Abstract

This series of studies investigated a new measure of cognitive ability, the Multi-Tasks test, its place within the structure of intelligence and its usefulness in predicting job performance. The Multi-Tasks test employed a competing task methodology, being the simultaneous performance of two cognitive tasks, which has been shown to have a significant relationship with intelligence and job performance, particularly for complex jobs. The competing tasks methodology has a long history in psychology research and has recently experienced a resurgence of interest as technological advances (e.g., the Internet) have made it easier to administer these measures within the workplace. In the pilot study (Part A of Study 1) the means, reliability and demographic group differences of the measure were investigated. In Part B of Study 1 and Studies 2 and 3, the reliability and predictive validity of the test was compared to measures of general mental ability (crystallized and fluid intelligence) which have been widely used in personnel selection. Crystallized intelligence measures are language based and influenced by culture and education, whereas fluid intelligence tasks typically draw on non-verbal reasoning and are unaffected by education. These measures feature prominently in the Cattell-Horn-Carroll Theory of Cognitive Abilities, which forms the theoretical basis for these studies. In Study 2 and Study 3, additional cognitive measures were added to further elucidate the place of Multi-Tasks within the intelligence model, including a measure of short-term memory (Gsm in the CHC Theory). Previous research shows short-term memory and a related concept working memory, to be important in performance on the Multi-Tasks test. Further, the reliability and predictive validity of Multi-Tasks was compared to a personality measure (the Big Five model of personality) in Study 2, which is also widely used in job selection.

In all studies the Multi-Tasks test had high reliability, and it was found to be a more reliable measure than the general mental ability measures in Study 1 (Part B), Study 2 and
Study 3. In Study 1 (Part B) it was more highly correlated with the fluid than the crystallized intelligence measure. The addition of the short-term memory task in Study 2 revealed that the highest correlation was between Multi-Tasks and Gsm, however this factor did not appear in Study 3 and Multi-Tasks was, as per Study 1, a Gf measure. These findings support previous research demonstrating that the measure is likely to be relatively independent of the influence of culture and language and that it draws on working memory ability. All studies showed Multi-Tasks to be a good predictor of job performance. It strongly predicted two of three measures of job performance in Study 1 (Part B), three of four measures in Study 2 and it was positively associated with 1 out of 3 job performance indicators in Study 3. The other cognitive measures also predicted some measures of job performance in all studies, but not as strongly or consistently as Multi-Tasks. Study 3 demonstrated that the factor structure and reliability of the measure in a sample of Chinese workers was comparable to previous studies, which indicates that the measure is not affected by culture and can be employed cross-culturally. Other group differences in performance on the Multi-Tasks test were not consistent between studies, however where they did exist they showed older and more highly educated workers to perform better. This supports research showing that the Multi-Tasks test shows promise as a predictor of performance in complex jobs and managerial potential.

There were a number of limitations discussed and many opportunities for further research. Overall the results of these studies indicate that the Multi-Tasks test shows promise as a valid, reliable, culturally unbiased measure of job performance that is suitable for a variety of job roles, both in Australia and cross-culturally, and may be particularly useful as an indicator of management potential. As a new test, further research to replicate these findings is encouraged.

Keywords: competing tasks, multi-tasks, CHC Theory, attention, working memory, job performance, culture, culturally unbiased.
CERTIFICATION OF DISSERTATION

I certify that the ideas, experimental work, results analyses, software and conclusions reported in this dissertation are entirely my own effort, except where otherwise acknowledged. I also certify that the work is original and has not been previously submitted for any other award, except where otherwise acknowledged.

__________________________________________

Signature of Candidate Date

ENDORSEMENT

__________________________________________

Signature of Supervisor/s Date
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I would like to dedicate this PhD to my son Toby and wife Melinda, the most important people in my life. To my Mum and Dad who taught me to never give up and encouraged me to follow my dreams. I have been truly blessed.
Table of Contents

Abstract ........................................................................................................................................... II

Certification of Dissertation ........................................................................................................... IV

Acknowledgements ....................................................................................................................... V

Table of Contents ........................................................................................................................ VI

List of Tables ................................................................................................................................ XV

List of Appendices ........................................................................................................................ XXII

CHAPTER 1 ..................................................................................................................................... 23

1.1 STRUCTURE............................................................................................................................ 24

