

Copyright is owned by the Author of the thesis. Permission is given for a copy to be downloaded by an individual for the purpose of research and private study only. The thesis may not be reproduced elsewhere without the permission of the Author.

**Reasoning ability and performance:  
A study of New Zealand corrections officers**

**A thesis presented in partial fulfilment of the requirements for the  
degree of**

**Master of Science  
in  
Psychology**

**At Massey University, Wellington, New Zealand**

**Bryony Jackson**

**2015**

## **Abstract**

The performance of frontline staff is one of the most central elements of an effective correctional system. This thesis reports findings related to the organisational psychology of the correctional environment, with special attention to person characteristics that may predict job performance of corrections officers. The empirical study investigated components of reasoning ability (abstract, verbal, numerical reasoning) on a sample of officers ( $N = 88$ ) working in seven prison facilities throughout New Zealand. Overseas research repeatedly identified cognitive abilities as a predictor of job performance across a range of occupational settings, including jobs similar to corrections officers. The current study sought to examine this relationship on a New Zealand officer sample, to provide evidence for criterion-related validity of psychometric assessment of reasoning ability, with implications for use in personnel selection procedures. An analysis of internal relationships among ability components was also undertaken. Consistent with theoretical models and extant empirical findings, abstract, verbal, and numerical reasoning were found to be positively related to one another. However, the given components of reasoning ability were unrelated to job performance in the local occupational setting. Potential explanations for the findings are offered in terms of limitations in the measurement tools and processes (e.g. scope of the performance appraisal tool). It is likely that given the unique job tasks and challenges of the corrections environment, officer performance requires important characteristics outside of reasoning ability, when officers perform affect-laden tasks (e.g. understanding their own and others' emotions and emotion-driven behaviours). Further investigation of potential predictors such as emotional intelligence is warranted, and is expected to assist prediction of performance in a corrections setting.

**Acknowledgments**

Thank you to the Department of Corrections, including the Research and Evaluation group for granting permission to complete this thesis. Also thank you to Charlotte Stephens for the early discussions, supporting access to data, and for your original project work from which this thesis stems. Additionally I would like to acknowledge OPRA; the initial discussions with Heather Morrell and Chris Densem's support with data were kindly appreciated.

Finally thank you to my supervisor Dr Gus Habermann for all the guidance and advice provided, as well as your patience and encouragement throughout.

## Contents

<b>CHAPTER 1: COGNITIVE ABILITIES .....</b>	<b>1</b>
1.1. Theoretical models and approaches.....	2
1.1.1. Approaches in differential psychology: “The correlationalists” .....	3
1.1.2. Current cognitive approaches.....	8
1.1.3. A few alternative approaches .....	11
1.1.4. Intelligence and culture .....	15
1.1.5. Cognitive ability in organisational psychology.....	16
1.2. Approaches to developing ability tests.....	18
<b>CHAPTER 2: UNDERSTANDING AND PREDICTING JOB PERFORMANCE .....</b>	<b>23</b>
2.1. Understanding job performance .....	23
2.1.1. The fundamental logic of using psychological information in personnel selection .....	23
2.1.2. Models of performance .....	23
2.1.3. Expansion of the performance domain.....	24
2.2. Methods of assessing job performance.....	27
2.2.1. Performance measurement issues .....	27
2.3. Predicting job performance.....	27
2.3.1. Cognitive ability and job performance.....	27
2.3.2. Empirical research into abilities as predictors .....	28
2.3.3. Validity in predicting job performance .....	32
<b>CHAPTER 3: CORRECTIONAL WORK AND PREDICTING PERFORMANCE .....</b>	<b>34</b>
3.1. Introduction to the corrections system in New Zealand .....	34
3.1.1. Correctional philosophies and principles.....	34
3.1.2. Legislative and institutional environment .....	37
3.2. The corrections officer role .....	38
3.2.1. The nature of the job .....	38
3.2.2. Job requirements and expectations.....	46
3.2.3. Job activities and behaviours in New Zealand prisons.....	47
3.2.4. New directions in the working environment .....	48
3.3. Predictors of corrections officer job performance .....	49
3.3.1. Specific antecedents to performance .....	50
<b>CHAPTER 4: THE PRESENT STUDY AND RESEARCH AIMS .....</b>	<b>54</b>
4.1. Evaluating tests for local use .....	54
4.2. Substantive research aims.....	57
<b>CHAPTER 5: METHOD .....</b>	<b>60</b>
5.1. Permissions.....	60
5.2. Participants.....	60
5.3. Data collection .....	61
5.3.1. The General Reasoning Test (GRT2).....	61
5.3.2. Verbal, numerical, and abstract reasoning subtests.....	62
5.3.3. Psychometric properties of the GRT2 .....	64
5.3.4. Job performance appraisal questionnaire .....	66
5.3.5. Data collection procedure.....	66

