San Francisco, CA.
- Kouzes, J.M., & Posner, B.Z. (2009). Related research. In *The*

Leadership Challenge, Retrieved from
www.leadershipchallenge.com/WileyCDA/Section/id-131358.html
on April 06, 2012.

Kouzes, J.M., & Posner, B.Z. (2011). *The Truth About Leadership*. San Francisco: Jossey-Bass.

Koydemir, S., Simsek, O.F., Schutz, A. & Tipandjan, A.. (2013)
Differences in how trait emotional intelligence predicts life
satisfaction: The role of affect balance versus social support in
India and Germany. *Journal of Happiness Study*, 14(1), 51-66.

Krejcie, R. V., & Morgan, D. W. (1970). Determining sample size for
research activities. *Educational and Psychological Measurement*,
30(3), 607–610.

Kunnan, A.J. (1998). *Validation in Language Assessment*. New Jersey:
Lawrence Erlbaum Associates.

Lam, C. S., & O'Higgins, E. R. E. (2012). Enhancing employee
outcomes: The interrelated influences of managers' emotional
intelligence and leadership style. *Leadership & Organization
Development Journal*, 33(2), 149–174.
doi:10.1108/01437731211203465

Landy, F. J. (2005). Some historical and scientific issues related to
research on emotional intelligence. *Journal of Organizational
Behavior*, 26(4), 411–424. doi:10.1002/job.317

Law, K. S., Wong, C., & Song, L. J. (2004). The construct and criterion

- validity of emotional intelligence and its potential utility for management studies. *Journal of Applied Psychology*, 89(3), 483-496.
- Law, K. S., Wong, C.-S., Huang, G.-H., & Li, X. (2007). The effects of emotional intelligence on job performance and life satisfaction for the research and development scientists in China. *Asia Pacific Journal of Management*, 25(1), 51–69.
doi:10.1007/s10490-007-9062-3
- Law, K. S., Wong, C. S., Huang, G. H., & Li, X. (2008). The effects of emotional intelligence on job performance and life satisfaction for the research and development scientists in China. *Asia Pacific Journal of Management*, 25(1), 51-69.
- Leary, M. M., Reilly, M. D., & Brown, F. W. (2009). A study of personality preferences and emotional intelligence. *Leadership & Organization Development Journal*, 30(5), 421–434.
doi:10.1108/01437730910968697
- LeDoux, J. E. (2000). Emotion circuits in the brain. *Annu. Rev. Neuroscience*, 23, 155-84.
- Libbrecht, N., & Lievens, F. (2012). Validity evidence for the situational judgment test paradigm in emotional intelligence measurement. *International Journal of Psychology*, 47(6), 438–447.
- Libbrecht, N., Lievens, F., & Schollaert, E. (2010). Scale across self and other ratings measurement equivalence of the WLEIS.

- Educational and Psychological Measurement*, 70(6), 1007-1020.
- Lindebaum, D., & Cartwright, S. (2011). Leadership effectiveness: the costs and benefits of being emotionally intelligent. *Leadership & Organization Development Journal*, 32(3), 281–290.
doi:10.1108/01437731111123924
- Lin YC, Wynn JK, Hellemann G., & Green MF. (2012). Factor structure of emotional intelligence in schizophrenia. *Schizophrenia Research*, 139(1), 78-81.
- Linacre, J.M. (2010a). *A user's guide to Winstep & Ministep Rasch-Model computer programs. Program Manual 3.69.1*. Retrieved from <http://www.winsteps.com/a/winsteps.pdf>
- Livingstone, H.A., & Day, A.L. (2005). Comparing the construct and criterion-related validity of ability-based and mixed-model measures of emotional intelligence. *Educational and Psychological Measurement*, 65(5), 757–779.
- Locke, E. A. (2005). Why emotional intelligence is an invalid concept. *Journal of Organizational Behaviour*, 26(4), 425–431.
doi:10.1002/job.318
- Lopes, P. N., Brackett, M. A., Nezlek, J. B., Schu"tz, A., Sellin, I., & Salovey, P. (2004). Emotional intelligence and social interaction. *Personality and Social Psychology Bulletin*, 30(8), 1018–1034.
doi:10.1177/0146167204264762
- Lopes, P.N., Salovey, P., & Straus, R. (2003). Emotional

- intelligence, personality, and the perceived quality of social relations. *Personality and Individual Differences*, 35(3), 641-658.
- Lopes, P. N., Salovey, P., Cote, S., & Beers, M. (2005). Emotion regulation abilities and the quality of social interaction. *Emotion*, 5(1), 113–118.
- Lopez-zafra, E., Garcia-Retamero, R., & Martos, M. P. B. (2012). The relationship between transformational leadership and emotional intelligence from a gendered approach. *The Psychological Record*, 62(1), 97–114.
- Lord, R. G., DeVader, C. L. & Alliger, G. M. (1986). Meta-analysis of the relation between personality traits and leadership perceptions: An application of validity generalization procedures. *Journal of Applied Psychology*, 71(3), 402-410.
- Lubinski, D. (2004). Introduction to the special section on cognitive abilities: 100 years after Spearman's (1904). *General intelligence,' objectively determined and measured*. *Journal of Personality and Social Psychology*, 86(1), 96–111.
- Lyons, J. B. & Schneider, T. R. (2005). The influence of emotional intelligence on performance. *Personality and Individual Differences*, 39(4), 693-703.
- Mabe, P. A., III, & West, S. G. (1982). Validity of self-evaluation of ability: A review and meta-analysis. *Journal of Applied Psychology*, 67(3), 280–296.

- MacCann, C. (2010). Further examination of emotional intelligence as a standard intelligence: A latent variable analysis of fluid intelligence, crystallized intelligence, and emotional intelligence. *Journal of Personality and Individual Differences, 49*(5), 490–496.
- Maccann, C., Pearce, N., & Roberts, R. D. (2011). Emotional intelligence as assessed by situational judgment and emotion recognition tests: Building the nomological net. *Psychological Topics, 20*(3), 393–412.
- MacCann, C., & Roberts, R. D. (2008). New paradigms for assessing emotional intelligence: Theory and data. *Emotion, 8*(4), 540–551.
- MacCann, C., Roberts, R. D., Matthews, G., & Zeidner, M. (2004). Consensus scoring and empirical option weighting of performance-based Emotional Intelligence (EI) tests. *Personality and Individual Differences, 36*(3), 645–662.
doi:10.1016/S0191-8869(03)00123-5
- Malouff, J. M., Schutte, N. S., & Thorsteinsson, E. B. (2014). Trait Emotional Intelligence and Romantic Relationship Satisfaction : A Meta-Analysis Trait Emotional Intelligence and Romantic Relationship Satisfaction : A Meta-Analysis. *The American Journal of Family Therapy, 42*(1), 53–66.
doi:10.1080/01926187.2012.748549
- Malouff, J. M., Thorsteinsson, E. B., Schutte, N. S., Bhullar, N., & Rooke, S. E. (2010). The Five-Factor Model of personality and

relationship satisfaction of intimate partners : A meta-analysis.
Journal of Research in Personality, 44(1), 124–127.

doi:10.1016/j.jrp.2009.09.004

Mandell, B. & Pherwani, S. (2003). Relationship between emotional intelligence and transformational leadership style: A gender comparison. *Journal of Business and Psychology*, 17(3), 387-404.

Márquez, P. G., Martín, R. P., & Brackett, M. A. (2006). Relating emotional intelligence to social competence and academic achievement in high school students. *Psicothema*, 18(1), 118–123.

Marsh, H. W., & Hocevar, D. (1985). Application of confirmatory factor analysis to the study of self-concept: First- and higher order factor models and their invariance across groups. *Psychological Bulletin*, 97(3), 562–582.

Martins, A., Ramalho, N., Morin, E. (2010). A comprehensive meta-analysis of the relationship between emotional intelligence and health. *Journal of Personality and Individual Differences*, 49(6), 554–564.

Martin, S. L., & Thomas, J. (2011). Emotional intelligence : Examining construct validity using the emotional stroop. *International Journal of Business and Social Science*, 2(1), 209–216.

Matarazzo, J. D. (1972). *Wechsler's measurement and appraisal of adult intelligence* (5th ed.). New York: Oxford University Press.

- Matsumoto, D., LeRoux, J. A., Wilson-Cohn, C., Raroque, J., Kooken, K., et al. (2000). A new test to measure emotion recognition ability: Matsumoto and Ekman's Japanese and Caucasian Brief Affect Recognition Test (JACBART). *Journal of Nonverbal Behaviour*, 24(3), 179-209.
- Matthews, G., Roberts, R. D., & Zeidner, M. (2004). Seven myths about emotional intelligence. *Psychological Inquiry*, 15, 179–196.
- Matthews, G., Zeidner, M., & Roberts, R. D. (2002). *Emotional intelligence: Science and myth*. Cambridge: MIT Press.
- Matthews, G., Zeidner, M., & Roberts, R. D. (2007a). Emotional intelligence: Consensus, controversies, and questions. In M. Matthews, M. Zeidner, & R. Roberts (Eds.), *The science of emotional intelligence: knowns and unknowns* (pp. 3-46). New York: Oxford University Press.
- Matthews, G., Zeidner, M., & Roberts, R. D. (2007b). Measuring emotional intelligence: Promises, pitfalls, solutions? In A. D. Ong & M. Van Dulmen (Eds.), *Handbook of methods in positive psychology* (pp. 189–204). Oxford: Oxford University Press.
- Matthews, G., Zeidner, M., & Roberts, R. D. (2012). Emotional intelligence: A promise unfulfilled? *Japanese Psychological Research*, 54(2), 105–127.
- doi:10.1111/j.1468-5884.2011.00502.x
- Maul, A. (2011). The factor structure and cross-test convergence of the