1.2 STATEMENT OF OBJECTIVES ............................................................................................. 24

1.3 BROAD STUDY AIMS ............................................................................................................ 25

CHAPTER 2 ..................................................................................................................................... 27

2.1 DEFINITION OF COMPETING TASKS .................................................................................. 28

2.1.1 Mechanisms underlying performance on competing tasks .............................................. 29

2.1.1.1 Capacity models of attention. .................................................................................... 29

2.1.1.2 Individual differences................................................................................................. 31

2.1.1.3 Timesharing. ............................................................................................................. 31

2.2 THE CHC THEORY OF COGNITIVE ABILITIES .................................................................. 34

2.2.1 Definitions of broad abilities. .......................................................................................... 37

2.2.2 Working memory and the CHC Theory ........................................................................... 40

2.2.3 Mental speed- the key to understanding intelligence? .................................................... 41

2.3 COMPETING TASKS AND INTELLIGENCE ........................................................................ 42

2.3.1 CHC theory and competing task performance ............................................................... 42
2.3.2 Competing tasks, Gf and WM ................................................................. 42
2.3.2.1 Competing tasks and processing speed ........................................... 45
2.3.3 Cognitive mechanisms underlying competing tasks ............................ 46
2.3.3.1 Complexity ..................................................................................... 46
2.3.3.2 Pools of resources ......................................................................... 48
2.3.3.3 Attention ....................................................................................... 49
2.4. Intelligence and Job Performance .......................................................... 51
2.5. Competing Tasks and Job Performance .................................................. 53
2.5.1 Methodological considerations ............................................................. 57
2.5.1.1 Task properties ............................................................................. 57
2.5.1.2 Practice .......................................................................................... 59
2.5.1.3 Feedback and incentives ................................................................. 59
2.5.1.4 Internet based testing .................................................................... 60
2.6. Summary and Rationale ......................................................................... 62
2.7. Study Aims ............................................................................................ 64
2.8 Method .................................................................................................... 69
2.8.1 Participants .......................................................................................... 69
2.8.2 Materials ............................................................................................. 70
2.8.3 Procedure ............................................................................................ 72
2.9 Results ..................................................................................................... 73
2.9.1 Preliminary Procedures ....................................................................... 73
2.9.1.1 Outlier checks ............................................................................... 73
2.9.1.2 Descriptive statistics and reliabilities of the measures ..................... 73
2.9.1.3 Multi-Tasks scores across demographic groups ............................. 74
2.9.1.3.1 Gender ...................................................................................... 74
2.11.3.1 Procedure for model evaluation ................................................................. 90
2.11.3.2 Confirmatory factor analysis of the Multi-Tasks test ................................. 91
2.11.3.3 Confirmatory factor analysis of the full measurement model ..................... 93
2.11.4 Predictive Validity of the Intelligence Measures ........................................... 97

2.12. DISCUSSION ......................................................................................................... 101
2.13. CONCLUSION ....................................................................................................... 104

CHAPTER 3 ..................................................................................................................... 105
3.1 COMPETING TASK RESEARCH ............................................................................. 106
3.2 MULTI-TASKS, GSM AND WORKING MEMORY ................................................. 107
3.3 GF, GSM AND TASK COMPLEXITY .................................................................... 109
3.4 PERSONALITY ASSESSMENT .............................................................................. 110
3.5 PERSONALITY AND COGNITIVE ABILITIES ..................................................... 110
   3.5.1 Extraversion and WM. .................................................................................... 111
   3.5.2 Implications for Performance on Multi-Tasks and job performance ............. 113
3.6 PERSONALITY ASSESSMENT AND JOB PERFORMANCE ................................. 114
   3.6.1 Personality Research in the 20th and 21st Centuries ................................. 114
   3.6.2 The Five Factor Model of Personality ......................................................... 115
   3.6.3 Early Meta-Analytic Evidence for the Relationship between the FFM and job
        performance ......................................................................................................... 117
   3.6.4 Relationship between each of the Five Factors and Job Performance .......... 118
      3.6.4.1 Conscientiousness ................................................................................ 118
      3.6.4.2 Emotional Stability .............................................................................. 119
      3.6.4.3 Agreeableness, Openness to Experience and Extraversion .................. 119
3.7 IMPLICATIONS AND METHODOLOGICAL CONCERNS ................................ 120
3.8 STUDY AIMS ........................................................................................................... 122
3.9 Method ........................................................................................................... 128

