The University of Sydney

Copyright in relation to this thesis*

Under the Copyright Act 1968 (several provision of which are referred to below), this thesis must be used only under the normal conditions of scholarly fair dealing for the purposes of research, criticism or review. In particular no results or conclusions should be extracted from it, nor should it be copied or closely paraphrased in whole or in part without the written consent of the author. Proper written acknowledgement should be made for any assistance obtained from this thesis.

Under Section 35(2) of the Copyright Act 1968 'the author of a literary, dramatic, musical or artistic work is the owner of any copyright subsisting in the work'. By virtue of Section 32(1) copyright 'subsists in an original literary, dramatic, musical or artistic work that is unpublished' and of which the author was an Australian citizen, an Australian protected person or a person resident in Australia.

The Act, by Section 36(1) provides: 'Subject to this Act, the copyright in a literary, dramatic, musical or artistic work is infringed by a person who, not being the owner of the copyright and without the licence of the owner of the copyright, does in Australia, or authorises the doing in Australia of, any act comprised in the copyright'.

Section 31(1)(a)(i) provides that copyright includes the exclusive right to 'reproduce the work in a material form'. Thus, copyright is infringed by a person who, not being the owner of the copyright, reproduces or authorises the reproduction of a work, or of more than a reasonable part of the work, in a material form, unless the reproduction is a 'fair dealing' with the work 'for the purpose of research or study' as further defined in Sections 40 and 41 of the Act.

Section 51(2) provides that "Where a manuscript, or a copy, of a thesis or other similar literary work that has not been published is kept in a library of a university or other similar institution or in an archives, the copyright in the thesis or other work is not infringed by the making of a copy of the thesis or other work by or on behalf of the officer in charge of the library or archives if the copy is supplied to a person who satisfies an authorized officer of the library or archives that he requires the copy for the purpose of research or study'.

*"Thesis" includes 'treatise', dissertation' and other similar productions.
THE NATURE OF PERFECTIONISM AND ITS ACADEMIC
IMPLICATIONS FOR SECONDARY SCHOOL STUDENTS

A thesis submitted in fulfillment of the requirements
for the degree of Doctor of Philosophy

COLLEEN C. HAWKINS
DipTeach (Wollongong), BEd (Sydney), MEd (UNSW)

School of Development and Learning
Faculty of Education and Social Work
The University of Sydney

April 2005
©Colleen C. Hawkins
ACKNOWLEDGEMENTS

I could not have reached the end of such a long and winding road without the support, guidance and patience of my supervisors Dr. Ken Sinclair and Dr. Helen Watt. No student could have wished for better mentors.

Along the way there are many friends and colleagues who have been ever ready to come to my assistance. In no particular order, my gratitude and heartfelt thanks to Alex Rivers who always believed in me, Christabel Wescombe for assisting with rigorous library tasks, Cecilia Hilton for fastidious attention to marking and scoring student test papers, Kelli McGraw for accurate and responsible data entry, Dr. Lorraine Smith for her generosity in sharing her knowledge and skills, Dr. Greg Cunningham, Wendy Christie and Bob Ireland for untiring effort in coordinating school visits, rounding up the participants, and collection of data, and, finally the students themselves who so willingly gave of their time and talents to make this research project possible.

I would also like to acknowledge the understanding and support of the Faculty of Education & Social Work and the NSW Institute of Education Research throughout my candidature, as well as the ongoing assistance of Fisher Library and IT support personnel of the University of Sydney.

Finally, to my husband Bob, who steadfastly steered me through troubled waters, all my love and thanks.
Statement of Authenticity

This work has not previously been submitted for a degree or diploma in any university. To the best of my knowledge, the thesis contains no material previously published or written by any other person except where due reference is made in the thesis itself.

[Signature]

Colleen C. Hawkins
# TABLE OF CONTENTS

LIST OF TABLES vii
LIST OF FIGURES ix
LIST OF APPENDICES x
ABSTRACT xii

1. **INTRODUCTION**

   Through the Looking Glass:

   A Study of Perfectionism.

2. **A REVIEW OF THE LITERATURE**

   The Nature of Perfectionism.

   2.1 Traditional Perspectives

   2.2 A Dual Concept of Perfectionism 9

   2.3 The Multidimensional View of Perfectionism 15

   2.4 Quantifying the Duality of Perfectionism 24

   2.5 The Role of Personal Standards 27

   2.6 Higher Order Factors of Perfectionism 33

   2.7 A Tripartite Typology of Perfectionism 42

   2.8 Perfectionism and Gifted Students 47

   2.9 Perfectionism and Personal Achievement Goal Orientations 51

   2.10 Perfectionism and Level of School Ability 53

   2.11 Perfectionism and Underachievement 56

   2.12 Empirical Studies of Perfectionism in Gifted and Typical Student Populations 59
2.13 Perfectionism and College Students

2.14 Perfectionism: Issues and educational applications to be addressed in the current investigation

2.15 Perfectionism: Consequences and Correlates

2.16 Perfectionism, Goal Orientations and Educationally Relevant Beliefs and Behaviours

2.17 Focus of the Present Study

3. METHODOLOGY

Perfectionism in the Context of Schooling.

3.1 Design

3.2 Participants

3.3 Schools

3.4 Materials

3.4.1 The Multidimensional Perfectionism Scale (Frost et al., 1990)

3.4.2 Student Learning Approach Questionnaire (LAQ)

3.4.2.1 Patterns of Adaptive Learning Survey (PALS; Midgley et al., 1997)

3.4.2.2 Motivated Strategies for Learning Questionnaire (MSLQ: Pintrich & DeGroot, 1990)

3.4.3 Academic Variables

3.4.3.1 Academic Self-Efficacy

3.4.3.2 Academic Self-Handicapping
3.4.3.3 Test Anxiety
3.4.3.4 Cognitive Strategy Use
3.4.3.5 Self-Regulation
3.4.4 Personal Achievement Goal Orientations
3.4.4.1 Task Goal Orientation
3.4.4.2 Performance-Approach Goal Orientation
3.4.4.3 Performance-Avoid Goal Orientation
3.4.5 Otis-Lennon Test of School Ability (OLSAT)
3.4.6 Year 8 School Administered Performance Tests
3.4.6.1 Literacy (TORCH: Test of Reading Comprehension)
3.4.6.2 Numeracy (PatMaths-Revised)
3.4.7 Year 11 School Performance Tests
3.4.7.1 New South Wales School Certificate

3.5. Procedure
3.6. Analyses
3.6.1 The Multidimensionality of Perfectionism
3.6.2 A Typology of Perfectionist Student
3.6.3 Perfectionism, Ability, Grade, Gender, Ethnicity, and School
3.6.4 Perfectionism and Academic Variables
3.6.5 Perfectionism and Personal Achievement 106

Goal Orientations

3.6.6 Perfectionism and Level of School Ability 107

3.7 Summary 108

4. RESULTS 110

Perfectionism: Dimensions, Typology, and Academic Variables

4.1 The Dimensions of Perfectionism 111

4.1.1 The Psychometric Properties of the Frost 112

Multidimensional Perfectionism Scale: A Pilot Study

4.1.2 Construct Validity in the Main Study 114

4.1.2.1 Exploratory factor analysis 114

4.1.2.2 Confirmatory factor analysis 119

4.1.2.3 Nested confirmatory factor analysis of higher order factors 124

4.2 A Typology of Perfectionist Secondary School Student 127

4.3 The Dimensions of Perfectionism and School Ability, Grade, Gender, Ethnicity, and School 136

4.4 Perfectionist Type and Academic Variables 139

4.4.1 Literacy Academic Variables 142

4.4.1.1 Effects of perfectionist type 142

4.4.1.2 Effects of grade 145

4.4.1.3 Effects of school 146

iv
4.4.1.4 Interaction effect between gender and grade in the literacy domain 147

4.4.2 Numeracy Academic Variables 148

4.4.2.1 Effects of perfectionist type 150

4.4.2.2 Interaction effect between gender and grade in the numeracy domain 153

4.5 Perfectionist Type and Personal Achievement Goal Orientations 154

4.5.1 Goal Orientations and Literacy 154

4.5.1.1 Effects of perfectionist type 155

4.5.2 Goal Orientations and Numeracy 156

4.5.2.1 Effects of perfectionist type 156

4.6 Perfectionism and Level of School Ability 158

4.6.1 The Dimensions of Perfectionism and Level of School Ability 159

4.6.2 Perfectionist Type, Academic Variables, Goal Orientations, and Level of School Ability 161

4.7 Summary 162

5. DISCUSSION OF RESULTS AND CONCLUSION 165

Perfectionism in Profile 165

5.1 Discussion 165

5.1.1 The Dimensions of Perfectionism 166

5.1.2 The Typology of Perfectionism 169

5.1.3 Perfectionism in the Context of Secondary School Students 172
5.1.4 Perfectionism and Academically Relevant Beliefs and Behaviours

5.1.5 Perfectionism and Personal Achievement Goal Orientations

5.1.6 Perfectionism and Level of School Ability

5.2 Implications for Educational Research

5.3 Limitations and Directions for Future Research

Conclusion

REFERENCES

APPENDICES
LIST OF TABLES

Table 2.1 Differences between Maladaptive ("Neurotic") and Adaptive ("Normal") Perfectionism 13

Table 3.1 Sample Size, Grade and Gender with School Participant Response Rates 83

Table 3.2 Ethnic Origins and Student Percentages 84

Table 3.3 Internal Reliabilities Measured by Cronbach's Alpha on Measured Variables in the Literacy and Numeracy Domains 95

Table 4.1 FMPS Items and Pattern Matrix Coefficients of the Four-Factor Solution with Oblimin Rotation 117

Table 4.2 Table of Item Pairs to Free, their Modification Indices, and Substatiation for Freeing 122

Table 4.3 Nested CFA: First-Order Factor Loadings (LY), Measurement Errors (TE), Higher-Order Factor Loadings (GA), and Uniquenesses (PSI) (Completely Standardised Solution) 126

Table 4.4 Multidimensional Perfectionism Scale Raw Score Means and Standard Deviations by Cluster Group, with Univariate F Tests, and Tukey a Post-Hoc Testing and $\eta^2$ as a Measure of Effect Size. 134

Table 4.5 Means and Standard Deviations by Grade on the Dimensions of Perfectionism 138
Table 4.6  Intercorrelations Between Study Constructs in the Literacy Domain  141
Table 4.7  Means and Standard Deviations of Cluster Group Scores for Literacy Academic Self-Handicapping and Test Anxiety  145
Table 4.8  Mean Scores and Standard Deviations for Literacy Academic Self-Efficacy  146
Table 4.9  Mean Scores and Standard Deviations for Literacy Cognitive Strategy Use (Years 8 and 11 Boys and Girls)  147
Table 4.10  Intercorrelations Between Study Constructs in the Numeracy Domain  149
Table 4.11  Mean Scores and Standard Deviations of Cluster Group Scores for Numeracy Academic Self-Handicapping and Test Anxiety  152
Table 4.12  Mean Scores and Standard Deviations for Numeracy Cognitive Strategy Use  153
Table 4.13  Intercorrelations Between the Four Dimensions of Perfectionism and Level of School Ability  160
LIST OF FIGURES

Figure 4.1 Confirmatory factor analysis for four theorised dimensions of perfectionism (completely standardised parameter estimates) 121

Figure 4.2 Confirmatory factor analysis for four theorised dimensions of perfectionism: Specific error covariances freed (completely standardised parameter estimates) 123

Figure 4.3 Plot of number of clusters versus fusion coefficient, Ward’s method solution 130

Figure 4.4 Mean perfectionism scores for healthy (P+), unhealthy (P-), and non-perfectionist (Pn) cluster groups 131

Figure 4.5 Mean scores of perfectionist types for literacy academic variables 143

Figure 4.6 Mean scores of perfectionist types for numeracy academic variables 151
Figure 4.7  Mean scores of perfectionist types for literacy goal orientations

Figure 4.8  Mean scores of perfectionist types for numeracy goal orientations
# LIST OF APPENDICES

<table>
<thead>
<tr>
<th>APPENDIX A.</th>
<th>The Frost Multidimensional Perfectionism Scale</th>
<th>227</th>
</tr>
</thead>
<tbody>
<tr>
<td>APPENDIX B.</td>
<td>Student Learning Approach Questionnaire (LAQ)</td>
<td>231</td>
</tr>
<tr>
<td>APPENDIX C.1</td>
<td>Letter of Invitation and Information to School Principals</td>
<td>241</td>
</tr>
<tr>
<td>APPENDIX C.2</td>
<td>Parent Information and Consent Forms</td>
<td>243</td>
</tr>
<tr>
<td>APPENDIX C.3</td>
<td>Year 11 Student Information and Consent Forms</td>
<td>247</td>
</tr>
<tr>
<td>APPENDIX C.4</td>
<td>Ethics Approval: The University of Sydney</td>
<td>250</td>
</tr>
<tr>
<td></td>
<td>Human Ethics Committee; The New South</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Wales Department of Education and Training, Strategic Information and Reporting</td>
<td></td>
</tr>
<tr>
<td>APPENDIX D.</td>
<td>A pilot study of the psychometric properties of the Frost Multidimensional Perfectionism Scale: Clarification of multidimensionality and perfectionist typology.</td>
<td>254</td>
</tr>
<tr>
<td>APPENDIX E.</td>
<td>SPSS EFA Output Pattern Matrices (Years 8 &amp; 11)</td>
<td>292</td>
</tr>
<tr>
<td>APPENDIX F.</td>
<td>SPSS EFA Output Pattern Matrix (Six Factor Solution)</td>
<td>295</td>
</tr>
<tr>
<td>APPENDIX G.1</td>
<td>LISREL Completely Standardised Solution for Four Theorised Dimensions of Perfectionism</td>
<td>297</td>
</tr>
<tr>
<td>APPENDIX G.2</td>
<td>LISREL Completely Standardised Solution for Four Theorised Dimensions of Perfectionism (Specific Error Covariances Freed)</td>
<td>300</td>
</tr>
<tr>
<td>APPENDIX G.3</td>
<td>LISREL Completely Standardised Solution for Nested Confirmatory Factor Analysis of Higher Order “Positive” and “Negative” Perfectionism Factors</td>
<td>303</td>
</tr>
<tr>
<td>APPENDIX H.</td>
<td>SPSS Cluster Analysis Dendogram Output</td>
<td>308</td>
</tr>
<tr>
<td>APPENDIX I.1</td>
<td>SPSS MANOVA Output: Literacy Academic Variables</td>
<td>328</td>
</tr>
<tr>
<td>APPENDIX I.2</td>
<td>SPSS MANOVA Output: Numeracy Academic Variables</td>
<td>344</td>
</tr>
<tr>
<td>APPENDIX I.3</td>
<td>SPSS MANOVA Output: Literacy Goal Orientations</td>
<td>360</td>
</tr>
<tr>
<td>APPENDIX I.4</td>
<td>SPSS MANOVA Output: Numeracy Goal Orientations</td>
<td>372</td>
</tr>
</tbody>
</table>
ABSTRACT

The present study investigated the implications of perfectionism in a large sample of 788 secondary male and female students from four Sydney (New South Wales, Australia) schools, on a range of academic variables and personal achievement goal orientations. A key aspect of the study was to examine the dimensionality of the perfectionism construct, using a measure developed in the USA and previously used in overseas studies, with an Australian sample of secondary school students. The *Frost Multidimensional Perfectionism Scale* (Frost et al., 1990) was selected because of its inter-personal focus on a set of core components which are closely aligned to behaviours attributed to perfectionist children in the educational arena (Kerr, 1991). Using exploratory and confirmatory factor analytic procedures, the scale was found to be psychometrically sound in a re-formulated 4 factor solution rather than the 6 factor theorisation by its authors. It was also determined that the scale could reliably be used in a person-centred cluster analysis approach, to identify a tripartite typology of perfectionist student (healthy, unhealthy and non-perfectionist), based on combinations of scores obtained on the four dimensions of perfectionism. Nested confirmatory factor analysis did not support a hierarchical structure of 'healthy' and 'unhealthy' perfectionism factors as proposed by Parker and his colleagues in the USA (e.g., Stumpf and Parker, 2000). This result re-affirms the advisability of retaining the four first-order dimensions of perfectionism in profiling healthy, unhealthy, and non-perfectionist student types.

There is a dearth of empirical studies in which the interplay between perfectionism and school learning behaviours in student populations is examined. This study
therefore seeks to redress this deficit by providing new insights into the educational implications of perfectionism through investigating the association between perfectionist types of students and such academic variables as academic self-efficacy, academic self-handicapping, test anxiety, cognitive strategy use, self-regulation, and personal achievement goal orientations in the major compulsory school curriculum areas of English (literacy) and Mathematics (numeracy).

Major findings reveal that both healthy and unhealthy perfectionists report higher levels of self-efficacy, more cognitive strategy use and self-regulation than non-perfectionists. The two perfectionist groups also demonstrate higher levels of motivation than non-perfectionists, as demonstrated by their significantly higher scores on the task goal and performance-approach goal orientations. It was found however, that in contrast to healthy perfectionists, unhealthy perfectionist students were more likely to adopt a performance-avoid goal orientation which resonates with literary formulations that unhealthy perfectionists are driven particularly by fear of failure.

Perfectionism was found to be a pervasive characteristic of the secondary students studied, with 76% of participants being either healthy or unhealthy perfectionists. Perfectionist type was also independent of school ability level, grade, academic domain, gender, ethnic background and school attended. The results of the study therefore appear remarkably robust, and are consequently of both theoretical and practical importance to researchers and educators interested in sound theory to inform teaching practice.
CHAPTER 1
INTRODUCTION

"When you aim for perfection, you discover it’s a moving target."

Geoffrey F. Fisher

Through the Looking Glass: A Study of Perfectionism

There is a childhood rhyme that says,

Good, better, best
Never let it rest,
’Til your good is better
And your better best.

and which epitomises the dilemma faced by teachers in encouraging students to be academically successful without contributing to the exacerbation of perfectionist tendencies by exposing them to the negative side effects of pressure to be the best. While teachers aim to develop good work habits including effortful persistence and pride in work well done, they need to be vigilant in seeking out students who “never let it rest”, and, as a consequence, may be unable to share the joy and rewards of satisfaction that come from effortful achievements. Indeed, teachers have long recognised perfectionist thinking and behaviour in students, some of which is positive and facilitates successful learning outcomes, but at other times, is debilitative and leads to undesired results such as a preoccupation with fear of failure and disapproval, and problems with procrastination, missed deadlines and low productivity.
Perfectionism is said to be a trait common in gifted children who may refuse to attempt certain tasks rather than risk failing to achieve a superior level of performance and consequently fall into patterns of underachievement. However, this begs the question as to why perfectionism is considered to be the prerogative of gifted children and not a challenge for students of lesser ability or even students with learning disabilities. Indeed, the ramifications of perfectionism in school students would appear to be many and of much complexity, thus providing a fertile ground for research.

Yet, perfectionism itself, is a relatively recent variable in terms of educational research. Although it enjoys a long history in the clinical literature, both conceptually and empirically, it is only in recent years that systematic studies in the educational context have been undertaken. These studies were spearheaded by the development of three popular scales each designed to measure perfectionism and each based on a multidimensional albeit pejorative view of the construct. Both Frost et al. (1990) and Hewitt and Flett, (1991) named their measures The Multidimensional Perfectionism Scale while Slaney and Johnson (1992) named their instrument The Almost Perfect Scale which was subsequently revised and re-named The Almost Perfect Scale-Revised (Slaney, Mobley, Trippi, Ashby, & Johnson, 1996). These instruments have been used in a number of studies which have ranged from evaluations of their factor structure (see Frost, Marten, Lahart, & Rosenblate, 1990; Hewitt & Flett, 1991; Slaney et al., 1996) to validation of their psychometric properties in clinical (Hewitt, Flett, Turnbull-Donovan, & Mikail, 1991), academically talented 6th graders (Parker & Stumpf, 1995) and university student (Slaney, Rice, Mobley, Trippi, & Ashby, 2001) populations. There has been some
evidence of factorial instability with the *Multidimensional Perfectionism Scale* (Frost et al., 1990) as well as debate as to how many factors to retain in the perfectionism measure (e.g., Rhéaume, Freeston, Dugas, Letarte, & Ladouceur, 1995; Stöber, 1998). In particular, the need for order and organisation variable has been called into question since the test authors (Frost et al., 1990) themselves reported low correlations of Organisation with the other perfectionism factors and advised against including scores on this factor in determining an overall perfectionism score. Clearly the validity of the factor structure of this instrument needs further investigation in order to establish the core components of the perfectionism construct in a wider range of cross cultural populations and including normative school student populations.

In addition to these studies a number of researchers have sought evidence for the existence of two high order perfectionism factors in support of Hamachek’s (1978) conceptualisation of *normal* and *neurotic* perfectionism, in college (e.g., Bieling, Israeli, Smith, & Antony, 2003; Enns, Cox, Sareen, & Freeman, 2001) and academically talented (e.g., Parker & Stumpf, 1995; Stumpf & Parker, 2000) student populations. These investigations have been pre-dominantly correlational designs in which groupings of positive factors were said to represent the ‘positive’ aspect of perfectionism while the negative group of factors represented the ‘negative’ aspect. The positive factors (represented by the setting and holding of high personal standards, and the need for order and organisation), were almost universally associated with measures of healthy psychological functioning and adjustment, whilst the negative factors (represented by excessive concern over mistakes, doubting one’s actions, and perceptions of negative parental judgments) were
associated with psychological distress and maladjustment (e.g., Frost, Heimberg, Holt, Mattia, & Neubauer, 1993; Slaney, Ashby, & Trippi, 1995; Suddarth, 1996). Although studies using confirmatory factor analyses reported empirical support for the existence of these two higher order perfectionism factors (see Bieling, Israeli, & Antony, 2003; Cox, Enns, & Clara, 2002; Rice, Ashby, & Slaney, 1998) there is evidence of poor model fit, across-construct correlations, and unacceptable alpha coefficients, together with incomplete reporting both of factor intercorrelations, and the use of appropriate statistical procedures, such as nested confirmatory factor analyses (e.g., Stumpf & Parker, 2000). From a methodological viewpoint there is a need to address this empirical concern by examining the validity of the existence of two higher order perfectionism factors representing a dichotomous view of the construct by conducting nested confirmatory factor analyses in which the full set of items are first specified to load on their respective first order factors which are then simultaneously specified to load as theorised on the second order factors.

A third major area of research has taken a person-centred approach to the study of perfectionism in which cluster analysis is used to identify a typology of perfectionism. Overseas research in North America, Germany and Czechoslovakia (e.g., Parker, Portešová, & Stumpf, 2001; Rice & Dellwo, 2002; Rice & Lapsley, 2001; Rice & Mirzadeh, 2000), together with two recent Australian studies (see Hawkins, Watt, & Sinclair, 2004; Kornblum, 2001) has supported the tripartite typology consisting of a healthy, a dysfunctional and a non-perfectionist type of perfectionist student first identified by Parker (1977) with a sample of academically talented 6th grade school students.
Through this approach it has been possible to develop profiles of two types of perfectionist, one healthy and one unhealthy, and compare these with a third, non-perfectionist student type. Collectively, extant studies have shown that setting high personal standards is indicative of both healthy and unhealthy perfectionists and that the need for order and organisation characterises the healthy perfectionist (see Hawkins et al., 2004; Kornblum, 2001; Parker, 1997; Parker et al., 2001; Rice & Dellwo, 2002; Rice & Lapsley, 2001; Rice & Mirzadeh, 2000). Although the combination of the personal standards and organisation variables have been identified as components of a 'positive' aspect of perfectionism in the above-mentioned higher order studies, the perfectionism typology has thus far strongly suggested that personal standards can be indicative of both healthy and unhealthy perfectionist types and clarification of the role of personal standards is needed.

This investigation therefore seeks to study perfectionism in the naturally occurring learning situations of school and classroom contexts. The study intends to extricate a number of key issues that have emerged in extant studies in the field of perfectionism research in order to gain insight into the educational implications of perfectionism for adolescent school students. The broad aims of the study are twofold. First, it seeks further clarification of the unidimensional versus multidimensional conceptualisations of the construct in order to determine its core components, the existence of two higher order perfectionism constructs representing positive and negative aspects of perfectionism and the perfectionism typology, and second, it aims to obtain a better understanding of the interplay between perfectionism and the key academically relevant beliefs and behaviours of academic self-efficacy, cognitive strategy use, self-regulation, academic self-handicapping and
test anxiety. In addition to this a conceptual link between perfectionism and achievement motivation will be proposed in the examination of the personal goal orientations of task, performance-approach and performance-avoid of perfectionist students.

The investigation will embrace a range of male and female adolescent school students of different levels of ability, school performance, age/grade, ethnic background and school, and will be embedded within the domain specific curriculum areas of English (literacy) and Mathematics (numeracy). This will provide valuable cross-cultural comparisons and extend previous studies of North American (Parker, 1997; Parker & Adkins, 1995a; Parker & Mills, 1996; Parker & Stumpf, 1995; Rice & Dellwo, 2002; Rice & Lapsley, 2001; Rice & Mirzadeh, 2000; Stumpf & Parker, 2000), German (Stöber, 1998), and Czech (Parker et al., 2001) students.

The key questions investigated in the present study are first, what are the dimensions of perfectionism? Second, what is the typology of perfectionist secondary school student? Third, is there an association between the dimensions of perfectionism and the contextual factors of level of school ability, grade, gender, ethnicity and school? Fourth, what is the relationship between perfectionist type and the academic variables of school performance, academic self-efficacy, academic self-handicapping, test anxiety, cognitive strategy use, and self-regulation in the literacy and numeracy domains? Fifth, what is the relationship between perfectionist type and individuals' personal achievement goal orientations of task, performance-approach, and performance-avoid, in the literacy and numeracy domains? Sixth, is there a relationship between perfectionism and level of school ability? For research
questions 4, 5, and 6, parallel analyses are conducted in the literacy and numeracy domains of English and Mathematics to assess the domain specificity of the findings.

This chapter has outlined the rationale and key research issues to be investigated in the study. Chapter 2 is a review of the literature pertaining to the nature of perfectionism and traces the development of a contemporary multidimensional view of the construct which is then embedded in an educational setting from which is presented an exposé of school related variables and goal orientations relevant to a study of perfectionism and its academic implications for Australian secondary students. Chapter 3 details the methodology for the study. Results for research questions one to six above, are presented in Chapter 4. The final chapter summarises the major findings, highlights major themes and contributions, identifies limitations of the study and suggests directions for future research and implications for educational practice.

In the course of conducting this research study a number of papers reporting sections of the investigation have been presented at national and international conferences and one paper has been accepted for publication in *Educational and Psychological Measurement*, subject to revision and re-submission. Aspects of the research have been subjected to scholarly comment and publication in the conference proceedings, details of which are listed below. As a result of these conference presentations, positive, critical feedback, for which the researcher is grateful, has been gained.
Details of conference presentations are as follows:


CHAPTER 2

"Striving to do better, oft we mar what's well."

☞ William Shakespeare ☞

A REVIEW OF THE LITERATURE

The Nature of Perfectionism

The construct of perfectionism has been described as a two-edged sword. Its study has its roots in the clinical literature in which it is primarily viewed as a pernicious personality construct and the harbinger of intent to wreak havoc with the emotionality and psychological health of the individual. At the same time, it has been lauded as an innate personality trait that is conducive to the fulfillment of human potential. This chapter documents a journey through the literature in order to tease out the convoluted strands of the perfectionism tapestry.

2.1 Traditional Perspectives

Many current studies of perfectionism are based on a tradition of historical thought and theoretical formulations on the subject. These have been extracted from the literature since the early 20th century commencing with the psychoanalytical works of Sigmund Freud published in 1926 (Freud, 1959). Early collective ruminations on the perfectionism syndrome centre on a common belief that it is a negative attribute which gives rise to psychological disturbance. In addition, it was generally asserted that perfectionists themselves appear to be cognitively dysfunctional in that they demonstrate a rigid, dichotomous thinking style. They perceive their environment in
A Review of the Literature

‘all or nothing’ terms in which the only outcomes are either perfection or total failure (Beck, 1976; Hamachek, 1978; Horney, 1950; Pacht, 1984). These individuals focus on flaws in their own performance (Hollender, 1965), and have a tendency to overgeneralise negative occurrences (Burns, 1980a). They have been described by various authors (Barrow & Moore, 1983; Delisle, 1986; Driscoll, 1982; Pacht, 1984) as pursuing excellence to an unhealthy extreme, “whose standards are high beyond reach or reason, people who strain unremittingly toward impossible goals and measure their own worth entirely in terms of productivity and accomplishment” (Burns, 1980a, p.34).

It was said, that for perfectionists, at all times, and in all places, things must be without flaw or fault. Perfectionists were thought to be recognisable by their repeated use of the phrases “I should” or “I should not”. In fact, perfectionism itself was described by Horney (1950), as “the tyranny of the shoulds” (Shafran & Mansell, 2001). Perfectionists were thought to crave total admiration which is never forthcoming and to blindly fear criticism or blame. They were perceived as being equally disturbed by mistakes, big or small alike and, like extremists, to act in superlatives, failing to separate the important from the unimportant. They were considered to be usually tense because they lacked self-confidence (Krausz, 1973), and exacting for the sake of being exacting. Unlike great artists, musicians, surgeons, and other true masters of their craft who feel pleased with the results of that painstaking effort which enhances their self esteem – the strivings of perfectionist people were considered to be accompanied by debilitating feelings of inferiority and an obsession with always needing to do better (Missildine, 1963).
In its embryonic form, the study of perfectionism was the province of theorists and clinicians whose views were derived from a combination of historical deliberations and professional interactions with clients seeking psychotherapy. Ensuing reports in the clinical literature consisted primarily of detailed case studies in which the experience of perfectionism was portrayed as a pernicious problem associated with psychopathology. Despite an almost universal acceptance of a negative unidimensional view of perfectionism, a universally agreed-upon definition of the construct remained elusive.

One of the first dictionary definitions of perfectionism was that it was considered "the practice of demanding of oneself or others a higher quality of performance than is required by the situation" (Hollender, 1965, p. 94). However, this definition lacked precision since it was open to many interpretations of what actually constituted a higher quality of performance than the situation required. Soon after this, an attempt to capture the essence of what was meant by perfectionism, defined it as a network of cognitions, including expectations, interpretations of events, and evaluations of oneself and others, characterised by a) the setting of unrealistic standards, b) rigid and indiscriminate adherence to these standards, and c) the equating of self-worth and performance (Burns, 1980b). This definition clearly reflected the unidimensional conceptualisation of perfectionism with psychopathological overtones, which persisted in the clinical and anecdotal literature until the end of the 1980's. It was a pejorative view of perfectionism as a malady to be cured, and perfectionists were considered to be candidates for potential

2.2 A Dual Concept of Perfectionism

The early unidimensional view of perfectionism however, gradually gave way to a dual conceptualisation of the construct. A duality of perfectionism was articulated in Hamachek’s (1978) description of normal and neurotic perfectionists. The former set very high standards and are highly motivated by their need for achievement whilst, at the same time, recognising and accepting their limitations in an attempt to reach their goals. Hamachek (1978) defined normal perfectionists as "those who derive a very real sense of pleasure from the labors of a painstaking effort and who feel free to be less precise as the situation permits" (p.27). These individuals seek approval in much the same way as everybody else; the positive feeling derived from this approval serves to heighten their own sense of well-being and they are encouraged to continue on and further improve their efforts (Hamachek, 1978).

Neurotic perfectionists, on the other hand, cannot accept any limitations in their efforts to attain the high standards they set for themselves. These individuals are driven more by a fear of failure than the pursuit of excellence, and, as a result, fail to obtain satisfaction either with themselves or their performance (Hill, McIntyre, & Bacharach, 1997; Nugent, 2000; Pacht, 1984). Hamachek (1978) asserted that the efforts of neurotic perfectionists “never seem good enough, at least in their own eyes . . . They are unable to feel satisfaction because in their own eyes they never seem to
do things good enough to warrant that feeling” (p.27). Pacht (1984) also viewed perfectionism as being associated with psychopathology. Along with Burns (1980a) and Hamachek (1978) he bemoaned the plight of such neurotic perfectionists, whose mental distortions and rigid goals that they establish for themselves, “doom them to a life of unhappiness unless, in some way, the learned patterns of behavior can be unlearned” (p.387).

Prior to the development of psychometric measures of perfectionism, a number of writers in the clinical literature referred to normal or adaptive perfectionism as opposed to neurotic or maladaptive perfectionism (Adler, 1956a; Burns, 1980a; Hamachek, 1978; Hollender, 1965; Pacht, 1984). The differences between adaptive and maladaptive perfectionism as described by these authors have been summarised by Enns and Cox (2002), and are reproduced in Table 2.1.

Table 2.1
Differences between Maladaptive ("Neurotic") and Adaptive ("Normal") Perfectionism

<table>
<thead>
<tr>
<th>Maladaptive Perfectionism</th>
<th>Adaptive Perfectionism</th>
</tr>
</thead>
<tbody>
<tr>
<td>Unable to experience pleasure from labors</td>
<td>Able to experience satisfaction or pleasure</td>
</tr>
<tr>
<td>Inflexibly high standards</td>
<td>Standards modified in accordance with the situation</td>
</tr>
<tr>
<td>Unrealistically or unreasonably high standards</td>
<td>Achievable standards</td>
</tr>
<tr>
<td>Overly generalised high standards</td>
<td>High standards are matched to the person’s limitations and strengths</td>
</tr>
<tr>
<td>Maladaptive Perfectionism</td>
<td>Adaptive Perfectionism</td>
</tr>
<tr>
<td>-------------------------------------------</td>
<td>------------------------------------------------------------</td>
</tr>
<tr>
<td>Fear of failure</td>
<td>Striving for success</td>
</tr>
<tr>
<td>Focus on avoiding error</td>
<td>Focus on doing things right</td>
</tr>
<tr>
<td>Tense/anxious attitude toward tasks</td>
<td>Relaxed but careful attitude</td>
</tr>
<tr>
<td>Large gap between performance and standards</td>
<td>Reasonable match between attainable performance and standards</td>
</tr>
<tr>
<td>Sense of self-worth dependent on performance</td>
<td>Sense of self independent of performance</td>
</tr>
<tr>
<td>Associated with procrastination</td>
<td>Timely completion of tasks</td>
</tr>
<tr>
<td>Motivation to avoid negative consequences</td>
<td>Motivation to achieve positive feedback/reward</td>
</tr>
<tr>
<td>Goals attained for self-enhancement</td>
<td>Goals attained for enhancement of society</td>
</tr>
<tr>
<td>Failure associated with harsh self criticism</td>
<td>Failure associated with disappointment and renewed efforts</td>
</tr>
<tr>
<td>Black and white thinking: perfection versus failure</td>
<td>Balanced thinking</td>
</tr>
<tr>
<td>Belief that one should excel</td>
<td>Desire to excel</td>
</tr>
<tr>
<td>“Compulsive” tendencies and doubting</td>
<td>Reasonable certainty about actions</td>
</tr>
</tbody>
</table>


Despite these theoretical underpinnings of the power of perfectionism as a potential positive driving force behind human achievement in a wide variety of human endeavours, little, if any, evidence of this aspect of the construct was reported in the literature to counter the pejorative portrayal of perfectionism permeating the clinical and anecdotal literature during the 1980's.
2.3 The Multidimensional View of Perfectionism

By the end of the 1980's, traditional theoretical formulations on the construct of perfectionism were supplanted by an expanded multidimensional conceptualisation which encapsulated both intra and inter-personal aspects. Perfectionism was differentially defined through the development of instruments designed to provide an objective measurement of its various dimensions. Two of the most widely used instruments were each named the *Multidimensional Perfectionism Scale* (Frost, Marten, Lahart, & Rosenblate, 1990; Hewitt & Flett, 1991).  