- Mayer–Salovey–Caruso model of emotional intelligence.
Personality and Individual Differences, 50(4), 457–463.
doi:10.1016/j.paid.2010.11.007
- Maul, A. (2012a). Examining the structure of emotional intelligence at the item level : New perspectives, new conclusions. *Cognition and Emotion*, 26(3), 503–520.
- Maul, A. (2012b). Higher standards of validity evidence are needed in the measurement of emotional intelligence. *Emotion Review*, 4(4), 411–412. doi:10.1177/1754073912446357
- Mavroveli, S., Petrides, K. V., Sangareau, Y., & Furnham, A. (2009). Exploring the relationships between trait emotional intelligence and objective socio-emotional outcomes in childhood. *The British Journal of Educational Psychology*, 79(2), 259–72.
doi:10.1348/000709908X368848
- Mavroveli, S., Petrides, K. V., Rieffe, C., & Bakker, F. (2007). Trait emotional intelligence, psychological well-being, and peer-rated social competence in adolescence. *British Journal of Developmental Psychology*, 25(2), 263–275.
- Mayer, J. D. (1999). Emotional intelligence: Popular or scientific psychology? *APA Monitor*, 30(8), 50.
- Mayer, J.D. (2006). A new field guide to emotional intelligence. In J. Ciarrochi, J. P. Forgas, & J. D. Mayer (Eds.). *Emotional*

- intelligence in everyday life* (pp. 3-26). Philadelphia, PA: Psychology Press.
- Mayer, J.D., Caruso, D.T., & Salovey, P. (1999). Emotional intelligence meets traditional standards for an intelligence. *Intelligence*, 27(4), 267-298.
- Mayer, J.D., Caruso, D. R., & Salovey, P. (2000). Selecting a measure of emotional intelligence: The case for ability testing. In R. Bar-On & J. D. A. Parker (Eds.), *Handbook of emotional intelligence* (pp. 320-342). San Francisco, CA: Jossey-Bass.
- Mayer, J. D., & Cobb, C. D. (2000). Educational policy on emotional intelligence: Does it make sense? *Educational Psychology Review*, 12(2), 163-183.
- Mayer, J. D., Dipaolo, M. T., & Salovey, P. (1990). Perceiving affective content in ambiguous visual stimuli: A component of emotional intelligence. *Journal of Personality Assessment*, 54(3-4), 772–781.
- Mayer, J. D., Roberts, R. D., & Barsade, S. G. (2008). Human abilities: Emotional intelligence. *Annual Review of Psychology*, 59, 507-536.
- Mayer, J. D., & Salovey, P. (1997). What is emotional intelligence? In P. Salovey & D. J. Sluyter (Eds.), *Emotional development and emotional intelligence: Educational implications* (pp. 3–31). New York: Basic Books.

- Mayer, J. D., Salovey, P., & Caruso, D.R. (2000a). Competing models of emotional intelligence. In R. J. Sternberg (Ed.), *Handbook of human intelligence* (2nd ed, pp. 396–420). New York: Cambridge University Press.
- Mayer, J. D., Salovey, P., & Caruso, D.R. (2000b). *Test manual for the Mayer-Salovey-Caruso Emotional Intelligence Test: Research Version 1.1* (3rd ed.). Toronto, Canada: Multi-Health Systems.
- Mayer, J. D., Salovey, P., & Caruso, D. R. (2002). *The Mayer-Salovey-Caruso Emotional Intelligence Test (MSCEIT): User's manual*. Toronto: Multi-Health Systems.
- Mayer, J. D., Salovey, P., & Caruso, D. (2008). Emotional intelligence: New ability or eclectic traits? *American Psychologist* , 63(6), 503–517. doi:10.1037/0003-066X.63.6.503
- Mayer, J. D., Salovey, P., & Caruso, D. R. (2012). The validity of the MSCEIT: Additional analyses and evidence. *Emotion Review*, 4(4), 403–408. doi:10.1177/1754073912445815
- Mayer, J. D., Salovey, P., Caruso, D. L., & Sitarenios, G. (2001). Emotional intelligence as a standard intelligence. *Emotion*, 1(3), 232-242.
- Mayer, J. D., Salovey, P., Caruso, D. R., & Sitarenios, G. (2003). Measuring emotional intelligence with the MSCEIT V2.0. *Emotion*, 3(1), 97-105.

- McCrae, R. R., & Costa, P. T., Jr. (1987). Validation of the five-factor model across instruments and observers. *Journal of Personality and Social Psychology*, 52(1), 81-90.
- McCrae, R. R., & Costa, P.T., Jr. (1996). Toward a new generation of personality theories: Theoretical contexts for the five-factor model. In J. S. Wiggins (Ed.), *The five-factor model of personality: Theoretical perspectives* (pp. 51-87). New York: Guilford Press
- McGrew, K. S. (2005). The Cattell-Horn-Carroll theory of cognitive abilities. In *Contemporary intellectual assessment: Theories, tests, and issues* (pp. 136–181).
- McGrew, K. S. (2009). CHC theory and the human cognitive abilities project: Standing on the shoulders of the giants of psychometric intelligence research. *Intelligence*, 37(1), 1–10.
doi:10.1016/j.intell.2008.08.004
- McGrew, K.S. (2011). Applied Psychometrics 101: #12: CHC Narrow Ability Assessment with the WJ III Battery. St. Joseph, MN: Institute for Applied Psychometrics. Retrieved from <http://iapsych.com/iapap101/iapap10112.pdf> on May 28, 2012.
- Mehrabian, A. (2000). Beyond IQ: Broad-based measurement of individual success potential or “emotional intelligence”. *Genetic, Social, and General Psychology Monographs*, 126(2), 133–239.
- Messick, S. (1992). Multiple intelligences or multilevel intelligence? Selective emphasis on distinctive properties of hierarchy: On

- Gardner's Frames of Mind and Sternberg's Beyond IQ in the context of theory and research on the structure of human abilities. *Psychological Inquiry*, 3(4), 365–384.
- Messick, S. (1995). Validity of psychological assessment : Validation of inferences from persons' responses and performances as scientific inquiry into score meaning. *American Psychologist*, 50(9), 741-749.
- Mikolajczak, M., Luminet, O., Leroy, C., & Roy, E. (2007). Psychometric properties of the trait emotional intelligence questionnaire: Factor structure, reliability, construct, and incremental validity in a French-speaking population. *Journal of Personality Assessment*, 88(3), 338–353. doi:10.1080/00223890701333431
- Min, J., & Peng, K.-H. (2012). Ranking emotional intelligence training needs in tour leaders: an entropy-based TOPSIS approach. *Current Issues in Tourism*, 15(6), 563–576.
doi:10.1080/13683500.2011.641946
- Mittal, E. V., & Sindhu, E. (2012). Emotional Intelligence & Leadership. *Global Journal of Management and Business Research*, 12(16), 34–38.
- Montes-Berges, B., & Augusto-Landa, J.-M. (2014). Emotional intelligence and affective intensity as life satisfaction and psychological well-being predictors on nursing. *Journal of*

Professional Nursing, 30(1), 80–88.

doi:10.1016/j.profnurs.2012.12.012

Morgan, G. A., Leech, N. L., Gloeckner, G. W., & Barrett, K. C. (2004).

SPSS for introductory statistics: Use and interpretation (2nd ed.).

London: Lawrence Erlbaum Associates.

Morrison, K. R. B. (2006). Sensitive educational research in educational

states and territories: the case of Macau. *Compare*, 36(2), 249-

264.

Murphy, K. R. (Ed.). (2006). *A critique of emotional intelligence: What*

are the problems and how can they be fixed? Mahwah, NJ:

Erlbaum.

Murphy, K. R., & Sideman, L. (2006). The fadification of emotional

intelligence. In K. R. Murphy (Ed.), *A critique of emotional*

intelligence: What are the problems and how can they be fixed?

(pp. 283-299). Mahwah, NJ: Erlbaum Publishers.

Naeem, N., & Muijtjens, A. (2015). Validity and reliability of bilingual

English-Arabic version of Schutte self report emotional

intelligence scale in an undergraduate Arab medical student

sample. *Medical teacher*, 37(S1)(1990), S20–26.

doi:10.3109/0142159X.2015.1006605

Neisser, U., Boodoo, G., Bouchard, T. J., Jr., Boykin, A. W., Brody, N., &

Ceci, S. J., et al. (1996). *Intelligence: Knowns and unknowns.*

American Psychologist, 51(2), 77–101.

- Nelis, D., Quoidbach, J., Hansenne, M., Kotsou, I., Weytens, F., & Dupuis, P. (2011). Increasing Emotional Competence Improves Psychological and Physical Well-Being, Social Relationships, and Employability. *Emotion, 11*(2), 354–366.
- Newman, D. A., Joseph, D. L., & MacCann, C. (2010). Emotional intelligence and job performance: The importance of emotion regulation and emotional labor context. *Industrial and Organizational Psychology, 3*(2), 150-164.
- Nguyen, T. V., & Pham, L. T. (2011). Scientific output and its relationship to knowledge economy: An analysis of ASEAN countries. *Scientometrics, 89*(1), 107–117. doi:10.1007/s11192-011-0446-2
- Nunnally, J. C. & Bernstein, I. H. (1994). *Psychometric theory*. (3rd ed.). New York: McGraw-Hill.
- Ono, M., Sachau, D. A., Deal, W. P., Englert, D. R., & Taylor, M. D. (2011). Cognitive Ability, Emotional Intelligence, and the Big Five Personality Dimensions as Predictors of Criminal Investigator Performance. *Criminal Justice and Behavior, 38*(5), 471–491. doi:10.1177/0093854811399406
- O'Connor, R. M., & Little, I. S. (2003). Revisiting the predictive validity of emotional intelligence: Self-report versus ability-based measures. *Personality and Individual Differences, 35*(8), 1893–1902. doi:10.1016/S0191-8869(03)00038-2

- O'Sullivan, M. (2007). Trolling for trout, trawling for tuna: The methodological morass in measuring emotional intelligence. In G. Matthews, M. Zeidner, & R. D. Roberts (Eds.), *The science of emotional intelligence: Knowns and unknowns* (pp.258-287). New York: Oxford University Press.
- Owen, D. B., (1962). *Handbook of Statistical Tables*. Michigan: Addison-Wesley Publishing Company.
- Pallant, J. (2007). *SPSS Survival Manual*. Buckingham: Open University Press.
- Palmer, B. R., & Stough, C. (2002). *Swinburne University Emotional Intelligence Test (Workplace SUEIT)*. Interim technical manual (Version 2). Victoria: Swinburne University of Technology.
- Parker, J. D. a, Keefer, K. V, & Wood, L. M. (2011). Toward a brief multidimensional assessment of emotional intelligence: sychometric properties of the Emotional Quotient Inventory-Short Form. *Psychological assessment*, 23(3), 762–77.
doi:10.1037/a0023289
- Pekrun, R., Frenzel, A. C., Goetz, T. & Perry, R. P. (2007). The control-value theory of achievement emotions: An integrative approach to emotions in education. In P. Schutz & R. Pekrun (Eds.), *Emotion in Education* (pp. 13–36). Oxford, England: Elsevier.
- Pena, M., Rey, L., & Extremera, N. (2012). Life satisfaction and