3.9.1 Participants .................................................................................................. 128

3.9.2 Materials. ...................................................................................................... 129

3.9.2.1 Digit Sequence Test .............................................................................. 130

3.9.2.2 Matrices. .................................................................................................. 130

3.9.2.3 Reading Comprehension .......................................................................... 131

3.9.2.4 Word Reasoning Test ............................................................................... 132

3.9.2.5 Digit Span. ................................................................................................ 133

3.9.2.6 Multi-Tasks Test ....................................................................................... 134

3.9.2.7 OCEANIC Personality Inventory ......................................................... 134

3.9.2.8 Job Performance Measures. ................................................................. 136

3.9.3 Procedure. .................................................................................................... 136

3.10 Results .............................................................................................................. 137

3.10.1 Preliminary Procedures. ............................................................................ 137

3.10.1.1 Outlier checks. ..................................................................................... 137

3.10.1.2 Descriptive Statistics and Reliabilities for the Multi-Tasks Subscales ..... 137

3.10.1.2.1 Word Recall. ................................................................................... 138

3.10.1.2.2 Placement Keeping. ......................................................................... 138

3.10.1.3 Descriptive Statistics and Reliability Measures for the other Intelligence Scales. ........................................................................................................ 138

3.10.1.3.1 Matrices............................................................................................ 138

3.10.1.3.2 Reading Comprehension .................................................................. 138

3.10.1.3.3 Digit Sequence ................................................................................ 139

3.10.1.3.4 Word Reasoning. ............................................................................. 139

3.10.1.3.5 Digit Span. ....................................................................................... 139
3.10.1.4 Descriptive Statistics for the Five Personality Subscales ......................... 140
3.10.1.5 Descriptive Statistics for the Job Performance Measures ......................... 140
3.10.1.6 Correlations between variables ............................................................... 141
3.10.2 Multi-Tasks Scores across Demographic Groups ......................................... 142
  3.10.2.1 Gender ..................................................................................................... 143
  3.10.2.2 Level of Education .................................................................................. 143
  3.10.2.3 Age ........................................................................................................ 144
3.10.3 Results of Measurement and Structural Model Tests ..................................... 145
  3.10.3.1 Parcels for Measurement and Structural Model Tests ............................ 145
    3.10.3.1.1 Multi-Tasks Parcels ........................................................................ 145
    3.10.3.1.2 Parcels for the other Intelligence Test Scales .................................. 146
  3.10.3.2 Model Evaluation .................................................................................... 147
  3.10.3.3 Confirmatory Factor Analysis of Multi-Tasks Tests ............................... 147
  3.10.3.4 Confirmatory Factor Analysis of the Full Measurement Model ................ 149
  3.10.3.5 Predictive Validity of the Intelligence Measures ..................................... 155
    3.10.3.5.1 Job Performance ............................................................................. 155
    3.10.3.5.2 Years of service .............................................................................. 157
    3.10.3.5.3 Employment Status ....................................................................... 158
    3.10.3.5.4 Job Level ......................................................................................... 159
  3.10.3.6 Predictive Validity of the Multi-Tasks and Personality Measures ........... 161
    3.10.3.6.1 Job Performance ............................................................................. 163
    3.10.3.6.2 Years of Service ............................................................................ 163
    3.10.3.6.3 Employment Status ....................................................................... 164
    3.10.3.6.4 Job Level ......................................................................................... 165
3.10.4 The relationship between the Multi-Tasks measure and the Five Personality
Subscales........................................................................................................................................166

3.11 DISCUSSION ..................................................................................................................................167

CHAPTER 4 ...........................................................................................................................................179

4.1 SUMMARY OF STUDY 1 AND STUDY 2 ......................................................................................180

4.2 THE MULTI-TASKS TEST AND THE CHC THEORY OF COGNITIVE ABILITIES ..................181

4.3 HISTORY OF COGNITIVE TESTING IN CHINA .........................................................................182

4.3.1 Use of cognitive ability tests cross culturally ...........................................................................184

4.3.2 Challenges associated with using foreign ability tests .................................................................184