These more contemporary views of perfectionism can be summarised into the two major dimensions of self and social contexts. The view of perfectionism by Hewitt and Flett (1991), identified three separate dimensions of perfectionism. The first is *self-oriented perfectionism* which focuses on the attainment of high self-standards. It includes such behaviours as the setting of demanding self-standards and severe appraisal of one's performance. This dimension was theorised to contain the motivational element of either striving for perfect outcomes or striving to avoid failure. The second dimension is *other-oriented perfectionism* which involves the setting of high standards for other people. This dimension is based on Hollender's (1965) suggestion that some individuals are prone to interpersonal perfectionist behaviour.

---

1 In order to distinguish between the two scales, Frost et al.'s (1990) instrument will be referred to as the Frost Multidimensional Perfectionism Scale (FMPS) as suggested by Flett, Sawatzky and Hewitt (1995). For the purpose of clarity the Hewitt and Flett (1991) scale will be referred to as the HMPS.
Thus other-oriented perfectionists are believed to place unrealistic demands on others and apply stringent evaluations of others’ performance. This is similar to self-oriented perfectionists, but, in this case, the perfectionist behaviour is directed outwards. The third dimension is socially-prescribed perfectionism which is the perception that other people demand perfection from the self. It relates to a perceived need to reach unrealistic standards which are externally imposed on the self and stringently evaluated by significant others, thus exacerbating the drive for perfection (Hewitt & Flett, 1991).

The 45-item Multidimensional Perfectionism Scale (HMPS) developed by Hewitt and Flett (1991) contains three subscales of 15 items each for the Self-Oriented (SOP), Other-Oriented (OOP), and Socially-Prescribed (SPP), dimensions of perfectionism. The instrument was normed on a sample of 1,106 university students who were instructed to rate their agreement with the statements on a 7-point Likert scale ranging from strongly disagree (1) to strongly agree (7). A principal-component factor analysis was performed on the item responses and the subsequent scree test (Cattell, 1966) confirmed that three factors, which accounted for 36% of the variance, should be retained. Alpha coefficients were calculated to confirm the internal consistency of the three subscales which were 0.89 for factor 1 (SOP), 0.79 for factor 2 (OOP), and 0.86 for factor 3 (SPP). There were no gender differences in mean subscale scores and the results provided support for the hypothesised dimensionality of the HMPS which contained three underlying factors corresponding to the three theorised perfectionism components. Consistent with the content of these three dimensions, it has been suggested that while self-oriented perfectionism
includes an intrapersonal motivational component instrumental in assisting perfectionists in their pursuit of excellence (Hewitt & Flett, 1991), an interpersonal motivational component is the focus of other-oriented and socially-prescribed perfectionism.

A distinction between the self and social components of perfectionism was also incorporated into the multidimensional formulation by Frost et al. (1990). Frost and his colleagues distinguished four components of perfectionism that focus primarily on the self (high self standards, concern over mistakes, doubts about actions, and the need for order and organisation) and two components that focus on socially evaluative reactions to the self (high parental expectations and parental criticism).

In developing their multidimensional measurement of the perfectionism construct the authors (Frost et al., 1990) drew on the prevailing literature which emphasised the centrality of high standard setting as a core component of perfectionism. In line with Hamachek’s (1978) distinction between ‘normal’ and ‘neurotic’ perfectionism, they acknowledged that while setting and striving for high standards was not in itself pathological, psychological problems were associated with perfectionism when these high standards were accompanied “by tendencies for overly critical evaluations of one’s own behavior” (Frost et al., 1990, p.450). Overly critical evaluations were described by several clinical writers as an overconcern for mistakes in one’s performance which led perfectionists to strive for their goals by a fear of failure rather than a need for achievement. It was claimed, that, for perfectionists, only perfect performance was good enough and even minor flaws constituted failure (see
Burns, 1980a; Hamachek, 1978; Pacht, 1984). A related evaluative tendency recounted in the clinical literature was doubt about the quality of one's performance in the sense that the task was not completed satisfactorily. This was expounded in writings on obsessional experiences (see Reed, 1985) and reflects uncertainty as to when a task is finished. In addition to high standards, critical self-evaluations and doubts about actions, the authors drew on the theorisation of prominent writers in the perfectionism literature which referred to perfectionists as those who feel that their parents have set impossible standards for them to meet, and that the inevitable failure to measure up to these excessive parental expectations will result in a loss of their parents' love and acceptance (see Burns, 1980a; Hamachek, 1978; Hollender, 1978; Pacht, 1984). The parental connection was therefore considered to be an integral dimension of perfectionism. The final dimension of perfectionism to be explicated from the literature was the need for precision, order and organisation. Hollender (1965) described perfectionists as "fussy and exacting" (p.96), with a fetish for orderliness and regularity (Hollender, 1978). This emphasis on order was not associated with standard setting or the self-evaluation of performance per se, but rather with how individuals approach the challenge of achieving such standards (Frost et al., 1990).

The Multidimensional Perfectionism Scale (FMPS) initially consisted of sixty seven items generated from the five theorised dimensions outlined above and the content of two existing perfectionism measures (Burns, 1980a; Garner, Olmstead, & Polivy, 1983), a measure of obsessionality (Rachman & Hodgson, 1980), and a number of newly generated items. From this body of literature, Frost et al. (1990)
conceptualised **Personal Standards** as high standard setting and an excessive emphasis placed on these standards for self-evaluation. **Concern over Mistakes** was conceptualised as reacting negatively to mistakes, interpreting mistakes as failure, and believing that respect from others is compromised by failure. The **Parental Expectations** dimension reflected a perception of unrealistic and overly critical parental pressure. A sense of inadequate and unsatisfactory task completion was reflected in the **Doubts about Actions** dimension, and an exaggerated need for order and **Organisation** constituted the final dimension. All items were in statement form and the participants were required to respond to a 5-point Likert scale ranging from “strongly disagree” to “strongly agree” (Frost et al., 1990).

Using a sample of female university undergraduates (n=232), a principal factor solution was employed and factors were rotated to orthogonal simple structure using Varimax. The criterion for factor extraction was a minimum eigenvalue of 1.0. This initial analysis produced ten factors each with eigenvalues exceeding unity. With a second sample of female university undergraduates (n=178), subsequent principal factor analyses and final assignment of items to subscales in order to maintain conceptual integrity and maximise reliability, resulted in six factor subscales. The **Concern over Mistakes** (CM) subscale contributed the most variance (25%), followed by **Organisation** (O) (15.7%), **Parental Criticism** (PC) (8.6%), **Personal Standards** (PS) (7.1%), **Doubts about Actions** (D) (4.6%), and **Parental Expectations** (PE) (3.5%). The coefficients of internal consistency for the factor scales ranged from .77 to .93, and for the total perfectionism scale .90. A total perfectionism score was obtained by adding subscale scores except for the O subscale, which showed the
weakest intercorrelation with the other subscales, but was retained as a dimension of perfectionism (Frost et al., 1990). In their review of numerous studies using the FMPS, Enns and Cox (2002) concluded that there was compelling evidence of the construct, concurrent, and discriminant validity of the instrument which is a reasonably brief, comprehensive, and psychometrically sound measure of six dimensions of the perfectionism construct (p.42).

It is of considerable relevance to the present investigation that Frost et al.'s (1990) conceptualisation of perfectionism is closely aligned with the complex characteristics and behaviours ascribed to perfectionist school students (see Kerr, 1991). These include unrealistic high standards for self and others, indiscriminate acquiescence to external evaluation and placing over-emphasis on precision, order and organisation (Kerr, 1991). The theoretical synchrony of Frost et al.'s dimensions of perfectionism in tune with student learning behaviours, strikes a harmonious chord with educators interested in facilitating the well-being and academic success of perfectionist students which is at the heart of this thesis.

The expanded view of perfectionism, then, was of a complex, multidimensional construct, salient features of which could be overlooked by the traditional unidimensional approach. However, it was claimed by some (Slaney, Ashby, & Trippi, 1995), that research into perfectionism was still dominated by a tendency to focus on the negative aspects of the construct, and that it failed to embrace the possibility of an adaptive function which may serve to spur individuals on to heightened levels of achievement and satisfaction. Slaney and Johnson (1992)
developed the *Almost Perfect Scale* (APS), in which they placed an emphasis on an “unbiased perspective” which allowed for “the possibility that perfectionism might have both positive and negative aspects” (p.281, cited in Enns and Cox, 2002). Their scale consisted of 32 items designed to measure four subscales. The *Standards and Order* subscale (12 items) measured high personal standards and a need for order (representing the ‘adaptive’ aspect of perfectionism). The other three subscales measured ‘maladaptive’ aspects of perfectionism: *Anxiety* (4 items), *Procrastination* (4 items), and *Difficulty in Interpersonal Relationships* (12 items). Support for the validity and reliability of the APS has been found in studies of university students (Johnson & Slaney, 1996; Slaney et al., 1995). Paradoxically, in developing their measure of perfectionism, Slaney and Johnson (1992) included a preponderance of negative items derived from a review of the literature, despite their attempt to emphasise the positive dimensions of perfectionism (Slaney, Rice, Mobley, Trippi, & Ashby, 2001).

The evocative nature of a positive perspective of perfectionism induced a more recent revision of the APS scale which was renamed the *Almost Perfect Scale-Revised* (APS-R; Slaney, Mobley, Trippi, Ashby, & Johnson, 1996; Slaney et al., 2001). The revised instrument consisted of two subscales which measured the positive dimensions of *High Standards* (7 items) and *Order* (4 items) and one subscale measuring the negative dimension of *Discrepancy* (13 items). CFA analyses have provided support for the factor structure of the APS-R scale and measures of internal consistency supporting the reliability of the three subscales have been reported (see Mobley, 1998). The APS-R is a reconceptualised measure of
variables representing both positive and negative aspects of the perfectionism
construct in concert with commonly held views, and has been empirically supported
in a number of extant studies (Accordino, Accordino, & Slaney, 2000; Ashby,
LoCicero, Kottman, Schoen, & Honsell, 1998; LoCicero & Ashby, 2000; Slaney et
al., 2001; Suddarth & Slaney, 2001; Vandiver & Worrell, 2002).

Thus the negative focus on early conceptualisations of perfectionism began to
change as personality theorists asserted that perfectionism, or at least some aspects
of perfectionism, may be conducive to human growth and well-being. The wish to
excel was considered an attribute to be admired and individuals who sought
‘perfection’ were not always regarded as pathological (Halgin & Leahy, 1989).
According to Adler (1956a) “the striving for perfection is . . . part of life, a striving,
an urge, a something without which life would be unthinkable” (p. 104). Adler
believed that the pursuit of perfection was healthy when one is maximising one’s
abilities, concomitant with a social concern for others. He admonished that when
people strive to concretize the goal of perfection by domineering over others, “such a
goal of perfection seems unfitted to guide the individual or the mass of men” (Adler,
1956b, p.129). In other words, if one demonstrates a propensity to dominate others,
then one is displaying a negative and unhealthy form of perfectionist striving.

Individuals who are more concerned with their standing in relation to their peers and
actively seek to dominate others, need to be differentiated from those who attempt to
fulfill their potential from within themselves (Spence & Helmreich, 1983). The
latter individuals epitomise Maslow’s (1970) view of self-actualisation which fully
utilises and exploits one's talents, capabilities and potentialities (Parker & Adkins, 1994). The gravitation towards perfectionism is a special form of self-actualisation. Such things as the innumerable repetitive actions of children are not manifestations of a senseless drive for repetition, but a tendency for completion and perfection. "The nearer we are to perfection, the stronger is the need to perform. This is valid for children as well as for adults" (Goldstein, 1939, p.196). It may be argued that this is particularly valid in academic situations, which proclaim the pursuit of scholastic excellence and the fulfilment of personal achievement potential. It is only when one relentlessly pursues unrealistic goals to the exclusion of all else, that perfectionism precludes the attainment of the goal and invokes personal distress (Parker, 1997). When viewed in pedagogical terms, this raises conjecture as to the pertinence of perfectionism in educational settings in general, and schools in particular.

These apposite formulations on human striving served to broaden conceptualisations of perfectionism from associations with neurosis, to associations with the fulfilment of human potential. However, in spite of these distinctions, ongoing attempts to define perfectionism often persisted in retaining the more traditional conceptualisation of the construct as a problematic personality orientation. The pejorative portrayal of perfectionism continued to permeate the clinical literature as a neurotic disposition associated with many psychopathologies (Flett, Hewitt, & Dyck, 1989; Frost, Heimberg, Holt, Mattia, & Neubauer, 1993). This is not surprising when one considers that studies of perfectionism were predominantly embedded in psychiatric settings, using patient samples presenting such various disorders as stress
(Flett, Hewitt, Endler, & Tassone, 1995; Hewitt & Dyck, 1986; Hewitt & Flett, 1993), eating disorders (C. Davis, 1997; Slade, 1982), depression (Blatt, 1995; Flett, Hewitt et al., 1995) and suicidal preoccupation (Adkins & Parker, 1996; Hewitt, Flett, & Weber, 1994). Any representation of perfectionism as a potential driving force behind human achievement in a wide variety of human endeavours and across a range of sample populations, was conspicuously absent from this body of clinical literature.

2.4 Quantifying the Duality of Perfectionism

With the development of instruments designed to measure perfectionism, the conceptual distinctions between adaptive and maladaptive forms of perfectionism captivated researchers who became interested in substantiating the dichotomy through empirical studies. Although various researchers claimed to have found evidence consistent with Hamachek's (1978) theorised normal and neurotic perfectionism, their descriptions varied both in name and substance.

Slade and Dewey (1986) described satisfied and dissatisfied perfectionists, in a study of 11th and 12th grade girls, female collegiates, and nursing students which aimed at developing a screening instrument to identify people at risk for developing anorexia nervosa. The only data available for the resulting Setting Conditions for Anorexia Nervosa Scale (SCANS) were from small groups of participants with eating disorders. Therefore in the absence of normative data across other groups, it would be unwise to extrapolate more general descriptions of their satisfied perfectionists.
Indeed, it is the maladaptive aspect of perfectionism that is central to studies reported in the eating disorder literature. One has to look elsewhere for evidence of perfectionism's adaptive function.

Adkins and Parker (1996) identified active and passive perfectionists in a correlational study of the relationship between dimensions of perfectionism and suicide ideation in a sample of college-age and adult psychology students. Using canonical correlation analysis, Adkins and Parker (1996) found a moderately strong relationship between scores on the FMPS measure of perfectionism, and a measure of suicide preoccupation (AAHS; Alabama Adolescent Health Survey). Their study provided evidence to indicate the differential relationships between perfectionism and depression when a multidimensional measure of perfectionism such as the FMPS is used. The researchers found that the Concern over Mistakes (CM) and Doubts about Actions (D) subscales accounted for most of the variance, with the remaining FMPS subscale scores Personal Standards (PS), Parental Expectations (PE), Parental Criticism (PC), and Organization (O), having little relationship. In explaining the differential relationships between perfectionism and suicidal preoccupation, Adkins and Parker (1996) concluded that the CM and D subscales measured “passive perfectionism” and that the PS, PE, PC and O subscales measured “active perfectionism” which was not associated with suicidal preoccupation.

Other researchers have attempted to distinguish between positive and negative aspects of perfectionism which were explicitly defined in terms of positive and negative outcomes (Terry-Short, Owens, Slade, & Dewey, 1995). These authors
devised a 40-item questionnaire based on the inspection of a range of established measures of perfectionism, which included the Eating Disorder Inventory (Garner et al., 1983), the Setting Conditions for Anorexia Nervosa Scale (Slade & Dewey, 1986); the Burns Perfectionism Scale (Burns, 1980a); the Multidimensional Perfectionism Scale (Hewitt & Flett, 1991); and the Neurotic Perfectionism Questionnaire (Mitzman, Slade, & Dewey, 1994). Because these scales were markedly based on ambiguous or negative items, with infrequent use of positive items, the new questionnaire emphasized clear specification of positive and negative outcomes and maintained a close balance between the two item sets. A series of exploratory principal components factor analyses supported the hypothesis of a positive/negative distinction in which such consequences as self-esteem and satisfaction (which they named 'personal') combined with perceived approval and acclaim of others (named 'social') converged to form positive perfectionism, which was identified as a function of achieving positive consequences. Conversely, negative perfectionism, both inter and intra-personally derived, was a function of avoiding negative consequences (Terry-Short et al., 1995). However, as it has not been possible to locate any further evidence of the reliability or validity of this scale in the reported literature, these findings have a limited application.

Although the above studies have mobilised an interest in establishing an empirical distinction between the dual perspectives of perfectionism as envisaged by Hamachek (1978), several issues remain obfuscated. Taken collectively, there is a continued lack of consistency in terminology describing healthy and unhealthy perfectionist individuals and behaviours. This is perhaps due to sample specific
factors such as female eating disordered participants being referred to as satisfied or dissatisfied perfectionists (Slade & Dewey, 1986). Such referents to the double-edged nature of perfectionism need to be extended across a wider and more diverse range of participants including clinical and community groups. A malodorous essence of perfectionism continues to dominate correlational studies, and while there is almost universal acceptance of the quintessential role of high personal standards in defining perfectionism, its affinity with either positive or negative perfectionism remains obscure.

2.5 The Role of Personal Standards

Empirical findings that portray personal standards as a healthy component of perfectionism are contrary to the pervasive pathological view of this core component underpinning the development of the three most widely used measures of perfectionism (The Multidimensional Perfectionism Scale; Frost et al., 1990; Hewitt & Flett, 1991; The Almost Perfect Scale; Slaney & Johnson, 1992). Although the Frost et al. (1990) scale was not specifically developed to measure adaptive and maladaptive perfectionism, the authors believed that a core component of perfectionism - the setting of high standards - is not of itself pathological, thus foreshadowing subsequent evidence of the adaptive nature of their Personal Standards perfectionism dimension. In retrospect, this admission, at the very outset of contemporary empirical approaches to the study of perfectionism, was perhaps more axiomatic of the positive role of personal standards than even the authors themselves (Frost et al., 1990), may have realised. Since much of the early research
using the FMPS was limited to correlations with measures of negative affect, Frost et al. (1993) conducted a correlational study of the Frost et al. (1990) and the Hewitt and Flett (1991) measures of perfectionism (both called *The Multidimensional Perfectionism Scale*, and referred to as the FMPS and HMPS respectively throughout this thesis), which aimed to provide additional data on the relationship of perfectionism with positive affect.

In this study, Frost et al. (1993) conducted a principal factor analysis of the subscale scores of the two measures of perfectionism both named *The Multidimensional Perfectionism Scale* (FMPS; Frost et al., 1990; HMPS; Hewitt & Flett, 1991), which resulted in a two-factor solution representing two conceptually unambiguous factors, following both orthogonal and oblique rotations. *Personal Standards* and *Organisation* (FMPS) clustered together with *Self-Oriented Perfectionism* and *Other-Oriented Perfectionism* (HMPS) to form a factor representing an adaptive form of perfectionism which they named *Positive Striving*. The authors posited that high scores on this factor were likely to be obtained by achievers who experience success as a result of skills (*Organisation*), and high levels of expectations for themselves (*Personal Standards, Self-Oriented Perfectionism*) and others (*Other-Oriented Perfectionism*).

The negative aspects of perfectionism were represented by the subscales of *Concern over Mistakes, Parental Criticism, Parental Expectations, Doubts about Actions* (FMPS), and *Socially-Prescribed Perfectionism* (HMPS). This factor was labelled *Maladaptive Evaluation Concern* as it reflected personal concern over mistakes and
failures, and a preoccupation with other people’s criticism and evaluations of oneself (Frost et al., 1993). The distinction between positive and negative facets of perfectionism was supported by the correlation of the Positive Striving factor with a measure of positive affect (Positive and Negative Affect Scales, PANAS; (Watson, Clark, & Tellegen, 1988), while the Maladaptive Evaluation Concerns factor was associated with negative affect from the PANAS and the Beck Depression Inventory (Beck, Ward, Mendelson, Mock, & Erbaugh, 1961). Although some evidence of the adaptive role of personal standards was presented in this study in terms of its association with positive affect, in the absence of any reported factor intercorrelations, the equating of high personal standards with an adaptive notion of perfectionism remains subject to further scrutiny.

While moderate positive correlations have been found between the two ‘positive’ subscales of Order (O) and Standards (S), an emergent body of research using the APS-R suggests that perfectionism is most strongly captured by the Standards dimension (Slaney et al., 2001). In summarizing research using the APS-R, Slaney et al., (2002) refer to consistently negligible relationships (mostly negative, but sometimes positive) between the positive Standards subscale and the negative Discrepancy (D) subscale. In their validation study (Slaney et al., 2001) describing the development of the APS-R scale, there was a moderate positive relationship between the two positive dimensions (O and S), and a correspondingly low negative relationship between S and D. The intercorrelations between the dimensions of perfectionism subscales from the APS-R, the HMPS and the FMPS showed moderately strong associations between the relevant positive dimension of standards
on all three measures; *Standards* (S) APS-R, *Self-Oriented Perfectionism* (SOP) HMPS, and *Personal Standards* (PS) FMPS. This is further explained in that, when comparing the three perfectionism measures, *Standards* (APS-R) showed statistically significant moderate correlations with the generally agreed-upon positive dimensions of *Order* (APS-R), *Self-Oriented Perfectionism* (HMPS), and both the *Personal Standards* and *Organisation* subscales of the FMPS. This was not the case for the HMPS *Self-Oriented Perfectionism* (SOP) and the FMPS *Personal Standards* (PS) subscales. The SOP subscale of the HMPS showed a statistically significant moderate correlation with the FMPS *Personal Standards* subscale in addition to positive correlations with both the APS-R *Standards* and FMPS *Concern over Mistakes* which were of a similar magnitude (see Slaney et al., 2001).

An adaptive function of personal standards may be challenged by examining both the pattern of interrelationships and the differential outcomes of the subscales measuring *Personal Standards* in these three commonly used perfectionism measures (FMPS, HMPS and APS-R). The *Standards* subscale of the APS-R was associated only with positive subscale dimensions of the three perfectionism measures and was negatively and not significantly correlated with worry. In contrast, the FMPS *Personal Standards* and the HMPS *Self-Oriented Perfectionism* subscales were statistically significantly and positively correlated with worry² (see Slaney et al., 2001).

---

² Worry was measured using the Penn State Worry Questionnaire (Watson et al., 1988)
Evidence of an adaptive role of personal standards was also presented by Adkins and Parker (1996) who proposed that the *Personal Standards* dimension was fundamental to the active perfectionist "for whom perfectionistic strivings motivate rather than paralyze; for whom perfectionism spurs rather than inhibits achievement" (Adkins & Parker, 1996, p. 539). Although there was a lack of association between *Personal Standards* and suicide ideation in this study, this is considered insufficient evidence of the prophylactic promise of holding high personal standards. As such, the findings of this study offer only a partial glimpse into the role of personal standards perfectionism in the psyche of the perfectionist individual.

Despite the amount of empirical support for a dual nature of perfectionism, it does not seem instrumental to define perfectionism on the basis of high personal standards only (see Frost et al., 1990), and further research is needed to establish the positive or negative role of this central dimension of perfectionism. It should be remembered that although the Personal Standards subscale loaded on the positive striving factor in the Frost et al. (1993) study and was thus deemed 'adaptive', the FMPS (as a popular measure of perfectionism) itself, was not specifically designed for the purpose of differentiating positive and negative perfectionism (Enns & Cox, 2002). The HMPS (Hewitt & Flett, 1991) was developed to measure perfectionism within a conceptual framework of its association with psychopathology and maladjustment. The authors stated that the three perfectionism dimensions "have an implicit or explicit focus on the attainment of standards" (Hewitt & Flett, 1991, p.458), thereby presenting standards in a negative light.
The two MPS measures (FMPS and HMPS) are professed to provide the most
evidence of validity in a wide range of clinical and community samples. Both
measures were developed from a pervading injurious view of the perfectionism
construct and yet many studies using these instruments have attested to the centrality
of the standards dimension which has been variously associated with both healthy
and unhealthy aspects of perfectionism. While the more recently developed APS-R
has been less widely used and validated, the standards dimension is consistently
associated with a positive form of perfectionism and it has been acknowledged that it
is the Discrepancy subscale which may prove useful in future attempts to delineate
healthy and unhealthy aspects of perfectionism (Enns & Cox, 2002).

How does one solve the conundrum that the setting of high personal standards on the
one hand can be theorised as the core component of a view of perfectionism with
pathological overtones, and, on the other hand, be associated with measures of
positive affect and non-pathological personality traits? Clearly, further investigation
into this apparent contradiction is warranted.

Since personal standard setting has been portrayed as a Janus coin in that the
anecdotal literature is focused on the problematic face of high personal standards,
current research compels us to view the facilitative nature of the setting and holding
of high standards for oneself. A fruitful area for research would be to examine
various combinations of high or low scores on both the healthy and unhealthy
dimensions of perfectionism with a particular emphasis on combinations involving
high personal standards scores. In this way healthy and unhealthy perfectionism
profiles can then be tested against a range of outcome variables of particular research interest. For example, researchers interested in the translation of perfectionism into the daily school-related behaviours of students, may consider a range of variables encompassing cognitive and motivational learning variables.

2.6 Higher Order Factors of Perfectionism

Initial attempts to dichotomise components of perfectionism measurement scales utilised instruments that were not originally designed to capture both adaptive and maladaptive forms of perfectionism (Adkins & Parker, 1996; Frost et al., 1993; Slade & Dewey, 1986). There is also a paucity of confirmatory factor analytic studies of either of the two most popular perfectionism instruments - the FMPS (Frost et., 1990), and the HMPS (Hewitt & Flett, 1991) - in either clinical or non-clinical samples (Cox, Enns, & Clara, 2002). Although Parker and Stumpf (1995) used confirmatory factor analysis (CFA) in their examination of the psychometric properties of the FMPS using a sample of academically talented sixth-grade children, they were only able to obtain an adequate fit of the model to the data after they assessed nine models which were modified by freeing parameter estimates that indicated unsatisfactory fit.

In a later study, Stumpf and Parker (2000) argued for two higher order factors based on the exploratory approach of a principal components factor analysis of the 6 subscales of the FMPS, with Personal Standards (PS) and Organisation (O) comprising the healthy, and Concern & Doubts (CD) and Parental Pressure (PP) the
unhealthy dimensions. Although significance levels were not reported by Stumpf and Parker (2000) for correlations between perfectionism factors and personality outcomes, inspection of the coefficients showed that two of the first order factors, Concern and Doubts (CD) and Parental Pressure (PP), differently predicted self-esteem as measured by the Rosenberg Self-Esteem Scale (Rosenberg, 1965). While CD related moderately strongly to self-esteem ( - 0.58), PP showed a much lower correlation ( - 0.28). Similarly the Organisation (O) factor appeared to have a somewhat higher association with the personality characteristics of endurance (0.35), and order (0.35) scales of the Adjective Check List (Gough & Heilbrun Jr., 1983) than with Personal Standards (PS), (0.23) and (0.26), respectively. O and PS also differently predicted conscientiousness. O was related more strongly to conscientiousness (0.52) than PS (0.39).

In addition to the first order component factors for the higher order constructs differently predicting several outcomes, their correlations were not especially strong (.28 for O and PS, .42 for CD and PP), when considered from the proposed positive/negative higher order perspective. Positive correlations found between the healthy factors (PS and O) and conscientiousness, and between the unhealthy factors (CD and PP) and low self-esteem, were presented as evidence for the predictive validity of a healthy and unhealthy dichotomy. This was reported as further support for the existence of higher order healthy versus unhealthy perfectionism factors on the FMPS.
It is timely that the validity of the proposed higher order healthy and unhealthy FMPS perfectionism constructs be assessed in additional studies and across diverse samples through the use of nested confirmatory factor analyses that simultaneously assess the fit of scale items to the first order constructs and these, in turn, to the higher order factors. In any case, it is contended that retention of the four first-order factors of the FMPS would yield a more informative description than the more global labelling of the individual as being either a healthy or an unhealthy perfectionist dependent on scores on these two higher order factors.

A number of studies have involved comparisons of the Frost et al. (FMPS; 1990), Hewitt and Flett (HMPS; 1991), and the Slaney and Johnson (APS; 1992) scales which were all based on a multidimensional view of perfectionism, in an attempt to quantify both positive and negative aspects of the construct. As has been noted earlier, one of the earliest factor analytic studies conducted with a university sample of undergraduates (Frost et al., 1993), resulted in a conceptually unambiguous two-factor solution. These were examined in relationship with measures of positive and negative affects and then interpreted as maladaptive evaluation Concern and positive achievement strivings. Slaney, Ashby and Trippi (1995), using a sample of college undergraduates, factor analysed all three multidimensional scales in a replication of the Frost et al. (1993) study and found two higher order factors representing positive and negative dimensions consistent with the positive striving and maladaptive evaluation Concern factors found by Frost et al. (1993). In an attempt to more finely approximate the higher order constructs of adaptive and maladaptive forms of perfectionism, Rice, Ashby and Slaney (1998) used a sample of college students, and
combined the subscales of the FMPS and the APS in a confirmatory factor analysis (CFA). They found support for an *a priori*, higher order two factor conceptualisation of perfectionism. *Adaptive* perfectionism was most indicated by high *Personal Standards* (PS) and *Organisation* (O), and closely resembled 'positive strivings' perfectionism. Maladaptive perfectionism was composed of measures tapping *Concern over Mistakes* (CM) and *Doubts* (D), difficulty in relationships, and anxiety, and closely resembled 'maladaptive evaluative concerns' perfectionism. Again there was evidence of adaptive and maladaptive elements of perfectionism in support of previous studies (e.g., Frost et al., 1993; Rice et al., 1998; Slaney et al. 1995; Stumpf & Parker, 2000), although this analysis was not a *nested* CFA.

Although the APS-R has been projected as a measurement instrument specifically designed to capture both positive and negative dimensions of perfectionism, support for a higher order perfectionism model was not found in a confirmatory factor analysis (CFA) of this scale conducted by Ashby and Rice (2002). These researchers caution against the possible loss of important information about individual dimensions of perfectionism and argue for the retention of a less parsimonious but better fitting model which maintains the separate dimensions of perfectionism (Ashby & Rice, 2002). This stance was also taken by Stumpf and Parker (2000), who advised the need to be specific about a particular component of perfectionism when making associations between related variables.

There is little evidence in the literature of the use of nested confirmatory factor analytic procedures in attempting to evaluate an hierarchical model to support claims
for 'positive' and 'negative' higher order factors of perfectionism. In evaluating
hierarchical CFA models, it has been asserted by Marsh and colleagues that weak
correlations among first order factors imply a weak hierarchy (Marsh, 1987; Marsh
& Hocevar, 1985) since most of the reliable variance in the first order factors is
unexplained by the higher order factors. This is an important consideration in
deciding whether to summarise data using higher order constructs, or to rely on the
great number of first order factors. Watt (2002) argues that conclusions relating to
higher order factors are more directly and securely based on a confirmatory analysis
nesting items within theorised constructs and also nesting first order constructs
within the theorised higher order constructs. Such an analysis is necessary in order
to investigate the convergent and divergent validity of the proposed higher-order
factors.

Analyses meeting these criteria would result in extending extant conceptual and
empirical knowledge regarding the component structure of adaptive and maladaptive
perfectionism. It would offer more reliable information regarding convergent and
divergent validity, rather than establishing relationships with concomitant constructs
as evidence towards criterion-related validity, which is what a number of studies
have concentrated on demonstrating (e.g., Bieling, Israeli, Smith, & Antony, 2003;
Dunkley, Blankstein, Halsall, Williams, & Winkworth, 2000; Frost et al., 1993). It
is timely, given an increasing research focus on perfectionism correlates and
outcomes, that proposed higher-order positive and negative perfectionism factors be
empirically examined by means of nested confirmatory factor analyses. In existing
studies concerned with assessing the construct validity of higher order perfectionism
factors, there is a noticeable lack of detailed reports of both factor intercorrelations, and the use of nested confirmatory analyses procedures, thus precluding the detailed examination of relationships between the core components of perfectionism in those studies.

In educational settings, where perfectionism can impact on student learning and well-being, the empirical clarification of these issues is vital to a more precise understanding of the perfectionism phenomenon as it translates into student cognitive and affective learning behaviours. There is a need to distinguish between those dimensions of perfectionism that are clearly healthy and conducive to academic achievement and those that act as precursors to negative outcomes in achievement and behaviour. This can be achieved by examining the validity of the higher order healthy and unhealthy perfectionism constructs in additional studies across diverse samples through the use of nested confirmatory factor analyses that simultaneously assess the fit of scale items to the first-order constructs and these, in turn, to the higher-order factors.

Some support for the validity of an hierarchical model of perfectionism can be found in Cox et al.'s (2002) examination of the first-order structure of the FMPS and the HMPS, using both clinically distressed and college student samples. The results of a CFA analysis of a higher order, two factor model of perfectionism based on the full set of items contained in the original MPS subscales indicated a poor fit to the data. However, a second analysis using CFA on modified versions of both instruments with a reduced number of items, resulted in both models passing several goodness-
of-fit indices (see Cox et al., 2002, p. 368). Moreover, when the authors assessed the content validity of the reduced set of items, they claimed that the refined subscale items were representative of the content domains originally described by the test authors (Frost et al., 1990; Hewitt & Flett, 1991). A second-order CFA of a healthy/unhealthy model of perfectionism resulted in a good fit to the data, but only when items from the brief versions of the two MPS instruments were included in the analysis. Maladaptive perfectionism was defined as a composite of items from the Concern over Mistakes (COM), Doubts about Actions (DA), and Parental Criticism (PC) subscales from the FMPS and the Socially Prescribed Perfectionism (SPP) subscale from the HMPS. Adaptive perfectionism included a composite of items from the Personal Standards (PS) and Organisation (O) FMPS subscales and the Self Oriented Perfectionism (SOP) HMPS subscale.