- engagement in elementary and primary educators : Differences in emotional intelligence. *Revista de Psicodidactica*, 17(2), 341–358. doi:10.1387/Rev.Psicodidact.1220
- Pérez-gonzález, J. C., & Sanchez-ruiz, M. (2014). Trait emotional intelligence anchored within the Big Five , Big Two and Big One frameworks. *Personality & Social Psychology Bulletin*, 65, 53–58. doi:10.1016/j.paid.2014.01.021
- Pescosolido, A.T. (2002). Emergent leaders as managers of group emotion. *The Leadership Quarterly*, 13(5), 583-99.
- Petrides, K. V. (2009a). Psychometric properties of the Trait Emotional Intelligence Questionnaire (TEIQue). In C. Stough, D. H. Saklofske, & J. D. A. Parker (Eds.), *Advances in the measurement of emotional intelligence*. New York: Springer.
- Petrides, K. V. (2009b). *Technical manual for the Trait Emotional Intelligence Questionnaires (TEIQue)*. London: London Psychometric Laboratory.
- Petrides, K. V. (2010). Trait emotional intelligence theory. *Industrial and Organizational Psychology*, 3(2), 136–139.
- Petrides, K. V., & Furnham, A. (2001). Trait emotional intelligence: Psychometric investigation with reference to established trait taxonomies. *European Journal of Personality*, 15(6), 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(1), 39-57.

Petrides, K. V., Furnham, A., & Mavroveli, S. (2007). Trait emotional intelligence: Moving forward in the field of EI. In G. Matthews, M. Zeidner, & R. Roberts (Eds.), *The science of emotional intelligence: Knowns and unknowns (series in affective science)* (pp. 151–166). Oxford: Oxford University Press.

Petrides, K. V., Niven, L., & Mouskounti, T. (2006). The trait emotional intelligence of ballet dancers and musicians. *Psicothema*, 18(1), 101-107.

Petrides, K. V., Pita, R., & Kokkinaki, F. (2007). The location of trait emotional intelligence in personality factor space. *British Journal of Psychology*, 98(2), 273-289.

Petrides, K. V., Pérez-González, J. C., & Furnham, A. (2007). On the criterion and incremental validity of trait emotional intelligence. *Cognition & Emotion*, 21(1), 26–55.
doi:10.1080/02699930601038912

Petrides, K. V., Vernon, P. A., Schermer, J. A., Ligthart, L., Boomsma, D. I., & Veselka, L. (2010). Relationships between trait emotional intelligence and the big five in the Netherlands. *Personality and Individual Differences*, 48(8), 906–910.
doi:10.1016/j.paid.2010.02.019

Pirola-Merlo, A., Hartel, C., Mann, L. & Hirst, G. (2002). How leaders

- influence the impact of affective events on team climate and performance in R&D teams. *The Leadership Quarterly*, 13(5), 561-81.
- Ployhart, R. E., Lim, B., & Chan, K. (2001). Exploring relations between typical and maximum performance ratings and the five-factor model of personality. *Personnel Psychology*, 54, 809-843.
- Posner, B.Z. (2004). A leadership development instrument for students, updated. *Journal of College Student Development*, 45(4), 443-56.
- Posner, B.Z. & Brodsky, B. (1992). A leadership development instrument for college students. *Journal of College Student Development*, 33(4), 231-7.
- Prati, L. M., Douglas, C., Ferris, G. R., Ammeter, A. P., & Buckley, M. R. (2003). Emotional intelligence, leadership effectiveness, and team outcomes. *International Journal of Organizational Analysis*, 11(1), 21-40.
- Ramo, L. G., Saris, W. E., & Boyatzis, R. E. (2009). The impact of social and emotional competencies on effectiveness of Spanish executives. *Journal of Management Development*, 28(9), 771-793. doi:10.1108/02621710910987656
- Rao, P. R. (2006). Emotional intelligence: The sine qua non for a clinical leadership toolbox. *Journal of Communication Disorders*, 39(4), 310-319.

Rivers, S. E., Brackett, M. A., Reyes, M. R., Mayer, J. D., Caruso, D. R., & Salovey, P. (2010). *Emotional intelligence in early adolescence: Its relation to academic performance and psychosocial functioning*. Manuscript submitted for publication.

Rivers, S. E., Brackett, M. A., Reyes, M. R., Mayer, J. D., Caruso, D. R., & Salovey, P. (2012). Measuring emotional intelligence in early adolescence with the MSCEIT-YV: psychometric properties and relationship with academic performance and psychosocial functioning. *Journal of Psychoeducational Assessment, 30*, (4), 344–366.

Roberts, R. D., MacCann, C., Matthews, G., & Zeidner, M. (2010). Emotional intelligence: Towards a consensus of models, measures, and applications. *Social and Personality Psychology Compass, 4*(10), 821-840.

Roberts, R. D., Matthews, G., & Zeidner, M. (2001). Does emotional intelligence meet traditional standards for an intelligence? Some new data and conclusions. *Emotion, 1*(3), 196–231.

Roberts, R. D., Matthews, G., & Zeidner, M. (2010). Emotional intelligence: Muddling through theory and measurement. *Industrial and Organizational Psychology, 3*(2), 140–144.

Roberts, R. D., Schulze, R., Zeidner, M., & Matthews, G. (2005). Understanding, measuring, and applying emotional intelligence: What have we learned? What have we missed? In R. Schulze &

- R. D. Roberts (Eds.), *International handbook of emotional intelligence* (pp. 311-341). Cambridge, MA: Hogrefe & Huber.
- Rossen, E., & Kranzler, J. H. (2009). Incremental validity of the Mayer–Salovey–Caruso Emotional Intelligence Test Version 2.0 (MSCEIT) after controlling for personality and intelligence. *Journal of Research in Personality, 43*(1), 60–65.
doi:10.1016/j.jrp.2008.12.002
- Ryff, C. D. (1989). Happiness is everything, or is it? Explorations on the meaning of psychological well-being. *Journal of Personality and Social Psychology, 57*(6), 1069–1081.
- Ryff, C.D., & Keyes, C.L.M. (1995). The structure of psychological wellbeing revisited. *Journal of Personality and Social Psychology, 69*(4), 719-27.
- Ryff, C. D. & Singer, B. (2000). Interpersonal Flourishing: A Positive Health Agenda for the New Millennium. *Personality and Social Psychology Review, 4*(1), 30-44.
- Saarni, C. (1999). *The development of emotional competence*. New York: Guilford Press.
- 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*(4), 707–721.
- Salas, E., Driskell, J. E., & Hughs, S. (1996). The study of human stress and performance. In J. E. Driskell & E. Salas (Eds.), *Stress and*

- human performance* (pp. 1–46). Mahwah, NJ: Lawrence Erlbaum Associates.
- Salovey, P., Bedell, B., Detweiler, J.B., & Mayer, J.D. (1999). Coping intelligently: Emotional intelligence and the coping process. In Snyder, C.R. (Ed.), *Coping: The psychology of what works* (pp. 141-64), New York, NY: Oxford University press.
- Salovey, P., & Mayer, J. (1990). Emotional intelligence. *Imagination, Cognition, and Personality*, 9(3), 185–211.
- Sani, M. K. J. A., Masrek, M. N., Sahid, N. Z., & Nadzar, F. M. (2013). Assessing the Emotional Intelligence Profile of Public Librarians in Malaysia : Descriptive Analysis. *Library Philosophy and Practice (e-journal)*, paper 1047.
- Schneider, W. J., & McGrew, K. (2012). The Cattell-Horn-Carroll model of intelligence. In D. Flanagan & P. Harrison (Eds.), *Contemporary Intellectual Assessment: Theories, Tests, and Issues* (3rd ed.). (p. 99-144). New York: Guilford.
- Schumacker, R. E., & Lomax, R. G. (2004). *A beginner's guide to structural equation modelling* (2nd ed.). Mahwah, New Jersey: Lawrence Erlbaum Associates.
- Schutte, N. S., Malouff, J. M., Hall, L. E., Haggerty, D. J., Cooper, J. T., & Golden, C. J., et al. (1998). Development and validation of a measure of emotional intelligence. *Personality and Individual Differences*, 25(2), 167–177.

- Segrin, C., & Taylor, M. (2007). Positive interpersonal relationships mediate the association between social skills and psychological well-being. *Personality and Individual Differences, 43*(4), 637-646.
doi:10.1016/j.paid.2007.01.017
- Sevdalis, N., Petrides, K. V., & Harvey, N. (2007). Trait emotional intelligence and decision-related emotions. *Personality and Individual Differences, 42*(7), 1347–1358.
- Sharma, S., Gangopadhyay, M., Austin, E., Mandal, M. K., & Louis, S. (2013). Development and validation of a situational judgment test of emotional intelligence. *International Journal of Selection and Assessment, 21*(1), 57–73.
- Shibley, W.C., Gruber, C.P., Martin, T.A., & Klein, A.M. (2009). *Manual Shipley-2*. Los Angeles: Western psychological services.
- Sieglin, A. B., Nieslen, C., & Petrides, K. V. (2014). Trait emotional intelligence and leadership in a European multinational company. *Personality and Individual Differences, 65*, 65–68.
- Sieglin, A. B., Saklofske, D. H., Vesely, A. K., & Nordstokke, D. W. (2012). Relations of emotional intelligence with gender-linked personality: Implications for a refinement of EI constructs q. *Personality and Individual Differences, 52*(7), 776–781.
doi:10.1016/j.paid.2012.01.003
- Smith, L., Heaven, P. C. L., & Ciarrochi, J. (2008). Trait emotional intelligence, conflict communication patterns, and relationship

- satisfaction. *Personality and Individual Differences*, 44(6), 1314–1325.
- Smithfield, S. (2008). Feedback Report Emotional and Social Competency Inventory. HayGroup.
- Spain, J. S., Eaton, L. G., & Funder, D. C. (2000). Perspectives on personality: The relative accuracy of self versus others for the prediction of emotion and behavior. *Journal of Personality*, 68(5), 837–867.
- Spearman, C. (1904). “General intelligence,” objectively determined and measured. *The American Journal of Psychology*, 15(2), 201–292.
- Spector, P. E., & Johnson, H. M. (2006). Improving the definition, measurement, and application of emotional intelligence. In K. R. Murphy (Ed.), *A critique of emotional intelligence: What are the problems and how can they be fixed?* (pp. 325–344). Mahwah, NJ: Erlbaum.
- Sternberg, R. J. (2002). The psychology of intelligence. *Intelligence*, 30(5), 482–483.
- Strang, S. E., & Kuhnert, K. W. (2009) Personality and leadership developmental levels as predictors of leader performance. *The Leadership Quarterly*, 20(3), 421-433.
- Sweet, J. A., & Bumpass, L. L. (1996). The national survey of families and households—Waves 1 and 2: Data description and documentation. Retrieved from <http://www.ssc.wisc.edu/nsfh/>

home.htm.