4.3.3 Successful adaptation of measures and ‘culture-fair’ assessments .............................................187

4.3.4 Performance of Chinese participants with specific cognitive domains .....................................188

4.3.4.1 Working memory .......................................................................................................................188

4.3.4.2 Attention ....................................................................................................................................189

4.4 GROUP DIFFERENCES IN COGNITIVE ABILITY WITHIN CHINA ......................................191

4.4.1 ‘Single’ children ............................................................................................................................191

4.4.2 City vs. rural ..................................................................................................................................191

4.4.3 Gender differences .........................................................................................................................192

4.5 INTELLIGENCE AND LATER SUCCESS ......................................................................................192

4.6 STUDY AIMS ....................................................................................................................................192

4.7 METHOD .........................................................................................................................................198

4.7.1 Participants .....................................................................................................................................198

4.7.2 Materials .........................................................................................................................................199

4.7.2.1 Digit Sequence test .......................................................................................................................200

4.7.2.2 Matrices .......................................................................................................................................200

4.7.2.3 Reading Comprehension test ......................................................................................................201
4.8.5.4 Confirmatory factor analysis for the Multi-Tasks measurement model. ... 218

4.8.5.5 Results for the confirmatory factor analysis of the full measurement model. ................................................................. 220

4.8.6 Predictive Validity of the Intelligence Measures .................................................. 224

4.8.6.1 Correlations between intelligence and Job Performance .................................. 224

4.8.6.2 Predictors of Job Level .......................................................... 225

4.9 DISCUSSION ................................................................................. 227

CHAPTER 5 .................................................................................. 233

GENERAL DISCUSSION ................................................................ 234

5.1 GENDER .................................................................................. 234

5.2 EDUCATION ........................................................................... 234

5.3 AGE ...................................................................................... 235

5.4 DEMOGRAPHIC EFFECTS BETWEEN THE STUDIES ................. 236

5.5 CORRELATIONS BETWEEN TESTS AND CONFIRMATORY FACTOR ANALYSIS ...... 237

5.6 KEY STATISTICAL STRENGTHS OF MULTI-TASKS ......................... 239

5.7 JOB PERFORMANCE OUTCOMES ........................................... 239

5.7.1 Quality of job performance data .............................................. 240

5.8 IDIOSYNCRASIES OF DATASETS AND OTHER CHALLENGES .......... 241

5.9 CROSS CULTURAL CONSIDERATIONS ..................................... 242

5.10 CONCLUSION ........................................................................ 243

REFERENCES .............................................................................. 245
List of Tables

TABLE 1.1 CHC BROAD ABILITY DOMAIN TERMS, CORRESPONDING CATTELL–HORN AND CARROLL BROAD ABILITY TERMS, AND DEFINITIONS .......................................................... 39

TABLE 1.2 AGE OF PARTICIPANTS .................................................................................. 69

TABLE 1.3 EDUCATION LEVEL OF PARTICIPANTS ......................................................... 70

TABLE 1.4 DESCRIPTIVE STATISTICS AND ALPHA COEFFICIENTS FOR THE VARIABLES .......... 74

TABLE 1.5 MEANS AND STANDARD DEVIATIONS FOR MULTI-TASKS SCORES OF MALES AND FEMALES ........................................................................................................ 74

TABLE 1.6 MEANS AND STANDARD DEVIATIONS FOR MULTI-TASKS SCORES ACROSS LEVELS OF EDUCATION .......................................................................................... 75

TABLE 1.7 MEANS AND STANDARD DEVIATIONS FOR MULTI-TASKS SCORES ACROSS AGE GROUPS .................................................................................................................. 76

TABLE 1.8 AGE OF PARTICIPANTS .................................................................................. 77

TABLE 1.9 EDUCATION LEVEL OF PARTICIPANTS ......................................................... 78

TABLE 1.10 DESCRIPTIVE STATISTICS AND ALPHA COEFFICIENTS FOR THE VARIABLES .......... 83

TABLE 1.11 KENDALL TAU CORRELATIONS BETWEEN VARIABLES .............................. 85

TABLE 1.12 MEANS AND STANDARD DEVIATIONS FOR MULTI-TASKS SCORES OF MALES AND FEMALES ........................................................................................................ 86

TABLE 1.13 MEANS AND STANDARD DEVIATIONS FOR MULTI-TASKS SCORES ACROSS LEVELS OF EDUCATION .......................................................................................... 87