Although these results appear to be encouraging, some points are worthy of comment. Because it was not clear from the reporting of the results whether the higher order CFA analysis was in fact, a nested CFA, where items were first specified to load on their respective first order factors and then these first order factors simultaneously specified to load as theorised on the higher order factors, the authors of that article were contacted directly by email. Those authors responded that they had in fact conducted such a nested CFA. Unfortunately the lack of detail in the reporting of the results (which only reports the model fit indices without the parameter estimates) precluded a detailed evaluation of this analysis.
Despite this, there still remains a degree of uncertainty regarding the idiosyncratic nature and role of personal standards which resurfaced in Cox et al.'s (2002) definition of adaptive perfectionism. Those researchers based their definition on Frost et al.'s (1993) correlational findings and interpretation of personal standards as a healthy dimension of perfectionism. Indeed, the attribution of personal standards to an adaptive form of perfectionism has dominated higher-order two-factor studies (Frost et al., 1993; Rice, Ashby & Slaney, 1998; Slaney et al., 1995; Stumpf & Parker, 2000). It is, however, brought into question when viewed alongside an examination of the interrelationships between the first order factors which, unfortunately, are not always reported. In the seminal study describing the development of the FMPS, the statistically significant correlations between both Personal Standards and each of Concern over Mistakes and Organisation, were of a similar magnitude (see Frost et al., 1990, p.456). Interestingly, although significance levels were not reported, Stumpf and Parker (2000) found only a moderate correlation between the purported healthy first-order factors of Personal Standards and Organisation (.28).

In the Cox et al. (2002) study, reported correlations between the refined versions of the seven subscales of the two MPS scales revealed that the Brief Personal Standards subscale of the FMPS was more strongly associated with the second-order maladaptive factor (containing Brief Concern over Mistakes, Brief Parental Perceptions, and Brief Doubts about Actions) than with the second-order adaptive factor of Organisation (see Cox et al., 2002, p.370). Definitive conclusions are difficult to draw from this study in light of these factor intercorrelations, the
omission of items from the original measurement instruments and incomplete reporting of the results (which may have been a result of editorial comment in the interest of brevity). There is clearly a need for further nested confirmatory factor analytic studies of the revised instruments described in this study across a range of clinical and community samples.

Overall, as can be gleaned from the literature, although there is a broad consensus that perfectionism remains a multidimensional construct with both positive and negative aspects, researchers may be well advised to adopt a conceptual stance in tune with particular study aims and design (Slaney et al., 2001). With this advice in mind at the time of the inception and initial data collection for the present study, the multidimensional view of perfectionism as conceptualised by Frost et al. (1990), and validated in school student samples, was particularly relevant to the educational context. The synchrony between this view and a subset of student behaviours, which again emphasises a negative connotation of perfectionism, has previously been noted.

However, it should be remembered that perfectionist school students have also been commended for their persistence and driving energy to achieve the goals they set for themselves (Silverman, 1993); such behaviours surely epitomizing a healthy striving for perfection. These observations serve to reiterate the double-edged nature of the sword of perfectionism that has been gleaned from both the anecdotal and empirical literature. This discussion has hitherto served to seek out and address a number of critical issues pertaining to the present study, focusing on attempts at definition and
measurement of variables central to the construct of perfectionism itself and offering a glimpse of the educational implications for the perfectionist student in a real life school situation. In alluding to perfectionist school students, a subtle nuance has emerged that further insights may be gained through an initial appreciation of the perfectionist persona by reviewing person-centered approaches to the study of perfectionism.

2.7 A Tripartite Typology of Perfectionism

In contrast to the foregoing factor analytic approach of examining possible correlates and higher order dimensions representing both positive and negative forms of perfectionism, other researchers have argued for a tripartite typology of perfectionist clusters. Scores on the FMPS have been used in a number of cluster analytic studies of perfectionism in which support has been found for such a typology. Parker (1997) identified two 'perfectionist' clusters and a third 'non-perfectionist' cluster in his study of academically talented youth. He described the first cluster as non-perfectionists who obtained low scores on PS, PE & O as well as for total perfectionism (P), which represented an aggregate of scores on each dimension of perfectionism. Low scores on CM, PC, and D, moderate PS, and high O scores indicated a healthy perfectionist cluster. Students falling into the third cluster group were referred to as dysfunctional perfectionists because they obtained the highest scores on the CM, PS, PE, PC, D subscales as well as total P on the FMPS. The FMPS was also used in a number of studies of college students (Rice & Dellwo, 2002; Rice & Lapsley, 2001; Rice & Mirzadeh, 2000; Slaney et al., 2002), which
found similar sets of two perfectionist clusters (named *adaptive* and *maladaptive*) as well as a third non-perfectionist cluster.

Although the perfectionist typology was supported across each of these cluster analytic studies, the representation of the dimensional subscales of the FMPS in each cluster contained some identifiable differences. Interestingly, *Personal Standards* (PS) has been found to be highest for unhealthy perfectionists in the Parker (1997) and Rice and Mirzadeh (2000) studies; similarly high for both unhealthy and healthy perfectionists (Rice & Lapsley, 2001); and highest for healthy perfectionists (Rice & Dellwo, 2002). Two Australian studies have found evidence for the perfectionist typology based on an examination of the four FMPS dimensions as proposed by Stöber (1998). In the pilot study preceding the current investigation (see Appendix D), it was determined, that in a sample of Australian secondary school students, both the healthy and unhealthy clusters had high and similar scores for PS (similar to Rice & Lapsley, 2001). In contrast, the composition of the perfectionist clusters in Kornblum's (2001) study of Australian gifted school students was similar to Rice and Mirzadeh (2000), with unhealthy perfectionists obtaining the highest scores on PS, and the healthy cluster reporting moderately high levels of PS alongside a high need for order and organization. High scores on O were consistently obtained by the healthy perfectionist groups across all of these cluster analytic studies using the FMPS, indicating both its relevance as a component of perfectionism and its association with a positive view of the construct.
Studies have consistently reported that the highest scores on O were obtained by the healthy cluster. It was the unhealthy cluster that scored highest on the CM, D, PE and PC subscales, although Rice and Dellwo (2002) found that the healthy cluster had higher PE than PC scores, demonstrating that healthy perfectionists perceived their parents to hold high expectations for their success accompanied by perceived lower levels of criticism. It is interesting to note that differential outcomes of the PE and PC subscale dimensions of the FMPS found by Rice and Dellwo (2002) were also reported by Stumpf and Parker (2000). In the latter study, the authors observed that scores on PC were more strongly related to lack of self-esteem than the PE scores and cautioned that some loss of information may be problematic if these two scales relating to perceptions of parental pressure are combined. In factor-analytic studies of the FMPS dimensionality, PC and PE have been found to be empirically indistinguishable, however (Hawkins et al., 2000, 2004; Kornblum, 2001; Stöber, 1998).

There is dissent in the literature regarding the role of the PE and PC subscales of the FMPS. Notably different treatment of the two subscales occurs between those findings which associate both parental dimensions with active perfectionism (Adkins & Parker, 1996; Lynd-Stevenson & Hearne, 1999), and the factor analytic findings of Frost et al. (1990) who reported that parental expectations and parental criticism loaded strongly on the maladaptive evaluation Concern factor. Interestingly enough, in the Frost et al. (1993) study, PE was not statistically significantly related to negative affect (NA) or to positive affect (PA)\(^3\), but PC was statistically significantly related to NA. In defense of four factor solutions in which PE and PC are combined

\(^3\) Measured by the PANAS scales (Watson et al., 1988)
to form a single factor (Cox et al., 2002; Hawkins et al., 2000, 2004; Kornblum, 2001; Stöber, 1998; Stumpf & Parker, 2000), it can be argued that the content validity of this factor is more consistent with the original theorisation of a single parental dimension of perfectionism as discussed in the Frost et al. (1990) article describing the development of the FMPS (Cox et al., 2002).

Scores on the Almost Perfect Scale-Revised (Slaney et al., 2001) have also been used to identify perfectionist cluster groups in line with previous analyses of the FMPS (Parker, 1997; Parker, Portešová, & Stumpf, 2001; Rice & Dellwo, 2002; Rice & Lapsley, 2001; Rice & Mirzadeh, 2000). The earliest of these studies used hypothetical groupings based on High Standards (HS), Order (O), and Discrepancy (D) subscale scores (Ashby & Kottman, 1996). The theoretical reasoning for these groupings was based on Hamachek’s (1978) conceptualisation of normal and neurotic types of perfectionists. For example, perfectionists were defined as those who scored above the 67th percentile on the HS subscale, with a median split on the D subscale to distinguish between maladaptive (below the median) and adaptive perfectionists (above the median). In a similar fashion, LoCicero and Ashby (2000), described three clusters as maladaptive perfectionists (high scores on HS and D), adaptive perfectionists (high scores on HS but low scores on D), and non-perfectionists (scores on HS below 67th percentile), although no tests for the discriminant validity of the groups were conducted. Additionally, no rationale for the omission of the Order (O) subscale from these studies was reported, despite the admission that order and organisation are relevant components of perfectionism as reasoned in Frost et al.’s (1990) theorisation and confirmed in two interview studies.
(Slaney & Ashby, 1996; Slaney, Chadha, Mobley, & Kennedy, 2000). In both these latter studies participants emphasised that in addition to their high personal standards, their sense of orderliness contributed to their success. Again, as in previous studies, high personal standards and order appeared to exemplify a positive form of perfectionism.

The first study to use cluster analytic procedures to group individuals on the basis of APS-R subscale scores replicated the findings of previous studies based on combinations of scores obtained on the FMPS subscales. Rice and Slaney (2002) reported both adaptive and maladaptive perfectionist groups scoring higher than non-perfectionists on HS, while maladaptive perfectionists scored higher then adaptive perfectionists on the D subscale. Once more, high personal standards were indicative of both healthy and unhealthy perfectionist types.

There is increasing support for the potential utility of cluster analysis of scores on positive and negative dimensions of perfectionism as a statistical tool for identifying different types of perfectionists. The marriage between theorisation and empirical corroboration provides a fertile ground for the study of perfectionism across a range of samples. It is particularly salient in the field of education which, hitherto, has been largely neglected in the perfectionism research literature. While there is a paucity of empirical perfectionism studies using normative school student populations, there is a considerable body of theoretical evidence throughout the gifted education literature linking perfectionism with giftedness in young children
and adolescents. This literature provides a useful source of academic variables said to be influenced by perfectionist thinking and behaviour.

2.8 Perfectionism and Gifted Students

Throughout the gifted literature it is claimed that perfectionism is commonly found in gifted and talented students. Various authors have noted perfectionism to be frequently found among gifted children, and estimate that 15-20% of these may be significantly handicapped by perfectionism at some time in their academic careers (Adderholdt-Elliott, 1987; Clark, 1992; Freeman, 1985; Hollingworth, 1926; Powell & Haden, 1984; Roeper, 1991; Webb, 1993; Webb, Meckstroth, & Tolan, 1982; Whitmore, 1985). Some claim that while perfectionism is not a huge problem for most people, it creates great difficulties for gifted students (G. A. Davis & Rimm, 1994; Roeper, 1982; Whitmore, 1980). Striving for excellence is unhealthy when the striving is unrealistically high and beyond a person’s capabilities. In gifted students the problem is confounded by the very nature and extent of their competencies and personality attributes. It is difficult to determine if they set themselves realistic goals (or have unrealistic goals set for them by significant others), or if they are obsessed with an unhealthy compulsion for perfect performance (Parker & Adkins, 1995b).

The ability to see how one might ideally perform, combined with emotional intensity, leads many gifted children to unrealistically high expectations of themselves. High ability children are often hindered significantly by perfectionism.
at some point in their academic careers and even later in life (Webb, 1993). By their own admission, gifted adolescents often feel like perfectionists. They have learned to set their standards high, to expect to do more and be more than their abilities might allow. Childhood desires to do demanding tasks perfectly become compounded during adolescence. It is not uncommon for gifted adolescents to experience real dissonance between what is actually done and how well they expected it to be accomplished. Often the dissonance perceived by young people is far greater than most parents or teachers realise (Buescher & Higham, 1989). Many gifted learners are concerned about accomplishment and the pursuit of excellence. They are able to discern the difference between the mediocre and the extraordinary. In their drive for perfection they are aware of the possibility of failure and may suffer from an ‘imposter’ syndrome in which they fear public disclosures as failures. Gifted students can feel inferior if they do not meet the high standards they set for themselves and are unfulfilled if they do not strive for the quality of performance of which they know they are capable. Perfectionism takes away their potential joy in life and may result in depression and neurosis (Webb, 1993)

As with the clinical and psychological literature, perfectionism in the gifted education field is usually seen in a negative light. The word perfectionism itself is said to have a pejorative connotation, apparently from a belief that it inhibits healthy development and academic achievement. The complex characteristics and behaviours ascribed to perfectionist children include such things as compulsiveness with regard to work habits, overconcern for details, unrealistic high standards for self and others, indiscriminate acquiescence to external evaluation, and rigid routines
(Kerr, 1991). The negative concomitants of perfectionism include depression, shame and guilt, shyness and procrastination, overemphasis on the future without appreciation for one’s progress, all-or-nothing thinking, and rigidity (Robinson & Noble, 1991).

On the other hand, it has been argued that if perfectionist students were instead described as persevering, high achievers, or as exhibiting high standards, that the interpretation of the same child engaged in identical behaviours would be much more positive (Parker & Adkins, 1995b). Indeed, the setting of high standards is central to those levels of attainment which have been reached by world-class pianists, sculptors, tennis players, swimmers, mathematicians, and research neurologists (Bloom, 1985). Many educators and theorists argue that perfectionism is as natural to the gifted as a love of mathematics or literature. Perfection is an abstract ideal which makes one aware of what is possible beyond that which exists in reality. Silverman (1993) asserts that the quest for self-perfection provides the driving energy which leads to great achievement. She claims that, "Without perfectionism there would be no Olympic champions, no great artistic endeavours, no scientific breakthroughs, no exquisite craftsmanship, no moral leaders. It is a basic drive to achieve excellence" (Silverman, 1993, p.59). Roedell (1984), and Robinson and Noble (1991) also draw attention to the positive aspects of perfectionism in which gifted children are more capable of holding and attaining high standards leading to achievement, efficacy, energy, optimism, self confirmation and high self esteem. Because they are used to achieving goals they are more optimistic about future attainments. They are described as being able to envision goals which are more
A Review of the Literature

complex, detailed, mature, complete, and creative than those of their same-age peers (Robinson & Noble, 1991; Roedell, 1984). However, the empirical literature in the field of gifted education is so sparse that one can only guess whether the consequences of high standards are positive or negative for gifted children (Robinson & Noble, 1992). On the other hand, there is much evidence in the motivation literature that goal setting promotes motivation and learning (Bandura, 1986; Locke & Latham, 1990). However, the effects of goals are not automatic. Goals that denote specific performance standards are more effective than a general goal urging one to do one's best. Goals seen as challenging but attainable increase motivation and learning more effectively than goals perceived as very easy or too difficult (Schunk, 1991).

The question is, are goals set by perfectionists attainable or obsessive and therefore debilitating? Clearly striving for excellence can be unhealthy when the striving is unrealistically high. Moreover the distinction between very high levels of achievable expectations and neurotic strivings can be a difficult one to make with gifted children who are often perceived to push themselves unrealistically. They have unusually high expectations of themselves and when they cannot live up to their self-imposed standards, the frustration that ensues is self-defeating and interferes with mental and emotional growth. For these students, perfectionism can become compulsive behaviour. It also interferes with the relationships gifted students have with others. In addition to meeting their own high standards and levels of achievement, their acceptance of others is often based on the other person's ability to meet these standards (Clark, 1992). Again this anecdotal literature continues to be

50
obdurately negative and little is known about the goal orientations that facilitate the school achievement and emotional adjustment of perfectionist students across a range of ability levels.

2.9 Perfectionism and Personal Achievement Goal Orientations

Achievement goal theory has emerged over the last two decades as a dominant approach to the study of motivation (Barron & Harackiewicz, 2000, 2001; Elliot & McGregor, 2001; Harackiewicz, Barron, Pintrich, Elliot, & Thrash, 2002b; Pintrich, 2000a, 2000b, 2000c). Achievement goals have been theorised to include the goal to develop one’s understanding (also referred to as mastery goal, learning goal, or task goal), and the goal to demonstrate one’s ability (a performance-approach goal), or to avoid the demonstration of one’s lack of ability (a performance-avoid goal). A performance goal orientation is referred to as ego orientation by Skaalvik (1997) who distinguishes between self-enhancing ego orientation as “the goal of demonstrating superior abilities and outperforming other students” (p.79), and self-defeating ego orientations as “the goal of avoiding looking stupid or being negatively judged by others” (p.79). These achievement goals are associated with varying patterns of cognition, affect, and behaviour (Dweck & Leggett, 1988).

Task goal orientations are associated with facilitative patterns of behaviour, cognition and affect. Students with task goals approach academic tasks in order to improve their competence and derive intrinsic satisfaction from learning. In contrast, performance oriented students perform academic work to display their
ability or to avoid being seen to be lacking in ability in comparison to others (Anderman & Midgley, 1997). We would expect that adaptive perfectionists would view learning, understanding, problem-solving and skill development as ends in themselves, thus demonstrating a task goal orientation. Conversely, we would expect maladaptive perfectionists to concentrate their efforts on demonstrating their superior ability to others (performance-approach), or more especially, avoiding demonstrating their lower ability relative to others (performance-avoid). This focus on social comparisons is consistent with early conceptualisations of the double-sided nature of perfectionism. Healthy perfectionism includes a social concern for others whilst maximising one's potential; striving for perfection becomes maladaptive when it is accompanied by a strong need to dominate (and outperform) others (Adler, 1956a; Murray, 1938; Spence & Helmreich, 1983).

There is consistent empirical evidence that mastery goal orientations are positively associated with adaptive patterns of learning (Ames, 1992; Dweck & Leggett, 1988; Pintrich & Schunk, 1996; Urdan, 1997), and that performance-avoid goals are associated with maladaptive patterns of learning (Elliot & Harackiewicz, 1996; Middleton & Midgley, 1997). Positive effects of performance-approach goals have been found for students high in perceived competence (Covington & Omelich, 1984; Dweck, 1986; Dweck & Leggett, 1988; Elliott & Dweck, 1988; Nicholls, 1983, 1984), although others have failed to replicate these results (Elliot & Harackiewicz, 1996; Harackiewicz, Barron, Carter, Lehto, & Elliott, 1997; Harackiewicz, Barron, Tauer, Carter, & Elliot, 2000; Kaplan & Midgley, 1997; Miller, Greene, Montavalo, Ravindran, & Nichols, 1996). Bandura and Dweck (1985), found an association
between performance goals and avoidance behaviours, even in participants with high confidence levels (Midgley, Kaplan, & Middleton, 2001). Recent research has shown that students adopting a multiple goal perspective of both mastery and performance-approach goal patterns are optimally motivated in such educational contexts as college education (Harackiewicz et al., 2002b) and middle school and high school contexts (Bouffard, Vezeau, & Bordeleau, 1998; Lopez, 1999; Pintrich, 2000; Skaalvik, 1997; Smith, 2003; Tanaka & Yamauchi, 2001; Wentzel, 1993; Wolters, Yu, & Pintrich, 1996).

Flett et al. (1995) identified a need to view perfectionism from a motivational perspective. They contended that perfectionism is more than a belief or attitude about the importance of being perfect. For some individuals, perfectionism is also the active pursuit and willing commitment to extremely high goals (p.120). Such a motivational role of perfectionism has received scant attention in the research literature, particularly in the recent developments in the achievement motivation and goal theory research.

2.10 Perfectionism and Level of School Ability

A recurrent theme in gifted education that one of the most striking characteristics observed in gifted students is their perfectionism, and that the intensity of their perfectionism increases in direct proportion to their intellectual ability - the more able the child, the more perfectionist (Adderholdt-Elliott, 1987; Gallagher, 1990; Hollingworth, 1926; Karnes & Oehler-Stinnet, 1986; Kerr, 1991; Manaster &
Powell, 1983; Robinson & Noble, 1991; Roedell, 1984; Whitmore, 1980). From a synthesis of the gifted education literature and anecdotal evidence of teachers of gifted education programs, there is an assumption that gifted students are more perfectionist than students of average ability. However, it is unclear if this simply means that they have high personal standards or that some maladjustment is indicated because of their high levels of ability. It is also unclear if perfectionist tendencies and levels of ability are positively related from the average range to some point in the high ability range beyond which adjustment begins to decline with increasing ability levels. In other words, are healthy forms of perfectionism associated with the lower levels of ability, and do maladaptive perfectionist behaviours become increasingly evident in higher ability levels?

There is a school of thought which asserts that high academic aptitude is negatively correlated with psychosocial adjustment (Brody & Benbow, 1986; Dauber & Benbow, 1990; Leaverton & Herzog, 1979). In this vein, some argue that while moderately high academic aptitude is an asset which positively correlates with adjustment, higher levels of academic aptitude become a liability that lowers adjustment. In fact, it is contended that the more gifted the child, the greater the risk of social maladjustment and unhappiness (Hollingworth, 1942; Tannenbaum, 1983). In contrast, Grossberg and Cornell (1988) stated that the contrast between high ability and low adjustment "has an ironic, compelling quality that draws attention and may lead to a superstitious reasoning about a causal connection between them" (p.270). Certainly there appears to be little empirical support for the suggestion that the propensity of maladjustment intensifies with higher levels of ability, and
researchers in the Terman tradition have found that adjustment and high academic aptitude are positively correlated (Grossberg & Cornell, 1988; Oram, Cornell, & Rutemiller, 1995; Parker, 1996). This, of course, does not address the relationship between level of ability and perfectionism which remains largely uncharted.

It is commonly assumed that high ability students who experience success in important areas of their lives, such as school, and have their needs effectively met by their environment, are likely to possess high levels of self-esteem and emotional adjustment. For such students perfectionism might be said to play a facilitative role in their levels of achievement. Dweck (1986) questioned the “commonsense belief” that “brighter” children have more adaptive learning patterns (p.1040) and claimed that high achievement does not appear to translate directly into high confidence when individuals are faced with challenging or troublesome tasks. This view is suggestive of a debilitating form of perfectionism and implies that highly able children cannot be assumed to choose personally challenging tasks or persist in the face of difficulty. In contrast to Dweck (1986), Silverman (1993) took a more positive view. In speaking about perfectionism and children of high ability, she commented, “Attaining excellence usually takes more time and hard work than mediocrity. Only those who believe it possible to reach their goals will put forth the effort” (p.89). Ochse (1990) emphasised the high personal standards and drive for excellence in eminent creative adults and concluded that the “most consistent characteristic of creative achievers is enthusiastic devotion to work” (p.130). There is clearly a connection between ability, high standards, and the belief in one’s ability
to achieve those standards but such associations have yet to be empirically confirmed.

Bandura (1986) contended that efficacy beliefs mediate the effect of abilities or other self-beliefs on learning performance because they influence effort, persistence and perseverance. In light of the myriad of negative consequences associated with perfectionism throughout the literature, it could be surmised that a maladaptive form of perfectionism is a major cause of the failure for some children to live up to either their self-imposed standards, or those of others.

2.11 Perfectionism and Underachievement

Underachieving gifted children are said to consistently exhibit low self-esteem (Fine & Pitts, 1980; Rimm, 1984; Davis & Rimm, 1994; Whitmore, 1980). They believe they are incapable of meeting family and teacher expectations of them and often mask their low self-esteem with highly protective defense mechanisms such as the apparently opposite strategies of defensive pessimism and high personal standards. The underachiever can lower the risk of failure by expecting low grades and a student's low goals are consistent with a poor self-image and low self-confidence. On the other hand, perfectionism offers a different form of protection. Since perfection is unachievable, and constitutes the setting of unrealistically high goals, the child has a ready excuse to perform poorly. For example, students may bravely assert that they set higher goals than their peers and so cannot be expected to always succeed. This provides a rationale for failure and even if they feel incompetent they
do not need to apply this label to themselves. Underachievers who refuse to do their work or hand in sloppy work often behave the way they do because they cannot meet their own high standards (Whitmore, 1980), so they give up in frustration.

Covington (1992), described the creation of impediments to performance as self-handicapping strategies. His theory of self-worth posits that “achievement behavior in school settings is best understood in terms of students’ attempts to maintain a positive self-image” (Midgley, Arunkumar, & Urdan, 1996), and their struggle “to escape being labeled as stupid” (Covington, 1992, p.85). According to Covington (1992) underachievement is an example of a self-handicapping strategy. His portrayal of underachievers resonates with the behaviours of gifted perfectionist students, who believe that their own worth depends on performance in relation to virtually unattainable standards of excellence. The gap between their ideal and actual selves becomes so intolerable that when their performances fall short of unwarranted expectations “they are angry and disappointed, fearing reprisals from those who might have been central to the process” (Buescher, 1991), particularly parents with high expectations but who offer little guidance for their children’s idealistic performances (Davids & Hainsworth, 1967, cited in Covington, 1992).

Another self-handicapping strategy often ascribed to perfectionist gifted students is procrastination. Procrastinators have little to lose and much to gain. If they do poorly they can claim that they put off study until the last minute, or that they had too much to do and not enough time in which to do it. If they do well, in spite of procrastination, they are viewed by their peers as being particularly able. In a subtle
variation, procrastinators who genuinely attempt to keep busy to such a degree that they never complete anything and are unable to meet deadlines, are afflicted by perfectionism so adversely that they become obsessed with "an endless succession of polishing and tinkering" (Covington, 1992, p. 86). Covington (1992) also described "the academic wooden leg" (p.88) in which a student admits to a minor personal handicap such as test anxiety, in order to avoid disclosure of a perceived greater weakness such as lack of ability. Self-handicappers appear to be particularly concerned with the distinction between effort and ability and it is during adolescence that students begin to associate success from little effort with high ability; and conversely, failure despite high effort with lack of ability (Midgley et al., 1996).

In differentiating underachievers from achievers, there is an assumption that "underachievers fail to fully understand, or believe, that their existing knowledge, skills, and experiences are the product of their own abilities and efforts" (Carr, Borkowski, & Maxwell, 1991). Successful learning outcomes are partly dependent on students' beliefs in the value of effort and the fact that they can control their own academic progress. There is evidence of a strong motivational and affective component in the development of a general strategy knowledge and understanding that effort is required in order to set goals, select appropriate learning strategies, and monitor self-performance on learning tasks (Carr et al., 1991). It is the failure to integrate self-regulation and affect that is a primary cause of underachievement (Borkowski & Thorpe, 1994). However, although the anecdotal literature has described how perfectionism impacts on underachievement, no empirical evidence has been located which explains a connection between perfectionism and self-
efficacy, use of learning strategies and self-regulation, self-handicapping or test anxiety in relation to school learning behaviours and beliefs.

2.12 Empirical Studies of Perfectionism and Gifted and Typical Student Populations

The development of two popular measures of perfectionism (FMPS; Frost et al., 1990; HMPS; Hewitt & Flett, 1991) signified the beginning of an interest in gaining empirical insights into the nature of perfectionism. Perhaps of equal importance to those interested in the relationship between perfectionism and gifted students was a succinct review of the extant literature on perfectionism by Parker and Adkins (1994). These authors highlighted the need for future research on perfectionism in gifted and talented populations with particular attention to such questions as whether there are healthy and unhealthy types of perfectionism, the influence of family and school factors on perfectionist behaviours, the role that perfectionism plays in the development of neuroses, and if individuals in general, or the gifted in particular, are predisposed to adjustment problems as a result of their perfectionism (see Parker & Adkins, 1994, p.175).

Following the publication of the Parker and Adkins (1994) review, Parker and his colleagues conducted a series of studies which directly addressed a number of major research concerns in the gifted education field. Since constructs are often defined by the instruments used to measure them, further insight into the multidimensional nature of perfectionism was obtained in the Parker and Adkins (1995a) psychometric
examination of the *Multidimensional Perfectionism Scale* (Frost et al., 1990). In this study Parker and Adkins (1995a) used a normative sample of 278 college students and using a principal factor solution, with Varimax rotation, confirmed its underlying six factor structure (Concern over Mistakes, Personal Standards, Parental Expectations, Parental Criticism, Doubts about Actions, and Organisation), as well as its suitability for use in a younger gifted student population. However, the authors reported a low alpha coefficient ($\alpha = .57$) for the Parental Expectations (PE) subscale, and a small negative correlation between Personal Standards (PS) and total perfectionism score ( -.09). These concerns were indicative of a need for further reliability studies of the PE subscale and the role that PS plays in perfectionism. A subsequent psychometric examination of the FMPS (Parker & Stumpf, 1995) was conducted with a sample of 855 academically talented children who were participating in a longitudinal *Developmental Study of Talented Youth* conducted by the Center for Talented Youth of Johns Hopkins University. The analysis was not a nested CFA, but principal axes factor analysis with oblimin rotation of FMPS subscale scores which yielded two factors, one identified as representing dysfunctional perfectionism and the other reflecting healthy perfectionism. These two factors were then correlated with the five-factor domain scores obtained on the NEO Five-Factor Inventory (NEO-FFI; Costa & McCrae, 1992). The 'dysfunctional' factor correlated most strongly with neuroticism and the 'healthy' factor correlated most strongly with conscientiousness. Thus Parker and Stumpf (1995) claimed empirical support for Hamachek's (1978) conceptualisation of a 'normal' and a 'neurotic' type of perfectionism, this time with a large sample of academically talented students.
Another area of research interest addressed by the Parker group concerned the prevalence of perfectionism in gifted and talented student populations. In order to assess the incidence of perfectionism among gifted students, Parker and Mills (1996) compared the Frost et al. (1990) *Multidimensional Perfectionism Scale* (FMPS) scores between a nationally gathered 6th grade sample of 600 academically talented students and 418 'typical' peers from the general cohort. Their findings indicated little difference between the two groups. In contrast, when comparing perfectionism scores (using the same measurement scale) between 90 Honors College students and 95 typical College students, Parker and Adkins (1995b) found that Honors College students had significantly higher scores on the subscales of Concern over Mistakes, Personal Standards, Parental Expectations and the total score of overall perfectionism. However, it was unclear if these findings indicated that the higher perfectionism scores among the college students were indicative of predisposition to maladjustment, or a healthy component of the pursuit of excellence among students of high ability. Parker and Adkins (1995b) conjectured that the higher scores of the Honors College students reflected "a healthy achievement motivation among those most able to achieve" (p.308), and suggested that future research consider perfectionism as the healthy pursuit of excellence in addition to what constrains success and emotional well-being.

A typology of perfectionism was first proposed by Parker (1977) who analysed scores on the FMPS and found empirical support for the existence of two perfectionist cluster groups (one healthy, and the other dysfunctional), and a third, non-perfectionist cluster in a sample of 820 academically talented 6th graders at the
Center for Talented Youth of Johns Hopkins University. These cluster groups were then validated against a range of broad personality measures. Healthy perfectionism was found to be associated firstly with conscientiousness, and then with agreeableness, while unhealthy perfectionism was associated with neurosis. In this study Parker (1997) identified a need to further investigate whether differential achievement orientations could be related to different types of perfectionist children.

More latterly, Stumpf and Parker (2000) have argued for a hierarchy of perfectionism factors based on factor analysis of FMPS scores, with academically talented 6th grade students, the replication of such a structure in a college student sample and the relationship of perfectionism components to general personality constructs as measured by the Adjective Check List (ACL; Gough & Heilbrun, 1983), the Myers-Briggs Type Indicator (Myers & McCaulley, 1985); NEO Five-Factor Inventory (NEO-FFI; Costa & McCrae, 1992). Self-esteem was measured by the Rosenberg Self-Esteem Scale (Rosenberg, 1965), and adjustment was measured by the Brief Symptom Inventory (Derogatis, 1993). Results with both samples were similar and consisted of an empirical argument based on factor analysis for a structure of perfectionism consisting of four first order factors named Concern & Doubts (CD), Organisation (O), Personal Standards (PS), and Parental Pressure (PP), and two second order factors in which PS and O represent a ‘positive’ form of perfectionism and CD and PP represent a ‘negative’ form. ‘Negative’ perfectionism was related to self-esteem, and ‘functional’ perfectionism to endurance, order, and particularly conscientiousness - having little relationship to psychopathology. In a study of mathematically gifted and typical Czech students, Parker et al. (2001) found
support for several previous findings with US samples, including the proposed hierarchical factor structure of the FMPS (Stumpf & Parker, 2000), the perfectionist typology (Parker, 1997), and the higher proportion of perfectionism in typical students (Parker & Mills, 1996). Only modest relationships were found between perfectionism and adjustment problems and psychosomatic conditions in this study.

While Parker and his colleagues could be said to have dominated the perfectionism research with gifted and talented student samples and an emphasis on the personality and adjustment correlates of perfectionist student types, Rice and a number of associates have directed attention to the counseling psychological literature with a focus on perfectionism and its psychological correlates in normative college student populations. Three studies are particularly relevant to this discussion in that they use the Multidimensional Perfectionism Scale (Frost, Marten, Lahart, & Rosenblate, 1990) as the measure of perfectionism, consistent with the Parker studies.

2.13 Perfectionism and College Students

Noting that the perfectionism literature tended to emphasise the maladaptive aspects of perfectionism with sparse attention to its adaptive features, Rice and Mirzadeh (2000) examined differences between types of perfectionist college students and the relationship of perfectionism to attachment, academic integration and depression. In the first of a sequence of three studies, the perfectionist typology as reported by Parker (1997) was replicated using the same cluster analytic procedures. The merit of addressing psychoeducational needs peculiar to particular types of perfectionists
was proposed, as opposed to a unitary approach to perfectionism. The results indicated that high personal standards and organisation were characteristic of adaptive perfectionists who also demonstrated successful academic integration and little emotional distress, although it remained unclear whether the effects of perfectionism were domain specific or more generalised. An empirical connection between adaptive perfectionists and secure attachment relationships with parents was made, as was a relationship between maladaptive perfectionists and depression. The maladaptive perfectionists were less academically integrated and more depressed than their adaptive counterparts, despite demonstrating similarly high personal standards - a recurring phenomenon throughout the literature. The authors appealed for the encouragement of adaptive, and the discouragement of maladaptive aspects of perfectionist thinking and behaviour.