Tabachnick, B. G., & Fidell, L. S. (2007). *Using multivariate statistics* (5th ed.). Boston: Allyn & Bacon.

Tabak, N. T., Green, M. F., Wynn, J. K., Proudfit, G. H., Altshuler, L., & Horan, W. P. (2015). Perceived emotional intelligence is impaired and associated with poor community functioning in schizophrenia and bipolar disorder. *Schizophrenia Research*, *162*(1-3), 189–195. doi:10.1016/j.schres.2014.12.005

Tett, R. P., Fox, K. E., & Wang, A. (2005). Development and validation of a self-report measure of emotional intelligence as a multidimensional trait domain. *Personality and Social Psychology Bulletin*, *31*(7), 859-88.

Tett, R. P., Freund, K. A., Christiansen, N. D., Fox, K. E., & Coaster, J. (2012). Faking on self-report emotional intelligence and personality tests : Effects of faking opportunity , cognitive ability , and job type q. *Personality and Individual Differences*, *52*(2), 195–201. doi:10.1016/j.paid.2011.10.017

Trochim, W. M. K., & Donnelly, J. P. (2007). *The research methods knowledge base*. (3rd ed.). New York: Thomson.

University of Nottingham Code of Research Conduct and Research Ethics. (2011). Retrieved from <http://www.nottingham.ac.uk/academicservices/documents/qmdocuments/code-of-research-conduct-and-research-ethics-v2->

- Vakola, M., Tsaousis, I., & Nikolaou, I. (2004). The role of emotional intelligence and personality variables on attitudes toward organisational change. *Journal of Managerial Psychology, 19*(2), 88–110. doi:10.1108/02683940410526082
- Van Rooy, D., & Viswesvaran, C. (2004). Emotional intelligence: A meta-analytic investigation of predictive validity and nomological net. *Journal of Vocational Behavior, 65*(1), 71–95.
- Van Rooy, D. L., Whitman, D., & Viswesvaran, C. (2010). Emotional intelligence: Additional questions still unanswered. *Industrial and Organizational Psychology, 3*(2), 149–153.
- Vernon, P. A., Villani, V. C., Schermer, J. A., & Petrides, K. V. (2008). Phenotypic and genetic associations between the big five and trait emotional intelligence. *Twin Research and Human Genetics, 11*(5), 524–530.
- Vernon, P. E. (1971). *The structure of human abilities*. New York: Methuan.
- Villanueva, J. J., & Sánchez, J. C. (2007). Trait emotional intelligence and leadership self-efficacy: Their relationship with collective efficacy. *The Spanish Journal of Psychology, 10*(2), 349–57.
Retrieved from <http://www.ncbi.nlm.nih.gov/pubmed/17992961>
- Vinluan, L. R. (2012). Research productivity in education and psychology in the Philippines and comparison with ASEAN countries.

- Scientometrics*, 91(1), 277–294. doi:10.1007/s11192-011-0496-5
- Walter, F., Cole, M. S., & Humphrey, R. H. (2011). Emotional intelligence: Sine qua non of leadership or folderol? *Academy of Management Properties*, 25(1), 45-59.
- Walter, F., Humphrey, R. H., & Cole, M. S. (2012). Unleashing leadership potential: *Organizational Dynamics*, 41(3), 212–219. doi:10.1016/j.orgdyn.2012.03.002
- Warwick, J., & Nettelbeck, T. (2004). Emotional intelligence is...? *Personality and Individual Differences*, 37(5), 1091–1100.
- Watson, D. (2000). *Mood and temperament*. New York: Guilford.
- Weaven, S., Grace, D., & Manning, M. (2009). Franchisee personality: An examination in the context of franchise unit density and service classification. *European Journal of Marketing*, 43(1/2), 90–109. doi:10.1108/03090560910923256
- Web of Knowledge. (2013). Retrived from http://wokinfo.com/products_tools/multidisciplinary/webofscience/, March 13, 2013.
- Wechsler, D. (1997). *WAIS-III/WMS-III Technical Manual*. San Antonio, TX: Harcourt Assessment.
- Wechsler, D. (1997). *WAIS III: Wechsler Adult Intelligence Scale* (3rd ed.). San Antonio, TX: The Psychological Corporation.
- Wolff, S. B. (2006). *Group Emotional Intelligence (GEI) Survey Technical Manual. GEI Partners*. New York: Thomson.

- Wong, C. S., & Law, K. S. (2002). The effect of leader and follower emotional intelligence on performance and attitude: An exploratory study. *Leadership Quarterly*, 13(3), 243–274.
- Wong, C. S., Law, K. S., & Wong, P. M. (2004). Development and validation of a forced choice emotional intelligence for Chinese respondents in Hong Kong. *Asia Pacific Journal of Management*, 21(4), 535–559.
- Wong, C. S., & Peng, K. Z. (2012). Chinese Emotional Intelligence. In Huang, X. & Bond, M. H. (Eds.) *Handbook of Chinese Organizational Behavior: Integrating Theory, Research and Practices*, 87-102. UK: Edwards Elgar Publishing Limited.
- Wong, C.-S., Wong, P.-M., & Law, K. S. (2007). Evidence on the practical utility of Wong's emotional intelligence scale in Hong Kong and mainland China. *Asia Pacific Journal of Management*, 24(1), 43–60.
- Wong, C.-S., Wong, P.-M., & Peng, K. Z. (2011). An exploratory study on the relationship between parents' career interests and the career interests of young adults. *International Journal for Educational and Vocational Guidance*, 11(1), 39–53.
- Woodcock, R. W. (1990). Theoretical foundations of the WJ-R measures of cognitive ability. *Journal of Psychoeducational Assessment*, 8(3), 231–258.
- Zeidner, M., Matthews, G., & Roberts, R. D. (2001). Slow down you

- move too fast: Emotional intelligence remains an “elusive” intelligence. *Emotions*, 1(3), 265-275.
- Zeidner, M., Roberts, R. D., & Matthews, G. (2002). Can emotional intelligence (EI) be schooled? A critical review. *Educational Psychologist*, 37(4), 215–231.
- Zeidner, M., Roberts, R. D., & Matthews, G. (2004). The emotional intelligence bandwagon: Too fast to live, too young to die? *Psychological Inquiry*, 15(3), 239-248.
- Zeidner, M., Roberts, R. D., & Matthews, G. (2008). The science of emotional intelligence: Current consensus and controversies. *European Psychologist*, 13(1), 64–78.
- Zeidner, M., Shani-Zinovich, I., Matthews, G., & Roberts, R. D. (2005). Assessing emotional intelligence in gifted and non-gifted high school students: Outcomes depend on the measure. *Intelligence*, 33(4), 369-391.
- Zhou, J., & George, J. M. (2003). Awakening employee creativity: The role of leader emotional intelligence. *The Leadership Quarterly*, 14(4), 545–568.
- 32,000 Graduan masih menganggur. (2010, June 30). *Utusan Malaysia*, p.8.

**APPENDIX A - A SUMMARY OF EMOTIONAL INTELLIGENCE MODEL
PREFERENCE FOR JOURNAL ARTICLES PUBLISHED IN THE WEB
OF KNOWLEDGE DATABASE 2012.**

No.	Author(S)	Article title	Emotional intelligence measure	Emotional intelligence model	Journal	Date published
1	Kong, Feng; Zhao, Jingjing; You, Xuqun	Emotional intelligence and life satisfaction in Chinese university students: The mediating role of self-esteem and social support	WLEIS	Ability	Personality and Individual Differences	Dec-2
2	Van Zyl, Casper J. J.; De Bruin, Karina	The relationship between mixed model emotional intelligence and personality	EQ-i	Mixed	South African Journal of Psychology	Dec-12
3	Lee, Junghoon (Jay); Ok, Chihyung	Reducing burnout and enhancing job satisfaction: Critical role of hotel employees' emotional intelligence and emotional labor	WLEIS	Ability	International Journal of Hospitality Management	Dec-12
4	Mavroveli, Stella; Siu, Angela F. Y.	The factor structure of trait emotional intelligence in Hong Kong adolescents	TEIQue	Trait	Journal of Psychoeducational Assessment	Dec-12
5	Psilopanagioti, Aristeia; Anagnostopoulos, Fotios; Mourtou, Efstratia; Niakas, Dimitris	Emotional intelligence, emotional labor, and job satisfaction among physicians in Greece	WLEIS	Ability	BMC Health Services Research	DEC 17 2012

No.	Author(S)	Article title	Emotional intelligence measure	Emotional intelligence model	Journal	Date published
6	Lizeretti, Nathalie P.; Extremera, Natalio; Rodriguez, Ana	Perceived emotional Intelligence and clinical symptoms in mental disorders	TMMS	Ability	Psychiatric Quarterly	Dec-12
7	Fernandez, Ritin; Salamonson, Yenna; Griffiths, Rhonda	Emotional intelligence as a predictor of academic performance in first-year accelerated graduate entry nursing students	TEIQue	Trait	Journal of Clinical Nursing	Dec-12
8	Lopez-Zafra, Esther; Garcia-Retamero, Rocio; Berrios Martos, M. Pilar	The relationship between transformational leadership and emotional intelligence from a gendered approach	EQ-i	Mixed	Psychological Record	WIN 2012
9	Hambrook, David; Brown, Gary; Tchanturia, Kate	Emotional intelligence in anorexia nervosa: Is anxiety a missing piece of the puzzle?	MSCEIT	Ability	Psychiatry Research	Nov-12
10	Schutte, Nicola S.; Malouff, John M.	Priming ability emotional intelligence	MSCEIT	Ability	Intelligence	NOV-DEC 2012
11	Carmen Carmona-Navarro, Ma; Carmen Pichardo-Martinez, Ma	Attitudes of nursing professionals towards suicidal behavior: influence of emotional intelligence	TMMS	Ability	Revista Latino-Americana De Enfermagem	NOV-DEC 2012