TABLE 1.14 MEANS AND STANDARD DEVIATIONS FOR MULTI-TASKS SCORES ACROSS AGE GROUPS .................................................................................................................. 88

TABLE 1.15 FIT INDICES FOR THE MULTI-TASKS MEASUREMENT MODELS .................. 92

TABLE 1.16 FIT INDICES FOR THE INTELLIGENCE MODEL ........................................... 94

TABLE 1.17 FIT INDICES FOR THE PREDICTIVE VALIDITY MODEL ............................... 98
<table>
<thead>
<tr>
<th>Table</th>
<th>Title</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.18</td>
<td>Path coefficients for the structural model</td>
<td>100</td>
</tr>
<tr>
<td>1.19</td>
<td>Squared multiple correlations for the endogenous constructs of the</td>
<td>100</td>
</tr>
<tr>
<td></td>
<td>structural model</td>
<td></td>
</tr>
<tr>
<td>2.1</td>
<td>Descriptions of Big Five factors</td>
<td>116</td>
</tr>
<tr>
<td>2.2</td>
<td>Age of participants</td>
<td>128</td>
</tr>
<tr>
<td>2.3</td>
<td>Education level of participants</td>
<td>129</td>
</tr>
<tr>
<td>2.4</td>
<td>Descriptive statistics and alpha coefficients for the multi-tasks</td>
<td>138</td>
</tr>
<tr>
<td></td>
<td>Subscales</td>
<td></td>
</tr>
<tr>
<td>2.5</td>
<td>Descriptive statistics and alpha coefficients for the intelligence</td>
<td>140</td>
</tr>
<tr>
<td></td>
<td>Scales</td>
<td></td>
</tr>
<tr>
<td>2.6</td>
<td>Descriptive statistics and alpha coefficients for the personality</td>
<td>140</td>
</tr>
<tr>
<td></td>
<td>Subscales</td>
<td></td>
</tr>
<tr>
<td>2.7</td>
<td>Frequencies and percentages for job performance measures</td>
<td>141</td>
</tr>
<tr>
<td>2.8</td>
<td>Descriptive statistics for job performance measures</td>
<td>141</td>
</tr>
<tr>
<td>2.9</td>
<td>Kendall Tau correlations between study variables</td>
<td>142</td>
</tr>
<tr>
<td>2.10</td>
<td>Means and standard deviations for multi-tasks scores of males and</td>
<td>143</td>
</tr>
<tr>
<td></td>
<td>females</td>
<td></td>
</tr>
<tr>
<td>2.11</td>
<td>Means and standard deviations for multi-tasks scores across levels</td>
<td>144</td>
</tr>
<tr>
<td></td>
<td>of education</td>
<td></td>
</tr>
<tr>
<td>2.12</td>
<td>Means and standard deviations for multi-tasks scores across age</td>
<td>145</td>
</tr>
<tr>
<td></td>
<td>groups</td>
<td></td>
</tr>
<tr>
<td>2.13</td>
<td>Fit indices for the multi-tasks measurement models</td>
<td>148</td>
</tr>
<tr>
<td>2.14</td>
<td>Fit indices for the intelligence model</td>
<td>153</td>
</tr>
<tr>
<td>2.15</td>
<td>Pearson correlations between intelligence measures and job</td>
<td>155</td>
</tr>
</tbody>
</table>
TABLE 2.16 LINEAR REGRESSION RESULTS FOR THE JOB PERFORMANCE MODEL .......... 156
TABLE 2.17 PEARSON CORRELATIONS BETWEEN INTELLIGENCE MEASURES AND YEARS OF SERVICE ............................................................................................................. 157
TABLE 2.18 LINEAR REGRESSION RESULTS FOR THE YEARS OF SERVICE MODEL .......... 158
TABLE 2.19 LOGISTIC REGRESSION RESULTS FOR THE EMPLOYMENT STATUS MODEL .......... 159
TABLE 2.20 LOGISTIC REGRESSION RESULTS FOR THE EMPLOYMENT STATUS MODEL .......... 160
TABLE 2.21 PEARSON CORRELATIONS AMONGST THE PERSONALITY SUBSCALES .......... 161
TABLE 2.22 PEARSON CORRELATIONS AMONGST THE PERSONALITY SUBSCALES .......... 162
TABLE 2.23 LINEAR REGRESSION RESULTS FOR MULTI-TASKS, PERSONALITY TRAITS, AND JOB PERFORMANCE ............................................................................................................. 163
TABLE 2.24 LINEAR REGRESSION RESULTS FOR MULTI-TASKS, PERSONALITY TRAITS, AND YEARS OF SERVICE ............................................................................................................. 164
TABLE 2.25 LOGISTIC REGRESSION RESULTS FOR MULTI-TASKS, PERSONALITY TRAITS, AND EMPLOYMENT STATUS ............................................................................................................. 165
TABLE 2.26 LOGISTIC REGRESSION RESULTS FOR MULTI-TASKS, PERSONALITY TRAITS, AND JOB LEVEL ............................................................................................................. 166
TABLE 3.1 AGE OF PARTICIPANTS ................................................................................... 198
TABLE 3.2 EDUCATION LEVEL OF PARTICIPANTS .......................................................... 199
TABLE 3.3 DESCRIPTIVE STATISTICS AND ALPHA COEFFICIENTS FOR THE MULTI-TASKS SUBSCALES ............................................................................................................. 207
TABLE 3.4 DESCRIPTIVE STATISTICS AND ALPHA COEFFICIENTS FOR THE OTHER INTELLIGENCE SCALES ............................................................................................................. 208
TABLE 3.5 JOB PERFORMANCE MEASURES ........................................................................ 209
TABLE 3.6 PEARSON CORRELATIONS AMONGST THE INTELLIGENCE MEASURES .......... 210
TABLE 3.7 MEANS AND STANDARD DEVIATIONS FOR MULTI-TASKS SCORES OF MALES AND FEMALES ................................................................. 211