In the second study, Rice and Lapsley (2001), asserted that a multidimensional approach to the examination of perfectionism was a critical factor in gaining insights into a range of psychosocial concerns among university students, including academic achievement, adjustment and mental health. They argued that while some perfectionist tendencies may negatively impact on emotional adjustment (Blatt, 1995; Pacht, 1984), others may serve an adaptive purpose in motivating individuals towards high levels of performance outcomes. With this in mind, Rice and Lapsley (2001) identified and replicated the perfectionism typology consistent with Parker (1997) and Rice and Mirzadeh (2000). They concluded that positive aspects of perfectionism may serve an effective coping role for university students in managing the emotional challenges of the college environment, and posited that maladaptive
perfectionists should be encouraged to set and maintain high personal standards, whilst at the same time, eliminating self-critical connections to those standards (Rice & Lapsley, 2001).

Perfectionism and college adjustment was also examined in the third study of this set, which examined the way in which perfectionism and self-development may predict adjustment outcomes such as self-esteem, academic and personal integration, and depression (Rice & Dellwo, 2002). Again the perfectionist typology as described by Parker (1997), Rice and Mirzadeh (2000), and Rice and Lapsley (2001) was identified, encompassing almost half of the sample. Rice and Dellwo (2002) found that both perfectionist groups reported having high personal standards, but that the maladaptive perfectionists reported worse emotional, academic, and social well-being than the adaptive and non-perfectionist groups. Interestingly, there were no group differences observed for grade point average (GPA) and the authors suggested that similar levels of academic achievement between the two perfectionist groups may come at costs to the maladaptive perfectionist, such as low self-esteem, depression and less college integration. Rice and Dellwo (2002) also referred to self-development problems in maladaptive perfectionists arising from impaired relationships with parents and "unmet grandiose needs to be admired" (p.194), resulting in perceived inadequacy about living up to high personal standards and low self-worth. Their study established an important empirical connection between perfectionism and parental models and behaviour, consistent with statements that the parental connection lies at the core of maladaptive perfectionism (Burns, 1980a; Frost et al., 1990; Hamachek, 1978; Hollender, 1965; Pacht, 1984).
2.14 Perfectionism: Issues and Educational Applications to be Addressed in the Current Investigation

Throughout the recent perfectionism literature, consensus has developed that perfectionism is a multidimensional construct, although there remain several points of difference on a number of salient issues. Varying conceptualisations of perfectionism are reflected by the development of the three widely-used perfectionism measures: the Multidimensional Perfectionism Scale (FMPS; Frost et al., 1990), the Multidimensional Perfectionism Scale (HMPS; Hewitt & Flett, 1991), and the Almost Perfect Scale-Revised (Slaney, Mobley, Trippi, Ashby, & Johnson, 1996). There are also points of difference in regard to the nomenclature associated with normal / healthy / adaptive / functional / positive perfectionism, as opposed to neurotic / unhealthy / maladaptive / dysfunctional / negative perfectionism (Adkins & Parker, 1996; Frost et al., 1990; Hewitt & Flett, 1991; Slaney et al., 1996; Terry-Short et al., 1995). Aside from the differential labeling, the choice of 'appropriate labels' to attach to perfectionist school students is pedantically problematic. Whilst certain terminology may suitably apply to clinical patients presenting with neuroses, from an educator's perspective it is difficult to envision descriptors such as 'neurotic' or 'dysfunctional' for school student perfectionists. It is anticipated that the findings from the present study will help to provide a more relevant nomenclature to apply in such educational environments as primary and secondary schools.
As previously discussed, the Multidimensional Perfectionism Scale (FMPS; Frost et al., 1990), consists of six theorised factors of Concern over Mistakes (CM), Personal Standards (PS), Parental Expectations (PE), Parental Criticism (PC), Doubts about Actions (D), and Organisation (O). The six factor structure has been confirmed in some studies (Frost et al., 1993; Frost, Lahart, & Rosenblate, 1991; Parker, 1997; Parker & Adkins, 1995a), while others argue for a more parsimonious four factor model which is robust across different populations (Hawkins et al., 2000, 2004; Kornblum, 2001; Stöber, 1998; Stumpf & Parker, 2000). It is of some concern that this apparent uncertainty regarding which factors best summarise the nature of perfectionism has not been adequately resolved through the use of confirmatory factor analyses. Further psychometric examination of the FMPS, using both EFA and CFA procedures, in the present sample may put the matter of the factorial stability of this measure to rest.

With regard to the need to determine the core components of perfectionism, there is also a degree of doubt as to the inclusion of Organisation (O) in the measurement of perfectionism. Its association with perfectionism is clearly reflected in conceptualisations and measurement scales (Frost et al., 1990; Slaney et al., 2001), correlations with positive outcomes (Frost et al., 1993; Hewitt & Flett, 1991; Parker, 1997; Parker & Stumpf, 1995), lack of association with psychopathology (Juster, Heimberg, Frost, & Holt, 1996; Lynd-Stevenson & Hearne, 1999), and qualitative findings from interview studies (Slaney & Ashby, 1996; Slaney et al., 2000). The present study will examine the need for order and organisation as a component of
perfectionism using the FMPS with a broadened sample and different outcome variables, thus providing further clarification of its relevance.

Researchers have conducted a number of factor analytic and correlational studies using combinations of the subscales of the FMPS and the HMPS and found support for a two factor solution in line with Hamachek’s (1978) distinction between normal and neurotic perfectionism (Dunkley et al., 2000; Frost et al., 1993; Hill et al., 1997; Rice et al., 1998, Slaney et al., 1995; Suddarth, 1996). More importantly, the recent argument for a hierarchical model of perfectionism (Stumpf & Parker, 2000) has not yet been confirmed in any other study using using a school student sample and nested CFA procedures. In such a model, the lowest level contains the six factors of the FMPS reformulated into a four factor model (as proposed by Stöber, 1998 and others), and the second level is proposed to consist of two higher-order factors representing ‘positive’ and ‘negative’ perfectionism. In view of concerns related to poor model fit, across-construct correlations, low alpha coefficients, and correlations differentially predicting outcomes, there is a clear need to bridge the gap in the literature exposed by the paucity of nested confirmatory factor analyses which simultaneously assess the fit of the scale items to first order constructs and the first order constructs to the higher order factors.

Of particular concern is the role of personal standards in an understanding of perfectionism. Throughout the literature theorists and empiricists uniformly agree that high personal standards is the sine qua non of perfectionism. The point of departure is whether personal standards are self-actualising (Adler, 1956b;
Goldstein, 1939; Maslow, 1970; Murray, 1938), or if they lead to maladjustment and neurosis. In particular, what is the implication of holding high personal standards for secondary school students? The literature is equivocal and abounds with examples of both positive and negative consequences and correlates. For example, Blatt (1995) asserts that high personal standards, combined with "constructive striving" (p.1006) behaviours, can provide a powerful impetus to succeed. Conversely, he also contended that when high personal standards are held in conjunction with perfectionism dimensions which tend to be associated with maladaptive functioning, those same high personal standards are potentially destructive. Blatt’s (1995) argument reiterates Hamachek’s (1978) theoretical contention that high personal standards can be associated with each of normal and neurotic perfectionism (Dunn, Dunn, & Syrotuik, 2002).

Using Hamachek’s (1978) theorisation of two distinct types of perfectionism, researchers followed the lead established by Parker (1997) who used cluster analysis of FMPS scores in order to classify students who had high personal standards scores as either "healthy perfectionists" or "dysfunctional perfectionists" (p.555) depending on the scores they obtained on the five remaining FMPS dimensions. These two groups, together with a third, non-perfectionist group of students provided empirical support for a typology of perfectionism which has been replicated in a number of studies and previously discussed in this review. However, whilst the typology itself has been well replicated and confirmed, the pattern of relationships between the dimensions of perfectionism is not consistent across all samples or measures. This applies most significantly to the personal standards dimension, which is attributed to
both healthy and unhealthy perfectionists according to combinations of scores across all perfectionism dimensions and across a range of studies. Further clarification of the pattern of relationships in different perfectionist types across a broader spectrum of age and ability level is needed in order to obtain a profile of what dimensions of perfectionism best describe a healthy perfectionist type, and those that characterise an unhealthy perfectionist type, and to then compare these with non-perfectionists. Such profiles may then be validated against a range of academic correlates that are closely aligned with school-related behaviours and achievement strivings.

One could argue that being able to identify types of perfectionist students is of prime importance in the school situation, given the degree of psychological maladjustment problems associated with negative perfectionism in the literature. Additionally, several researchers (Parker & Adkins, 1995b; Parker & Mills, 1996; Rice & Dellwo, 2002; Rice & Lapsley, 2001; Rice & Mirzadeh, 2000) have signalled the need to consider ways in which adaptive forms of perfectionism translate into school learning behaviours and achievement outcomes. One could then equally argue the importance of understanding what healthy perfectionists do, and how they feel in their pursuit of excellence. A more refined understanding of how to distinguish healthy and unhealthy perfectionists would be welcomed by teachers presently faced with the dilemma of how to meet the needs of perfectionist students in their classrooms. Moreover, since no study has been located which links perfectionism and outcomes across specific learning domains, it is important to establish whether perfectionist thinking and behaviour is domain specific, or if it can be generalised across a number of curriculum areas and school learning in general.
2.15 Perfectionism: Consequences and Correlates

Current knowledge and understanding in the field of perfectionism research consists predominantly of insights recently gained into the multidimensionality of perfectionism, its measurement, and empirical support for the theorised positive and negative aspects of the construct. A wide array of measured psychological outcomes have added empirical weight to various theorisations, and perfectionism in its negative form has been associated with a range of psychopathologies such as depression (Blatt, 1995; Hewitt, Flett, & Ediger, 1996; Lynd-Stevenson & Hearne, 1999), eating disorders (C. Davis, 1997; Slade, 1982), social phobia and anxiety (Antony, Purdon, Huta, & Swinson, 1998), and obsessive compulsive disorders (Frost & Steketee, 1997). Researchers have reported a host of putative negative outcomes as a result of perfectionism, including feelings of failure and anxiety (Flett, Blankstein, Hewitt, & Koledin, 1992; Flett, Hewitt, & Dyck, 1989; Sorotzkin, 1985), suicide ideation (Adkins & Parker, 1996; Delisle, 1986; Hewitt et al., 1994), and low self-esteem (Flett et al., 1989). Thus perfectionism continues to be regarded as a pernicious problem in the clinical literature.

What is of concern to this study, is the observation that the traditionally deleterious nature of perfectionism portrayed in the literature has been replaced somewhat by a burgeoning research interest in both the adaptive and maladaptive aspects of perfectionism. This has resulted in a concomitant person-centered approach to the research in which types of perfectionists are identified and compared according to
patterns of scores obtained on measures outcomes. This study will offer further insights into the multidimensionality of perfectionism, and differential profiles of types of perfectionist students.

Outcome measures identified in previous studies include such variables as depression (Cox et al., 2002), self-esteem (Rice, Ashby, & Slaney, 1998), relationship with parents (Rice, Ashby, & Preusser, 1996; Rice & Dellwo, 2002), attachment (Rice & Mirzadeh, 2000), hassles, coping, social support and distress (Dunkley et al., 2000), and anxiety and psychological distress (Suddarth & Slaney, 2001). Negative outcomes and adjustment problems have been shown to be consistently associated with maladaptive perfectionists, and have been found to be of less concern for adaptive perfectionists. Studies conducted by the Parker group with academically talented 6th grade students and the adult college student populations studied by Rice and his colleagues, have obtained valuable insights into the personality attributes and adjustment of healthy and unhealthy types of perfectionists.

In the educational arena, conceptual links such as those between perfectionism, ability and achievement in adolescent school student populations have not yet been adequately established in empirical research. Achievement outcomes continue to be assessed through self-report grade point average scores (GPA) in North American studies (Accordin et al., 2000; Gilman & Ashby, 2003; Grzegorek, Slaney, Franze, & Rice, 2004). The field would be better served if more psychometrically sound measures of academic achievement were incorporated in the design of research
studies together with a range of academically related variables of specific interest to teachers responsible for the academic outcomes of students under their tutelage.

2.16 Perfectionism, Goal Orientations and Educationally Relevant Beliefs and Behaviours

This study is primarily concerned with gaining an understanding of the implications of perfectionism for adolescent school students. The selection of outcome variables is based on previous conceptualisations and empirical findings. Throughout the clinical, psychological and gifted education literature runs the common conceptual thread that high personal standards are integral to perfectionism. Empirical studies have shown that high personal standards can be attributed to both healthy and unhealthy perfectionist students (Hawkins, Watt, & Sinclair, 2004; Kornblum, 2001; Parker, 1997; Rice & Lapsley, 2001), but little is known about the achievement orientations of these types of perfectionist students, and no study has been located which examines differences in goal orientations between healthy and unhealthy perfectionists in an Australian adolescent secondary school sample.

Goal orientation research suggests that a task goal orientation is associated with adaptive educational outcomes whilst a performance goal orientation is associated with less adaptive outcomes. Since healthy perfectionists demonstrate the most adaptive motivational and behavioral tendencies in school and have been described as "conscientious, goal and achievement oriented, predictable, well adjusted, and socially at ease" (Parker, 1977 p.555), they would be expected to hold a strong task
goal orientation. Task goals have been found to be positively related to perceptions of academic self-efficacy (Midgley, Anderman, & Hicks, 1995; Midgley & Urdan, 1995; Roeser, Midgley, & Urdan, 1996; Schunck, 1996; Wolters et al., 1996), and effective use of learning strategies (Ames & Archer, 1988; Wolters et al., 1996). Because they are achievement oriented (see Parker, 1997) healthy perfectionists would be expected to not only select appropriate strategies, but also to monitor self-performance (see Carr et al., 1991). From this achievement motivation literature, the outcome measures of academic self-efficacy, use of learning strategies and self-regulation have been selected to represent adaptive learning patterns which have been shown to be associated with students with a task goal orientation and which are hypothesised to be characteristic of healthy perfectionist school students.

Students with a performance goal orientation strive to demonstrate ability relative to others, or to avoid to be seen as lacking in ability compared to others. The self becomes more salient than the task (Middleton & Midgley, 1997), and this, coupled with a focus on social comparisons is associated with the early motivation theorists’ (e.g., Adler, 1956b; Murray, 1938; Spence & Helmreich, 1983) clinical conceptualisation of unhealthy perfectionism. It is compelling to hypothesise that unhealthy perfectionists therefore, tend to hold a performance-approach goal orientation. However, the jury is out on this as far as current goal theory is concerned. Results from studies of performance-approach goals and educational outcomes have been inconsistent. Academic self-efficacy has been positively (Midgley et al., 1995; Midgley & Urdan, 1995; Wolters et al., 1996), and negatively (Anderman & Young, 1994) associated with performance-approach goals across
different studies. Middleton and Midgley (1997) found that performance-approach goals were unrelated to academic efficacy and positively related to classroom avoidance behaviours and to test anxiety. Moreover, students who were concerned with performing better than others, or who wanted to avoid looking incompetent, seemed to show maladaptive patterns of cognition, motivation and behavior (Dweck & Leggett, 1988). This appears to associate unhealthy perfectionists with a performance-approach goal orientation, and needs further investigation.

Recent studies have found that performance-avoid goals undermine intrinsic motivation and that this dimension of performance goals may be more powerful in predicting outcomes than the approach dimension (Middleton & Midgley, 1997). For example, Pintrich (2000a) observed that, in line with studies of general performance orientation (Ames, 1992; Dweck & Leggett, 1988), students with a performance-avoid goal orientation are more anxious about tests and their performance (Middleton & Midgley, 1997; Skaalvik, 1997), fearing they might reveal a lack of ability. Since unhealthy perfectionists are focussed on avoiding failure, they often create impediments to their performance which Covington (1992), describes as self-handicapping. Students who engage in self-handicapping strategies are likely to “have a history of concern about their ability relative to others and feel most successful when they outperform others” (Martin, Marsh, Williamson, & Debus, 2003). Such a description echoes Parker’s (1997) refrain that unhealthy perfectionist children are predisposed to be “overly competitive” (p.556) and to experience shame or guilt when failure occurs despite effort (Bransky, 1989). Unhealthy perfectionists would thus be expected to demonstrate a performance-
avoid goal orientation, experience higher levels of test anxiety and to be more likely to engage in self-handicapping behaviours than healthy perfectionists.

Prominent researchers in the field of achievement motivation acknowledge that students do not have either one goal orientation or another, and emphasise a multiple goals perspective (Harackiewicz, Barron, Pintrich, Elliot, & Thrash, 2002a; Pintrich, 2000). High task goals alongside high performance-approach goals have been shown to be the most adaptive goal combination (Elliot, 1999; Elliot & Church, 1997; Elliot & McGregor, 2001; Meece & Holt, 1993; Wolters et al., 1996). In a recent study of Australian final year high-school students, Smith (2003) also found that a dual task/performance-approach goal orientation reflected the most adaptive pattern of achievement motivation in relation to academic self-efficacy, academic self-regulation, and affective distress. From this literature, one might expect that healthy perfectionists adopt this adaptive pattern of personal achievement goal orientations.
2.17 Focus of the Present Study

Specifically, this study will examine the differences between healthy perfectionists, unhealthy perfectionists, and non-perfectionists on measures of task, performance-approach and performance-avoid goal orientations, as well as academic self-efficacy, cognitive strategy use, self-regulation, academic self-handicapping, and test anxiety. The outcome measures will be contextualised in the domains of literacy and numeracy, in order to determine whether patterns of findings are domain specific, or whether these may be generalised across academic learning domains.

The present study of perfectionism among Australian adolescent male and female school students may identify healthy and unhealthy aspects of perfectionism that have not previously been uncovered, and assist in a more distinct understanding of perfectionism that has important implications not only for researchers, but also for educators involved in meeting the individualised needs of all students.
CHAPTER 3

"Perfection consists not in doing extraordinary things, but in doing things extraordinarily well."

Angelique Arnaud

METHODOLOGY

Perfectionism in the Context of Schooling

The majority of research investigating perfectionism in non-clinical samples has used adult or college student populations. Although a number of studies have been conducted in gifted populations by Parker and his colleagues (Parker, 1997, 2002; Parker & Adkins, 1995b; Parker, Portešová, & Stumpf, 2001; Parker & Stumpf, 1995), very little research has explored the dimensionality of the construct among general samples of school-aged students. One study, however, by Accordino, Accordino and Slaney (2000) found that high school students who endorsed high personal standards as measured by the Almost Perfect Scale-Revised (Slaney, Mobley, Trippi, Ashby, & Johnson, 1996), also reported higher grade-point averages (GPA) but the relationship between perfectionism and academically relevant beliefs and behaviours was not explored. Consistent with Accordino et al. (2000), Gilman and Ashby (2003) administered the APS-R and the Behavioral Assessment System for Children (Reynolds & Kamphaus, 1992) to 185 middle school students, and found that holding high personal standards was positively and significantly related to interpersonal relationships with parents, and peers, overall personal adjustment, positive perceptions of school, and self-reported GPA.
Very little is known about the interaction between perfectionism and such academic variables as academic self-efficacy, cognitive strategy use, self-regulation, academic self-handicapping, and test anxiety among Australian school students of different age and school ability levels. The present investigation sought to extend extant theories of perfectionism as a multidimensional construct and to establish an empirical rationale for the existence of both healthy and unhealthy forms of perfectionism in Australian secondary school students. A particular point of interest was to make an empirical connection between perfectionism and level of school ability. It also aimed to examine the relationship between types of perfectionist students and the associated academic learning variables of academic self-efficacy, cognitive strategy use, self-regulation, academic self-handicapping and test anxiety together with the personal achievement goal orientations of task, performance-approach, and performance avoid goals. The study was conducted with a large sample of male and female mixed-ability students from a range of different school structures, school grades\(^4\) and socio-economic family and cultural backgrounds. It has been shown that students who attend different classes with different teachers develop patterns of beliefs and attitudes based on their learning experiences in different subject areas (Stodolsky, Salk, & Glaessner, 1991). Therefore all data were embedded in the learning domains of literacy and numeracy, in order to assess the domain specificity of the findings.

In this chapter the methodology to be employed in the study is presented. Characteristics of the participants and the schools they attend are outlined, and the outcome variables that were examined are discussed. The standardised tests used in

\(^{4}\) In the present study, the word "grade" (as a variable included in the data analysis) will be used in reference to year or grade level of schooling e.g. Year 8 or Year 11.
the collection of data and the materials used in the student survey questionnaire are described. An overview of the procedures involved in the administration of the research instrumentation is provided. Finally, the application of the selected statistical tests which were used to analyse the data is reviewed in relation to each of the research questions.

3.1. Design

The present study examines the dimensionality of the perfectionism construct, and the existence of healthy and unhealthy types of perfectionist secondary school students in an Australian school setting. Differences between perfectionist types and the academically relevant beliefs and behaviours of academic self-efficacy, cognitive strategy use, self-regulation, academic self-handicapping, test anxiety and the personal goal achievement orientations of task, performance-approach, and performance-avoid goals according to level of school ability, school performance, grade, gender, ethnicity, and school attended, within the specific learning domains of literacy and numeracy, as well as possible interaction effects are assessed.

3.2 Participants

Participants were Year 8 and Year 11 male and female mixed-ability students attending four secondary schools in Sydney, New South Wales (NSW), Australia. In the state of NSW, the first stage of schooling at approximately age five, is commonly referred to as the Infants’ stage and includes Kindergarten (K), Year One and Year Two. Infants’ school is followed by the Primary stage of Years Three to Six. The
third stage of formal schooling occurs in the Secondary school commencing in Year 7 and concluding at the end of Year 12.

The choice of students from Year 8 and Year 11 was influenced by the theoretical view expressed in the literature that the propensity to expect more from oneself than talent or ability might actually warrant (unrealistic standards), may be compounded during adolescence (Buescher, 1991). At school children encounter an emphasis on achievement and perfection and the popular culture provides a proliferation of unrealistic models, particularly through advertisements and movies. This becomes most evident as adolescents struggle to define their adult identities and achieve autonomy in their lives (Barrow & Moore, 1983). From the relatively non-competitive atmosphere of primary school, students experience an incremental creep in the number of life experiences with a potential for failure and rejection as they progress through secondary school and into young adulthood. Such experiences as the public embarrassment of failing to gain the necessary entrance mark for admission to a preferred tertiary course may result in the acquisition of a “very fragile sense of self” (Halgin & Leahy, 1989, p.223). In an effort to regain their self-esteem these individuals develop a compulsion to prove their worthiness by being perfect in order to be accepted and loved (Halgin & Leahy, 1989).

In addition, Year 8 represents an early secondary school experience when learning patterns established in the primary grades become intensified and have greater impact on academic achievement (Dweck, 1986). Towards the end of secondary schooling, in Year 11, students have been subjected to a wider range of developmental experiences and environmental demands, which, together with family
influences, contribute to the development of perfectionism. It should also be noted that Year 8 and Year 11 are extreme secondary schooling points which are not confounded by the stresses incurred at Year 7 (transition from primary school) and Year 12 (end of schooling assessment and matriculation). Useful comparative data could be obtained by exploring the interplay between perfectionism, academic learning variables and personal achievement goal orientations at these two focal points in the secondary school experience.

All participation in the study was on a voluntary basis, including parental and student permission, together with agreement from individual class teachers. This, together with the inherent constraints of secondary school timetabling complexities, resulted in a varied response across the four schools to the invitation for all Year 8 and Year 11 classes to take part in the study. For the Year 8 sample, the response rate was 85% for school 1, 91% for school 2, 82% for school 3, and 70% for school 4. The response rate for the Year 11 sample was 76% for school 1, 86% for school 2, 78% for school 3 and 75% for school 4. Table 3.1 shows the composition of students and schools with participant response rates.
Table 3.1

Sample Size, Grade and Gender with School Participant Response Rates

<table>
<thead>
<tr>
<th>School</th>
<th>Year 8</th>
<th>Year 11</th>
<th>Response Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Boys</td>
<td>Girls</td>
<td>Boys</td>
</tr>
<tr>
<td>School 1&lt;sup&gt;a&lt;/sup&gt;</td>
<td>_</td>
<td>51</td>
<td>_</td>
</tr>
<tr>
<td>School 2&lt;sup&gt;b&lt;/sup&gt;</td>
<td>181</td>
<td>_</td>
<td>160</td>
</tr>
<tr>
<td>School 3&lt;sup&gt;c&lt;/sup&gt;</td>
<td>66</td>
<td>49</td>
<td>63</td>
</tr>
<tr>
<td>School 4&lt;sup&gt;d&lt;/sup&gt;</td>
<td>8</td>
<td>6</td>
<td>17</td>
</tr>
<tr>
<td>Total</td>
<td>255</td>
<td>106</td>
<td>240</td>
</tr>
</tbody>
</table>

N = 783

<sup>a</sup> Independent, all girls’ school K – Year 12

<sup>b</sup> Independent, boys K-Year 10; coeducational Years 11 & 12

<sup>c</sup> Government, coeducational Year 7 – Year 12

<sup>d</sup> Independent, coeducational K – Year 12

3.3 Schools

Across the state of NSW there are three major school systems: Government, Catholic, and Independent. The four schools which accepted the invitation to be involved in this research project are representative of a range of different school structures within the Independent and Government school systems in the metropolitan area of Sydney. The school structures included single-sex (one for each of boys and girls) and coeducational school populations. All four school populations consisted of a percentage of students from non-English speaking
(NESB) backgrounds thus reflecting the multicultural nature of Australian community groups. The total number of NESB students was 22.24%. Details of ethnic composition are shown in Table 3.2.

Table 3.2

*Ethnic Origins and Student Percentages*

<table>
<thead>
<tr>
<th>Ethnic Origins</th>
<th>Student %</th>
</tr>
</thead>
<tbody>
<tr>
<td>South East Asia</td>
<td>12.83</td>
</tr>
<tr>
<td>Western Europe</td>
<td>4.83</td>
</tr>
<tr>
<td>Central Europe</td>
<td>1.91</td>
</tr>
<tr>
<td>Middle East</td>
<td>1.78</td>
</tr>
<tr>
<td>Eastern Europe</td>
<td>0.51</td>
</tr>
<tr>
<td>Other</td>
<td>0.38</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>22.24</strong></td>
</tr>
</tbody>
</table>

There was a range of socio-economic family status from working class to upper middle class. The schools are situated in the northern, southern and eastern suburbs of Sydney. All three of these suburban localities are indicative of a multi-level stratum of living standards.

### 3.4 Materials

Instrumentation used in this study included a measure of the construct of perfectionism, a student questionnaire adapted from a range of widely-used scales of
well reported internal consistency, and tests of school ability, reading comprehension
and mathematics. A detailed description of each measure and the study variables is
set out below.

3.4.1 The Multidimensional Perfectionism Scale (Frost et al., 1990).

The instrument used to measure the dimensions of perfectionism was an adapted
version of the Multidimensional Perfectionism Scale 5 (MPS) (Frost et al., 1990). In
its original form, the FMPS consists of 35 statements, to which participants respond
on a five-point Likert scale ranging from 1 (not at all true) through to 5 (very true).
The self-report questionnaire produces scores for six subscales. The Concern over
Mistakes (CM) subscale (items 9, 10, 13, 14, 18, 21, 23, 25, 34; see Table 3), reflects
negative reactions to mistakes, a tendency to interpret mistakes as equivalent to
failure, and a tendency to believe that one will lose the respect of others following
failure (e.g., “People will probably think less of me if I make a mistake”, “I should
be upset if I make a mistake”). The Personal Standards (PS) subscale (items 4, 6,
12, 16, 19, 24, 30) involves the setting of very high standards and the excessive
importance placed on these high standards for self-evaluation (e.g., “If I do not set
the highest standards for myself, I am likely to end up a second-rate person”, “I hate
being less than the best at things”). The tendency to believe that one’s parents set
very high goals is measured by the Parental Expectations (PE) subscale (items 1, 11,
15, 20, 26; e.g., “My parents expect excellence from me,” “My parents want me to
be the best at everything”). The Parental Criticism (PC) subscale (items 3, 5, 22, 35;
e.g., “As a child I was punished for doing things less than perfectly”, “I never felt

5 "The Multidimensional Perfectionism Scale" is also the title of the scale developed by Hewitt and
Flett (1991). In order to distinguish between the two scales, Frost et al.'s (1990) instrument is
referred to as the Frost Multidimensional Scale (FMPS) throughout this thesis.
that I could meet my parents' standards”), reflects the perception that one’s parents are overly critical. *Doubts about Actions* (D; items 17, 28, 32, 33) contains items from the Maudsley Obsessive-Compulsive Inventory doubting subscale (Rachman & Hodgson, 1980), and reflects the extent to which people doubt their ability to accomplish tasks (e.g., “Even when I do something very carefully, I often feel that it is not quite right”). Concern for order and *Organisation* (O; items 2, 7, 8, 27, 29, 31; e.g., “Organisation is very important to me,” “I try to be a neat person”) is measured in the last subscale. An emphasis on order and orderliness has often been associated with perfectionism and is included as a dimension of perfectionism in this study.

The FMPS yields subscale scores (CM, PS, PE, PC, D, and O). The total score is a linear combination of all subscale scores except for Organisation. Frost et al. (1990) reported six subscale alphas ranging from .77 to .93. Strong validity coefficients have been reported for the six subscales of the FMPS which relates in expected directions with early measures of perfectionism such as the Burns Perfectionism Scale (Burns, 1980a), The Self-Evaluative Scale from the Irrational Beliefs Test (Jones, 1968) and the Eating Disorders Inventory (Garner, Olmstead, & Polivy, 1983), and, more latterly the Multidimensional Perfectionism Scale (Hewitt & Flett, 1991), and the Almost Perfect Scale (Slaney, Ashby, & Trippi, 1995). Criterion-related validity was obtained by correlations between the FMPS subscales and a range of personality variables and psychological symptomatology (Frost et al., 1993; Frost et al., 1990).

For this study several items were modified in order to be more meaningful to the student participants. These modifications consisted of converting statements originally phrased in the past tense to the present tense as follows: item 67, “My
parents wanted me to be the best at everything” became “My parents want me to be the best at everything”, item 76, “My parents have expected excellence from me”, became “My parents expect excellence from me”, item 82, “My parents have always had higher expectations for my future than I have”, became “My parents have higher expectations for my future than I have”, item 61, “My parents never tried to understand my mistakes”, became “My parents never try to understand my mistakes”, item 78, “I never felt I could meet my parents’ expectations”, became “I never feel that I can meet my parents’ expectations”, and item 91, “I never felt I could meet my parents’ standards”, became “I never feel that I can meet my parents’ standards”.

The FMPS was selected as the measurement of perfectionism in this study because it had been validated in both school-aged and college student samples in a number of empirical studies conducted by Parker and his colleagues (Parker, 1997, 2002; Parker & Adkins, 1995a, 1995b; Parker & Mills, 1996; Parker et al., 2001; Parker & Stumpf, 1995). On conceptual grounds, its intra-personal focus on the six theorised dimensions, resonated with perfectionist behaviours commonly ascribed to students of high ability (Kerr, 1991), as discussed in section 2.8, which was a theme of particular interest in this study. (A copy of the original FMPS (Frost et al., 1990) can be seen in Appendix A).

In an intensive pilot study prior to the present data collection, the FMPS was administered to a sample of 409 mixed-ability girls in Years 7, 8, 10 & 11 from two Independent secondary schools in Sydney, none of whom participated in the main study. From the examination of the psychometric properties of the FMPS it was
concluded that the instrument would better serve the present population in a re-
formulated 4 factor, 33 item format which formed the last 33 items of the Student 
Learning Approach Questionnaire (LAQ) (see Appendix B).

3.4.2 Student Learning Approach Questionnaire (LAQ)

An omnibus student questionnaire was developed to investigate the relationship 
between perfectionism, academic learning variables and personal goal orientations in 
both the literacy and numeracy domains. The survey included a demographic data 
cover sheet which provided details such as age, address, language spoken at home, 
and parental occupations. The academic learning process variables examined were 
the Academic Efficacy and the Academic Self-Handicapping Strategies scales from 
the Patterns of Adaptive Learning Survey (Midgley et al., 1997), and the Test 
Anxiety, the Cognitive Strategy Use scale and the Self-Regulation scales from the 
Motivated Strategies for Learning Questionnaire (Pintrich & De Groot, 1990). To 
assess students’ personal achievement goal orientations, the three PALS scales of 
Task Goal Orientation, Performance-Approach Goal Orientation, and Performance-
Avoidance Orientation, were used. Items from the PALS and the MSLQ were 
interspersed throughout the questionnaire rather than being presented subscale by 
subscale. The survey was set out in such a way that the students could respond to 
each item simultaneously according to their learning approaches in both English and 
Mathematics classes. The FMPS items were included at the end of the survey as 
student responses were not domain specific, but again, items were interspersed 
amongst the four factors. A copy of the LAQ student survey can be found in 
Appendix B.
3.4.2.1 Patterns of Adaptive Learning Survey (PALS; Midgley et al., 1997).

The PALS is a self-report survey which includes scales to assess students’ personal achievement goal orientations, perceptions of the goal structures in the classroom, academic self-efficacy, self-handicapping strategies, and perceived cultural dissonance between home and school. The survey also includes scales to assess teachers’ perceptions of the goal structure in the school for students and teachers, approaches to teaching and learning, and personal efficacy. Many of the scales are based on research that shows that a differential emphasis on “task” and “ability” goals is associated with adaptive or maladaptive patterns of learning.

Over a period of eight years, researchers from the University of Michigan undertook the development and validation of the PALS scales assessing students’ goal orientations. Using confirmatory factor analysis (CFA), Midgley et al. (1998), established the convergent and discriminant validity of the three goal scales (task, performance-approach, and performance-avoidance). The authors concluded that construct validity of the three scales was satisfactorily demonstrated.

The items in the scales assessing students’ personal goal orientations and their perceptions of the classroom goal structures have also been adapted to measure domain-specific (mathematics) goals and goal structures with alpha coefficients consistent with those reported in the PALS instrument (Midgley et al., 1997). The authors report that the PALS scales have been found to be reasonably stable over time, have good internal consistency and appear to operate similarly with students of
both genders and different ethnic backgrounds across a range of grade levels (Midgley et al., 1998). The instrument was designed so that different scales could be used together or individually. Students were asked to respond to each item on a 5-point Likert scale which ranged from 1 = Not at all true of me, through to 5 = Very true of me. The PALS scales (alpha coefficients as reported in the PALS manual) used in this study included the two academic learning variables of Academic Efficacy ($\alpha=.77$) and Academic Self-Handicapping Strategies ($\alpha=.84$), as well as the three personal achievement goal orientations of Task Goal Orientation ($\alpha=.83$), Performance-Approach Goal Orientation ($\alpha=.86$), and Performance-Avoid Goal Orientation ($\alpha=.75$).