No.	Author(S)	Article title	Emotional intelligence measure	Emotional intelligence model	Journal	Date published
12	Brunetto, Yvonne; Teo, Stephen T. T.; Shacklock, Kate; Farr-Wharton, Rod	Emotional intelligence, job satisfaction, well-being and engagement: explaining organisational commitment and turnover intentions in policing	WLEIS	Ability	Human Resource Management Journal	Nov-12
13	Aminabadi, Naser-Asl; Pourkazemi, Maryam; Babapour, Jalil; Oskouei, Sina-Ghertasi	The impact of maternal emotional intelligence and parenting style on child anxiety and behavior in the dental setting	EQ-i	Mixed	Medicina Oral Patologia Oral Y Cirugia Bucal	Nov-12
14	Di Fabio, Annamaria; Kenny, Maureen E.	The contribution of emotional Intelligence to decisional styles among Italian high school students	EQ-i	Mixed	Journal of Career Assessment	Nov-12
15	Berastegui, C.; Van Leeuwen, N.; Chabrol, H.	Relationships between emotional intelligence, alexithymia and interpersonal delinquent behaviour in a sample of high-school students	TEIQue	Trait	Encephale-Revue De Psychiatrie Clinique Biologique Et Therapeutique	Oct-12
16	Alegre, Albert	The relation between the time mothers and children spent together and the children's trait emotional intelligence	TEIQue	Trait	Child & Youth Care Forum	Oct-12

No.	Author(S)	Article title	Emotional intelligence measure	Emotional intelligence model	Journal	Date published
17	Di Fabio, Annamaria; Kenny, Maureen E.	Emotional intelligence and perceived social support among Italian high school students	MSCEIT	Ability	Journal of Career Development	Oct-12
18	Lloyd, Sandra J.; Malek-Ahmadi, Michael; Barclay, Kathleen; Fernandez, Miguel R.; Chartrand, Max Stanley	Emotional intelligence (EI) as a predictor of depression status in older adults	EQ-i	Mixed	Archives of Gerontology And Geriatrics	NOV-DEC 2012
19	Kajbafnezhad, H.; Ahadi, H.; Heidarie, A.; Askari, P.; Enayati, M.	Predicting athletic success motivation using mental skin and emotional intelligence and its components in male athletes	EQ-i	Mixed	Journal of Sports Medicine And Physical Fitness	Oct-12
20	Maul, Andrew	The validity of the Mayer-Salovey-Caruso emotional intelligence Test (MSCEIT) as a measure of emotional intelligence	MSCEIT	Ability	Emotion Review	Oct-12
21	Lolaty, Hamideh A; Ghahari, Sharbanoo; Tirgari, Abdolhaki m; Fard, Jabbar Heydari	The effect of life skills training on emotional intelligence of the medical sciences students in Iran.	EQ-i	Mixed	Indian Journal of Psychological Medicine	2012 -Oct

No.	Author(S)	Article title	Emotional intelligence measure	Emotional intelligence model	Journal	Date published
22	Smith, Samuel G.; Petrides, K. V.; Green, James S. A.; Sevdalis, Nick	The role of trait emotional intelligence in the diagnostic cancer pathway	TEIQue	Trait	Supportive Care In Cancer	Nov-12
23	Stanescu, Dan Florin; Cicei, Cristiana Catalina	Leadership styles and emotional intelligence of Romanian public managers. Evidences from an exploratory pilot study	EQ-i	Mixed	Revista De Cercetare Si Interventie Sociala	Sep-12
24	Sadri, Golnaz	Emotional intelligence and leadership development	MSCEIT	Ability	Public Personnel Management	FAL 2012
25	Agnoli, Sergio; Mancini, Giacomo; Pozzoli, Tiziana; Baldaro, Bruno; Russo, Paolo Maria; Surcinelli, Paola	The interaction between emotional intelligence and cognitive ability in predicting scholastic performance in school-aged children	TEIQue	Trait	Personality and Individual Differences	Oct-12

No.	Author(S)	Article title	Emotional intelligence measure	Emotional intelligence model	Journal	Date published
26	Lanciano, Tiziana; Curci, Antonietta; Kafetsios, Konstantinos; Elia, Lucia; Zammuner, Vanda Lucia	Attachment and dysfunctional rumination: The mediating role of emotional intelligence abilities	MSCEIT	Ability	Personality and Individual Differences	Oct-12
27	Kilpatrick, Charlie C.; Doyle, Peter D.; Reichman, Eric F.; Chohan, Lubna; Uthman, Margaret O.; Orejuela, Francisco J.	Emotional intelligence and selection to administrative chief residency	EQ-i	Mixed	Academic Psychiatry	SEP-OCT 2012
28	Baltaci, Hulya Sahin; Demir, Kamile	Pre-service classroom teachers' emotional intelligence and anger expression styles	EQ-i	Mixed	Kuram Ve Uygulamada Egitim Bilimleri	FAL 2012
29	Di Fabio, Annamaria; Palazzeschi, Letizia; Bar-On, Reuven	The role of personality traits, core self-evaluation, and emotional intelligence in career decision-making difficulties	EQ-i	Mixed	Journal of Employment Counseling	Sep-12

No.	Author(S)	Article title	Emotional intelligence measure	Emotional intelligence model	Journal	Date published
30	Pena Garrido, Mario; Extremera Pacheco, Natalio	Perceived emotional intelligence in primary school teachers and its relationship with levels of burnout and engagement	TMMS	Ability	Revista De Educacion	SEP-DEC 2012
31	Ruiz, Eulalia; Salazar, Isabel C.; Caballo, Vicente E.	Emotional intelligence, emotional regulation and personality styles/disorders	TMMS	Ability	Behavioral Psychology-Psicologia Conductual	Sep-12
32	Jahangard, Leila; Haghghi, Mohammad; Bajoghli, Hafez; Ahmadpanah, Mohammad; Ghaleiha, Ali; Zarrabian, Mohammad Kazem; Brand, Serge	Training emotional intelligence improves both emotional intelligence and depressive symptoms in inpatients with borderline personality disorder and depression	EQ-i	Mixed	International Journal of Psychiatry In Clinical Practice	Sep-12
33	Kong, Feng; Zhao, Jingjing; You, Xuqun	Social support mediates the impact of emotional intelligence on mental distress and life satisfaction in Chinese young adults	WLEIS	Ability	Personality and Individual Differences	Sep-12

No.	Author(S)	Article title	Emotional intelligence measure	Emotional intelligence model	Journal	Date published
34	Harper, Mary G.; Jones-Schenk, Jan	The emotional intelligence profile of successful staff nurses	EQ-i	Mixed	Journal of Continuing Education in Nursing	Aug-12
35	Ford, Brett Q.; Tamir, Maya	When Getting Angry Is Smart: Emotional Preferences and Emotional Intelligence	MSCEIT	Ability	PAEDIATRICA CROATICA	Nov-12
36	Iliescu, Dragos; Ilie, Alexandra; Ispas, Dan; Ion, Andrei	Emotional intelligence in personnel selection: applicant reactions, criterion, and incremental validity	MSCEIT	Ability	International Journal of Selection and Assessment	Sep-12
37	Nizielski, Sophia; Hallum, Suhair; Lopes, Paulo N.; Schuetz, Astrid	Attention to student needs mediates the relationship between teacher emotional intelligence and student misconduct in the classroom	WLEIS	Ability	Journal of Psychoeducational Assessment	Aug-12
38	Cheng, Ting; Huang, Guo-Hua; Lee, Cynthia; Ren, Xiaopeng	Longitudinal effects of job insecurity on employee outcomes: The moderating role of emotional intelligence and the leader-member exchange	WLEIS	Ability	Asia Pacific Journal of Management	Sep-12

No.	Author(S)	Article title	Emotional intelligence measure	Emotional intelligence model	Journal	Date published
39	Chen, Ziguang; Lam, Wing; Zhong, Jian An	Effects of perceptions on LMX and work performance: Effects of supervisors' perception of subordinates' emotional intelligence and subordinates' perception of trust in the supervisor on LMX and, consequently, performance	WLEIS	Ability	Asia Pacific Journal of Management	Sep-12
40	Goergens-Ekermans, Gina; Brand, Tamari	Emotional intelligence as a moderator in the stress-burnout relationship: a questionnaire study on nurses	SUEIT	Ability	Journal of Clinical Nursing	Aug-12
41	Rivers, Susan E.; Brackett, Marc A.; Reyes, Maria R.; Mayer, John D.; Caruso, David R.; Salovey, Peter	Measuring emotional intelligence in early adolescence with the MSCEIT-YV: Psychometric properties and relationship with academic performance and psychosocial functioning	MSCEIT	Ability	Journal of Psychoeducational Assessment	Aug-12
42	James, Colin; Bore, Miles; Zito, Susanna	Emotional intelligence and personality as predictors of psychological well-being	WLEIS	Ability	Journal of Psychoeducational Assessment	Aug-12

No.	Author(S)	Article title	Emotional intelligence measure	Emotional intelligence model	Journal	Date published
43	Burrus, Jeremy; Betancourt, Anthony; Holtzman, Steven; Minsky, Jennifer; Maccann, Carolyn; Roberts, Richard D.	Emotional intelligence relates to well-being: Evidence from the situational judgment test of emotional management	STEM	Ability	Applied Psychology-Health and Well Being	Jul-12
44	Keefe, Kateryna V.; Parker, James D. A.; Wood, Laura M.	Trait emotional intelligence and university graduation outcomes: Using latent profile analysis to identify students at risk for degree noncompletion	TEIQue	Trait	Journal of Psychoeducational Assessment	Aug-12
45	Troth, Ashlea C.; Jordan, Peter J.; Lawrence, Sandra A.	Emotional intelligence, communication competence, and student perceptions of team social cohesion	WEIP	Ability	Journal of Psychoeducational Assessment	Aug-12
46	Lopez-Zafra, Esther; Martos, Manuel-Pulido; Berrios Martos, M. Pilar; Augusto-Landa, Jose M.	Psychometric properties of the Spanish version of the work group emotional intelligence profile-short version	WEIP	Ability	Psicothema	Aug-12