TABLE 3.8 MEANS AND STANDARD DEVIATIONS FOR MULTI-TASKS SCORES ACROSS AGE GROUPS ................................................................. 212

TABLE 3.9 MEANS AND STANDARD DEVIATIONS FOR MULTI-TASKS SCORES ACROSS LEVELS OF EDUCATION ................................................................. 213

TABLE 3.10 MEANS AND STANDARD DEVIATIONS FOR MULTI-TASKS SCORES ACROSS LEVELS OF ABSENTEEISM ................................................................. 214

TABLE 3.11 MEANS AND STANDARD DEVIATIONS FOR MULTI-TASKS SCORES ACROSS LEVELS OF UNRELIABILITY ................................................................. 215

TABLE 3.12 MEANS AND STANDARD DEVIATIONS FOR MULTI-TASKS SCORES ACROSS JOB LEVELS ................................................................. 216

TABLE 3.13 CHI-SQUARE RESULTS AND FIT INDICES FOR THE MULTI-TASKS MEASUREMENT MODELS ................................................................. 220

TABLE 3.14 CHI-SQUARE RESULTS AND FIT INDICES FOR THE FULL MEASUREMENT MODELS ................................................................. 221

TABLE 3.15 KENDALL TAU CORRELATIONS BETWEEN THE INTELLIGENCE MEASURES AND JOB PERFORMANCE ................................................................. 225

TABLE 3.16 MULTIPLE LINEAR REGRESSION RESULTS FOR INTELLIGENCE AND JOB LEVEL ................................................................. 226

TABLE 3.17 MULTIPLE LINEAR REGRESSION RESULTS FOR WEIGHTED INTELLIGENCE MEASURE AND JOB LEVEL ................................................................. 226

TABLE 4.1 EFFECT SIZES FOR MULTI-TASKS SCORES ACROSS GENDER, LEVELS OF EDUCATION, AND AGE GROUPS ................................................................. 237
List of Figures


FIGURE 1.2. PROPOSED MULTI-TASKS MODEL .......................................................... 65

FIGURE 1.3 PROPOSED MODEL FOR MULTI-TASKS, GF, AND GC MEASURES. .................. 67

FIGURE 1.4 PROPOSED MODEL TESTING THE PREDICTIVE VALIDITY OF THE INTELLIGENCE MEASURES AGAINST THE JOB PERFORMANCE MEASURES ........................................... 68

FIGURE 1.5. MULTI-TASKS TEST PLACEMENT KEEPING SUB-TASK (LEFT), THEN WORD RECALL SUB-TASK (RIGHT) ........................................................................................................... 72