### 3.4.2.2. Motivated Strategies for Learning Questionnaire (MSLQ: Pintrich & De Groot, 1990)

The MSLQ is a self-report survey which was adapted for use with a school student sample by Pintrich and De Groot (1990). The scales were developed over a period of five years between 1986 and 1990. The instrument included 56 items on student motivation, cognitive strategy use, metacognitive strategy use, and the management of effort. Students were instructed to respond to the items on a 7-point Likert scale from 1 = Not at all true of me, through to 7 = Very true of me, in terms of their behaviour in the specific Science or English class.

In the present study the MSLQ subscales of Test Anxiety ($\alpha = .75$), Cognitive Strategy Use ($\alpha = .83$) and Self-Regulation ($\alpha = .74$) were included. In order to maintain consistency in student responses a 5-point Likert scale was also used for the MSLQ items, ranging from 1 = Not at all true of me, through to 5 = Very true of me.
The specific content domains for scales adapted from both the PALS and the MSLQ instruments, were Mathematics and English classes. Item scores for each scale were then summed and averaged for each domain.

3.4.3 Academic Variables

Since little is known about the relationship between perfectionism and aspects of student learning behaviours, the academic variables included in this study will provide valuable insights into correlates of perfectionism in this normative sample of secondary school students. This study will examine how perfectionism is associated with how students feel about their ability to perform certain learning tasks, how they avoid the possibility of failure, how they react to test situations, what cognitive strategies they employ and how they regulate their own learning processes.

3.4.3.1 Academic Self-Efficacy

The Academic Self-Efficacy scale of PALS measures students’ perceptions of their competence to do their class work. Sample items from this scale include “I’m certain I can master the skills taught in class this year”; and “I can do even the hardest work in this class if I try”.

3.4.3.2 Academic Self-Handicapping Strategies

The Academic Self-Handicapping scale refers to strategies that students use, such as procrastinating and ‘fooling around’, so that they can blame these behaviours for poor performance rather than a perceived lack of ability. Sample questions include,
"Some students put off doing their school work until the last moment so if they don't do well on their work, they can say that is the reason. How true is this of you?"; and "Some students fool around the night before a test, so that if they don't do well, they can say that is the reason. How true is this of you?"

3.4.3.3 Test Anxiety

Test anxiety was included as a variable in the present study based on a theoretical assumption that unhealthy perfectionists would be more concerned with avoiding failure than non-perfectionists. Four items (e.g., "I am so nervous during a test that I cannot remember facts I have learned," "When I take a test I think about how poorly I am doing"), concerning worry about and cognitive interference on tests comprise the Test Anxiety scale (Pintrich & De Groot, 1990).

3.4.3.4 Cognitive Strategy Use

The Cognitive Strategy Use scale consists of 13 items pertaining to the use of rehearsal strategies (e.g., "When I read material for this class, I say the words over and over to myself to help me remember"), elaboration strategies such as summarising and paraphrasing (e.g., "When I study for this class, I put important ideas in my own words"), and organisational strategies (e.g., "I outline the chapters in my book to help me study."

3.4.3.5 Self-Regulation

The Self Regulation scale included metacognitive and effort management items. Metacognitive strategies included planning, skimming, and comprehension monitoring (e.g., "I ask myself questions to make sure I know the material I have
been studying”). Effort management strategies included students’ persistence at
difficult or boring tasks and working diligently (e.g., “Even when study materials are
dull and uninteresting, I keep working until I finish”) (Pintrich & De Groot, 1990).

3.4.4 Personal Achievement Goal Orientations

Throughout the literature, the setting of high standards for personal performance is
integral to perfectionism (Adler, 1956; Burns, 1980a; Frost et al., 1990; Hamachek,
1978; Hollender, 1965; Horney, 1950; Pacht, 1984; Sorotskin, 1985). An area not
yet explored in either the perfectionism or achievement motivation literature is the
relationship between perfectionism and personal achievement goal orientations.
Conceptually there is a connection between perfectionism and personal goal
orientations since both are concerned with the “what, why and how individuals are
motivated to achieve in different settings” (Pintrich, 2000).

3.4.4.1 Task Goal Orientation

Students who are oriented towards task (mastery) goals in an achievement setting are
motivated to develop their competence. They strive for mastery and understanding
and perceive learning as inherently interesting. Their attention is focused on the
learning task. A task goal orientation is associated with an adaptive learning
approach. Examples of items include “I like school work that I’ll learn from even if
I make a lot of mistakes”, and “I do my school work because I am interested in it”.

93
3.4.4.2 Performance-Approach Goal Orientation

Students who adopt a *performance-approach goal orientation* have a need to demonstrate their competence relative to others. Their attention is focused on themselves. This goal orientation has been associated with both adaptive and maladaptive patterns of learning. Item examples include “I want to do better than other students in my class”, and “It’s important to me that the other students in this class think that I am good at my work”.

3.4.4.3 Performance-Avoid Goal Orientation.

Students with a *performance-avoid goal orientation* are primarily concerned with avoiding the demonstration of incompetence. Again attention is self-focused and this goal orientation has been associated with maladaptive learning patterns. Examples of items are “An important reason I do my school work is so that I don’t embarrass myself”, and “The reason I do my work is so others won’t think I’m dumb”.

Internal reliabilities of the measured variables of the study were assessed using Cronbach’s alpha and displayed in Table 3.3.
Table 3.3

*Internal Reliabilities Measured by Cronbach's Alpha on Measured Variables in the Literacy and Numeracy Domains*

<table>
<thead>
<tr>
<th>Variable</th>
<th>Literacy</th>
<th>Numeracy</th>
</tr>
</thead>
<tbody>
<tr>
<td>Academic Self-Efficacy</td>
<td>.76</td>
<td>.79</td>
</tr>
<tr>
<td>Academic Self-Handicapping</td>
<td>.81</td>
<td>.83</td>
</tr>
<tr>
<td>Test Anxiety</td>
<td>.80</td>
<td>.79</td>
</tr>
<tr>
<td>Cognitive Strategy Use</td>
<td>.77</td>
<td>.77</td>
</tr>
<tr>
<td>Self-Regulation</td>
<td>.78</td>
<td>.73</td>
</tr>
<tr>
<td>Task Goal</td>
<td>.76</td>
<td>.78</td>
</tr>
<tr>
<td>Performance-Approach Goal</td>
<td>.76</td>
<td>.77</td>
</tr>
<tr>
<td>Performance-Avoid Goal</td>
<td>.78</td>
<td>.78</td>
</tr>
</tbody>
</table>

3.4.5 Otis-Lennon Test of School Ability (OLSAT)

The test of school ability selected in the present study was the *Otis-Lennon School Ability Test, 7th Edition* (Otis & Lennon, 1996). The OLSAT 7 is the current version of an ability test series that dates back to 1918, and is designed to measure abstract thinking and reasoning ability. The name ‘school ability’ rather than ‘mental ability’ is used to reflect the most appropriate use of the test i.e., to assess students’ ability to cope with school learning tasks, to guide placement in selected school classes, and to
evaluate their achievement in relation to the talents they bring to school learning situations. The OLSAT measures those thinking and reasoning abilities that are most relevant to school achievement. The seven levels of OLSAT provide for accurate assessment at every grade level, and yield verbal and nonverbal scores in addition to a total score, thus providing a more complete picture of students' ability. The total score, however, is the best overall indicator of school learning ability. The OLSAT contains verbal comprehension and reasoning items in addition to nonverbal reasoning with geometric figures and quantitative reasoning items to determine nonverbal school ability (from OLSAT: Otis-Lennon School Ability Test Directions for Administering, pp. 5-8). Criterion validity of the primary, elementary and intermediate school forms of the OLSAT was established in a study of approximately 8,000 Australian children in grades 1 through 8 (Szaday, 1989). The OLSAT yields a school ability index that can be interpreted in a similar way to the intelligent quotient.

3.4.6 Year 8 School Administered Performance Tests

Year 8 school administered performance tests were conducted by the regular English and Mathematics teachers in normal school hours. Students absent from these classes did not complete the tests.

3.4.6.1 Literacy

The test of literacy performance was *The Killer Smog of London* from the *Tests of Reading Comprehension* (Mossenson, Hill, & Masters, 1990). The TORCH are a set of fourteen untimed reading tests for use with students in Years 3 to 10. They aim to
assess the extent to which readers are able to obtain meaning from text. Scores on TORCH may be interpreted from the content-referenced criteria or the group-referenced (normative) data. Group referenced scores are provided as percentile rank scores and stanine scores. The Western Australian reference groups data for eight of the tests were obtained from a 1984 standardization study. The Australian reference group data were derived indirectly from the 1984 norms for the Progressive Achievement Tests in Reading – Form A (ACER 1986) using a Rasch test model equating procedure from which all tests provide measures of reading ability on a common scale that runs from zero to 100. Scores on different tests can therefore be placed on the same scale thus making it possible for teachers to select tests most appropriate for the purpose of the test with a particular student or group of students, and still make valid comparisons (from the TORCH Manual, p.1). In the present study TORCH raw scores were used and converted to percentages.

3.4.6.2 Numeracy

The test for numeracy performance was Level 3B from the Progressive Achievement Tests in Mathematics (PATMaths) Revised. These tests are for use in Australian schools to provide information to teachers about the level of achievement attained by their students in the skills and understanding of mathematics and are suitable for students in Year 3 to Year 9. The PATMaths Revised Norming Manual enables the raw scores on a test to be converted to a norm-referenced rank or stanine score using 1997 norms. The PATMaths Revised Tests have been developed by the Measurement Division of the Australian Council for Educational Research. They are a revision of the Progressive Achievement Tests in Mathematics (PATMATHS) which were first published by ACER and NZCER (New Zealand Council for
Educational Research) in 1984 (from the Teacher’s Manual, p.1). In the present study students’ raw scores on this test were used and converted into percentages.

3.4.7 Year 11 School Performance Tests

3.4.7.1 New South Wales (NSW) School Certificate

The School Certificate is awarded by the Board of Studies NSW to all eligible students at the end of Year 10. In order to receive the certificate, students are required to study courses in each year in Years 7 through Year 10 in English, Mathematics, Science, Human Society and Its Environment, and Personal Development, Health and Physical Education. In November each year, all Year 10 students sit for statewide tests in English-literacy, Mathematics, and Science. The tests assess individual achievement in the foundation knowledge and skills needed to successfully undertake subjects in Years 11 and 12 and to participate effectively in the wider community. Students receive individual test results for these tests.

In order to examine the relationship between perfectionism and school performance in the literacy and numeracy domains in the Year 11 students, the parents and the School Principals gave permission to make the previous end of Year 10 School Certificate results in English and Mathematics available to the researcher. Both these subject areas were marked out of a total possible score of 100.
3.5 Procedure

Following ethics approval by the University of Sydney and the NSW Department of School Education letters were sent to the School Principals inviting them to participate in the study (Appendix C.1). In each of the four schools, the School Principal gave overall approval for the conduct of the study and then nominated a senior member of staff to liaise between teachers and the researcher in organising appropriate times and dates for both teacher training in the procedures of the study and assisting the researcher in the administration of the research instruments.

On obtaining the Principals' approval, information and consent letters were sent home from school to all Year 8 and Year 11 parents (Appendix C.2). Information and consent letters were also sent to all Year 11 students (Appendix C.3). Final nomination of Year 8 students to participate in the study was contingent on receiving signed parent consent forms. Either parent or self consent was acceptable for the Year 11 students. It was also necessary to obtain the consent of individual class teachers to act as trained research assistants in the administration of test instrumentation. For this reason, the number of classes participating in the study varied from school to school (see Table 3.1 above). The procedure for data collection was the same for each school and the progression through each stage of the study is now described. The study was initiated at the beginning of Term 2 of the academic school year.\(^6\) In week 3, following the final collection of parent and student permission forms by each school coordinator, a meeting was held with the

\(^6\) In New South Wales there are four school terms per year each of approximately 10 weeks duration. Term 1 commences around the end of January and Term 4 concludes just before Christmas.
researcher and school staff involved in the study in order to explain the study procedures and directions for the administration of the student survey and school performance tests. One week later, a second meeting was held between the researcher and the school coordinator to review all the instrumentation and organise these into separate class sets. It was agreed at this meeting that all data collection would be completed before the end of the second term and was collected by the researcher from each school as it became available. At all times during the data collection phase there was regular communication between the school coordinator and the researcher.

3.6 Analyses

The key research questions for the quantitative phase are also outlined in Chapter 4. This section details the methods of analyses used for each research question. The significance level for all statistical tests was set at alpha \( \leq .01 \) in view of the sample size and number of tests being conducted. Listwise deletion was employed for the treatment of missing data which were not systematic for variables or cases.

3.6.1 Research Question 1

What are the dimensions of perfectionism?

There have been a number of empirical studies to determine the multidimensionality of the perfectionism construct based on scores obtained on the Frost *Multidimensional Perfectionism Scale* (Frost et al., 1990). Results have varied between the original six dimensions as theorised by Frost and his colleagues (Frost,
Lahart, & Rosenblate, 1991; Parker, 1997; Parker & Stumpf, 1995) and a four factor model (Hawkins et al., 2000, 2004; Kornblum, 2001; Stöber, 1998).

3.6.1.1 Factor Analyses

3.6.1.1.1 Exploratory factor analysis (EFA). The SPSS 11.0 (SPSS Inc. 1999) statistical analysis software program was used for the EFA which was conducted using maximum likelihood extraction to determine the factor structure of the perfectionism measure (FMPS). Since the factors were expected to be correlated, an oblique procedure (oblimin with Kaiser Normalization) was used to rotate the solution to approximate simple structure. The criteria for selecting a solution were the number of ‘steps’ in the scree test (Cattell, 1966), the Kaiser criterion of eigenvalues greater than one (Kaiser, 1974), the percentage of explained variance, and factor interpretability.

3.6.1.1.2 Confirmatory factor analysis (CFA). Although there is much literary debate regarding the appropriate use of both EFA and CFA procedures (Tabachnick & Fidell, 1996; Velicer & Jackson, 1990), Velicer and Jackson (1990) argue that EFA is the least restricted procedure which acts as a conservative confirmatory test without any a priori expectations. In contrast, CFA allows the a priori specification of the associations between items and factors, and controls measurement error, thus disattenuating results that would otherwise be affected by error variance (Slaney, Rice, & Ashby, 2002).
Using LISREL 8.5 (Jöreskog & Sörbom, 2001), a CFA was conducted to test the validity of the measurement model recovered in the EFA and provide discriminant validity of the underlying factors. The CFA applied to the EFA factor solution used robust maximum likelihood extraction, where all items were specified to load only on their respective factors, no error covariances were permitted to correlate, and correlations among the latent constructs were estimated freely. A nested CFA was then conducted to assess the validity of two possible high-order ‘positive’ and ‘negative’ perfectionism factors. In this analysis, response items were specified as indicators for first-order factors as in the preceding CFA analysis. First-order ‘positive’ Personal Standards and Organisation factors were specified as equally contributing indicators for a latent ‘positive’ factor, and first-order Parental Expectations & Criticism and Concern over Mistakes & Doubts factors specified as equally contributing indicators for a latent ‘negative’ perfectionism factor. Intercorrelations were freely estimated and robust maximum likelihood was again used.

To determine the adequacy of the CFA models, four indices of absolute fit, Normal Theory Weighted Least Squares Chi Square ($\chi^2$), Goodness of Fit Index (GFI), Adjusted Goodness of Fit Index (AGFI), Root Mean Square of Approximation (RMSEA) and two indices of incremental fit, Normed Fit Index (NFI), and Non-Normed Fit Index (NNFI) were used. In addition to these commonly accepted model fit statistics, modification indices were also taken into account in evaluating the fit of the CFA.
3.6.2 Research Question 2

Is there a typology of perfectionist secondary school student?

3.6.2.1 Cluster Analysis

In order to determine whether types of perfectionist students could be identified from their scores on the FMPS, a person-centered approach using cluster analysis was used. Cluster analysis is a useful multivariate data analytic technique in locating homogenous subtypes within a complex data set (Borgen & Barnett, 1987). In this analysis Ward's method and squared Euclidean distance was used. The selection of the number of clusters to retain was based on both theoretical and empirical grounds.

In line with Hamachek's (1978) description of normal and neurotic perfectionists, a number of researchers diverted their attention from variable centered analyses of perfectionism and its correlates and adopted a person centered approach which identified a tripartite typology of perfectionism. This typology consisted of a healthy and an unhealthy perfectionist type as theorised by Hamachek (1978), together with a third, non-perfectionist group (Hawkins et al., 2004; Kornblum, 2001; Parker, 1997; Parker et al., 2001; Rice & Mirzadeh, 2000; Slaney et al., 2002). The empirical rationale for cluster selection was based on inspection of the cluster dendogram, and relative changes in the fusion coefficient (Hair, Anderson, Tathan, & Black, 1995; Kim & Mueller, 1984).

3.6.2.2 MANOVA

Multivariate analysis of variance was also performed on the dependent set of perfectionism subscale scores, with cluster membership as the grouping variable in order to determine statistically significant differences between the cluster groups.
Post hoc comparisons using Tukey’s a located significant differences between cluster pairs.

3.6.2.3 Chi-Square Test of Significance

Because there has been a relative lack of gender differences reported in the perfectionism literature, whether there were such effects was of particular interest. Chi-square analysis was used to determine any gender differences across the perfectionist clusters.

3.6.3 Research Question 3

Is there an association between the dimensions of perfectionism and the contextual variables of ability, grade, gender, ethnicity, and school?

3.6.3.1 MANOVA

The association between perfectionism and school contextual factors was examined using a multivariate analysis of variance in which the four dimensions of perfectionism were the dependent variables. The independent variables were school ability level (quintiles 1 through 5), grade (8 or 11), gender (male or female), ethnicity, (English Speaking Background: ESB, or non English Speaking Background: NESB), and school (1 through 4).
3.6.4 Research Question 4

What is the relationship between perfectionist type and the academic learning variables of school performance, academic self-efficacy, academic self-handicapping, test anxiety, cognitive strategy use, and self-regulation in the literacy and numeracy domains?

3.6.4.1 Bivariate Correlation Analysis

Correlations measured associations between the complete set of study variables in each of the literacy and numeracy domains.

3.6.4.2 MANOVA

MANOVA examined differences between clusters on the academic learning variables of academic self-efficacy, academic self-handicapping, test anxiety, cognitive strategy use, and self-regulation. These variables were the dependent variables in two MANOVAs that were conducted, one for literacy and one for numeracy. In both MANOVAs, the independent variables were perfectionist type, ability level, school performance level, grade, gender, school and ethnicity. To identify statistically significant differences between cluster pairs, post hoc tests, using Tukey’s $a$ were conducted. Descriptive statistics examined differences in mean scores and standard deviations.
3.6.5 Research Question 5

What is the relationship between perfectionist type and the personal goal orientations of task, performance-approach, and performance-avoid in the literacy and numeracy domains?

Having determined that the setting and holding of high personal standards is integral to any conceptualisation about perfectionism, the literature on perfectionism would be enriched by some insight into the relationship between this pervasive personality trait and the current prominent goal theory of achievement motivation. No conceptual link between goal theory and perfectionism has so far been proposed in either the achievement motivation or perfectionism literature. It could be argued that perfectionism itself is integral to achievement motivation theory, since it is perfectionism that drives individuals towards perfection. Certainly, an important outcome of this study will be an expanded insight into the relationship between perfectionism and the personal achievement goal orientations of perfectionist students.

3.6.5.1 MANOVA

For each of the literacy and numeracy domains, MANOVA was used to examine perfectionist type differences in the personal achievement goal orientations of task goal orientation, performance-approach goal orientation, and performance-avoid goal orientation. These three goal orientations were the dependent variables, and the independent variables were perfectionist type, along with ability level (quintiles 1 to 5), literacy and numeracy performance (quintiles 1 to 5), grade (8 or 11), gender
(male or female), ethnicity (English Speaking Background: ESB, or Non English Speaking Background: NESB), and school. Post hoc tests using Tukey’s a were used to identify statistically significant differences between cluster pairs.

3.6.6 Research Question 6

Is there a relationship between perfectionism and level of school ability?

It was stated earlier that an important aspect of the present study is to determine the relationship between perfectionism and level of school ability. In response to what appears to be a surfeit of supposition throughout the gifted literature that gifted children are particularly prone to perfectionist thinking and behaviour, much of the empirical research into perfectionism and school-aged students to date has been conducted on gifted and talented populations (see Parker, 1997; Parker & Mills, 1996; Roberts & Lovett, 1994). Apart from three perfectionism studies using more typical school-aged student samples which have been located in the literature to date (see Accordino et al., 2000; Gilman and Ashby, 2003; LoCicero et al., 2001), this area of research is limited, especially using adolescent samples.

The relationship between perfectionism and level of school ability was examined in three ways.

3.6.6.1. MANOVA

First, level of school ability (quintiles 1 to 5) was included as a variable in the MANOVA which tested for the effects of perfectionist type cluster membership along with grade, gender, ethnicity and school.
3.6.6.2 Bivariate Correlation Analysis

Second, a, more intensive examination was conducted using continuous ability data in bivariate correlations.

3.6.6.3 MANOVA

Third, the presence of interaction terms between ability level and perfectionist type as part of the multivariate analysis of variance (MANOVA) conducted for Research Question 4 would suggest that ability level moderated the relationship between perfectionist type and the academic variables of school performance, academic self-efficacy, academic self-handicapping, test anxiety, cognitive strategy use, and self-regulation. This would indicate a linear relationship between level of school ability and the measured outcomes.

3.7 Summary

This study was conceptualised to add further insights into the role that perfectionism plays in the day to day learning experiences of Australian adolescent school students. For this reason, variables representing educationally relevant beliefs and behaviours and representing adaptive and maladaptive patterns of learning were selected to support the examination of the interplay between school learning processes and perfectionist type in NSW (Australia) school settings. The study variables were adapted from research instruments with previously demonstrated high construct validity and reliability. Appropriate statistical analysis tools were used in the analysis of data, presented in sequence with the research questions. The study is of
theoretical, empirical and practical importance in that it provides extended insights into perfectionism, its nature, measurement and correlates in a large mixed-ability population of boys and girls across two important developmental stages in the secondary school learning experience.
CHAPTER 4

RESULTS

"The more perfect a thing is, the more susceptible to good and bad treatment it is."

Dante (Alighieri)

PERFECTIONISM: DIMENSIONS, TYPOLOGY AND ACADEMIC VARIABLES

The conceptualisation of perfectionism as a personality trait is the cornerstone of the present study which examines the multidimensional nature of the construct, types of perfectionist students and associated academic learning variables. The study is conducted in an Australian secondary school setting in New South Wales and aims to gain insights into the nature of perfectionism and its academic implications for secondary school students. The key questions guiding the study provide a framework for the reporting of relevant data in this chapter.

1. What are the dimensions of perfectionism?

2. What is the typology of perfectionist secondary school student?

3. Is there an association between the dimensions of perfectionism and the contextual factors of level of school ability, grade, gender, ethnicity and school?
4. What is the relationship between perfectionist type and the academic variables of school performance, academic self-efficacy, academic self-handicapping, test anxiety, cognitive strategy use, and self-regulation in the literacy and numeracy domains?

5. What is the relationship between perfectionist type and individuals’ personal achievement goal orientations of task, performance-approach, and performance-avoid, in the literacy and numeracy domains?

6. Is there a relationship between perfectionism and level of school ability?

In order to proceed with this study, it was first necessary to establish an empirical basis for the theorised dimensions of perfectionism, and to determine the suitability of an existing instrument designed to measure those dimensions. The Frost Multidimensional Perfectionism Scale (Frost et al., 1990) was selected because it had been validated with school student samples (Parker, 1997; Parker & Stumpf, 1995), and because the theorised dimensions of the scale closely resembled behaviours of perfectionist children reported in the literature (see Kerr, 1991).

4.1 Research Question 1

**What are the dimensions of perfectionism?**

While a number of empirical studies have examined the presence of perfectionism in school-aged children, these have been limited to either gifted populations, or have
tended to focus on negative aspects of perfectionism (Bieling, Israeli, Smith, & Antony, 2003; Einstein, Lovibund, & Gaston, 2000; Kornblum, 2001; LoCicero & Ashby, 2000; Parker, 1997; Parker et al., 2001; Parker & Stumpf, 1995). My pilot study extended on this body of work by examining the dimensionality of the perfectionism construct in a sample of 409 Australian adolescent girls spanning the secondary school Years 7 to 10 from two private Sydney Metropolitan girls’ schools, and incorporating a broader spectrum of student ability.

4.1.1 The Psychometric Properties of the Frost Multidimensional Perfectionism Scale: A Pilot Study

The initial investigation into the construct of perfectionism in an Australian ecological school setting necessitated an examination of the psychometric properties of a measurement of perfectionism to clarify prevailing theories on the multidimensional nature of the construct and on the existence of both healthy and unhealthy types of perfectionists. The purpose of the pilot study was to extend previous studies of perfectionism conducted outside Australia through an examination of the psychometric properties of the Frost Multidimensional Perfectionism Scale (Frost et al., 1990), and to assess its usefulness as a measure of perfectionism to be used in the follow-up main study. My first objective was to determine the number and nature of the core components of perfectionism as theorised by Frost et al. (1990), and to examine support for the presence of two higher-order factors representing positive and negative aspects of perfectionism. I
also aimed to establish an empirical basis for the existence of a perfectionist typology which could be identified from scores on the FMPS.

The findings of the pilot study supported previous assertions that the FMPS is more stable with four, not six, underlying dimensions. (For a detailed report on the pilot study see Appendix D). The loading pattern of the pilot analysis was in concurrence with Stöber (1998), Stumpf and Parker (2000), and Kornblum (2001), in which the Concern over Mistakes and Doubts about Actions subscales converged into one factor, and the Parental Expectations and Parental Criticism subscales also combined to form a single new factor.

The nested confirmatory factor analysis of the resulting four first-order factors (which were named Concern over Mistakes & Doubts (CMD), Parental Expectations & Criticism (PEC), Personal Standards (PS), and Organisation (O), demonstrated marginal fit, weak within-construct correlations, sizeable across-construct correlations, and unacceptable alpha reliability coefficients. Higher-order positive and negative perfectionism factors were therefore not supported in the pilot study. Cluster analysis indicated that scores on the FMPS could be used to distinguish two types of perfectionist, and a third, non-perfectionist type of student in this sample of Australian girls.
For the main study, in convergence with previous findings (Hawkins et al., 2000, 2004; Kornblum, 2001; Stöber, 1998; Stumpf & Parker, 2000), it was hypothesised that scores on the FMPS would again fall into four distinct factors: (1) concern with making mistakes and doubting one's actions (CMD), (2) a perception of stringent parental judgement (PEC), (3) setting and holding high personal standards (PS), and (4) a need for order and organisation (O). It was further hypothesised that the four factor model would not be well summarised by a second-order model of healthy (PS and O factors), and unhealthy (CMD and PEC factors) perfectionism.

4.1.2 Construct Validity in the Main Study

Following the pilot study it was necessary to again evaluate the suitability of the FMPS as a measure of perfectionism in a broadened sample which included males across a wider developmental spectrum.

4.1.2.1 Exploratory Factor Analysis

Based on the findings of previous analytic studies (Hawkins et al., 2000; 2004; Kornblum, 2001; Stöber, 1998; Stumpf & Parker, 2000), scores on the adapted\(^8\)

---

\(^8\) All items worded in the past tense on the original Frost Multidimensional Perfectionism Scale were re-worded into the present tense (see Section 3.4.1).
version of the FMPS were subjected to exploratory factor analysis (EFA) using maximum likelihood extraction and oblimin rotation. In this method, the distinction between the intercorrelations of the sample and the (hypothetical) intercorrelations of the population is made from the beginning and this distinction remains during the whole estimation process (Comrey & Lee, 1992).

The criteria for selecting a factor solution were the number of “steps” in the scree test (Cattell, 1966), the Kaiser criterion of eigenvalues greater than one (Kaiser, 1974), the percentage of explained variance, and factor interpretability. Based on these criteria, a four factor solution was selected which converged in 12 iterations. In this solution, items 62 and 74 were problematic as they both showed substantial loadings on more than one factor. Item 62 “It is important to me that I be thoroughly competent in everything I do”, loaded similarly on the Personal Standards subscale to which it was assigned, and on Organisation. In the pilot study item 74 was also dropped from the analysis because of similar cross-loadings. This is also in line with previous findings which showed similar factor loadings on the PS and CM factors for Item 74 (Kornblum, 2001; Parker & Adkins, 1995b; Rhéaume, Freeston, Dugas, Letarte, & Ladouceur, 1995; Stöber, 1998).

Subsequently, items 62 and 74 were dropped from the analysis and a second exploratory factor analysis was run, again using maximum likelihood extraction and oblimin rotation, and converging in 11 iterations. All items loaded on the respective factors to which they were assigned, and there were no cross loadings. The FMPS items and pattern coefficients are shown in Table 4.1. In this solution, scores on the
four factors accounted for 54% of the total variance, with the largest amount of variance (27.59%) accounted for by the subscale which measured student perceptions of *Parental Expectations and Criticism* (PEC). This finding was interesting given that in previous studies of typical students, the *Concern over Mistakes & Doubts* (CMD) (Stöber, 1998) and *Concern over Mistakes* (CM) (Parker & Adkins, 1995a), subscales had accounted for the highest percentage of the variance. The CMD subscale also accounted for the highest percentage of variance in Kornblum's (2001) study of gifted students.
**Table 4.1**

*FMPS Items and Pattern Matrix Coefficients of the Four-Factor Solution with Oblimin Rotation*

<table>
<thead>
<tr>
<th>Item No.</th>
<th>Stem</th>
<th>PEC</th>
<th>O</th>
<th>PS</th>
<th>CMD</th>
</tr>
</thead>
<tbody>
<tr>
<td>76</td>
<td>My parents expect excellence from me.</td>
<td>.787</td>
<td>.024</td>
<td>-2.25</td>
<td>-2.074</td>
</tr>
<tr>
<td>78</td>
<td>I never feel that I can meet my parents' expectations.</td>
<td>.748</td>
<td>-.018</td>
<td>.196</td>
<td>.128</td>
</tr>
<tr>
<td>82</td>
<td>My parents have always had higher expectations for my future than I have.</td>
<td>.744</td>
<td>-.057</td>
<td>.102</td>
<td>.072</td>
</tr>
<tr>
<td>91</td>
<td>I never feel that I can meet my parents' standards.</td>
<td>.742</td>
<td>-.065</td>
<td>.197</td>
<td>.073</td>
</tr>
<tr>
<td>67</td>
<td>My parents want me to be the best at everything.</td>
<td>.722</td>
<td>.018</td>
<td>-.158</td>
<td>-.019</td>
</tr>
<tr>
<td>71</td>
<td>Only outstanding performance is good enough in my family.</td>
<td>.677</td>
<td>-.015</td>
<td>-.112</td>
<td>.146</td>
</tr>
<tr>
<td>57</td>
<td>My parents set very high standards for me.</td>
<td>.664</td>
<td>.058</td>
<td>-.189</td>
<td>-.193</td>
</tr>
<tr>
<td>61</td>
<td>My parents never try to understand my mistakes.</td>
<td>.571</td>
<td>-.047</td>
<td>.105</td>
<td>.084</td>
</tr>
<tr>
<td>59</td>
<td>As a child, I was punished for doing things less than perfectly.</td>
<td>.547</td>
<td>.037</td>
<td>-.013</td>
<td>.144</td>
</tr>
<tr>
<td>83</td>
<td>I try to be a neat person.</td>
<td>.010</td>
<td>.815</td>
<td>.087</td>
<td>.008</td>
</tr>
<tr>
<td>87</td>
<td>I am an organised person.</td>
<td>-.062</td>
<td>.807</td>
<td>-.013</td>
<td>-.022</td>
</tr>
<tr>
<td>85</td>
<td>neatness is very important to me.</td>
<td>.040</td>
<td>.797</td>
<td>.003</td>
<td>.018</td>
</tr>
<tr>
<td>64</td>
<td>I try to be an organised person.</td>
<td>-.023</td>
<td>.785</td>
<td>.008</td>
<td>-.005</td>
</tr>
<tr>
<td>63</td>
<td>I am a neat person.</td>
<td>-.027</td>
<td>.753</td>
<td>-.020</td>
<td>-.057</td>
</tr>
<tr>
<td>58</td>
<td>Organisation is very important to me.</td>
<td>-.007</td>
<td>.737</td>
<td>-.078</td>
<td>.073</td>
</tr>
<tr>
<td>68</td>
<td>I set higher goals than most people.</td>
<td>.112</td>
<td>.037</td>
<td>-.762</td>
<td>.095</td>
</tr>
<tr>
<td>75</td>
<td>I have extremely high goals.</td>
<td>.111</td>
<td>.075</td>
<td>-.727</td>
<td>.105</td>
</tr>
<tr>
<td>86</td>
<td>I expect higher performance in my daily tasks than most people.</td>
<td>.062</td>
<td>.169</td>
<td>-.589</td>
<td>.287</td>
</tr>
<tr>
<td>80</td>
<td>Other people seem to accept lower standards from themselves than I do.</td>
<td>.026</td>
<td>.010</td>
<td>-.473</td>
<td>.218</td>
</tr>
<tr>
<td>72</td>
<td>I am very good at focusing my efforts on attaining a goal.</td>
<td>.001</td>
<td>.273</td>
<td>-.430</td>
<td>-.049</td>
</tr>
<tr>
<td>79</td>
<td>If I do not do as well as other people, it means I am an inferior being.</td>
<td>.002</td>
<td>-.009</td>
<td>-.085</td>
<td>.672</td>
</tr>
<tr>
<td>69</td>
<td>If someone does a task at school better than I do, I feel as if I failed the whole task.</td>
<td>-.030</td>
<td>-.009</td>
<td>-.111</td>
<td>.643</td>
</tr>
<tr>
<td>65</td>
<td>If I fail at school, I am a failure as a person.</td>
<td>-.004</td>
<td>-.013</td>
<td>-.030</td>
<td>.638</td>
</tr>
<tr>
<td>81</td>
<td>If I do not do well all the time, people will not respect me.</td>
<td>.010</td>
<td>-.007</td>
<td>-.117</td>
<td>.627</td>
</tr>
<tr>
<td>77</td>
<td>People will probably think less of me if I make a mistake.</td>
<td>-.062</td>
<td>-.018</td>
<td>-.120</td>
<td>.622</td>
</tr>
<tr>
<td>70</td>
<td>If I fail partly, it is as bad as being a complete failure.</td>
<td>.040</td>
<td>-.039</td>
<td>-.150</td>
<td>.619</td>
</tr>
<tr>
<td>66</td>
<td>I should be upset if I make a mistake.</td>
<td>-.023</td>
<td>.002</td>
<td>-.123</td>
<td>.588</td>
</tr>
<tr>
<td>90</td>
<td>The fewer mistakes I make, the more people will like me.</td>
<td>-.027</td>
<td>-.020</td>
<td>.006</td>
<td>.566</td>
</tr>
<tr>
<td>84</td>
<td>I usually have doubts about the simple everyday things that I do.</td>
<td>-.007</td>
<td>.052</td>
<td>.099</td>
<td>.511</td>
</tr>
<tr>
<td>89</td>
<td>It takes me a long time to do something &quot;right&quot;.</td>
<td>.112</td>
<td>.013</td>
<td>.289</td>
<td>.481</td>
</tr>
<tr>
<td>60</td>
<td>If I do not set the highest standards for myself, I am likely to end up a second-rate person.</td>
<td>.111</td>
<td>.071</td>
<td>-.291</td>
<td>.400</td>
</tr>
<tr>
<td>88</td>
<td>I tend to get behind in my work because I repeat things over and over.</td>
<td>.062</td>
<td>.121</td>
<td>.184</td>
<td>.391</td>
</tr>
<tr>
<td>73</td>
<td>Even when I do something very carefully, I often feel that it is not quite right.</td>
<td>.026</td>
<td>.067</td>
<td>.002</td>
<td>.355</td>
</tr>
</tbody>
</table>

% variance: 27.59  13.54  6.98  6.35
Eigenvalues: 9.10  4.47  2.30  2.09

*Note. N = 788. Factor loadings .30 or greater bolded.*
Results

The outcome of the exploratory factor analysis confirmed the theoretical and analytic view of perfectionism as a fourfold multidimensional construct. Reliabilities using Cronbach’s alpha were computed for the four factor scales. The coefficients of internal consistency were as follows: PEC: $\alpha = .90$, CMD: $\alpha = .88$, PS: $\alpha = .82$, O: $\alpha = .90$. These reliabilities were all above the .80 value, recommended by Carmines and Zeller (1979) to be the lower boundary for scales widely used as research instruments.