No.	Author(S)	Article title	Emotional intelligence measure	Emotional intelligence model	Journal	Date published
47	Van Der Linden, Dimitri; Tsaousis, Ioannis; Petrides, K. V.	Overlap between general factors of personality in the big five, giant three, and trait emotional intelligence	TEIQue	Trait	Personality and Individual Differences	Aug-12
48	Li, Tongwei; Saklofske, Donald H.; Bowden, Stephen C.; Yan, Gonggu; Fung, Tak Shing	The measurement invariance of the wong and law emotional intelligence scale (WLEIS) across three chinese university student groups from Canada and China	WLEIS	Ability	Journal of Psychoeducational Assessment	Aug-12
49	Lin, Yu-Chung; Wynn, Jonathan K.; Hellemann, Gerhard; Green, Michael F.	Factor structure of emotional intelligence in schizophrenia	MSCEIT	Ability	Schizophrenia Research	Aug-12
50	Salguero, Jose M.; Extremera, Natalio; Fernandez-Berrocal, Pablo	Emotional intelligence and depression: The moderator role of gender	MSCEIT	Ability	Personality and Individual Differences	Jul-12
51	Celik, Vehbi; Karakus, Mehmet	Emotional intelligence and affect based job outcomes: a multilevel study on school administrators and teachers	EQ-i	Mixed	Energy Education Science and Technology Part B-Social and Educational Studies	Jul-12

No.	Author(S)	Article title	Emotional intelligence measure	Emotional intelligence model	Journal	Date published
52	Choi, Sungwon; Kluemper, Donald H.	The relative utility of differing measures of emotional intelligence: Other-report EI as a predictor of social functioning	MSCEIT	Ability	European Review of Applied Psychology- Revue Europeenne De Psychologie Appliquee	Jul-12
53	Farh, Crystal I. C. Chien; Seo, Myeong-Gu; Tesluk, Paul E.	Emotional intelligence, teamwork effectiveness, and job performance: The moderating role of job context	MSCEIT	Ability	Journal of Applied Psychology	Jul-12
54	Lin, Yi-Chun; Chen, Angela Shin-Yih; Song, Yi-Chen	Does your intelligence help to survive in a foreign jungle? The effects of cultural intelligence and emotional intelligence on cross-cultural adjustment	WLEIS	Ability	International Journal of Intercultural Relations	Jul-12
55	Allen, Dianne E.; Ploeg, Jenny; Kaasalainen, Sharon	The relationship between emotional intelligence and clinical teaching effectiveness in nursing faculty	EQ-i	Mixed	Journal of Professional Nursing	JUL-AUG 2012
56	Ermer, Elsa; Kahn, Rachel E.; Salovey, Peter; Kiehl, Kent A.	Emotional intelligence in incarcerated men with psychopathic traits	MSCEIT	Ability	Journal of Personality And Social Psychology	Jul-12

No.	Author(S)	Article title	Emotional intelligence measure	Emotional intelligence model	Journal	Date published
57	Walter, Frank; Humphrey, Ronald H.; Cole, Michael S.	Unleashing leadership potential: Toward an evidence-based management of emotional intelligence	MSCEIT	Ability	Organizational Dynamics	JUL-SEP 2012
58	Peter, Paula C.; Brinberg, David	Learning Emotional Intelligence: An Exploratory Study in the Domain of Health	MSCEIT	Ability	Journal of Applied Social Psychology	Jun-12
59	Pool, Lorraine Dacre; Qualter, Pamela	Improving emotional intelligence and emotional self-efficacy through a teaching intervention for university students	MSCEIT	Ability	Learning and Individual Differences	Jun-12
60	Lee, Hyuneung; Kwak, Yunjung	Development and initial validation of a trait emotional intelligence scale for Korean adults	TEIQue	Trait	Asia Pacific Education Review	Jun-12
61	Killgore, William D. S.; Weber, Mareen; Schwab, Zachary J.; Deldonno, Sophie R.; Kipman, Maia; Weiner, Melissa R.; Rauch, Scott L.	Gray matter correlates of trait and ability models of emotional intelligence	MSCEIT	Ability	Neuroreport	JUN 20 2012

No.	Author(S)	Article title	Emotional intelligence measure	Emotional intelligence model	Journal	Date published
62	Fellner, Angela N.; Matthews, Gerald; Shockley, Kevin D.; Warm, Joel S.; Zeidner, Moshe; Karlov, Lisa; Roberts, Richard D.	Using emotional cues in a discrimination learning task: Effects of trait emotional intelligence and affective state	TEIQue	Trait	Journal of Research in Personality	Jun-12
63	Ann, Bao-Yi; Yang, Chun-Chi	The moderating role of personality traits on emotional intelligence and conflict management styles	WLEIS	Ability	Psychological Reports	Jun-12
64	Turnipseed, David L.; Vandewaa, Elizabeth A.	Relationship between emotional intelligence and organizational citizenship behavior	GENOS/S UIET	Ability	Psychological Reports	Jun-12
65	Cavazotte, Flavia; Moreno, Valter; Hickmann, Mateus	Effects of leader intelligence, personality and emotional intelligence on transformational leadership and managerial performance	WLEIS	Ability	Leadership Quarterly	Jun-12

No.	Author(S)	Article title	Emotional intelligence measure	Emotional intelligence model	Journal	Date published
66	Russo, Paolo Maria; Mancini, Giacomo; Trombini, Elena; Baldaro, Bruno; Mavroveli, Stella; Petrides, K. V.	Trait Emotional Intelligence and the Big Five: A study on Italian Children and Preadolescents	TEIQue	Trait	Journal of Psychoeducational Assessment	Jun-12
67	Gartzia, Leire; Aritzeta, Aitor; Balluerka, Nekane; Barbera, Esther	Emotional intelligence and gender: beyond sex differences	MSCEIT	Ability	Anales De Psicologia	May-12
68	Pastuszak, Anna	[Relationship between emotion regulation and emotional intelligence in borderline personality disorder].	MSCEIT	Ability	Psychiatria Polska	2012 May-Jun
69	Siegling, Alexander B.; Saklofske, Donald H.; Vesely, Ashley K.; Nordstokke, David W.	Relations of emotional intelligence with gender-linked personality: Implications for a refinement of EI constructs	TEIQue	Trait	Personality and Individual Differences	May-12

No.	Author(S)	Article title	Emotional intelligence measure	Emotional intelligence model	Journal	Date published
70	Chamorro-Premuzic, Tomas; Swami, Viren; Cermakova, Blanka	Individual differences in music consumption are predicted by uses of music and age rather than emotional intelligence, neuroticism, extraversion or openness	TEIQve	Trait	Psychology of Music	May-12
71	Jung, Hyo Sun; Yoon, Hye Hyun	The effects of emotional intelligence on counterproductive work behaviors and organizational citizen behaviors among food and beverage employees in a deluxe hotel	MSCEIT	Ability	International Journal of Hospitality Management	Jun-12
72	Fiori, Marina; Antonakis, John	Selective attention to emotional stimuli: What IQ and openness do, and emotional intelligence does not	MSCEIT	Ability	Intelligence	MAY-JUN 2012
73	Del Carmen Aguilar-Luzon, Ma; Calvo-Salguero, Antonia; Monteoliva-Sanchez, Adelaida	Perceived emotional intelligence and its relationship with adult attachment	TMMS	Ability	Behavioral Psychology-Psicologia Conductual	Apr-12

No.	Author(S)	Article title	Emotional intelligence measure	Emotional intelligence model	Journal	Date published
74	Faria, Luisa; Lima-Santos, Nelson	Emotional intelligence in the portuguese academic context: validation studies of "the emotional skills and competence questionnaire" (escq)	MSCEIT	Ability	Behavioral Psychology- Psicologia Conductual	Apr-12
75	Trinidad Sanchez-Nunez, Ma; Latorre Postigo, Jose Miguel	Emotional intelligence and family environment	TMMS	Ability	Behavioral Psychology- Psicologia Conductual	Apr-12
76	Sainz, Marta; Ferrando, Mercedes; Hernandez, Daniel; del Carmen Fernandez, Maria; Ferrandiz, Carmen; Bermejo, Rosario; Dolores Prieto, Maria	Stress management as an emotional intelligence competence in students	BAR-ON	Mixed	Behavioral Psychology- Psicologia Conductual	Apr-12
77	Schmitz, Paul G.; Schmitz, Florian	Emotional intelligence and acculturation	TMMS	Ability	Behavioral Psychology- Psicologia Conductual	Apr-12
78	Alicia Zavala, Maria; Lopez, Isaura	Adolescents at risks: what is the role of emotional intelligence?	EQ-i	Mixed	Behavioral Psychology- Psicologia Conductual	Apr-12

No.	Author(S)	Article title	Emotional intelligence measure	Emotional intelligence model	Journal	Date published
79	Wang, Chuang; Kim, Do-Hong; Ng, Kok-Mun	Factorial and Item-Level Invariance of an Emotional Intelligence Scale Across Groups of International Students	WLEIS	Ability	Journal of Psychoeducational Assessment	Apr-12
80	Fernandez-Berrocal, Pablo; Cabello, Rosario; Castillo, Ruth; Extremera, Natalio	Gender differences in emotional intelligence: the mediating effect of age	MSCEIT	Ability	Behavioral Psychology-Psicologia Conductual	Apr-12
81	Augusto-Landa, Jose Ma; Lopez-Zafra, Esther; Pilar Berrios-Martos, M.; Pulido-Martos, Manuel	Analyzing the relations among perceived emotional intelligence, affect balance and burnout	TMMS	Ability	Behavioral Psychology-Psicologia Conductual	Apr-12
82	Pilar Berrios-Martos, M.; Pulido-Martos, Manuel; Maria Augusto-Landa, Jose; Lopez-Zafra, Esther	Emotional intelligence and sense of humor as predictors of subjective well-being	BAR-ON	Mixed	Behavioral Psychology-Psicologia Conductual	Apr-12