FIGURE 1.6 SAMPLE OF A DIGIT SEQUENCE TEST ITEM ............................................. 79

FIGURE 1.7 SAMPLE OF WORD REASONING TEST ITEM ............................................. 80

FIGURE 1.8. THREE-FACTOR MEASUREMENT MODEL FOR MULTI-TASKS (STANDARDISED COEFFICIENTS). ................................................................................................. 93

FIGURE 1.9. FULL MULTI-TASKS MEASUREMENT MODEL INCLUDING SINGLE TESTS ........ 95

FIGURE 1.10. REVISED MEASUREMENT MODEL FOR INTELLIGENCE ................................. 96

FIGURE 1.11. PREDICTIVE VALIDITY MODEL FOR MULTI-TASKS TEST. ......................... 99

FIGURE 2.1. PROPOSED MEASUREMENT MODEL FOR MULTI-TASKS ............................ 124

FIGURE 2.2. PROPOSED MEASUREMENT MODEL FOR MULTI-TASKS AND OTHER INTELLIGENCE MEASURES ................................................................................................................. 125

FIGURE 2.3. PROPOSED MEASUREMENT MODEL FOR MULTI-TASKS AND OTHER INTELLIGENCE MEASURES (2) ........................................................................................................... 127

FIGURE 2.4. DIGIT SEQUENCE TASK ............................................................................... 130

FIGURE 2.5. MATRICES TASK ......................................................................................... 131

FIGURE 2.6. READING COMPREHENSION TASK ............................................................ 132
FIGURE 2.7 Word Reasoning Task .................................................................................. 133

FIGURE 2.8. Multi-Tasks Placement Keeping component (left) and then Word
Recall component (right) ............................................................................................... 134

FIGURE 2.9. Multi-Tasks test answer option whereby the participant must recall
the number of balls in each box and then the order of one of the words shown
in the display .................................................................................................................. 134

FIGURE 2.10. Personality Measure .................................................................................. 135

FIGURES 2.11 Two-factor model for multi-tasks test (standardised coefficients) 149

FIGURES 2.12. Proposed two-factor measurement model ................................................. 151

FIGURES 2.13. Proposed three-factor measurement model ............................................. 152

FIGURES 2.14. Revised measurement model .................................................................... 154

FIGURE 3.1. Proposed measurement model for Multi-Tasks ........................................ 194

FIGURE 3.2. Proposed measurement model for Multi-Tasks and other intelligence
measures .......................................................................................................................... 195

FIGURE 3.3. Proposed measurement model for Multi-Tasks and other intelligence
measures (2) ...................................................................................................................... 197

FIGURE 3.4. Digit sequence task .................................................................................... 200

FIGURE 3.5. Matrices task ............................................................................................... 201

FIGURE 3.6. Reading Comprehension task ..................................................................... 201

FIGURE 3.7. Word Reasoning task .................................................................................. 202

FIGURE 3.8. Number Series task .................................................................................... 203

FIGURE 3.9. Multi-Tasks Placement Keeping component (left) and then Word
Recall component (right) ............................................................................................... 203
FIGURE 3.10. Multi-Tasks test answer option whereby the participant must recall the number of balls in each box and then the order of one of the words shown in the display ......................................................... 204

FIGURE 3.11. Results for the proposed two-factor model (with standardised coefficients). ................................................................. 219

FIGURE 3.12. Results for the proposed second-order two-factor full measurement model (with standardised coefficients) ................................................. 222

FIGURE 3.13. Results for the alternative second-order single-factor full measurement model (with standardised coefficients) ...................................... 223
List of Appendices

APPENDIX 1A...........................................................................................................268
APPENDIX 1B...........................................................................................................274
APPENDIX 1C...........................................................................................................276
APPENDIX 1D...........................................................................................................279
APPENDIX 2A...........................................................................................................281
APPENDIX 2B...........................................................................................................290
APPENDIX 2C...........................................................................................................292
APPENDIX 2D...........................................................................................................294
APPENDIX 2E...........................................................................................................296
APPENDIX 2F...........................................................................................................300
APPENDIX 3A...........................................................................................................302
APPENDIX 3B...........................................................................................................307
APPENDIX 3C...........................................................................................................310
APPENDIX 3D...........................................................................................................312
APPENDIX 3E...........................................................................................................315