Separate exploratory factor analyses, again using maximum likelihood extraction and oblique rotation, were also conducted within each of the Year 8 (n=357) and Year 11 (n=411) student groups. For both groups, inspection of the scree plot, eigenvalues in excess of unity, percentage of explained variance and interpretability clearly indicated a four factor solution. For the Year 8 group, item 62 again loaded on more than one factor, and so was omitted as in the combined Year 8 and Year 11 EFA. The result of a second EFA was a clearly interpretable four factor 34-item model which converged in 12 iterations and represented the PEC, CMD, PS and O dimensions of perfectionism. For Year 11, items 62 and 74 were again discarded due to cross loadings.
As a result of a second EFA, all remaining items loaded according to their original assignments and simple structure was achieved in an unambiguous four factor solution as identified with the combined sample (Years 8 and 11) analyses. (The Years 8 and 11 pattern matrices can be seen in Appendix E).\textsuperscript{9}

These factor analyses make two important contributions to the empirical literature on perfectionism research. First, they provide confirmation of the reliability and validity of a four factor multidimensional model of perfectionism which has been identified by others as a validation of the original six factors theorised Frost et al. (1990), and secondly, the consistency of the findings within the Year 8, Year 11, and combined sample groups, attest to the stability of the four factor multidimensional structure of perfectionism across the age levels studied.

4.1.2.2 Confirmatory Factor Analysis

Having obtained a four factor solution in two independent samples (the present study and the pilot study reported in Appendix D), the underlying measurement model obtained in both samples was evaluated using confirmatory factor analysis (CFA). CFA allows the \textit{a priori} specification of item-factor associations and controls measurement error, thereby disattenuating results that would otherwise be affected.

\textsuperscript{9} In fact, a 6 factor solution yielded factors (see Appendix F) which, on inspection of face validity, appeared to represent Parental Expectations and Criticism (PEC), Organisation (O), Personal Standards (PS), Concern over Mistakes (CM), Need for Approval (NA), and Doubts about Actions (D). While these factors were intuitively interpretable, they did not immediately follow from the authors' theorisation of perfectionism. Based on theoretical and empirical considerations, this solution was not pursued, although it may be deserving of further study.
by error variance (Slaney, Rice, & Ashby, 2002). In the present model each item was specified as an indicator of the factor to which it was theorised to belong (refer to Table 4.1), and no cross loadings were permitted. Error variances were freely estimated but no error covariances were specified. Correlations among latent constructs were also estimated.

This model converged in 10 iterations and had a marginal fit. To determine the adequacy of the model four indices of absolute fit were used: Normal Theory Weighted Least Squares Chi-Square ($\chi^2$), Goodness of Fit Index (GFI), Adjusted Goodness of Fit Index (AGFI), Root Mean Square Error of Approximation (RMSEA); and two indices of incremental fit: Normed Fit Index (NFI), and Non-Normed Fit Index (NNFI) were used. Fit statistics were as follows: $\chi^2 = 2684.517$ ($p<.001$), $df = 489$, RMSEA = 0.069, NFI = 0.934, NNFI = 0.943, GFI = 0.825, AGFI = 0.799. All parameter estimates were statistically significant ($|t| > 1.96$) excepting the correlation between PEC and O. Completely standardised parameter estimates are presented in Figure 4.1 and Appendix G.1.
Figure 4.1. Confirmatory factor analysis for four theorised dimensions of perfectionism (completely standardised parameter estimates).

Note. PEC = Parental Expectations & Criticism, CMD = Concern over Mistakes & Doubts, PS = Personal Standards, O = Organisation
Inspection of the modification indices revealed that freeing some of the error covariances would improve the model fit. The three largest modification indices are shown in Table 4.2.

**Table 4.2.**

*Table of Item Pairs to Free, their Modification Indices, and Substantiation for Freeing.*

<table>
<thead>
<tr>
<th>Item No.</th>
<th>Item Content</th>
<th>Modification Index</th>
<th>Substantiation</th>
</tr>
</thead>
<tbody>
<tr>
<td>57</td>
<td>My parents set very high standards for me.</td>
<td>87.729</td>
<td>These are the only two items which refer specifically to the degree of parental expectations.</td>
</tr>
<tr>
<td>76</td>
<td>My parents expect excellence from me.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>91</td>
<td>I never feel that I can meet my parents’ standards.</td>
<td></td>
<td>Parallel wording “I never feel that I can meet my parents’…”</td>
</tr>
<tr>
<td>78</td>
<td>I never feel that I can meet my parents’ expectations of me.</td>
<td>222.837</td>
<td></td>
</tr>
<tr>
<td>88</td>
<td>I tend to get behind in my work because I repeat things over and over.</td>
<td></td>
<td>These items are the only two in the <em>Doubts about Actions</em> scale which reflect a central feature of perfectionism as uncertainty regarding when a task is done (see Reed, 1985).</td>
</tr>
<tr>
<td>89</td>
<td>It takes me a long time to do something “right”.</td>
<td>101.695</td>
<td></td>
</tr>
</tbody>
</table>

Since it was possible to explain correlated error variances between these 3 item pairs on substantive grounds, as described in Table 4.2, a second CFA was estimated. Specifications for this CFA were as for the preceding analysis with the addition of the three freed error covariances as detailed in Table 4.2. The model converged in 10 iterations and the solution was superior to that of the first model. Fit statistics were as follows: $\chi^2 = 1818.706 \ (p < .001)$, $df = 486$, RMSEA = 0.060, NFI = 0.944,
NNFI = 0.954 GFI = 0.855, AGFI = 0.833. All parameter estimates were again statistically significant, except the correlation between PEC and O. Completely standardised parameter estimates are presented in Figure 4.2 and Appendix G.2.

Figure 4.2. Confirmatory factor analysis for four theorised dimensions of perfectionism: Specific error covariances freed (completely standardised parameter estimates).

Note. PEC = Parental Expectations & Criticism, CMD = Concern over Mistakes & Doubts, PS = Personal Standards, O = Organisation
Confirmatory factor analyses provided a rigorous assessment of the fit of the reformulated four factor, 33 item FMPS instrument. After modelling the error covariances that were identified in the initial CFA (see Table 4.2), results show acceptable model fit across a range of frequently emphasised measures of model fit (Hoyle & Panter, 1995).

### 4.1.2.3 Nested CFA Analysis of Higher Order Factors

To assess the validity of possible higher-order ‘positive’ and ‘negative’ perfectionism factors in the main study, a nested CFA was conducted. Here, items were specified as indicators for first-order factors with the error variances freely estimated as in the preceding section and the three error covariances freed as before. First-order ‘positive’ PS and O factors were specified as equally contributing indicators for a latent *healthy perfectionism* factor, and first-order ‘negative’ PEC and CMD factors specified as equally contributing indicators for a latent *unhealthy perfectionism* factor. Intercorrelations among the latent factors were freely estimated.

This nested CFA showed marginal model fit, converging in 34 iterations ($\chi^2 = 1402.49$ $df = 491$, RMSEA = .07, NFI = .89, NNFI = .93, GFI = .83, AGFI = .81). Table 4.3 shows first-order factor loadings and measurement errors, and higher-order factor loadings and uniquenesses from the nested CFA. While these fit indices aid in the evaluation in model fits, there is ultimately a degree of subjectivity and professional judgment in the selection of ‘best’ models. Inspection of interrelations among
Results

'healthy' PS and O components (.42) and 'unhealthy' CMD and PEC (.64, see Figure 4.2), shows these were similar to across-construct correlations, and for the healthy perfectionism factor the correlation was not strong in any case. This was also the case in the Stumpf and Parker (2000) study, despite their conclusion favouring two higher order positive and negative factors.

In evaluating hierarchical CFA models, it has been argued by Marsh and colleagues that weak correlations among first-order factors imply a weak hierarchy (Marsh, 1987; Marsh & Hocevar, 1985) since most of the reliable variance in the first-order factors is unexplained by the higher-order factors. This is an important consideration in choosing whether to summarize data using higher-order constructs, or to rely on the greater number of first-order factors. As shown in Figure 4.2, PS correlated more strongly with CMD, one of the 'negative' perfectionism factors (.52), than with O, the other 'positive' factor (.42). PS also correlated with the 'negative' dimension of PEC (.42).

As in my pilot study, the weak associations between any proposed higher-order factors relative to across-construct correlations, together with a marginal fit of the model and unacceptable alpha reliabilities precluded any support for the presence of two higher-order 'healthy' (PS and O, $\alpha = .56$) and 'unhealthy' (CMD and PEC, $\alpha = .67$) perfectionism factors.
Table 4.3  

*Nested CFA: First-Order Factor Loadings (LY) and Measurement Errors (TE), and Higher-Order Factor Loadings (GA) and Uniquenesses (PSI) (Completely Standardised Solution)*.

<table>
<thead>
<tr>
<th>Higher-Order Factor</th>
<th>Scale/item</th>
<th>LY</th>
<th>TE</th>
<th>GA</th>
<th>PSI</th>
</tr>
</thead>
<tbody>
<tr>
<td>‘Negative’ Perfectionism</td>
<td><em>Parental Expectations and Criticism</em></td>
<td></td>
<td></td>
<td>.73</td>
<td>.47</td>
</tr>
<tr>
<td>Perf57</td>
<td></td>
<td>.56</td>
<td>.66</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Perf59</td>
<td></td>
<td>.67</td>
<td>.56</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Perf61</td>
<td></td>
<td>.59</td>
<td>.65</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Perf67</td>
<td></td>
<td>.77</td>
<td>.41</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Perf71</td>
<td></td>
<td>.82</td>
<td>.33</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Perf76</td>
<td></td>
<td>.79</td>
<td>.37</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Perf78</td>
<td></td>
<td>.72</td>
<td>.48</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Perf82</td>
<td></td>
<td>.75</td>
<td>.44</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Perf91</td>
<td></td>
<td>.67</td>
<td>.56</td>
<td></td>
<td></td>
</tr>
<tr>
<td><em>Concerns over Mistakes and Doubts</em></td>
<td></td>
<td></td>
<td></td>
<td>.84</td>
<td>.29</td>
</tr>
<tr>
<td>Perf60</td>
<td></td>
<td>.47</td>
<td>.78</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Perf65</td>
<td></td>
<td>.58</td>
<td>.67</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Perf66</td>
<td></td>
<td>.56</td>
<td>.69</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Perf69</td>
<td></td>
<td>.60</td>
<td>.65</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Perf70</td>
<td></td>
<td>.62</td>
<td>.62</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Perf73</td>
<td></td>
<td>.41</td>
<td>.83</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Perf77</td>
<td></td>
<td>.65</td>
<td>.58</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Perf79</td>
<td></td>
<td>.63</td>
<td>.60</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Perf81</td>
<td></td>
<td>.60</td>
<td>.64</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Perf84</td>
<td></td>
<td>.46</td>
<td>.79</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Perf88</td>
<td></td>
<td>.32</td>
<td>.90</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Perf89</td>
<td></td>
<td>.34</td>
<td>.88</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Perf90</td>
<td></td>
<td>.50</td>
<td>.75</td>
<td></td>
<td></td>
</tr>
<tr>
<td>‘Positive’ Perfectionism</td>
<td><em>Personal Standards</em></td>
<td></td>
<td></td>
<td>.67</td>
<td>.55</td>
</tr>
<tr>
<td>Perf68</td>
<td></td>
<td>.80</td>
<td>.36</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Perf72</td>
<td></td>
<td>.48</td>
<td>.77</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Perf75</td>
<td></td>
<td>.81</td>
<td>.35</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Perf80</td>
<td></td>
<td>.56</td>
<td>.69</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Perf86</td>
<td></td>
<td>.78</td>
<td>.39</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Higher-Order Factor</td>
<td>Scale/item</td>
<td>LY</td>
<td>TE</td>
<td>GA</td>
<td>PSI</td>
</tr>
<tr>
<td>---------------------</td>
<td>------------</td>
<td>----</td>
<td>----</td>
<td>----</td>
<td>-----</td>
</tr>
<tr>
<td></td>
<td>Organisation</td>
<td></td>
<td></td>
<td>.66</td>
<td>.48</td>
</tr>
<tr>
<td>Perf58</td>
<td>.82</td>
<td>.33</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Perf63</td>
<td>.76</td>
<td>.42</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Perf64</td>
<td>.80</td>
<td>.36</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Perf83</td>
<td>.81</td>
<td>.35</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Perf85</td>
<td>.82</td>
<td>.33</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Perf87</td>
<td>.82</td>
<td>.33</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Note.* Error covariances between Perf57 & Perf76 = .12, Perf78 & 91 = .26, and Perf88 & Perf89 = .32

(The LISREL output of the completely standardised solution for the nested CFA analysis of higher-order 'positive' and 'negative' perfectionism factors is presented in Appendix G.3).

4.2 Research Question 2

*Is there a typology of perfectionist secondary school student?*

It was hypothesised that students could be classified as being either healthy perfectionists, unhealthy perfectionists, or non-perfectionists. A number of researchers have established the validity of a tripartite typology of perfectionism in non-clinical samples. This typology was proposed by Parker (1997) in his study of academically talented sixth graders at the Center for Talented Youth of Johns Hopkins University. Parker identified a *non-perfectionist* type, a *healthy* perfectionist type, and a *dysfunctional* perfectionist type. Other researchers have replicated this typology, although in some instances, slight variations in structure
were found for scores on the *Personal Standards* (PS) dimension of perfectionism. For example, the highest scores on PS were obtained by the unhealthy cluster in some studies (Kornblum, 2001; Parker, 1997; Rice & Mirzadeh, 2000), whereas in other studies both the unhealthy and healthy clusters had comparably high scores on this dimension (Hawkins et al., 2000, 2004; Rice & Lapsley, 2001). It was therefore necessary to establish an empirical basis for distinguishing the theorised three types of students in the present study and to clarify the role of personal standards in the typology. Based on the theoretical conceptualisation that the setting and holding of high personal standards is integral to the construct of perfectionism, it was hypothesised that both healthy and unhealthy types of perfectionists would score highly on this key dimension.

Individual scores on the four dimensions of perfectionism were used to cluster the students. Cluster analysis is a multivariate data analytic technique that is useful for identifying homogenous subtypes within a complex data set (Borgen & Barnett, 1987). Individual responses for the four FMPS subtest scores were analysed using hierarchical cluster analysis and employing Ward’s method which is designed to optimise the minimum variance within clusters (Ward, 1963). Hair, Anderson, Tathan, and Black (1995), argue that there is no standard objective selection procedure in determining the number of relevant clusters in a data set. Cluster sets should be examined in light of “practical judgement, common sense, or theoretical foundations” (p.443). A more formal empirical approach is to graph the number of clusters implied by an hierarchical tree against the agglomeration coefficient, which is the numerical value at which the various cases merge to form a cluster. This test
can be interpreted in a way that is analogous to the “scree test” of factor analysis. A marked flattening of the curve indicates that little new information can be gleaned from the ensuing cluster mergers (Kim & Mueller, 1984). (The SPSS cluster analysis dendogram is presented in Appendix H).

The identification of three distinct clusters to retain in this study was based on theoretical and empirical criteria. First, there was the a priori theoretical expectation as evidenced in previous studies using the FMPS (Kornblum, 2001; Parker, 1997; Parker et al., 2001; Rice & Dellwo, 2002; Rice & Lapsley, 2001; Rice & Mirzadeh, 2000) and others using the Almost Perfect Scale-Revised (APS-R Slaney, Mobley, Trippi, Ashby, & Johnson, 1996) perfectionism measure which all identified three types of perfectionists (Rice & Slaney, 2002; Slaney et al., 2002). The second criterion was empirical, from examination of the graph of the number of clusters against the agglomeration coefficient. This graph identified three clear clusters and is presented in Figure 4.3.
Figure 4.3. Plot of number of clusters versus fusion coefficient, Ward’s method solution.

On the basis of these two criteria three clusters of perfectionists were identified in this sample of secondary school students. This finding is in concurrence with the pilot study (Hawkins et al., 2000, 2001, 2004), Kornblum’s (2001) study of Australian gifted students, and previous overseas studies using either the Frost Multidimensional Perfectionism Scale \(^{10}\) (Grzegorek, Slaney, Franze, & Rice, 2004; Parker, 1997; Parker et al., 2001; Rice & Dellwo, 2002; Rice & Lapsley, 2001; Rice & Mirzadeh, 2000; Rice & Slaney, 2002; Slaney et al., 2002), or the Almost Perfect Scale-Revised \(^{11}\) (Grzegorek et al., 2004; Rice & Slaney, 2002; Slaney et al., 2002). The mean scores of the three clusters on each of the four dimensions of perfectionism, are graphed in Figure 4.4.

\(^{10}\) FMPS; Frost et al. (1990)
\(^{11}\) APS-R; Slaney et al., (1996)
Figure 4.4. Mean perfectionism scores for healthy (P+), unhealthy (P-), and non-perfectionist (Pn) cluster groups.

Note. PEC = Parental Expectations & Criticism; CMD = Concern over Mistakes & Doubts; PS = Personal Standards; O = Organisation

Figure 4.4 shows a distinctive three-way pattern of scores on the FMPS. Group 1 scores on O and PS were higher than their scores on CMD and PEC. The O scores for this group were the highest of the three groups. Group 2 scores were similarly higher for O, PS, and PEC than for CMD although their scores on CMD were the highest of the three groups. Group 3 were the lowest scoring group on all four
dimensions of perfectionism. A comparison between Groups 1 and 2 shows that both groups had similar PS scores, with Group 1 scoring higher than Group 2 on O, and Group 2 scoring higher than Group 1 on PEC and CMD. Group 1 was labelled the healthy (P+) cluster (n=274), Group 2 the unhealthy (P-) cluster (n=310), and Group 3 (n=186), the non-perfectionist (n) cluster. The cluster groups thus consisted of a non-perfectionist type (Pn=24.16%), a healthy perfectionist type (P+ = 35.58%), and an unhealthy perfectionist type (P- = 40.26%).\textsuperscript{12} The gender distribution across the clusters was not significant $\chi^2(2, N=767)=6.75, p<.01$.

It is of some considerable interest to note the number of participants falling into the composite perfectionist groups. Nearly 76% of the present sample were classified as perfectionists providing a strong indication of the relevance of perfectionism as a significant variable to be investigated in this study. Indeed, there is a remarkable similarity in the prevalence of perfectionism overall, across a range of previously studied populations, and the numbers of participants falling into each of the three perfectionist clusters (Ablard & Parker, 1997; Hawkins et al., 2000, 2001, 2004; Kornblum, 2001; Parker, 1997; Parker et al., 2001; Rice & Dellwo, 2002; Rice & Lapsley, 2001; Rice & Mirzadeh, 2000; Rice & Slaney, 2002). In Parker’s (1997) study of academically talented 6\textsuperscript{th} graders, 67% of the participants were perfectionists (42% P+ and 25% P-); in Kornblum’s (2001) school student sample, 68% of the gifted students were perfectionists (35% P+ and 28% P-), while 80% of the nongifted students were perfectionists (35% P+ and 23% P-); in the Rice and Lapsley (2001) study of undergraduates, 65% of participants were perfectionists.

\textsuperscript{12} To assist the reader in ease of readability and interpretability, the three perfectionist types will be referred to as P+ (healthy), P- (unhealthy), and Pn (non-perfectionists) throughout the remainder of this dissertation.
(34% P+ and 31% P-); in Rice and Slaney’s (2002) study of undergraduates, 69% were perfectionists (43%P+ and 26%P-).

There are two findings of particular interest in the present study. The first is the finding that the highest scores on the Organisation(O) subscale were obtained by the healthy perfectionists thus providing further empirical support for similar results across a range of samples in both Australia and North America (Hawkins et al., 2000; Kornblum, 2001; Parker, 1997; Parker et al., 2001; Rice & Dellwo, 2002; Rice & Lapsley, 2001; Rice & Mirzadeh, 2000; Slaney et al., 2002). The second interesting finding was that the P- cluster scored highest on the O (although lower than the P+ cluster), and PEC (higher than P+) dimensions of perfectionism with PS scores of a similar magnitude both to O and PEC and the PS scores of the P+ cluster.

To determine statistically significant differences between the three cluster groups on the dimensions of perfectionism, a MANOVA was performed on the dependent set of perfectionism subscale scores (PEC, CMD, PS & O), with cluster membership (P+, P-, and Pn) as the grouping variable. There was a statistically significant multivariate effect of cluster membership on the dimensions of perfectionism ($F$ (8, 767) = 225.836, $p < .001$) by the Pillai’s Trace Criterion (Tabachnick & Fidell, 1996). The results of follow-up univariate $F$-tests are presented in Table 4.4.
Table 4.4

*Multidimensional Perfectionism Scale Raw Score Means and Standard Deviations by Cluster Group, with Univariate F Tests, Tukey a Post-Hoc Testing, and $\eta^2$ as a Measure of Effect Size.*

<table>
<thead>
<tr>
<th></th>
<th>Cluster 1 (P+)</th>
<th>Cluster 2 (P-)</th>
<th>Cluster 3 (Pn)</th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>M</td>
<td>SD</td>
<td>M</td>
<td>SD</td>
<td>M</td>
<td>SD</td>
<td>F</td>
<td>$\eta^2$</td>
</tr>
<tr>
<td>PEC</td>
<td>1.86</td>
<td>.51</td>
<td>3.52</td>
<td>.64</td>
<td>1.78</td>
<td>.53</td>
<td>811.28$^{ab}$</td>
<td>.68</td>
</tr>
<tr>
<td>CMD</td>
<td>2.07</td>
<td>.63</td>
<td>2.71</td>
<td>.67</td>
<td>1.76</td>
<td>.41</td>
<td>167.06$^{abc}$</td>
<td>.30</td>
</tr>
<tr>
<td>PS</td>
<td>3.19</td>
<td>.97</td>
<td>3.30</td>
<td>.77</td>
<td>2.11</td>
<td>.54</td>
<td>143.58$^{bc}$</td>
<td>.27</td>
</tr>
<tr>
<td>O</td>
<td>4.02</td>
<td>.76</td>
<td>3.51</td>
<td>.94</td>
<td>2.49</td>
<td>.64</td>
<td>198.21$^{abc}$</td>
<td>.34</td>
</tr>
</tbody>
</table>

*Note.* $df = 2$; error $df = 767$; all $F$-tests statistically significant at $p < .001$; significant Tukey $a$ pairs: $a =$ Clusters 1 and 2, $b =$ Clusters 1 and 3, $c =$ Clusters 2 and 3.

P+ = healthy perfectionist; P- = unhealthy perfectionist; Pn = non-perfectionist

In the Tukey $a$ post hoc testing, all pairwise comparisons were statistically significant for each of the four dimensions of perfectionism, with the exception of a non-significant difference between the P+ and Pn clusters on PEC, and between P- and P+ clusters on PS. The difference between the scores of both perfectionist groups (P- and P+) and the non-perfectionist (Pn) group on PS was statistically significant, thus confirming the theoretical understanding of standard setting as an integral component of the construct of perfectionism. This was an important result in that it provides empirical evidence that both types of perfectionists, healthy or
unhealthy, can be characterised as having high personal standards in this sample. The finding replicates the cluster analysis results of my pilot study and those of Rice and Lapsley (2001) who reported comparable scores between both perfectionist types on the Personal Standards subscale of the FMPS, and Rice and Slaney (2002), who analysed scores on the APS-R. It is also consistent with studies reporting highest standards scores being obtained by healthy perfectionists (Rice & Dellwo, 2002), and those in which unhealthy perfectionists scored highest on the standards dimension of perfectionism (Kornblum, 2001; Parker, 1997; Rice & Mirzadeh, 2000). Of particular interest in the present study is the finding that both perfectionist types each scored highest on the O perfectionism dimension. Thus, both healthy and unhealthy perfectionists demonstrated high personal standards and a high need for organisation. The essential difference between the two clusters in this study is that the unhealthy perfectionists had significantly lower O scores and higher PEC and CMD scores than the healthy perfectionists. The healthy perfectionist cluster had similar PS scores, higher O scores and lower PEC and CMD scores than the unhealthy cluster.

From an educational perspective, the results of the cluster analysis are particularly relevant in that they provide empirical support for the hypothesised healthy and unhealthy perfectionist types in an Australian school student population. A study of 820 academically talented sixth form students conducted at the Center for Talented Youth of Johns Hopkins University (Parker, 1997), also concluded there was evidence to support the notion of the existence of both “normal” and “neurotic” perfectionism. This convergence of results, from the US sample of academically
talented primary-aged students, Kornblum's (2001) study of Australian gifted students, and the present Australian sample of secondary school mixed-ability students, provides compelling evidence that substantial numbers of students in schools may exhibit unhealthy forms of perfectionism, which in turn, may negatively impact on levels of academic performance and/or social and emotional well-being.

On the other hand, an examination of the interplay between perfectionist type and a range of school related variables will serve to clarify the role that perfectionism plays in school learning situations. The variables of interest in the present study include contextual factors (school ability, grade, gender, ethnicity and school attended); academic variables (academic self-efficacy, academic self-handicapping, test anxiety, cognitive strategy use, and self-regulation); and the personal achievement goal orientations of task, performance-approach and performance avoid. These will be discussed in the following sections.

4.3 Research Question 3

Is there an association between the dimensions of perfectionism and the contextual factors of school ability, grade, gender, ethnicity, and school?

In order to examine the relationship between perfectionism and school related variables, a multivariate analysis of variance was conducted on the dependent set of perfectionism subscale scores (PEC, CMD, PS and O) with the grouping variables of school ability level (quintiles 1 through 5), grade (8 or 11), gender (male or female),
Results

ethnicity (English Speaking Background: ESB, or Non English Speaking Background: NESB), school (1 through 4), and including all 2-way interactions.\textsuperscript{13}

There was a multivariate effect of perfectionism on gender ($F(4, 716) = 3.497$, $p = .008$), with an effect size of $\eta^2 = .019$, and school ($F(12, 2154) = 2.650$, $p = .002$, with an effect size of $\eta^2 = .015$. Follow up univariate tests showed a statistically significant effect of gender on PEC ($F(1, 719) = 10.904$, $p = .001$, with an effect size of $\eta^2 = .015$, and CMD ($F(1, 719) = 6.658$, $p = .010$, with an effect size of $\eta^2 = .009$.

There was a univariate effect of school on PEC ($F(3, 719) = 4.308$, $p = .005$, with an effect size of $\eta^2 = .018$.

In light of the complexity of this analysis and the small effect sizes,\textsuperscript{14} a power analysis was conducted which yielded an acceptable median power of .712 for main effects and .648 for interaction effects. However, because all effect sizes were of too small a magnitude to be meaningful, they are of little practical importance. It was therefore concluded that perfectionism was independent of the influences of level of ability, year of schooling, ethnicity, and school attended.

In addition, the results did not suggest any developmental course of perfectionism between Year 8 and Year 11 (see Table 4.5), or a particular affiliation with students of different levels of school ability or ethnic group (ESB vs. NESB).

\textsuperscript{13} Note. 3-way interactions and above were unable to be estimated due to computational constraints.

\textsuperscript{14} Cohen (1977) identified small, medium, and large effect sizes to correspond to $r$'s of .10, .30, and .50, respectively.
Table 4.5

*Means and Standard Deviations by Grade on the Dimensions of Perfectionism*

<table>
<thead>
<tr>
<th></th>
<th>Year 8 (n=357)</th>
<th></th>
<th>Year 11 (n=411)</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>M</td>
<td>SD</td>
<td>M</td>
<td>SD</td>
</tr>
<tr>
<td>Parent Expectations</td>
<td>2.50</td>
<td>1.01</td>
<td>2.53</td>
<td>1.01</td>
</tr>
<tr>
<td>&amp; Criticism (PEC)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Concern over Mistakes</td>
<td>2.27</td>
<td>.76</td>
<td>2.24</td>
<td>.68</td>
</tr>
<tr>
<td>&amp; Doubts (CMD)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Personal Standards (PS)</td>
<td>3.03</td>
<td>.94</td>
<td>2.93</td>
<td>.93</td>
</tr>
<tr>
<td>Organisation (O)</td>
<td>3.54</td>
<td>1.00</td>
<td>3.38</td>
<td>.99</td>
</tr>
</tbody>
</table>

There are several important educational implications of these results. First, contrary to substantial literary discourse, perfectionism was found not to be the prerogative of high ability students, but rather a pervasive influence on a relatively high proportion of these mixed-ability students in both positive and negative perfectionist forms, as also found by Parker and Mills (1996). There was empirical support for the contention that perfectionism was a relatively stable construct across the age and grade levels targeted in the present study.
4.4 Research Question 4

What is the relationship between perfectionist type and academic variables in the literacy and numeracy domains?

The academic learning variables under scrutiny within literacy and numeracy domains were academic self-efficacy, academic self-handicapping, test anxiety, cognitive strategy use and self-regulation. These variables were the dependent variables in two MANOVAs that were conducted: one for literacy, and one for numeracy. In both MANOVAs the independent variables were perfectionist type (P+, P-, Pn), ability level (quintiles 1 through 5), school performance level (quintiles 1 through 5), grade (8 or 11), gender (male or female), school (1 through 4), and ethnicity (ESB or NESB), for literacy and numeracy, as well as all 2-way interactions.

Intercorrelations among the full set of study variables in the literacy domain are shown in Table 4.6. With explicit regard to the relationships between the four dimensions of perfectionism and academic self-efficacy, academic self-handicapping, test anxiety, cognitive strategy use, self-regulation, task goal, performance-approach and performance-avoid goal orientations, the PEC factor was significantly positively correlated with academic self-handicapping, test anxiety, performance-approach goal and performance-avoid goal. Significant positive relationships were found between the O factor and academic self-efficacy, cognitive strategy use, self-regulation, task goal and performance-approach goal. The PS factor significantly positively correlated with academic self-efficacy, cognitive
strategy use, self-regulation, task goal, performance-approach goal, and performance-avoid goal. There were significant positive relationships between the CMD perfectionism factor and academic self-handicapping, test anxiety, performance-approach goal and performance-avoid goal. These correlations between variables not previously examined in empirical studies of perfectionism, offer further support for the discriminant validity of the four factor structure of perfectionism and its relationship with learning and motivation in a school learning context.
Table 4.6

Intercorrelations Between Study Constructs in the Literacy Domain

<table>
<thead>
<tr>
<th>Variable</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
<th>10</th>
<th>11</th>
<th>12</th>
<th>13</th>
<th>14</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.PEC</td>
<td></td>
<td>.063</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2.O</td>
<td></td>
<td></td>
<td>.329*</td>
<td></td>
<td>.387*</td>
<td>.411*</td>
<td></td>
<td>.553*</td>
<td>.208*</td>
<td></td>
<td>.411*</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3.PS</td>
<td>.553*</td>
<td>.208*</td>
<td></td>
<td>.387*</td>
<td>.411*</td>
<td></td>
<td>.553*</td>
<td>.208*</td>
<td>.387*</td>
<td>.411*</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4.CMD</td>
<td>.018</td>
<td>.097*</td>
<td>.104*</td>
<td>.055</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5.Abil</td>
<td>.105</td>
<td>.133*</td>
<td>.060</td>
<td>.147*</td>
<td>.466*</td>
<td></td>
<td>.105</td>
<td>.133*</td>
<td>.060</td>
<td>.147*</td>
<td>.466*</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7.SEff</td>
<td>.242*</td>
<td>.059</td>
<td>.008</td>
<td>.336*</td>
<td></td>
<td>.232*</td>
<td>.148*</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8.SHand</td>
<td>.300*</td>
<td>.177*</td>
<td>.084*</td>
<td>.450*</td>
<td>.156*</td>
<td>.191*</td>
<td>.167*</td>
<td>.286*</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>9.TAnx</td>
<td>.029</td>
<td>.458*</td>
<td>.275*</td>
<td>.105*</td>
<td>.090</td>
<td>.037</td>
<td>.258*</td>
<td>.079*</td>
<td>.143*</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10.CogStrat</td>
<td>.017</td>
<td>.416*</td>
<td>.368*</td>
<td>.061</td>
<td>.003</td>
<td>.056</td>
<td>.133*</td>
<td>.044</td>
<td>.600*</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>11.SReg</td>
<td>.042</td>
<td>.382*</td>
<td>.300*</td>
<td>.140*</td>
<td>.127*</td>
<td>.063</td>
<td>.449*</td>
<td>.008</td>
<td>.101*</td>
<td>.501*</td>
<td>.516*</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>12.Task</td>
<td>.224*</td>
<td>.333*</td>
<td>.435*</td>
<td>.351*</td>
<td>.023</td>
<td>.009</td>
<td>.343*</td>
<td>.067</td>
<td>.194*</td>
<td>.303*</td>
<td>.280*</td>
<td>.326*</td>
<td></td>
<td></td>
</tr>
<tr>
<td>13.PApp</td>
<td>.277*</td>
<td>.164*</td>
<td>.204*</td>
<td>.442*</td>
<td>.117*</td>
<td>.108*</td>
<td>.069</td>
<td>.301*</td>
<td>.281*</td>
<td>.137*</td>
<td>.107*</td>
<td>.209*</td>
<td>.462*</td>
<td></td>
</tr>
</tbody>
</table>

Note. 1=Parental Expectations & Criticism; 2=Organisation; 3=Personal Standards; 4=Concern over Mistakes & Doubts; 5=Ability; 6=Literacy Performance; 7=Academic Self-Efficacy; 8=Academic Self-Handicapping; 9=Test Anxiety; 10=Cognitive Strategy Use; 11=Self-Regulation; 12=Task Goal; 13=Performance-Approach Goal; 14=Performance-Avoid Goal

p < .01 (2-tailed)
4.4.1 Literacy Academic Variables

The specific literacy academic variables selected for examination in this study included three positive variables (academic self-efficacy, cognitive strategy use, and self-regulation), and two negative variables (academic self-handicapping and test anxiety). Different academic correlates were expected for the three perfectionist clusters. It was thought likely that the healthy perfectionist cluster would have stronger correlations with positive outcomes such as higher levels of academic self-efficacy, cognitive strategy use and self-regulation, whereas in contrast, the unhealthy perfectionists would be associated with the negative outcomes of academic self-handicapping and test anxiety.