<b>CHAPTER 6: RESULTS</b> .....	<b>68</b>
6.1. Description of variables .....	68
6.2. Initial data analyses .....	69
6.2.1. Cognitive ability: Descriptive statistics.....	69
6.2.2. Job performance data: Descriptive statistics .....	70
6.3. Evaluating local adequacy of ability test.....	71
6.3.1. Factor structure of GRT2.....	71
6.3.2. Reliability.....	73
6.3.3. Item analysis .....	74
6.4. Evaluating the performance appraisal tool .....	77
6.4.1. Dimensionality of job performance .....	77
6.4.2. Reliability of the job performance measure .....	82
6.5. Substantive results and hypothesis testing .....	82
6.5.1. Relationships among GRT2 reasoning dimensions .....	82
6.5.2. Cognitive ability and job performance.....	83
6.5.3. Participant characteristics, ability, and job performance .....	84
 <b>CHAPTER 7: DISCUSSION</b> .....	 <b>88</b>
7.1. Interpreting findings from evaluation of the GRT2 and performance measure.....	88
7.2. Interpreting findings from hypothesis testing .....	96
7.3. Limitations .....	100
7.4. Recommendations and directions for future research.....	102
 <b>APPENDICES</b> .....	 <b>104</b>
Appendix A References.....	105
Appendix B Information and consent form .....	117
Appendix C Job appraisal form .....	120
Appendix D Figures and tables .....	122

## List of Figures

Figure 1. Difficulty of items in the verbal reasoning subscale.....	75
Figure 2. Difficulty of items in the numerical reasoning subscale.....	75
Figure 3. Difficulty of items in the abstract reasoning subscale.....	76
Figure A1. Distribution of GRT2 verbal reasoning scores.....	122
Figure A2. Distribution of GRT2 numerical reasoning scores.....	122
Figure A3. Distribution of GRT2 abstract reasoning scores.....	123

## List of Tables

Table 1 Range, Mean, Standard Deviation, and Distribution of GRT2 Subscale Scores.....	69
Table 2 Frequency of Ratings for Performance Item 1 (Overall Performance).....	71
Table 3 Eigenvalues and Variance Explained Before and After Rotation for GRT2 Factors 1 to 3.....	72
Table 4 Eigenvalues and Variance Explained Before and After Rotation for Performance Factors 1 to 3.....	78
Table 5 Distribution Statistics for Performance Factors 1 to 3.....	80
Table 6 Correlations between Overall Job Performance and Performance Factors.....	81
Table 7 Correlations between GRT2 Subscales.....	82
Table 8 Correlations between GRT2 (Subscales and Overall) and Job Performance (Overall and Dimensions).....	84
Table 9 Mean GRT2 Subscale Scores for Male and Female Participants.....	85
Table 10 Correlations between GRT2 Subscales for Male and Female Participants.....	86
Table 11 Correlations between GRT2 Subscale Scores and Overall Job Performance for Male and Female Participants.....	87
Table A1 Variable Names, Description, Possible Values, and Level of Measurement.....	124
Table A2 Mean, Median, Range, and Distribution Statistics for Performance Measure Items.....	126
Table A3 Pattern Coefficients (Loadings) for GRT2 Factors 1 to 3.....	127
Table A4 Structure Coefficients (Loadings) for GRT2 Factors 1 to 3.....	128
Table A5 Reliability Analysis of Items in the Verbal Reasoning Subscale.....	129
Table A6 Reliability Analysis of Items in the Numerical Reasoning Subscale.....	130
Table A7 Reliability Analysis of Items in the Abstract Reasoning Subscale.....	131
Table A8 Verbal Reasoning Item Difficulty and Discrimination Indices.....	132
Table A9 Numerical Reasoning Item Difficulty and Discrimination Indices.....	133
Table A10 Abstract Reasoning Item Difficulty and Discrimination Indices.....	134
Table A11 Correlation Matrix for Performance Measure Items.....	135
Table A12 Loadings on Rotated Performance Factors 1 to 3.....	136
Table A13 Reliability of Performance Appraisal; Item-Total Score Correlations.....	137
Table A14 Descriptive Statistics for Performance Measure Items by Gender, and t-Test of Mean Differences.....	138