No.	Author(S)	Article title	Emotional intelligence measure	Emotional intelligence model	Journal	Date published
83	Fukuda, Eriko; Saklofske, Donald H.; Tamaoka, Katsuo; Lim, Hyunjung	Factor structure of the Korean version of Wong and Law's emotional intelligence scale	WLEIS	Ability	Assessment	Mar-12
84	Di Fabio, Annamaria; Palazzeschi, Letizia	Organizational justice: personality traits or emotional intelligence? An empirical study in an Italian hospital context	EQ-i	Mixed	Journal of Employment Counseling	Mar-12
85	Saklofske, Donald H.; Austin, Elizabeth J.; Mastoras, Sarah M.; Beaton, Laura; Osborne, Shona E.	Relationships of personality, affect, emotional intelligence and coping with student stress and academic success: Different patterns of association for stress and success	TEIQue	Trait	Learning and Individual Differences	Apr-12
86	Salguero, Jose M.; Palomera, Raquel; Fernandez-Berrocal, Pablo	Perceived emotional intelligence as predictor of psychological adjustment in adolescents: a 1-year prospective study	TMMS	Ability	European Journal of Psychology of Education	Mar-12
87	Zeidner, Moshe; Matthews, Gerald; Roberts, Richard D.	The emotional intelligence, health, and well-being nexus: what have we learned and what have we missed?	TEIQue	Trait	Applied Psychology-Health and Well Being	Mar-12

No.	Author(S)	Article title	Emotional intelligence measure	Emotional intelligence model	Journal	Date published
88	Smith, Samuel G.; Turner, Bruce; Pati, Jhumur; Petrides, K. V.; Sevdalis, Nick; Green, James S. A.	Psychological impairment in patients urgently referred for prostate and bladder cancer investigations: the role of trait emotional intelligence and perceived social support	TEIQue	Trait	Supportive Care in Cancer	Apr-12
89	Sinclair, Helen; Feigenbaum, Janet	Trait emotional intelligence and borderline personality disorder	TEIQue	Trait	Personality and Individual Differences	Apr-12
90	Frederickson, Norah; Petrides, K. V.; Simmonds, Elizabeth	Trait emotional intelligence as a predictor of socioemotional outcomes in early adolescence	TEIQue	Trait	Personality and Individual Differences	Feb-12
91	Lomas, Justine; Stough, Con; Hansen, Karen; Downey, Luke A.	Brief report: Emotional intelligence, victimisation and bullying in adolescents	SUIET	Ability	Journal of Adolescence	Feb-12
92	Kokkinos, Constantinos M.; Kipritsi, Eirini	The relationship between bullying, victimization, trait emotional intelligence, self-efficacy and empathy among preadolescents	TEIQue	Trait	Social Psychology of Education	Mar-12
93	Benson, Gerry; Martin, Lynn; Ploeg, Jenny; Wessel, Jean	Longitudinal study of emotional intelligence, leadership, and caring in undergraduate nursing students	EQ-i	Mixed	Journal of Nursing Education	Feb-12

No.	Author(S)	Article title	Emotional intelligence measure	Emotional intelligence model	Journal	Date published
94	Pishghadam, Reza; Sahebjam, Samaneh	Personality and Emotional Intelligence in Teacher Burnout	BAR-ON	Mixed	Spanish Journal of Psychology	Mar-12
95	Edgar, Christopher; Mcrorie, Margaret; Sneddon, Ian	Emotional intelligence, personality and the decoding of non-verbal expressions of emotion	EIS	Ability	Personality and Individual Differences	Feb-12
96	Chang, Jin Wook; Sy, Thomas; Choi, Jin Nam	Team Emotional Intelligence and Performance: Interactive Dynamics between Leaders and Members	SCHUTTE	Mixed	Acta Paulista de Enfermagem	2012
97	Espinoza, Maritza, V; Sanhueza A, Olivia	Fear of death and its relationship with emotional intelligence of nursing students in Concepcion	TMMS	Ability	Life Science Journal-Acta Zhengzhou University Overseas Edition	2012
98	Mirza, Mojgan; Redzuan, Ma'rof	The relationship between principal's emotional intelligence and leadership styles in primary schools	EQ-i	Mixed	Life Science Journal-Acta Zhengzhou University Overseas Edition	2012
99	Aradilla-Herrero, Amor; Tomas-Sabado, Joaquin; Gomez-Benito, Juana	Death attitudes and emotional intelligence in nursing students	TMMS	Ability	Omega-Journal of Death and Dying	2012

No.	Author(S)	Article title	Emotional intelligence measure	Emotional intelligence model	Journal	Date published
100	Ferragut, Marta; Fierro, Alfredo	Emotional intelligence, well-being and academic achievement in preadolescents	TMMS	Ability	Revista Latinoamericana De Psicología	2012
101	Senior, Carl; Howard, Christopher; Reddy, Peter; Clark, Robin; Lim, Ming	The relationship between student-centred lectures, emotional intelligence, and study teams: a social telemetry study with mobile telephony	TEIQue	Trait	Emotion	Aug-12
102	Abadi, Sadighe Homayoni Najaf; Shahtalebi, Badri	The relationship between emotional intelligence and organizational commitment of principals of schools in Najaf Abad in 1390-91	SCHUTTE	Mixed	International Journal of Psychology	2012
103	Libbrecht, Nele; Lievens, Filip	Validity evidence for the situational judgment test paradigm in emotional intelligence measurement	STEU	Ability	International Journal of Psychology	2012
104	Dawson, Sara; Kettler, Lisa; Burton, Cassandra; Galletly, Cherrie	Do people with schizophrenia lack emotional intelligence?	MSCEIT	Ability	Schizophrenia a research and treatment	2012

No.	Author(S)	Article title	Emotional intelligence measure	Emotional intelligence model	Journal	Date published
105	Kong, Feng; Zhao, Jingjing; You, Xuqun	Trait emotional intelligence and mental distress: The mediating role of positive and negative affect	WLEIS	Ability	International Journal of Psychology	2012
106	Zhang Hui; Ding Lu; Sun Hong	Correlation between trait emotional intelligence and life quality in medical staff	TEIQue	Trait	Chinese General Practice	2012
107	Yuan, Benjamin J. C.; Hsu, Wan-Lung; Shieh, Jia-Horng; Li, Kuang-Pin	Increasing emotional intelligence of employees: evidence from research and development teams in taiwan	WLEIS	Ability	Creativity and Innovation Management	Jun-12
108	Kim, Taegoo (Terry); Yoo, Joanne Jung-Eun; Lee, Gyehee; Kim, Joungman	Emotional intelligence and emotional labor acting strategies among frontline hotel employees	WLEIS	Ability	Psychological Reports	Jun-12

No.	Author(S)	Article title	Emotional intelligence measure	Emotional intelligence model	Journal	Date published
109	Ruiz-Aranda, Desiree; Martin Salguero, Jose; Cabello, Rosario; Palomera, Raquel; Fernandez-Berrocal, Pablo	Can an emotional intelligence program improve adolescents' psychosocial adjustment? results from the intemo project	MSCEIT	Ability	Life Science Journal-Acta Zhengzhou University Overseas Edition	2012
110	Naghavi, Fataneh; Redzuan, Ma'rof	Family size and construct of the early adolescent's emotional intelligence	EIS	Ability	Life Science Journal-Acta Zhengzhou University Overseas Edition	2012
111	Erkutlu, Hakan; Chafra, Jamel	The impact of team empowerment on proactivity: the moderating roles of leader's emotional intelligence and proactive personality	Bar-on	Mixed	Journal of health organization and management	2012
112	Rodeiro, Carmen L. Vidal; Emery, Joanne L.; Bell, John F.	Emotional intelligence and academic attainment of British secondary school children: a cross-sectional survey	TEIQue	Trait	Educational Studies	2012
113	Pope, Debbie; Roper, Claire; Qualter, Pamela	The influence of emotional intelligence on academic progress and achievement in UK university students	MSCEIT	Ability	Assessment & Evaluation in Higher Education	2012

No.	Author(S)	Article title	Emotional intelligence measure	Emotional intelligence model	Journal	Date published
114	Borges, Nicole J.; Kirkham, Karen; Deardorff, Adam S.; Moore, Jeremy A.	Development of emotional intelligence in a team-based learning internal medicine clerkship	WEIP	Ability	Medical Teacher	2012
115	Grubb, Amy; Brown, Sarah	Hostage (crisis) negotiation: the potential role of negotiator personality, decision-making style, coping style and emotional intelligence on negotiator success.	BAR-ON	Mixed	International journal of emergency mental health	2012
116	Naghavi, Fataneh; Redzuan, Ma'rof; Asgari, Arezoo; Mirza, Mojgan	Gender differences and construct of the early adolescent's emotional intelligence	EIS	Ability	Life Science Journal-Acta Zhengzhou University Overseas Edition	2012
117	Ferrandiz, Carmen; Hernandez, Daniel; Bermejo, Rosario; Ferrando, Mercedes; Sainz, Marta	Emotional and social intelligence in childhood and adolescence: Spanish evaluation of a measurement instrument	EQ-i	Mixed	Revista De Psicodidactica	2012

No.	Author(S)	Article title	Emotional intelligence measure	Emotional intelligence model	Journal	Date published
118	Zakariasen, Ken; Victoroff, Kristin; Zakariasen	Leaders and emotional intelligence: a view from those who follow.	ESCI	Mixed	Healthcare Management Forum / Canadian College of Health Service Executives = Forum Gestion Des Soins De Sante / College Canadien Des Directeurs De Services De Sante	2012
119	Brabec, Claire M.; Gfeller, Jeffrey D.; Ross, Michael J.	An exploration of relationships among measures of social cognition, decision making, and emotional intelligence	TMMS	Ability	Journal of Clinical and Experimental Neuropsychology	2012
120	Turnipseed, David L.; Vandewaa, Elizabeth	The relationship between the four branch model of emotional intelligence and discretionary behavior of university educators	MSCEIT	Ability	Discretionary Behavior and Performance in Educational Organizations: The Missing Link In Educational Leadership and Management, Vol 13	2012

No.	Author(S)	Article title	Emotional intelligence measure	Emotional intelligence model	Journal	Date published
121	Min, Jennifer; Peng, Kua-Hsin	Ranking emotional intelligence training needs in tour leaders: an entropy-based TOPSIS approach	MSCEIT	Ability	Current Issues in Tourism	2012
122	Pena, Mario; Rey, Lourdes; Extremera, Natalio	Personal welfare and labor in elementary and primary teachers: differences depending on their emotional intelligence and gender	WLEIS	Ability	Revista De Psicodidactica	2012
123	Ding Xiaqi; Tian Kun; Yang Chongsen; Gong Sufang	Abusive supervision and LMX Leaders' emotional intelligence as antecedent variable and trust as consequence variable	WLEIS	Ability	Chinese Management Studies	2012
124	Maul, Andrew	Examining the structure of emotional intelligence at the item level: New perspectives, new conclusions	MSCEIT	Ability	Cognition & Emotion	2012
125	Hu, Hsiu-Hua	The influence of employee emotional intelligence on coping with supervisor abuse in a banking context	WLEIS	Ability	Social Behavior and Personality	2012

