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**Computerised ACER Advanced Test BL: Analysis of Equivalency,
Test Anxiety, and the Effects of Input Device Using New Zealand
University Participants**

A thesis presented in partial fulfilment
of the requirements for the degree
of Master of Arts in Psychology
at Massey University

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This thesis is dedicated to my father, Brian Robert Gosse.

*O Trinity of love and power,
Our brethren shield in danger's hour;
From rock and tempest, fire and foe,
Protect them wheresoe'er they go:
Thus evermore shall rise to thee
Glad hymns of praise from land and sea.*

Abstract

Study 1 examined the effects of the computerised format of the ACER Advanced Test BL (ACER-BL) on the test scores and anxiety of undergraduate participants, compared with the traditional paper-and-pencil format. Forty-one students were assigned to either a computer or paper-and-pencil treatment group using a stratified random design. Participants sequentially completed a general background questionnaire, the ACER-BL, an anxiety questionnaire, the ACER-BL, and a final anxiety questionnaire, with a 10 minute test-retest period between the ACER-BL administrations. There were no significant differences in ACER-BL score, and subsection scores, between the 2 treatment groups on either administration. The internal consistency reliability of each formats was moderate to high, and there was a high test-retest reliability for each format. While the mean scores for each treatment group were higher for the second test administration compared with the first, this result only reached significance for the computerised group. Gender, Undergraduate Year, and Typing Ability significantly influenced test score, although these failed to remain significant when treatment group was included in each analysis. These results suggest that the computerised version of the ACER-BL is equivalent to the paper-and-pencil version. Generally, there was no significant difference in reported test anxiety measures between the treatment groups, with mean reported anxiety indicating "slight anxiety." These anxiety results suggest little influence of test format on test anxiety.

Study 2 examined the influence of input device (keyboard, numeric pad, and mouse) on ACER-BL scores and test anxiety of undergraduate participants. Using stratified random assignment, 90 subjects were tested on all three input devices using a one factor repeated measures design. Each participant sequentially completed a general background questionnaire, the ACER-BL, an anxiety questionnaire, the ACER-BL, an anxiety questionnaire, the ACER-BL, and a final anxiety questionnaire, with a 10 minute delay between each ACER-BL administration. There was no significant main effect of input device on test score, and there was no significant order effect for input device. Between-subjects analyses indicated a significant increase in mean test score across administrations for the keyboard and numeric pad, but no significant change in mean scores with the mouse. These results were also reflected in the analyses of mean input response time. While there

was no significant effect of any measured participant characteristic on input device scores, mathematical ability and undergraduate year each had a significant influence on mean scores in the first ACER-BL administration. Participants with higher mathematical ability or more years at university had significantly higher mean test scores than participants with less mathematical ability or first year undergraduates respectively. While mean reported anxiety on all test anxiety measures decreased over the ACER-BL administrations, all mean reported anxiety indicated “slight anxiety.” These anxiety results suggest little influence of input device on test anxiety.

The lack of test-retest comparisons between the computerised and paper-and-pencil formats of a test was discussed along with the need for future computerised testing research to use participants from the general population.

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Table of Contents

ABSTRACT	iii
ACKNOWLEDGMENTS	v
TABLE OF CONTENTS.....	vi
LIST OF TABLES.....	ix
LIST OF FIGURES	x
CHAPTER 1: INTRODUCTION TO AUTOMATED PSYCHOLOGICAL TESTING	1
HISTORICAL BACKGROUND.....	1
DISADVANTAGES AND ADVANTAGES OF COMPUTERISED PSYCHOLOGICAL TESTS	4
CHAPTER 2: ISSUES IN COMPUTERISED TESTING.....	8
GENERAL OVERVIEW	8
COPYRIGHT CONCERNS.....	10
PRIVACY OF TEST RESULTS.....	10
VALIDITY ISSUES	11
EQUIVALENCY BETWEEN COMPUTERISED AND PAPER-AND-PENCIL TEST FORMATS.....	13
CHAPTER 3: HUMAN-COMPUTER INTERACTION	16
HARDWARE CONSIDERATIONS	16
SOFTWARE CONSIDERATIONS.....	17
VISUAL FACTORS AND CPT	20
TEST TAKER FAMILIARITY WITH COMPUTERS	24
<i>Overview</i>	24
<i>Research on Test Taker Familiarity With Computers</i>	25
CHAPTER 4: COMPARISONS OF COMPUTERISED AND PAPER-AND PENCIL FORMATS.....	29
OVERVIEW	29
RESEARCH ON PERSONALITY TESTS AND TESTS OF AFFECT.....	31
APTITUDE TEST RESEARCH	34
CPT RESEARCH INVOLVING TEST ANXIETY MEASURES.....	40
FEEDBACK AND TEST TAKER PERFORMANCE	43
HYPOTHESES	44