Statistically significant multivariate effects on literacy academic variables were found for perfectionist type \( (F (10, 1246) = 2.895, p = .001) \), grade \( (F (5, 622) = 3.532, p = .004) \), and school \( (F(15, 872) = 2.334, p = .003) \), as well as an interaction effect between grade and gender \( (F (5, 622) = 3.271, p = .006) \). (See Appendix 1.1 for SPSS MANOVA output showing effect sizes and power analyses.)

4.4.1.1 Effects of perfectionist type

Significant univariate differences between perfectionist types were evident for academic self-efficacy \( (F (2, 626) = 4.716, p = .009) \), and self-regulation \( (F (2, 626) = 2.840, p \leq .001) \). These statistically significant differences are shown in Figure 4.5. There were no statistically significant univariate effects of perfectionist cluster for cognitive strategy use, academic self-handicapping or test anxiety in the literacy domain.
Figure 4.5. Mean scores of perfectionist types for literacy academic variables.

Note. P+ = healthy type; P- = unhealthy type; Pn = non-perfectionist; Academic Efficacy = Academic Self-Efficacy; Self-Handicap = Academic Self-Handicapping

* $p \leq .01$

Post hoc testing supported the hypothesis that the P+ cluster would obtain the highest scores on academic self-efficacy, cognitive strategy use, and self-regulation, and that both P+ and P- clusters would score higher than the Pn cluster on these variables. There were statistically significant differences between each of the P+ and P- clusters and the Pn cluster ($p < .01$) for academic self-efficacy, but not between the
two perfectionist clusters. The univariate effect of perfectionist cluster for cognitive strategy use was very close to statistical significance ($p = .011$), and post hoc testing showed significant differences between all cluster pairs for this variable. For literacy self-regulation, all paired differences were statistically significant. The results therefore reveal that both P+ and P- students reported similar levels of academic self-efficacy which were higher than the non-perfectionists. The healthy perfectionist cluster had the highest scores on academic self-efficacy, cognitive strategy use and self-regulation, and both perfectionist clusters had higher scores than the non-perfectionists on all three positive academic variables in the literacy domain.

Contrary to the expectation that the unhealthy perfectionists would be distinguished by their highest scores for academic self-handicapping and test anxiety, the multivariate analysis of variance showed no significant main effects of cluster group membership for these two variables, although Tukey $a$ post hoc tests revealed significant cluster group differences. Mean scores and standard deviations of the three clusters on self-handicapping and test anxiety are shown in Table 4.7.
Table 4.7

*Means and Standard Deviations of Cluster Group Scores for Literacy Academic Self-Handicapping and Test Anxiety*

<table>
<thead>
<tr>
<th>Cluster</th>
<th>Academic Self-Handicapping</th>
<th>Test Anxiety</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>M</td>
<td>SD</td>
</tr>
<tr>
<td>Unhealthy (P-)</td>
<td>2.03</td>
<td>0.87</td>
</tr>
<tr>
<td>Healthy (P+)</td>
<td>1.64</td>
<td>0.70</td>
</tr>
<tr>
<td>Non (Pn)</td>
<td>1.74</td>
<td>0.65</td>
</tr>
</tbody>
</table>

Table 4.7 shows that the P- cluster had the highest scores for academic self-handicapping and test anxiety, and that both P+ and P- rated test anxiety higher than the Pn cluster. Tukey a post hoc tests, revealed significant differences between P+ and P- and between P- and Pn \( (p \leq .01) \), for both academic self-handicapping and test anxiety (although there were no significant multivariate or univariate effects of cluster here). Thus, unhealthy perfectionists reported significantly higher levels of academic self-handicapping and test anxiety than *either* healthy perfectionists or non-perfectionists, while healthy perfectionists and non-perfectionists reported similar levels.

**4.4.1.2 Effects of grade**

The significant multivariate effect of grade was accounted for by a significant univariate effect of grade for literacy self-regulation \( (F (1, 626) = 11.249, p = .001) \). Year 8 students scored higher \( (M = 3.33, SD = 0.67) \), than Year 11 students \( (M = 3.09, SD = 0.62) \). This indicated that students’ use of self-regulatory strategies was
dependent on grade and that students in their early experience of secondary school reported using self-regulation more than students nearing school completion.

4.4.1.3 Effects of school

The significant multivariate effect of school was accounted for by a significant univariate effect of school for literacy academic self-efficacy ($F(3, 626) = 7.840, p \leq .001$). Mean scores and standard deviations on literacy academic self-efficacy for the four participating schools are shown in Table 4.8.

Table 4.8
Mean Scores and Standard Deviations for Literacy Academic Self-Efficacy

<table>
<thead>
<tr>
<th>School No.</th>
<th>Literacy Academic Self-Efficacy</th>
<th>M</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td></td>
<td>3.57</td>
<td>.653</td>
</tr>
<tr>
<td>2</td>
<td></td>
<td>3.74</td>
<td>.675</td>
</tr>
<tr>
<td>3</td>
<td></td>
<td>3.83</td>
<td>.639</td>
</tr>
<tr>
<td>4</td>
<td></td>
<td>3.61</td>
<td>.781</td>
</tr>
</tbody>
</table>

Note. $N=779$ (Mean 76.21, SD 17.96)

There was a statistically significant difference in literacy academic self-efficacy scores between school no. 1 and school no. 3. School one was an all girls’ private school where the average score for literacy performance was 80% and school three was a comprehensive coeducational government school, where the literacy performance mean was the lowest at 63%. The higher self-efficacy score in school 3, as compared to school 1, resonates with the considerable body of research
regarding the Big Fish Little Pond Effect (BFLPE), which suggests that students who attend high-ability schools would show lower academic self-efficacy than students from lower ability schools (Marsh, 1990).

4.4.1.4. Interaction effects between gender and grade

Significant interaction effects between gender and grade were identified for cognitive strategy use ($F(1, 626) = 9.005, p = .003$) in the literacy domain. This indicated that the effect of gender was dependent on grade for literacy cognitive strategy use. Mean scores and standard deviations for Year 8 and Year 11 boys and girls on literacy cognitive strategy use are shown in Table 4.9.

Table 4.9

<table>
<thead>
<tr>
<th></th>
<th>Boys (n=495)</th>
<th>Girls (n=288)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>M</td>
<td>SD</td>
</tr>
<tr>
<td>Year 8 (n=357)</td>
<td>3.43</td>
<td>0.64</td>
</tr>
<tr>
<td>Year 11 (n=411)</td>
<td>3.33</td>
<td>0.60</td>
</tr>
</tbody>
</table>

From Table 4.9 we can see that girls reported more cognitive strategy use than boys at both grade levels, with higher levels in Year 11 than in Year 8. On the other hand, boys’ self-report of the cognitive strategy use was lower than girls’ self-reports at both grade levels, and lower in Year 11 than in Year 8. This may represent a developmental growth in girls’ cognitive strategy use in the latter phase of secondary school, and a contrasting decline in boys’ cognitive strategy use.
4.4.2 Numeracy Academic Variables

The numeracy academic variables examined in this study were the same as for the literacy academic variables. Table 4.10 shows the correlations among the full set of study constructs in relation to the numeracy domain. The PEC perfectionism factor showed significant positive relationships with academic self-handicapping, test anxiety, performance-approach goal and performance-avoid goal. O significantly positively correlated with cognitive strategy use, self-regulation, task goal and performance-approach goal. The PS factor was significantly positively related to cognitive strategy use, self-regulation, and the three goal orientations of task goal, performance-approach goal, and performance-avoid goal. The CMD factor was significantly positively correlated with academic self-efficacy, test anxiety, performance-approach goal, and performance-avoid goal. As in the literacy domain, these intercorrelations among variables not previously examined in extant perfectionism studies, provide additional discriminant validity of the four perfectionism factors.
Table 4.10  
*Intercorrelations Between Study Constructs in the Numeracy Domain*

<table>
<thead>
<tr>
<th>Variable</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
<th>10</th>
<th>11</th>
<th>12</th>
<th>13</th>
<th>14</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.PEC</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2.O</td>
<td>.063</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3.PS</td>
<td>.329*</td>
<td>.387*</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4.CMD</td>
<td>.553*</td>
<td>.208*</td>
<td>.411*</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5.Abil</td>
<td>-.018</td>
<td>.097*</td>
<td>.104*</td>
<td>-.055</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6.Perf</td>
<td>-.019</td>
<td>.125*</td>
<td>.169*</td>
<td>-.030</td>
<td>.596*</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7.SEff</td>
<td>.079</td>
<td>.079*</td>
<td>.399*</td>
<td>.098*</td>
<td>.195*</td>
<td>.259*</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8.SHand</td>
<td>.247*</td>
<td>-.063</td>
<td>.001</td>
<td>.331*</td>
<td>.190*</td>
<td>-.184*</td>
<td>.134*</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>9.TAnx</td>
<td>.268*</td>
<td>.159*</td>
<td>.024*</td>
<td>.407*</td>
<td>-.177*</td>
<td>-.263*</td>
<td>-.200*</td>
<td>.304*</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10.CStrat</td>
<td>.053</td>
<td>.446*</td>
<td>.287*</td>
<td>.116*</td>
<td>-.026</td>
<td>-.078*</td>
<td>.294*</td>
<td>-.083*</td>
<td>.099*</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>11.SReg</td>
<td>-.014</td>
<td>.413*</td>
<td>.397*</td>
<td>.067</td>
<td>.047</td>
<td>.078*</td>
<td>.481*</td>
<td>-.173*</td>
<td>-.066</td>
<td>.592</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>12.Task</td>
<td>.081*</td>
<td>.380*</td>
<td>.339*</td>
<td>.191*</td>
<td>-.062*</td>
<td>.036</td>
<td>.531*</td>
<td>-.022</td>
<td>.026</td>
<td>.448*</td>
<td>.554*</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>13.PApp</td>
<td>.211*</td>
<td>.320*</td>
<td>.403*</td>
<td>.329*</td>
<td>.016</td>
<td>.059</td>
<td>.382*</td>
<td>.064</td>
<td>.129*</td>
<td>.328*</td>
<td>.325*</td>
<td>.397*</td>
<td></td>
<td></td>
</tr>
<tr>
<td>14.PAv</td>
<td>.269*</td>
<td>.159*</td>
<td>.213*</td>
<td>.443*</td>
<td>-.110*</td>
<td>-.091*</td>
<td>.089*</td>
<td>.310*</td>
<td>.271*</td>
<td>.151*</td>
<td>.102*</td>
<td>.223*</td>
<td>.465*</td>
<td></td>
</tr>
</tbody>
</table>

*Note. 1=Parental Expectations & Criticism; 2=Organisation; 3=Personal Standards; 4=Concern over Mistakes & Doubts; 5=Ability; 6=Literacy Performance; 7=Academic Self-Efficacy; 8=Academic Self-Handicapping; 9=Test Anxiety; 10=Learning Strategies; 11=Self-Regulation; 12=Task Goal; 13=Performance-Approach Goal; 14=Performance-Avoid Goal

* p < .01 (2-tailed)
The specific numeracy academic variables were the three positive variables of academic self-efficacy, cognitive strategy use, and self-regulation, and the two negative variables of academic self-handicapping and test anxiety. As in the literacy domain, it was expected that the healthy perfectionist cluster would obtain the highest scores on academic efficacy, cognitive strategy use and self-regulation. The unhealthy cluster was thought most likely to obtain the highest scores on academic self-handicapping and test anxiety. There was a significant multivariate effect on numeracy academic variables for perfectionist type \( (F(10, 1244) = 3.856, p \leq .001) \) and a multivariate interaction effect between gender and grade \( (F(5, 621) = 4.138, p = .001) \). (See Appendix I.2 for SPSS MANOVA output showing effect sizes and power analyses.)

4.4.2.1 Effects of perfectionist type

There were significant univariate effects of perfectionist type for academic efficacy \( (F(2, 625) = 8.558, p \leq .001) \), cognitive strategy use \( (F(2, 625) = 8.927, p \leq .001) \), and self-regulation \( (F(2, 625) = 8.816, p \leq .001) \), in the numeracy domain. Figure 4.6 shows the mean scores of perfectionist cluster types for numeracy academic variables.
**Figure 4.6.** Mean scores of perfectionist types for numeracy academic variables.

*Note.* P+ = healthy type; P- = unhealthy type; Pn = non-perfectionist; Academic Efficacy = Academic Self-Efficacy; Self-Handicap = Academic Self-Handicapping

*p ≤ .01*

For numeracy academic self-efficacy, Tukey a post hoc tests showed significant differences between P+ and Pn clusters (*p* ≤ .01), and P- and Pn clusters (*p* ≤ .01), while there were no significant differences between the P+ and P- clusters. There were statistically significant differences between P+ and P- clusters (*p* < .007), and for each of P+ and Pn and P- and Pn clusters (*p* = ≤ .01) for numeracy cognitive strategy use. All pairwise comparisons were significant (*p* ≤ .01) for self-regulation
in the numeracy domain. It could be inferred from these results that non-perfectionist students lacked either the commitment or skill to utilise self-regulatory learning strategies as was evidenced by the higher scores of the two perfectionist groups on academic self-efficacy, cognitive strategy use and self-regulation in the numeracy domain. The healthy perfectionists obtained the highest scores on these three positive numeracy academic variables.

As in the literacy domain, while the multivariate analysis of variance showed no significant main effects of cluster group on measures of academic self-handicapping and test anxiety, post hoc tests revealed significant cluster differences. The mean scores of the three clusters for academic self-handicapping and test anxiety are shown in Table 4.11.

Table 4.11

_Mean Scores and Standard Deviations of Cluster Group Scores for Numeracy Academic Self-Handicapping and Test Anxiety_

<table>
<thead>
<tr>
<th>Cluster</th>
<th>Academic Self-Handicapping</th>
<th>Test Anxiety</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>M</td>
<td>SD</td>
</tr>
<tr>
<td>Unhealthy (P-)</td>
<td>2.05</td>
<td>.91</td>
</tr>
<tr>
<td>Healthy (P+)</td>
<td>1.62</td>
<td>.71</td>
</tr>
<tr>
<td>Non (Pn)</td>
<td>1.75</td>
<td>.67</td>
</tr>
</tbody>
</table>

Table 4.11 shows that the P- cluster had the highest scores for academic self-handicapping and test anxiety, and that both P+ and P- rated test anxiety higher than the Pn cluster. Tukey a post hoc tests revealed significant differences between P+ and P- and between P- and Pn (p ≤ .01), for both academic self-handicapping and
test anxiety (although there were no significant multivariate or univariate effects of cluster here). Again results were consistent with those in the literacy domain. Unhealthy perfectionists reported significantly higher levels of academic self-handicapping and test anxiety than either healthy perfectionists or non-perfectionists, while healthy perfectionists and non-perfectionists reported similar levels.

4.4.2.2. Interaction effect between gender and grade in the numeracy domain

A statistically significant interaction effect between gender and grade was identified for numeracy cognitive strategy use ($F(1, 625) = 13.643, p \leq .001$) indicating that there was an effect of grade which was dependent on gender for numeracy cognitive strategy use. Means and standard deviations for numeracy cognitive strategy use are shown in Table 4.12.

Table 4.12
Mean Scores and Standard Deviations for Numeracy Cognitive Strategy Use

<table>
<thead>
<tr>
<th></th>
<th>Boys (n=495)</th>
<th></th>
<th>Girls (n=288)</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>M</td>
<td>SD</td>
<td>M</td>
<td>SD</td>
</tr>
<tr>
<td>Year 8 (n=357)</td>
<td>3.52</td>
<td>0.67</td>
<td>3.68</td>
<td>0.61</td>
</tr>
<tr>
<td>Year 11 (n=411)</td>
<td>3.40</td>
<td>0.61</td>
<td>3.66</td>
<td>0.57</td>
</tr>
</tbody>
</table>

This interaction was due to Year 8 boys scoring higher than Year 11 boys on numeracy cognitive strategy use, while Years 8 and 11 girls scored similarly, and higher than boys. As in the literacy domain, this result may again suggest the
Results

possibility of a developmental decline in numeracy cognitive strategy use for boys, while girls maintain consistently higher ratings through Years 8 to 11.

4.5 Research Question 5

What is the relationship between perfectionist type and personal achievement goal orientations?

The personal achievement goal orientations examined in relation to literacy and numeracy domains were task goal, performance-approach, and performance-avoid goals as measured by these three subscales of the Patterns of Adaptive Learning Survey (Midgley et al., 1997). Two separate MANOVAs were conducted, one for literacy goals and one for numeracy goals. In each MANOVA the dependent variables were task goal, performance-approach goal, and performance-avoid goal, while the independent variables again included perfectionist type (P+, P- and Pn), ability level (quintiles 1 through 5), literacy and numeracy performance (quintiles 1 through 5), grade (8 or 11), gender (male or female), ethnicity (ESB or NESB), and school (1 through 4), as well as all 2-way interactions.

4.5.1 Goal Orientations and Literacy

Healthy perfectionists were expected to obtain the highest scores on task goal orientation, while performance-approach and performance-avoid goal orientation scores were expected to be higher for the unhealthy perfectionist cluster. There was a statistically significant multivariate effect on literacy goal orientations for perfectionist type ($F (6,1250) = 6.272, p \leq .001$, Pillai’s Trace). No statistically significant effects were found for ability level, literacy performance, grade, gender,,

154
Results

ethnicity, or school. (See Appendix I.3 for SPSS MANOVA output showing effect sizes and power analyses.)

4.5.1.1 Effects of perfectionist type

Statistically significant univariate effects of perfectionist type were identified for task goal ($F (2, 626) = 7.132, p = .001$), and performance-approach ($F (2, 626) = 13.158, p \leq .001$). These differences are shown graphically in Figure 4.7.

Figure 4.7. Mean scores of perfectionist types for literacy goal orientations.

*Note.* P+ = healthy type; P- = unhealthy type; Pn = non-perfectionist; PerfApproach Goal = Performance-Approach Goal; PerfAvoid Goal = Performance-Avoid Goal

$p \leq .01$
Tukey a post hoc tests showed that significant paired differences occurred for P+ and Pn clusters as well as P- and Pn clusters \((p < .01)\) for task goal and performance approach goal orientations. It was interesting that both types of perfectionist clusters had similarly high scores on these two variables. The univariate effect for the performance-avoid goal orientation was very close to statistical significance, \((p = .013)\) and Tukey a post hoc testing also showed statistically significant paired differences between P- and P+, as well as between P- and Pn. The unhealthy perfectionist cluster as expected, had the highest scores on this goal orientation. It would appear from these results that both perfectionist types compare favourably on the two goal orientations that are generally regarded in a positive light, while, at the same time, the unhealthy perfectionists report higher scores on the performance-avoid goal orientation which is considered detrimental to personal achievement (see Midgley et al. (1998)).

4.5.2 Goal Orientations and Numeracy

Again there was a statistically significant multivariate effect \((F (6, 1222) = 4.979, p \leq .001)\) on numeracy goal orientations for perfectionist type, and no statistically significant effect for any of grade, ability level, numeracy performance, gender, ethnicity, or school variables.

4.5.2.1 Effects of perfectionist type

Differences between perfectionist types were statistically significant for performance-approach and performance-avoid numeracy goal orientations
(performance-approach: \( F (2, 612) = 9.004, p \leq .001 \)), performance-avoid: \( F (2, 612) = 4.677, p \leq .01 \)). (See Appendix I.4 for SPSS MANOVA output showing effect sizes and power analyses.) Figure 4.8 shows the differences between the three perfectionist types in numeracy goal orientations.

![Graph showing mean scores for P+, P-, and Pn types across task, PerfApproach, and PerfAvoid goal orientations.]

**Figure 4.8.** Mean scores of perfectionist types for numeracy goal orientations.

*Note.* P+ = healthy type; P- = unhealthy type; Pn = non-perfectionist; PerfApproach Goal = Performance-Approach Goal; PerfAvoid Goal = Performance-Avoid Goal

\( p \leq .01 \)

For the performance-approach goal orientation, paired differences were significant for P+ and Pn clusters \( (p \leq .01) \), and for P- and Pn clusters \( (p \leq .01) \). The univariate
effect of perfectionist type on numeracy task goal orientation was very close to statistical significance \((p = .013)\), and Tukey \(a\) post hoc tests showed significant paired differences for \(P+\) and \(Pn\) clusters \((p \leq .01)\), and for \(P-\) and \(Pn\) clusters for this goal orientation \((p \leq .01)\). Again, as in the literacy domain, it was interesting to note that no statistically significant difference occurred for \(P+\) and \(P-\) clusters in either task goal or performance-approach goal orientation. Differences in the performance-avoid goal orientation achieved significance for \(P+\) and \(P-\) clusters, as well as for \(P-\) and \(Pn\) clusters \((p \leq .01)\) in each case. The unhealthy perfectionists had the highest scores on the performance-avoid goal orientation, and there were no statistically significant differences between \(P+\) and \(Pn\) clusters on this variable. These appear to be robust results as they are replicated across two major school subject domains of English (literacy) and Mathematics (numeracy).

### 4.6 Research Question 6

**Is there a relationship between perfectionism and level of school ability?**

Throughout the gifted education literature, perfectionism has been considered to be a common characteristic of students with high ability (Adderholdt-Elliott, 1987; Clark, 1992; Delisle, 1986; Roedell, 1984; Roeper, 1991; Silverman, 1993, 1995; Webb, 1993) although much of the discussion has centred on theoretical formulations only. In an attempt to quantify anecdotal evidence, it was considered possible that ability effects could operate in three ways, all of which were investigated. First, the hypothesised relationship between ability and perfectionism was examined using MANOVA (see Section 4.3). Second, a more intensive examination using continuous ability data in bivariate correlations was conducted. Third, it was
hypothesised that ability could moderate the association between the dimensions of perfectionism and the measured outcomes of academic self-efficacy, cognitive strategy use, self-regulation, academic self-handicapping, test anxiety, task goal orientation, performance-approach goal orientation and performance-avoid goal orientation (see Sections 4.4 and 4.5).

### 4.6.1 The Dimensions of Perfectionism and Level of School Ability

The relationship between the dimensions of perfectionism and level of school ability was examined as part of research question three (see section 4.3). Level of school ability (quintiles 1 through 5) was included in the MANOVA which tested for the effects of perfectionist type cluster membership, along with grade, gender, ethnicity, and school. In these analyses, there was neither a multivariate effect of ability level nor univariate effects on any of the four dimensions of perfectionism.

In order to examine the relationship between the dimensions of perfectionism and school ability more intensively, continuous ability data were utilised in bivariate correlations, rather than the quintiles employed in the MANOVA analysis. Significant relationships were identified between ability and each of Organisation and Personal Standards, \( r = -0.098 \) and \( 0.120 \) respectively. The negative relationship between ability and Organisation indicated that students of higher ability were less concerned with order and organisation, although the relationship was very slight. The relationship between ability and Personal Standards \( (r = 0.120) \) would suggest that high ability students have higher personal standards, although again this relationship was weak. There were no statistically significant relationships
between ability and either Parental Expectations & Criticism, or Concern over Mistakes & Doubts. The pattern of interrelationships is shown in Table 4.13.

Table 4.13.

**Intercorrelations Between the Four Dimensions of Perfectionism and Level of School Ability**

<table>
<thead>
<tr>
<th></th>
<th>Ability</th>
<th>PEC</th>
<th>O</th>
<th>PS</th>
<th>CMD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ability</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Parent Expectations &amp; Criticism (PEC)</td>
<td>-.020</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Organisation (O)</td>
<td></td>
<td>-.098*</td>
<td>.063</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Personal Standards (PS)</td>
<td>.120*</td>
<td>.330*</td>
<td>.388*</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Concern over Mistakes &amp; Doubts (CMD)</td>
<td>-.037</td>
<td>.209*</td>
<td>.209*</td>
<td>.412*</td>
<td></td>
</tr>
</tbody>
</table>

* p < .01 (2-tailed)

The lack of firm support for an association between perfectionism and level of ability in these results is consistent with studies conducted on gifted and talented samples by Parker and his colleagues. Parker and Mills (1996) found few differences between a group of gifted sixth grade students and a comparison group of less able students from the same schools, and perfectionism was found to be more problematic in comparison group populations than among the gifted students studied in the Czech Republic by Parker et al. (2001). On the other hand, Honors College students obtained significantly higher scores on the FMPS measure of perfectionism.
than their more typical peers (Parker & Adkins, 1995b). The present findings therefore provide an expanded view of the prevalence of perfectionism among school-aged students at all levels of school ability.

### 4.6.2 Perfectionist Type, Academic Variables, Goal Orientations and Level of School Ability

This section investigated whether the impact of perfectionism on academic variables and personal goal orientations was more pronounced amongst high ability students. That is, did level of ability moderate the relationship between perfectionism and the measured outcomes? In MANOVA analyses, reported in sections 4.4 and 4.5, the presence of interaction effects between perfectionist type and ability level would indicate that the impact of perfectionism was dependent on ability level. This was not the case, as there were no statistically significant multivariate or univariate interaction effects between perfectionist type and level of ability, thus providing no indication that ability moderated the relationship between the dimensions of perfectionism, academic variables, and personal achievement goal orientations. It would appear that on the basis of these analyses, any relationship between perfectionism and ability is tenuous. This is not to say that perfectionism can not be the plight of students of high ability, but rather that it is not their prerogative (see also Parker & Mills, 1996; Parker et al., 2001).
From these results it appears that perfectionism is a pervasive trait among the secondary school student participants in this study and perhaps even among secondary school students in general. This conclusion is consistent with Rice and Dellwo (2002), who reported that almost half of their nonclinical sample of undergraduate university students was clustered into the perfectionism groups, and Rice and Slaney (2002) whose perfectionist groups consisted of more than two thirds of their sample (also university undergraduates). As in the present study, both these groups of North American researchers conclude that the dimensions of perfectionism appear to be relatively pervasive personality constructs which are not constrained to any particular group or sub-population.

4.7 Summary

This chapter has examined the nature of perfectionism as measured by the Frost Multidimensional Perfectionism Scale (Frost et al. (1990). The resulting four factor model supports the contention that the construct of perfectionism is multidimensional, and that it has relevance for both male and female adolescent secondary school students across a broad spectrum of age, ethnic background and level of school ability. Major findings indicate that perfectionism is best summarized by the four factors of Personal Standards (PS), Organisation (O), Parental Expectations and Criticism (PEC), and Concern over Mistakes and Doubts (CMD). Scores on these four dimensions may be used to create profiles of healthy, unhealthy and non-perfectionists.
Results

The findings do not support a simple dichotomy between healthy and unhealthy perfectionism factors defined in terms of PS/O and CMD/PEC respectively, due to weak correlations between the proposed higher-order factors relative to the across-construct correlations, unacceptable alphas, and marginal model fit. There was evidence to support a tripartite typology of perfectionist student in which high personal standards and organisation were common to both healthy (P+) and unhealthy (P-) perfectionists. Lower O scores discriminated between the positive differences of P+ and P-, while PEC and CMD discriminated between the negative differences of P+ and P- students. Perfectionism was found to be a pervasive and relative stable construct in both boys and girls and across a spectrum of age, ethnic background and level of school ability.

Results of the examination of the relationship between perfectionism and academic variables revealed that both P+ and P- students reported significantly higher levels of academic self-efficacy, cognitive strategy use, and self-regulation than the Pn students in the literacy domain. In the numeracy domain, both perfectionist student types again had significantly higher scores on all three of the positive academic variables of academic self-efficacy, cognitive strategy use, and self-regulation than their non-perfectionist peers. In both the literacy and numeracy domains, unhealthy perfectionists reported the highest level of test anxiety and use of self-handicapping learning strategies.

Statistically significant differences between the two types of perfectionists and the non-perfectionists were also found when examining the association between
perfectionism and personal goal achievement orientations. Both perfectionist types reported similar levels of task and performance-approach goal orientations which were significantly higher than the non-perfectionists, while the P- students had significantly higher scores on the performance-avoid goal orientation than either the P+ or Pn students. These appear to be robust findings in that they replicate across the two major school domains of literacy and numeracy and provide a unique cross-cultural comparison with similar studies conducted in non-clinical student populations outside Australia.
CHAPTER 5

"Remember that fear always lurks behind perfectionism. Confronting your fears and allowing yourself the right to be human can, paradoxically, make you a far happier and more productive person."

David M. Burns

DISCUSSION OF RESULTS AND CONCLUSION

Perfectionism in Profile

5.1 Discussion

The present study has investigated a number of key issues related to the academic implications of perfectionism in Australian secondary school students. Given the range of psychopathology associated with perfectionism in the literature, and the paucity of empirical research in the field, it is important to gain insights into the interplay between perfectionism and academically relevant beliefs and behaviours in educational settings. It is particularly important to understand the differences between perfectionist types in order to meet individual needs and facilitate the academic success and emotional well-being of adolescent school students during a critical period of growth and development.

This investigation has confirmed and extended current thinking and research into the multidimensionality of the perfectionism construct and its typology by addressing key issues through the sequence of the questions guiding the study. This chapter presents a synthesis of the findings of the study, educational implications,
limitations, future directions and conclusions regarding the study’s relevance to the extant literature and perfectionism research.

5.1.1 The Dimensions of Perfectionism

Through exploratory and confirmatory factor analyses empirical evidence has confirmed the multidimensionality of the construct of perfectionism as theorised by Frost and his colleagues in their (1990) development of the Multidimensional Perfectionism Scale (FMPS). Using the FMPS, there was strong support for the retention of four dimensions of perfectionism (Personal Standards, PS; Organisation, O; Parent Expectations & Criticism, PEC; and Concern over Mistakes & Doubts, CMD), clearly identified in empirical psychometric studies conducted by researchers in Australia and overseas (see Hawkins et al., 2000, 2004; Kornblum, 2001; Stöber, 1998; Stumpf & Parker, 2000).

However, the present study did not find empirical support for the existence of two higher order perfectionism factors consisting of a Personal Standards/Organisation ‘healthy’, and a Concern over Mistakes & Doubts/Parent Expectations & Criticism ‘unhealthy’ dichotomy, as proposed in a number of correlational and factor analytic studies (e.g., Frost et al., 1993; Stumpf & Parker, 2000). In order to provide a statistically rigorous examination of the proposed higher order model, a nested confirmatory factor analysis was conducted in this study, a procedure that appears to have been neglected in much of the empirical research on perfectionism (see Chapter 2). This analysis resulted in a poor fit of the data to the model, significant across-construct correlations in which the Personal Standards factor was associated with
both the ‘healthy’ Organisation factor and the ‘unhealthy’ Concern over Mistakes & Doubts factor, as well as unacceptable alpha reliability coefficients for each of the higher order factors. Although the healthy/unhealthy dichotomy has been supported in a number of correlational (e.g., Frost et al., 1993), and factor analytic (e.g., Stumpf & Parker, 2000) studies, the findings of these studies are called into question mainly because, unlike the present study, they failed to use the more rigorous nested confirmatory factor analytic procedures and also because of the absence of reported factor intercorrelations, the strength of associations between ‘healthy’ and ‘unhealthy’ factors is unclear. More importantly, the present results provide empirical evidence that personal standards may represent both healthy and unhealthy aspects of perfectionism. This is in contrast to studies which relate personal standards to measures of positive personality constructs and affect (Frost et al., 1993; Hewitt & Flett, 1991; Parker, 1997; Stumpf & Parker, 2000), and therefore preclude acknowledgement of the negative nature of this key dimension of perfectionism.

The findings of the study therefore suggest that a two factor higher order model is untenable, in that important information about individual dimensions of perfectionism may be lost to teachers and school counsellors interested in compiling detailed profiles of perfectionist students. Stumpf and Parker (2000) advise researchers to be specific about which perfectionism component is being related to some other particular variable of interest. This advice is well intentioned when one considers such instances as the combined Concern over Mistakes and Doubts about Actions scales which converged to form the Concerns and Doubts (CD) factor, having positive weights in predicting depressive affect (Stumpf & Parker, 2000), whereas the Organisation (O) factor had a negative weight (Lynd-Stevenson &
Hearne, 1999). Lynd-Stevenson and Hearne (1999) also warned researchers to be aware of the differential relationships between the dimensions of perfectionism and depressive affect (p. 560). Parker (1997) has shown that by considering the pattern of scores across all the dimensions simultaneously, distinct patterns of perfectionist types can emerge to facilitate our understanding of the perfectionism construct (Dunn, Dunn, & Syrotuik, 2002). Ashby and Rice (2002) also concluded that specific components of perfectionism may need to be examined individually, based on the results of factor analytic analyses in which the healthy factors of Standards and Order failed to load on to one higher order factor representing 'healthy' perfectionism.

The authors of the FMPS themselves, admitted that individuals may display varying amounts of each of the characteristics sampled by the perfectionism subscales, and called for further research to examine the implications and importance of patterning these characteristics (Frost, Marten, Lahart, & Rosenblate, 1990). This study has, in part, answered this call by confirming previous findings (Hawkins et al., 2004; Kornblum, 2001; Stöber, 1998; Stumpf & Parker, 2000) in providing additional evidence of the importance of retaining the four first order perfectionism dimensions of Personal Standards (PS), Organisation (O), Concern over Mistakes & Doubts (CMD), and Parental Expectations & Criticism (PEC). The four factor structure of perfectionism in the present study is consistent with both the original six factor theorisation of the multidimensionality of perfectionism by Frost et al. (1990) when developing the Multidimensional Perfectionism Scale, and the findings of overseas and Australian researchers (e.g., Hawkins et al., 2000, 2004; Kornblum, 2001; Stöber, 1998; Stumpf & Parker, 2000). The study therefore provides new evidence
of the multidimensional nature of perfectionism using a large normative sample of secondary school students to complement previous studies of gifted and college student populations (see Parker, 1997; Parker & Mills, 1996; Parker & Stumpf, 1995; Rice & Dellwo, 2002; Rice & Lapsley, 2001; Rice & Mirzadeh, 2000).