No.	Author(S)	Article title	Emotional intelligence measure	Emotional intelligence model	Journal	Date published
126	Naghavi, Fataneh; Redzuan, Marof	Relationships between family functioning, alexithymia and emotional intelligence among early adolescents in Tehran-Iran	EIS	Ability	Life Science Journal-Acta Zhengzhou University Overseas Edition	2012
127	Whiteoak, John W.; Manning, Rana L.	Emotional intelligence and its implications on individual and group performance: a study investigating employee perceptions in the United Arab Emirates	WEIP	Ability	Psychiatria Polska	MAR-APR 2012
128	Naghavi, Fataneh; Redzuan, Marof	Relationship between family environment and emotional intelligence: examination of the Moderating Factor	EQ-i	Mixed	Life Science Journal-Acta Zhengzhou University Overseas Edition	2012
129	Koydemir, Selda; Schuetz, Astrid	Emotional intelligence predicts components of subjective well-being beyond personality: A two-country study using self- and informant reports	SCHUTTE	Mixed	British Journal of Management	Mar-12
130	Emmerling, Robert J.; Boyatzis, Richard E.	Emotional and social intelligence competencies: cross cultural implications	ESC	Mixed	Cross Cultural Management -An International Journal	2012

No.	Author(S)	Article title	Emotional intelligence measure	Emotional intelligence model	Journal	Date published
131	Sharma, Radha	Measuring social and emotional intelligence competencies in the Indian context	ECI	Mixed	Cross Cultural Management -An International Journal	2012
132	Han, Heeyoung; Johnson, Scott D.	Relationship between students' emotional intelligence, social bond, and interactions in online learning	MSCEIT	Ability	Educational Technology & Society	Jan-12
133	Nooryan, Kheirollah; Gasparyan, K; Sharif, F; Zoladl, M	Controlling anxiety in physicians and nurses working in intensive care units using emotional intelligence items as an anxiety management tool in Iran.	BAR-ON	Mixed	International Journal of Bilingual Education and Bilingualism	2012
134	Cheung, Francis Yue-lok; Tang, Catherine So-kum	The Effect of Emotional Dissonance and Emotional Intelligence on Work-Family Interference	WLEIS	Ability	Life Science Journal-Acta Zhengzhou University Overseas Edition	2012
135	Wagner, Shannon L.; Martin, Crystal A.	Can firefighters' mental health be predicted by emotional intelligence and proactive coping?	EIS	Ability	Journal Of Loss & Trauma	2012
136	Ozanska-Ponikwia, Katarzyna	What has personality and emotional intelligence to do with 'feeling different' while using a foreign language?	TEIQue	Trait	International Journal of Bilingual Education and Bilingualism	2012

No.	Author(S)	Article title	Emotional intelligence measure	Emotional intelligence model	Journal	Date published
137	Basseda, Zahra; Amini, Homayoun; Sharifi, Vandad; Kaviani, Hosein; Pooretemad, Hamid Reza; Zadbood, Asieh	Emotional Intelligence in a group of patients with first-episode psychosis in Iran.	EQ-i	Mixed	Acta Medica Iranica	2012
138	Davis, Sarah K.; Humphrey, Neil	Emotional intelligence predicts adolescent mental health beyond personality and cognitive ability	TEIQue	Trait	Personality and Individual Differences	Jan-12

APPENDIX B1 – TABLE FOR DETERMINING SAMPLE SIZE

Table for determining sample size from a given population (Taken from the original source Krejcie & Morgan (1970) page 608)

<i>N</i>	<i>S</i>	<i>N</i>	<i>S</i>	<i>N</i>	<i>S</i>
10	10	220	140	1200	291
15	14	230	144	1300	297
20	19	240	148	1400	302
25	24	250	152	1500	306
30	28	260	155	1600	310
35	32	270	159	1700	313
40	36	280	162	1800	317
45	40	290	165	1900	320
50	44	300	169	2000	322
55	48	320	175	2200	327
60	52	340	181	2400	331
65	56	360	186	2600	335
70	59	380	191	2800	338
75	63	400	196	3000	341
80	66	420	201	3500	346
85	70	440	205	4000	351
90	73	460	210	4500	354
95	76	480	214	5000	357
100	80	500	217	6000	361
110	86	550	226	7000	364
120	92	600	234	8000	367
130	97	650	242	9000	368
140	103	700	248	10000	370

150	108	750	254	15000	375
160	113	800	260	20000	377
170	118	850	265	30000	379
180	123	900	269	40000	380
190	127	950	274	50000	381
200	132	1000	278	75000	382
210	136	1100	285	1000000	384

Note.— N is population size.

S is sample size.

APPENDIX B2 – TABLE FOR STATISTICAL POWER ANALYSIS

Table for Power levels for the Comparison of Two Means, Variations by Sample Size, Significance Level and Effect Size

Sample Size	alpha (α) = .05		alpha (α) = .01	
	Effect Size (<i>ES</i>)		Effect Size (<i>ES</i>)	
	Small	Moderate	Small	Moderate
	(.2)	(.5)	(.2)	(.5)
20	.095	.338	.025	.144
40	.143	.598	.045	.349
60	.192	.775	.067	.549
80	.242	.882	.092	.709
100	.290	.940	.120	.823
150	.411	.990	.201	.959
200	.516	.998	.284	.992

Source: SOLO Power Analysis, BMDP Statistical Software, Inc. [2] taken from Hair et al., (2006)

APPENDIX E – ETHICS APPROVAL

E1: Approval letter for Study 1

Institute of Work, Health & Organisations

<http://www.nottingham.ac.uk/iwho>



The University of
Nottingham

WAN NURUL IZZA BINTI WAN HUSIN
Institute of Work Health and Organisations
University of Nottingham Malaysia Campus

Institute of Work, Health & Organisations
University of Nottingham Malaysia Campus
Jalan Broga 43500
Semenyih, Selangor Darul Ehsan
Malaysia

T: +603 8924 8250
F: +603 8924 8019

5 June 2012

Dear Izza

I-WHO Ethics Committee Review

Thank you for submitting your proposal on 'Emotional Intelligence: Ability or Trait?'. This proposal has now been reviewed by I-WHO's Ethics Committee to the extent that it is described in your submission.

I am happy to tell you that the Committee has found no problems with your proposal and is able to give approval.

If there are any significant changes or developments in the methods, treatment of data or debriefing of participants, then you are obliged to seek further ethical approval for these changes.

We would remind all researchers of their ethical responsibilities to research participants. The Codes of Practice setting out these responsibilities have been published by the British Psychological Society. If you have any concerns whatsoever during the conduct of your research then you should consult those Codes of Practice and contact the Ethics Committee.

Independently of the Ethics Committee procedures, supervisors also have responsibilities for staff and student safety during projects. Some information can be found in the Safety Office pages of the University web site. Particularly relevant may be:

Sections 6.9, 6.10, 6.11, 6.14 of the *Safety Handbook*, which deal with working away from the University.

<http://www.nottingham.ac.uk/safety/>

Safety circulars:

Fieldwork P5/99A on <http://www.nottingham.ac.uk/safety/publications/circulars/fieldwk.html>

Overseas travel/work P4/97A on <http://www.nottingham.ac.uk/safety/publications/circulars/overseas.html>

Risk assessment on <http://www.nottingham.ac.uk/safety/publications/circulars/risk-assessment.html>

Responsibility for compliance with the University Data Protection Policy and Guidance also lies with the project supervisor.

Ethics Committee approval does not alter, replace or remove those responsibilities, nor does it certify that they have been met.

We would remind all researchers of their responsibilities:

- to provide feedback to participants and participant organisations whenever appropriate, and
- to publish research for which ethical approval is given in appropriate academic and professional journals.

Sincerely

Angeli Santos, PhD
Director of Studies
On behalf of the Ethics Committee, I-WHO



E2: Approval letter for Study 2

Institute of Work, Health & Organisations

<http://www.nottingham.ac.uk/iwho>



The University of
Nottingham

WAN NURUL IZZA BINTI WAN HUSIN
Institute of Work Health and Organisations
University of Nottingham Malaysia Campus

Institute of Work, Health & Organisations
University of Nottingham Malaysia Campus
Jalan Broga 43500
Semenyih, Selangor Darul Ehsan
Malaysia

T: +603 8924 8250
F: +603 8924 8019

26 February 2013

Dear Izza

I-WHO Ethics Committee Review

Thank you for submitting your proposal on 'Emotional Intelligence: Ability or Trait? – Phase 2'. This proposal has now been reviewed by I-WHO's Ethics Committee to the extent that it is described in your submission.

I am happy to tell you that the Committee has found no problems with your proposal and is able to give approval.

If there are any significant changes or developments in the methods, treatment of data or debriefing of participants, then you are obliged to seek further ethical approval for these changes.

We would remind all researchers of their ethical responsibilities to research participants. The Codes of Practice setting out these responsibilities have been published by the British Psychological Society. If you have any concerns whatsoever during the conduct of your research then you should consult those Codes of Practice and contact the Ethics Committee.

Independently of the Ethics Committee procedures, supervisors also have responsibilities for staff and student safety during projects. Some information can be found in the Safety Office pages of the University web site. Particularly relevant may be:

Sections 6.9, 6.10, 6.11, 6.14 of the *Safety Handbook*, which deal with working away from the University.
<http://www.nottingham.ac.uk/safety/>

Safety circulars:

Fieldwork P5/99A on <http://www.nottingham.ac.uk/safety/publications/circulars/fieldwk.html>

Overseas travel/work P4/97A on <http://www.nottingham.ac.uk/safety/publications/circulars/overseas.html>

Risk assessment on <http://www.nottingham.ac.uk/safety/publications/circulars/risk-assessment.html>

Responsibility for compliance with the University Data Protection Policy and Guidance also lies with the project supervisor.

Ethics Committee approval does not alter, replace or remove those responsibilities, nor does it certify that they have been met.

We would remind all researchers of their responsibilities:

- to provide feedback to participants and participant organisations whenever appropriate, and
- to publish research for which ethical approval is given in appropriate academic and professional journals.

Sincerely

Angeli Santos, PhD
Director of Studies
On behalf of the Ethics Committee, I-WHO