CHAPTER 5: STUDY 1: RELIABILITY COMPARISONS BETWEEN PAPER-AND-PENCIL FORMAT AND COMPUTERISED FORMAT OF THE ACER ADVANCED TEST BL	45
METHOD.....	45
<i>Participants</i>	45
<i>Apparatus</i>	45
<i>Procedure</i>	49
RESULTS.....	52
<i>General Participant Characteristics</i>	52
<i>Comparison of Participant Results with ACER-BL New Zealand Norms</i>	55
<i>ACER Advanced Test BL Internal Consistency</i>	56
<i>ACER Advanced Test BL Test-Retest Reliability</i>	57
<i>Subsection Analysis of ACER Advanced Test BL Scores</i>	57
<i>Effect of Treatment Group by ACER-BL Administration Interactions on Total Test Score</i>	59
<i>Effect of Participant Characteristics Interactions on Total Test Score</i>	59
<i>Test Anxiety Analyses</i>	64
RESULTS SUMMARY AND BRIEF CONCLUSIONS	68
CHAPTER 6: STUDY 2: COMPARISONS BETWEEN INPUT DEVICE FOR THE COMPUTERISED FORMAT OF THE ACER ADVANCED TEST BL.....	70
METHOD.....	70
<i>Participants</i>	70
<i>Apparatus</i>	70
<i>Procedure</i>	71
RESULTS.....	73
<i>General Participant Characteristics</i>	73
<i>ACER-BL Test Score Analyses</i>	76
<i>Analysis of Order Effects</i>	78
<i>Input Device Analyses</i>	79
<i>Ecological Validity Analyses</i>	79
<i>Test Anxiety Analyses</i>	80
RESULTS SUMMARY AND BRIEF CONCLUSIONS	83
CHAPTER 7: GENERAL DISCUSSION	85
PAPER-AND-PENCIL AND COMPUTER EQUIVALENCE OF THE ACER-BL (STUDY 1)	85
PRACTISE EFFECTS (STUDIES 1 AND 2)	87
TEST ANXIETY (STUDIES 1 AND 2)	89
EYESTRAIN ANALYSES.....	91
SUMMARY AND IMPLICATIONS OF FINDINGS.....	91
REFERENCES.....	93

APPENDIX A. GLOSSARY OF TECHNICAL TERMS	101
CAT	101
CBTI	101
CGA	101
CPT	101
EGA	102
VDU	102
VGA	102
APPENDIX B. CONSENT FORM & QUESTIONNAIRES USED IN STUDY 1.	103
APPENDIX C. PARTICIPANT CHARACTERISTIC INTERACTIONS WITH MEAN TEST SCORE (STUDY 1): GRAPHS OF INSIGNIFICANT INTERACTIONS.....	117
APPENDIX D. CONSENT FORM & QUESTIONNAIRES USED IN STUDY 2.	122
APPENDIX E: PARTICIPANT CHARACTERISTICS INTERACTIONS WITH INPUT DEVICE ACER-BL TEST SCORE	140

List of Tables

Table 5.1. Demographics of participants, by treatment group.....	52
Table 5.2. General characteristics of participants, by treatment group.	53
Table 5.3. Computer abilities reported by participants, by treatment group.	54
Table 5.4. Characteristics reported by participants, by treatment group. Results of t-test analyses.	55
Table 5.5. Comparison of NZCER university students norm sample scores with the first ACER-BL administration scores for P and C group participants.....	56
Table 5.6. Internal consistency reliabilities for each ACER-BL administration, by treatment group.	56
Table 5.7. Mean correct items by subsection for each ACER-BL administration, by treatment group.	58
Table 6.1. Demographics of participants, by treatment group.....	73
Table 6.2. General characteristics of participants, by treatment group.	74
Table 6.3. Computer abilities reported by participants, by treatment group.	75
Table 6.4. Mean characteristics reported by participants, by treatment group. Results of ANOVA analyses.	76
Table E1. Participant characteristics interactions with ACER-BL score for each input device. Results of repeated measures ANOVAs.	140

List of Figures

Figure 5.1. Mean test score for each ACER-BL administration and treatment group.....	59
Figure 5.2. Mean test score for each ACER-BL administration, by gender.....	60
Figure 5.3. Mean test score for each ACER-BL administration, by gender and treatment group.....	61
Figure 5.4. Mean test score for each ACER-BL administration, by year of undergraduate study.....	62
Figure 5.5. Mean test score for each ACER-BL administration, by typist grouping.....	63
Figure 5.6. Mean test score for each ACER-BL administration, by typing ability and treatment group.....	63
Figure 5.7. Mean general anxiety scores by ACER-BL administration, scores for treatment groups combined.....	65
Figure 5.8. Mean subsection anxiety scores by ACER-BL administration, scores for treatment groups combined.....	66
Figure 5.9. Mean question type anxiety scores by ACER-BL administration and treatment group.....	67
Figure 6.1. Mean test score for each ACER-BL administration, by treatment group.....	77
Figure 6.2. Mean test score for each input device, by ACER-BL administration.....	78
Figure 6.3. Mean general anxiety scores by ACER-BL administration, scores for treatment groups combined.....	81
Figure 6.4. Mean subsection anxiety scores by ACER-BL administration, scores for treatment groups combined.....	82
Figure 6.5. Mean question type anxiety scores by ACER-BL administration, scores for treatment groups combined.....	83
Figure C1. Mean test score for each ACER-BL administration, by participant age.....	117
Figure C2. Mean test score for each ACER-BL administration, by annual family income (\$NZD).....	117
Figure C3. Mean test score for each ACER-BL administration, by participant vision.....	118
Figure C4. Mean test score for each ACER-BL administration, by participant mathematics ability.....	118
Figure C5. Mean test score for each ACER-BL administration, by participant statistical ability.....	119
Figure C6. Mean test score for each ACER-BL administration, by participant English ability.....	119
Figure C7. Mean test score for each ACER-BL administration, by participant programming ability.....	120
Figure C8. Mean test score for each ACER-BL administration, by participant numeric pad use.....	120
Figure C9. Mean test score for each ACER-BL administration, by participant mouse use.....	121
Figure C10. Mean test score for each ACER-BL administration, by participant computer use.....	121