5.1.2 The Typology of Perfectionism

This study adopted the person centered approach of cluster analysis in order to examine the perfectionist typology first proposed by Parker (1997) and later replicated in a number of overseas studies (Parker, Portešová, & Stumpf, 2001; Rice & Dellwo, 2002; Rice & Lapsley, 2001; Rice & Mirzadeh, 2000), and Kornblum’s (2001) study of Australian gifted students. This approach was in contrast to studies, often using clinical samples, which concentrated on construct validation and variable centred approaches (Enns & Cox, 1999; Flett, Hewitt, & De Rosa, 1996; Frost & Steketee, 1997; Hewitt, Flett, & Ediger, 1996). It is considered particularly useful in the educational context as it enables the identification of different types of perfectionist student and provides an informed frame of reference for teachers and school counsellors in developing and implementing appropriate interventions to facilitate both their academic achievement and socio-emotional development. The results of the person-centred approach also afford an empirical link with the achievement motivation literature by offering new insights into the differential relationships between perfectionist student types and their personal achievement goal orientations.
The present findings corroborated the common view that standard setting is the *sine qua non* of perfectionism, but deviated from the conclusions of a number of factor analytic and correlational studies that it relates solely to an adaptive or healthy form of perfectionism (see Dunkley et al., 2000; Frost et al., 1993; Rice et al., 1998; Slaney et al., 1995; Terry-Short et al., 1995). A second point of departure from these overseas studies is the finding that high scores on each of the *Personal Standards* and *Organisation* dimensions characterised both healthy and unhealthy perfectionists, although the healthy cluster’s scores were significantly higher than those of the unhealthy cluster. It is therefore considered more useful for researchers and educators to adopt a person-centred cluster approach to the identification of perfectionist students based on a profile of scores on each dimension of perfectionism rather than a variable-centred approach based on correlations with broadly defined personality constructs.

In the present study, cluster analysis of scores obtained on the four dimensions of the FMPS (PS, O, CMD and PEC), provided additional cross-cultural, theoretical and empirical evidence of a tripartite typology of perfectionism in which two perfectionist clusters, one healthy and one unhealthy, and a third, non-perfectionist cluster have been identified in a variety of populations and by a number of perfectionism researchers (Gilman & Ashby, 2003; Grzegorek et al., 2004; Hawkins et al., 2000, 2004; Kornblum, 2001; LoCicero & Ashby, 2000; Parker, 1997; Parker et al., 2001; Rice & Dellwo, 2002; Rice & Lapsley, 2001; Rice & Mirzadeh, 2000; Rice & Slaney, 2002; Slaney et al., 2002), using either the *Multidimensional Perfectionism Scale* (FMPS; Frost et al., 1990), or the *Almost Perfect Scale-Revised* (APS-R; Slaney et al., 1996). Across all of these cluster analytic studies both
perfectionist types were characterised by high personal standards. For the healthy perfectionists in this study, high standard setting was accompanied by an elevated level of organisation which was offset by lower concern with mistakes, doubts and perceived parental censure. The unhealthy perfectionists were also characterized by high personal standards and need for organisation, albeit at a statistically significantly lower level than that of the healthy group. The distinction between the perfectionist types was that the unhealthy perfectionists’ scores on the negative dimensions of *Parental Expectations & Criticism*, and *Concern over Mistakes & Doubts* were significantly higher than the healthy perfectionists’ scores on these dimensions of perfectionism. The non-perfectionists demonstrated the lowest levels on all four perfectionism dimensions. In addition to similarly high scores on the *Organisation (O)* dimension of perfectionism across existing cluster analytic studies, is a marked similarity in the numbers of perfectionists, both healthy and unhealthy types, among all the populations studied. This finding is particularly relevant for educators who may not be aware of the prevalence of perfectionism among their students.

An additional outcome of the person-centred examination of the perfectionist typology was further clarification of the role of O as a dimension of perfectionism. This study has shown that O characterises both healthy and unhealthy perfectionists thus further attesting to its empirical importance. The need for order and organisation has long been associated with perfectionism from the early clinical writings of Hollender (1965), to its inclusion as a core component in the measurement of perfectionism (Frost et al., 1990; Slaney, Mobley, Trippi, Ashby, & Johnson, 1996), and the acknowledgement of its importance in the lives of
perfectionists as self-described in qualitative studies (see Slaney & Ashby, 1996; Slaney et al., 2000). This study therefore provides additional support for an empirical rationale for the inclusion of *Organisation* as a key dimension in the measurement of perfectionism.

An important feature of this study is that, by using a large sample of male and female Australian secondary school students, the results of variable-centred exploratory, confirmatory, and nested confirmatory factor analyses, as well as person-centred cluster analysis, replicate and extend previous studies in the field. The present study has provided additional evidence that there appears to be a stable and pervasive distribution of perfectionist types across different samples, at primary, secondary and tertiary levels of education (Ablard & Parker, 1997; Hawkins et al., 2000, 2004; Kornblum, 2001; Parker, 1997; Parker & Mills, 1996; Rice & Dellwo, 2002; Rice & Slaney, 2002). It has therefore extended the generalisability of extant findings on the tripartite perfectionism typology by including male and female students of all levels of school ability, in early and late stages of secondary schooling, and from a wide range of ethnic backgrounds.

### 5.1.3 Perfectionism in the Context of Secondary School Students

The effects of level of school ability, grade, gender, ethnicity and school on the four dimensions of perfectionism were examined. The results indicated that perfectionism was a generally pervasive personality trait in that perfectionist students were not confined to any particular level of school ability, grade, gender, ethnic background, or school attended. The lack of association between perfectionism and
level of school ability was contrary to an expectation gleaned from the gifted education literature that students of high intellectual ability are particularly affected by perfectionism. The present findings did not contradict the fact that gifted students may be perfectionists, but made an empirical connection between perfectionism and perfectionist type of student at all levels of ability.

5.1.4 Perfectionism and Academically Relevant Beliefs and Behaviours

This study has contributed to the literature on perfectionism in academic settings. An important result was the insight gained into a number of academic beliefs and behaviours of different types of perfectionist students. This importance was highlighted by the examination of the differences between healthy, unhealthy and non-perfectionist types of students on the positive academic variables of academic self-efficacy, cognitive strategy use, and self-regulation, and the negative variables of academic self-handicapping and test anxiety, in addition to the personal achievement goal orientations of task, performance-approach, and performance-avoid goals. The examination of these variables was situated in the specific learning areas of English (literacy) and Mathematics (numeracy). A robust pattern of findings was evident in the lack of domain specificity and consistent results across both of these key curriculum areas.

No empirical study has been located which has examined such an extensive set of academically relevant beliefs and behaviours in perfectionist secondary school
students either in Australia or overseas. This study, therefore bridges a gap in the literature by using adolescent students in an ecological school context, and examining the link between perfectionism and selected outcome variables based on conceptual papers and empirical findings not previously linked to the field of perfectionism research.

As expected, there were significant differences among the three perfectionist types for the positive variables of academic self-efficacy, cognitive strategy use and self-regulation in both literacy and numeracy domains. The healthy perfectionists reported the highest levels of academic self-efficacy, cognitive strategy use and self-regulation while the non-perfectionists obtained the lowest scores on these three variables. Unexpectedly, there was no statistically significant difference between the two perfectionist clusters on academic self-efficacy. Overall, the findings indicated that both healthy and unhealthy perfectionists reported higher levels of self-efficacy, more use of cognitive learning strategies and more self-regulatory approaches to learning than their non-perfectionist peers.

However, it was interesting to note that, despite the absence of significant mean score differences between the two perfectionist types for academic self-efficacy, a consistent pattern emerged in which the healthy perfectionists reported the highest scores on academic self-efficacy in both the literacy and numeracy domains. This result was similar to the Ashby and Rice (2002) finding that adaptive perfectionists obtained significantly higher self-efficacy scores than either maladaptive perfectionists or non-perfectionists. Similarly, a consistent pattern also emerged with the unhealthy perfectionists reporting lower scores than healthy perfectionists.
on academic self-efficacy, cognitive strategy use and self-regulation. This result makes intuitive sense when viewed in relation to Brackney and Karabenick's (1995) finding that lower self-efficacy led to a decreased use of learning strategies and self-regulation. The present findings also suggested, that in both the literacy and numeracy domains, it would appear that there is a developmental incline in girls' reported use of cognitive strategies as they progress through secondary school, with a corresponding decline in boys' reported use of such strategies.

The findings supported the expectation that unhealthy perfectionists would be the most likely group to engage in self-handicapping strategies. Both perfectionist types experienced higher levels of test anxiety than the non-perfectionists and healthy perfectionists were the least likely to self-handicap. This was consistent with evidence in the literature that unhealthy perfectionists are typically characterised as high in fear of failure (Blankstein, Flett, Hewitt, & Eng, 1993; Flett, Blankstein, Hewitt, & Koledin, 1992; Flett, Hewitt, Blankstein, & Mosher, 1991; Hamachek, 1978) and therefore more likely to self-handicap. It has been suggested that the proposed antecedents of perfectionism and self-handicapping are similar in that the need to self-handicap comes from an environment of conditional love (Jones & Berglas, 1978). The unhealthy perfectionists in this study were also characterised by high levels of perceived negative parental judgement. Following Hamachek's (1978) proposal, it is possible that, for the unhealthy perfectionists in this study, the need to self-handicap was a result of inconsistent parental approval or a family atmosphere of conditional positive regard (Hobden & Pliner, 1995). This is a fertile ground for future research. In regard to test anxiety, it makes intuitive sense, that because they strive for perfection, both perfectionist types would be more test
anxious than non-perfectionists. It was also not surprising that the unhealthy perfectionists scored highest on this variable because of their elevated concerns with mistakes and fear of failure, consistent with Adler's (1956) description of neurotic perfectionists' intense fear of criticism (Rice, Ashby, & Preusser, 1996).

No differences between perfectionist types were found for either literacy or numeracy school performance. In a similar finding, healthy perfectionists, on the basis of high personal standards and psychological health, showed no particular advantage over unhealthy perfectionists as far as learning performance (GPA) was concerned (Rice & Slaney, 2002). Rice and Dellwo (2002) also reported that no differences were found between the perfectionist groups for academic achievement. They suggest that since unhealthy perfectionism is associated with negative emotional states and correlated with a number of psychopathologies, comparable levels of academic achievement between both perfectionist groups may come with decided costs to the well-being of unhealthy perfectionists. This conclusion by Rice and Dellwo (2002) may provide a key to a possible interpretation of the present finding of similar levels of academic self-efficacy reported by both healthy and unhealthy perfectionists. The scale used to measure the cognitively-based construct of academic self-efficacy in this study is, understandably, devoid of an emotional component. Since unhealthy perfectionists are theorised to be driven by a failure-avoidance orientation, it could be that this particular group were loathe to admit either their inability or lack of persistence to complete class tasks. Besides the inherent limitations of self-report data, it could also be that these unhealthy perfectionist students were concerned about how they were viewed by others, and so they sought to portray themselves as positively as possible. In a rare interview study
Rice, Bair, Castro, Cohen and Hood (2003) reported that perfectionists admitted to concealing possible problems from others by assuming a false facade of non-concern. It has been suggested that perfectionists are very self-conscious and try hard to hide their mistakes and shortcomings from others (see Frost et al., 1995; Lombardi, Florentino, & Lombardi, 1998). In an experimental study conducted by Frost et al. (1995), it was found that individuals demonstrating a high level of concern over mistakes were reluctant to admit making mistakes to others. Although a link between perfectionism and school student self-presentational concerns has not been tested empirically, Hewitt et al. (2003) found that perfectionist self-presentation was associated with such psychological distress as anxiety, depression and negative feelings about physical appearance (Flett & Hewitt, 2005).

Cognitive attribution theory states that motivated behaviour is controlled by the cognitive side of human nature (Covington, 1992). For the unhealthy perfectionists identified in this study, it is possible, that as Rice and Dellwo (2002) judiciously point out, possible negative emotional states were masked by the cognitive concerns for avoiding failure and self-presentation concerns for the impression they make on significant others. A promising line of research would be to investigate the differential role of self-presentation in student perfectionist types using the recently developed Perfectionistic Self-Presentation Scale (see Hewitt et al., 2003).

5.1.5 Perfectionism and Personal Achievement Goal Orientations

Since perfectionism is primarily associated with the setting of high standards, it was anticipated that an investigation of the relationship between perfectionist types and
personal achievement goal orientations would afford important insights into the goal
directed behaviour of both healthy and unhealthy perfectionist students. The present
findings revealed that both the healthy and unhealthy perfectionists were more task
and performance-approach goal oriented than the non-perfectionists, while the
highest levels of performance-avoid goal orientations were demonstrated by the
unhealthy perfectionists. This finding contributes to the considerable body of
research that has linked avoidance behaviour to maladaptive learning patterns (e.g.,
Middleton & Midgley, 1997; Pintrich, 2000c; Skaalvik, 1997) and such negative
outcomes as less interest and lower levels of performance (Pintrich, 2000a).

The finding that both healthy and unhealthy perfectionists obtained similarly high
scores on task goal and slightly higher (and similar) scores on performance-approach
goal orientation was of considerable interest. The question arises as to whether the
results of this study suggest a potentially adaptive function of perfectionism in the
school learning situation since both healthy and unhealthy perfectionists were almost
equally oriented to both task and performance-approach goals. The motivation
achievement literature offers a possible theoretical framework in which to interpret
these results. Research by Elliot and his colleagues on approach and avoidance
performance goals (Elliot & Church, 1997; Elliot & Harackiewicz, 1996) has
suggested that mastery (or task) goals are related to interest, and that performance
approach goals can have positive associations with school performance.
Furthermore, Harackiewicz, Barron and Elliot (1998), have argued for the unique
positive potential of performance-approach goals, and yet other researchers have
shown how motivation is positively influenced by a combination of performance-
approach and mastery goals (Barron & Harackiewicz, 2000, 2001; Pintrich, 2000b).
Harackiewicz et al., (2002) found that college students who adopted both mastery and performance-approach goals were optimally motivated and concluded that a multiple goal perspective was adaptive in the college educational context. The empirical evidence that performance goals are adaptive if mastery goals are also salient (Elliot & Church, 1997; Pintrich, 2000b; Wentzel, 1991) was confirmed in a recent study of Australian senior secondary school students by Smith (2003), who found that the combination of high task and performance-approach goals was the most adaptive goal orientation. Other Australian researchers have also acknowledged the positive role of multiple goals (Ainley, 1993; Martin & Debus, 1998) and the benefits to students of coordinating a mastery (task goal) orientation and a competitive (performance-approach goal) to learning (Martin, Marsh, Williamson, & Debus, 2003).

Through a synthesis of the findings of extant multiple goal theory studies and the present study, there emerges an implicit syllogism. The elements of the syllogism are:

1. High task (mastery) plus high performance-approach goals are associated with adaptive learning patterns
2. Unhealthy perfectionists in this study demonstrated high task (mastery) plus high performance-approach goal orientations
3. Adaptive learning patterns will be associated with the unhealthy perfectionists in this study.

This inference that unhealthy perfectionism positively influences adaptive learning patterns is counter-intuitive in light of the myriad of conceptualisations and
empirical findings to the contrary purveyed throughout the perfectionism literature. How then can one explain the similar task and performance-approach goal orientations of both healthy and unhealthy perfectionists? To add complexity to the situation is the finding that the unhealthy perfectionists also demonstrated a performance-avoid goal orientation. Since no research has been located which examines a relationship between perfectionism and personal achievement goal orientations, in the absence of an extant empirical base, one is compelled to speculate on possible explanations of the current findings.

Throughout this thesis there has been an underlying assumption, as has been evidenced in the literature, that there is a mismatch between positive and negative perfectionism as far as academic achievement and psychological health are concerned. Logic and the conventional wisdom of the literature dictate that unhealthy perfectionists are unlikely to adopt a mastery (or task goal) approach to learning since they are concerned with both avoiding failure and appearing to look ‘dumb’ or ‘stupid’ to significant others. The seeming paradox of a task goal orientation being demonstrated by unhealthy perfectionists may be explained in part, by making a conceptual link between perfectionism and a relatively new line of research which delineates a new achievement goal model. This model extends the trichotomous framework of mastery goals and approach/avoidance aspects of performance goals by applying the approach/avoidance distinction to mastery goals as well (see Elliot, 1999; Elliot & Church, 1997; Elliot & Harackiewicz, 1996; Elliot & McGregor, 2001; Pintrich, 2000a, 2000c). The conceptualisation of a mastery avoidance goal is couched in terms of avoiding ‘not mastering’ the task, or avoiding ‘not learning’ or ‘not understanding’ the task. The criteria in this goal orientation is
a concern with not ‘being wrong’ in reference only to the self or the task and not relative to others (Pintrich, 2000a).

Although this conceptualisation lacks empirical precision, it is conceivable that unhealthy perfectionist students would be more concerned with failing a task because of the high standards they set for themselves rather than comparisons with others. A mastery-avoid orientation involves students avoiding incorrect completion of classroom tasks as distinct from the mastery-approach focus on learning and self-improvement. One wonders if unhealthy perfectionists would have been more oriented to mastery-avoid goals had this been measured in this study.

Pintrich (2000c) asserted that mastery-avoid goals may not interfere greatly with cognition, but have their own costs in terms of student motivation and affect. There is evidence in the literature that affect is differentially related to goal orientations (Dweck & Leggett, 1988; Elliott & Dweck, 1988; Roeser, Midgley, & Urdan, 1996). Mastery-approach goals have been associated with general positive affect and the absence of anxiety (Carver, Lawrence, & Scheier, 1996; Dweck & Leggett, 1988). In contrast, individuals with mastery-avoid goals would be anxious to avoid not mastering a learning task. It is likely that if these students are not able to avoid being wrong they may become anxious and frustrated. On the other hand, if they are able to avoid being wrong they will most likely feel relief (Carver & Scheier, 1998). Students with performance-approach goals could also become anxious because of their concern with outperforming others (Wolters, Yu, & Pintrich, 1996), and performance-avoid goals have been shown to be related to high levels of anxiety (Elliot & McGregor, 1999). Indeed, Linnenbrink and Pintrich (2000), argue that
performance-avoid students are generally anxious, as well as when they fail to meet their avoidance goal, and as such, experience the highest levels of anxiety. One then would expect that, since the unhealthy perfectionists in this study were highest on performance-avoid, they would be the most anxious.

It has become apparent that it is affect and not cognition that discriminates between healthy and unhealthy perfectionism in this study. Since goal theory assumes that goals are cognitive representations of what individuals are striving for and why, the finding that both healthy and unhealthy perfectionists have similar task (mastery) and approach goal orientations is not surprising. Cognitively, both perfectionist types appear to be indistinguishable, and demonstrate, in the main, more adaptive learning patterns than the non-perfectionists studied in this investigation. However, it seems very likely that underlying negative affect and possible psychological distress is being masked by the cognitive approach of the present study which indicates that future research including measures of affect and psychological distress is clearly needed in order to determine differential outcomes of student perfectionist type impacting on student achievement and well-being.

For the moment, it would appear from the present findings that the perfectionist healthy/unhealthy dichotomy closely parallels the approach/avoidance distinction that has dominated traditional achievement motivation research (Atkinson, 1957; Elliot, 1997). More recently a social cognitive model of self-regulation has distinguished a promotion (approach) focus towards desired outcomes from a prevention (avoidance) focus on avoiding and preventing undesired outcomes (Higgins, 1997). Healthy perfectionists, who are focussed on the promotion of
Discussion

extremely high standards of performance may therefore be characterised as having an ‘approach’ goal focus and unhealthy perfectionists, being concerned with avoiding failure, may be characteristically focussed on ‘avoidance’ goal orientations. Perhaps this distinction between ‘types’ of perfectionist students which is couched in goal theory terminology provides us with a more appropriate nomenclature to apply to the educational arena. It has been suggested previously in this thesis, that Hamachek’s (1978) ‘normal’ and ‘neurotic’ descriptors are more suitably applied to the clinical field. Perhaps terms such as “approach perfectionists” and “avoid perfectionists” would be more appropriate in terms of helping teachers and school personnel understand and take appropriate action to counteract any ill effects of perfectionism in their students.

The interpretation of the findings of this study represents an initial attempt to provide a conceptual link between perfectionism and achievement goal theory, an avenue of research that, to my knowledge, has previously not been attempted. It is acknowledged that such a link is as yet, theoretically and operationally undefined, and beyond the scope of this thesis. However, it may be deserving of further empirical work by incorporating the present findings of the differential relations between types of perfectionists and academic and goal orientation outcome variables into future achievement motivation research. This perspective is important both for theoretical and pedagogical reasons. Empirical studies have shown that “there are important qualitative differences in how students are motivated and these different qualities have a dramatic influence on learning and achievement” (Pintrich, 2000c, p.101).
5.1.6 Perfectionism and Level of School Ability

Throughout the field of gifted education, it is widely believed that perfectionism is disproportionately found in gifted populations and that it is associated with maladjustment and underachievement in student populations (e.g., Adderholdt-Elliott, 1987; Greenspon, 2000; Pfeiffer & Stocking, 2000). The present study sought to examine the relationship between perfectionism and level of school ability. It was considered that ability effects could operate in three ways all of which were investigated. In the first analysis, the relationship between ability and the dimensions of perfectionism was examined using MANOVA which tested for the effects of perfectionist type cluster membership, along with grade, gender, ethnicity, and school. No multivariate effect of ability level or univariate effect on any of the four perfectionism dimensions were identified. In the second analysis, bivariate correlations between the dimensions of perfectionism revealed only weak associations between ability and Personal Standards ($r = .120$) and ability and Organisation ($r = -.098$). The third analysis examined whether the impact of perfectionism on academic and personal achievement goal orientation outcome variables was more pronounced in students of high school ability. Again, MANOVA analysis resulted in no statistically significant multivariate or univariate interaction effects between level of school ability and perfectionist type, thus indicating that ability did not moderate the relationship between the perfectionism dimensions, academic variables and personal achievement goal orientations. These findings are consistent with other studies which examined the incidence of perfectionism among gifted student samples (see Parker & Mills, 1996; Parker et al.,
2001) although Parker and Adkins (1995b) found elevated levels of perfectionism among North American Honors College students.

It was concluded that although the results of the present study clearly indicated a lack of association between perfectionism and school ability, it should be noted that they do not refute anecdotal reports of greater perfectionism among the gifted but serve to establish an empirical connection between ability and perfectionism. However, the present findings concur with others that perfectionism appears to be a pervasive trait not only in the present Australian secondary school student sample but also in North American college student samples (see Rice & Dellwo, 2002; Rice & Slaney, 2002).

5.2 Implications for Educational Practice

In terms of the educational context there are several implications of this study. The pervasiveness of perfectionism in the present secondary school student population reflects similar numbers of perfectionists present in North American college student populations. The present empirical evidence of the prevalence of student perfectionism may propel school communities to use the findings to assist in the development of appropriate staff inservice programs aimed at raising teacher and parent awareness of both the nature and the prevalence of perfectionism, and how to identify and support the learning needs of different types of perfectionist student in their particular school communities.
The high levels of perceived parental pressure reported by the unhealthy perfectionist students in the study are of some concern and suggest the need for teachers and school counsellors to encourage these students to seek help for any academic or psychological problems. Positive effects of counselling on help-seeking and academic success have been demonstrated by Schwitzer, Grogan, Kaddoura, and Ochoa (1993). Parents and teachers, as well as students, should be made aware of the potentially negative effects of high levels of external pressure and unrealistic expectations on student learning and affect (Mills & Blankstein, 2000). School pastoral care and peer support programs should include strategies for parents, teachers and students alike to approach problems with perfectionism by channelling perfectionist thinking and behaviour in positive and meaningful ways to promote successful and fulfilling learning outcomes.

A major implication of the present study is that the findings have a practical application to classroom practice by identifying a number of academic beliefs and behaviours which are particularly relevant to daily teaching and learning activity. As such the results may form a practical, yet sound, theoretical basis for the development of checklists and/or rating scales describing perfectionist thinking and behaviours to assist teachers in screening for perfectionist students and implementing early intervention strategies into their teaching programs. These strategies would need to focus on the substyless of differing perfectionist profiles. For the “avoid” perfectionists, interventions may include such things as training in use of learning strategies to enhance organisation and time management skills and positive reinforcement of effort to reduce levels of concern and doubts.
Of particular concern is the need to develop teacher skills in identifying the "avoid perfectionists" who may be shielding their fear of failure by engaging in self-handicapping strategies and who may also appear to be unduly anxious in test situations. Symptomatology presented to school counsellors such as difficulty in completing tasks, and associated feelings of anxiety, may, in fact, be derived from the students' "avoid" perfectionism. By raising teacher awareness of these cognitive representations of types of perfectionist students, possible pathways to psychological distress and maladjustment may be blocked by guiding at-risk students to seek out assistance in coping and overcoming any detrimental consequence of their perfectionism.

5.3 Limitations and Directions for Future Research

The present data provided a number of new perspectives on the nature of perfectionism and its academic implications for secondary school students. There were, however, limitations to the study which must be acknowledged. Because each of the identified limitations has direct bearing on future research this will be included in the discussion.

The present study has extended the generalisability of previous findings on the tripartite perfectionism typology by including male and female students of all levels of school ability, in early and late stages of secondary schooling, and from a wide range of ethnic backgrounds. However, little is known about the developmental nature of perfectionism and future studies could assess the extent to which these findings replicate across younger, primary school-aged students as well as secondary
students at such critical time points as transition from primary into secondary school, Year 10 School Certificate examinations and the final Year 12 Higher School Certificate and tertiary entrance assessment.

Although significant differences between perfectionist types were found, the present study used a cross-sectional design and a longitudinal design would provide a more thorough evaluation of the academic implications of perfectionism for secondary school students. The results were theoretically sound and the measures used had well established levels of validity and reliability, but were, however, based on a self-report questionnaire and may have been influenced by social desirability and halo effects (not to mention perfectionism itself). Future studies using a combination of methods such as the development of a valid and reliable structured interview on the multiple dimensions and experience of perfectionism is a clear direction for future research.

All of the data were gathered from the same respondents and an interesting question for further study is the degree to which participants’ responses and those of their parents or teachers converge. From the present results it is clear that the parental connection with these students was extremely relevant, particularly for the unhealthy perfectionists who clearly perceived their parents to hold unduly stringent expectations for their academic achievement. Future research into the impact of parental influences on the development of perfectionism in children especially with regard to parent levels of perfectionism and parental expectations (Parker, 1997) and parent-gender and child gender (Frost, Lahart, & Rosenblate, 1991; Rice et al., 1996) interactions is needed. It would be useful to replicate and extend recent research
which has shown significant convergence between mothers’ and daughters’ maladaptive perfectionism, and that psychological control predicted daughters’ perfectionism in addition to their mothers’ perfectionism (Soenens, Vansteenkiste, Luyten, Duriez, & Goossens, 2005). The specific findings of this study regarding student perceptions of parental expectations have important implications for the academic success and emotional health of perfectionist students, since “the manner in which parents engage their children in the competence domain is likely to have a longstanding impact that pervades all areas of functioning” (Elliot & McGregor, 2001).

When interpreting the present findings, it is important to recognise that the measured outcomes were predominantly cognitively-based constructs. While significant differences within the perfectionist typology were found according to expectations, there were also the unexpected and interesting findings that both perfectionist types had similar levels of academic self-efficacy as well as task (mastery) and performance-approach goal orientations. However, the unhealthy perfectionists also met the expectation of more use of self-handicapping strategies, more test anxiety, and having a performance-avoid goal orientation. In line with a considerable body of literary evidence attesting to various psychopathologies associated with unhealthy perfectionism, the presence of maladaptive learning patterns in the unhealthy perfectionists suggested the likelihood that underlying negative affect was masked by the primary focus on cognitive constructs.

Since affect was not directly assessed in this study, this would need to be confirmed in further studies of the perfectionism typology in Australian secondary student
populations, by including valid and reliable measures of affect and personal adjustment. It is proposed that an instrument such as the Depression Anxiety Stress Scales (DASS; Lovibund & Lovibund, 1995) would be an appropriate measure to include in future perfectionism studies. The DASS is a self-report set of scales which measure students’ symptoms of negative affective distress. The DASS was normed on Australian, non-clinical sample populations, and is designed to discriminate between the negative emotional states of depression, anxiety and stress.

Conclusion

This study has provided insights into the differential perfectionist profiles of secondary school students. Healthy “approach” perfectionist students are portrayed as those who set high personal standards for themselves and who value order and organisation in approaching learning tasks. These students perceive their parents to be supportive of their efforts and they are not unduly concerned if they make mistakes. They demonstrate high levels of academic self-efficacy, effective use of cognitive learning strategies and employ self-regulatory processes to monitor their learning. The adaptive learning patterns of healthy perfectionist students are attributed to a combination of task (mastery) and performance-approach personal achievement goal orientations. Indeed, these students appear to relish a healthy competitive edge to their efforts and react positively to high parental expectations.

The profile of unhealthy “avoid” perfectionist students is more complex and less distinct. Although these students also have high personal standards, they differ from the healthy group, in that they perceive these standards to be imposed on them by
excessively high parental expectations. Additionally, although they demonstrate a high level of organisation, it is not as high as that demonstrated by healthy perfectionists. These students are very concerned about living up to the expectations of their parents and are more preoccupied with doubts about their work and concern with making mistakes than healthy perfectionist students. On a cognitive level they demonstrate similar levels of academic self-efficacy, cognitive strategy use and self-regulation as their healthy counterparts, but they are also hampered by academic self-handicapping and test anxiety. Whilst adaptive learning patterns are indicated from their levels of task and performance-approach goal orientations, similar to the healthy group, they are distinguished from healthy perfectionists by their orientation to performance-avoid goals which are associated with maladaptive learning patterns, as well as their preoccupation with the avoidance of failure and self-presentational concerns. It is very likely that these unhealthy perfectionist students have developed a “strong defensive armor” (Rice et al., 2003, p.56) to protect their perfectionism and that some degree of emotional distress hovers beneath their cognitive veneer of coping.

In this sample of secondary school students almost one quarter of the students are characterised by low personal standards, little concern for order or making mistakes and low levels of perceived parental expectation and criticism. They have significantly lower levels of academic self-efficacy, cognitive strategy use and self-regulation than either of the perfectionist groups. Their significantly lower scores on task (mastery) and performance-approach goal orientations indicate low levels of motivation. Low aspirations and motivation to achieve are portrayed in the profile of non-perfectionist students in this study.
Cognitively speaking, although successful learning outcomes may be better achieved by both types of perfectionists rather than their non-perfectionist peers, as evidenced by the findings of this study and reiterated by the words of Lord Chesterfield who says,

“Aim at perfection in everything, though in most things it is unattainable. However, they who aim at it, and persevere, will come much nearer to it than those whose laziness and despondency make them give it up as unattainable.”

for the unhealthy “avoid” perfectionists, the question remains, at what cost?
REFERENCES


195


References


198
References


References


References


References


References


References


205


References


References


References


References


218
References


References


220


References


223
References


APPENDIX A.

THE FROST MULTIDIMENSIONAL PERFECTIONISM SCALE
MULTIDIMENSIONAL PERFECTIONISM SCALE

Please circle the number that best corresponds to your agreement with each statement below. Use this rating system:

Strongly disagree 1 2 3 4 5 Strongly agree

1. My parents set very high standards for me. 1 2 3 4 5
2. Organization is very important to me. 1 2 3 4 5
3. As a child, I was punished for doing things less than perfectly. 1 2 3 4 5
4. If I do not set the highest standards for myself, I am likely to end up a second rate person. 1 2 3 4 5
5. My parents never tried to understand my mistakes. 1 2 3 4 5
6. It is important to me that I be thoroughly competent in everything I do. 1 2 3 4 5
7. I am a neat person. 1 2 3 4 5
8. I try to be an organized person. 1 2 3 4 5
9. If I fail at work/school, I am a failure as a person. 1 2 3 4 5
10. I should be upset if I make a mistake. 1 2 3 4 5
11. My parents wanted me to be the best at everything. 1 2 3 4 5
12. I set higher goals than most people. 1 2 3 4 5
13. If someone does a task at work/school better than I, then I feel like I failed the whole task. 1 2 3 4 5
14. If I fail partly, it is as bad as being a complete failure. 1 2 3 4 5
15. Only outstanding performance is good enough in my family. 1 2 3 4 5
16. I am very good at focusing my efforts on attaining a goal. 1 2 3 4 5
17. Even when I do something very carefully, I often feel that it is not quite right. 1 2 3 4 5
18. I hate being less than best at things. 1 2 3 4 5
19. I have extremely high goals. 1 2 3 4 5
20. My parents have expected excellence from me. 1 2 3 4 5
21. People will probably think less of me if I make a mistake. 1 2 3 4 5

228
22. I never felt like I could meet my parents' expectations. 1 2 3 4 5
23. If I do not do as well as other people, it means I am an inferior human being. 1 2 3 4 5
24. Other people seem to accept lower standards from themselves than I do. 1 2 3 4 5
25. If I do not do well all the time, people will not respect me. 1 2 3 4 5
26. My parents have always had higher expectations for my future than I have. 1 2 3 4 5
27. I try to be a neat person. 1 2 3 4 5
28. I usually have doubts about the simple everyday things I do. 1 2 3 4 5
29. Neatness is very important to me. 1 2 3 4 5
30. I expect higher performance in my daily tasks than most people. 1 2 3 4 5
31. I am an organized person. 1 2 3 4 5
32. I tend to get behind in my work because I repeat things over and over. 1 2 3 4 5
33. It takes me a long time to do something "right". 1 2 3 4 5
34. The fewer mistakes I make, the more people will like me. 1 2 3 4 5
35. I never felt like I could meet my parents' standards. 1 2 3 4 5
Multidimensional Perfectionism Scale (MPS)
Frost et al., 1990

Description: The MPS is a 35 item questionnaire designed to measure perfectionism.

Scoring: Each of the six subscales is scored by summing the items. Additionally, there is an overall perfectionism score which is the sum of the subscales except Organization.

Subscales: The Concern over Mistakes (CM) subscale (Item #’s: 9, 10, 13, 14, 18, 21, 23, 25, 34) reflects negative reactions to mistakes, a tendency to interpret mistakes as equivalent to failure, and a tendency to believe that one will lose the respect of others following failure.

Personal Standards (PS) (Items #’s: 4, 6, 12, 16, 19, 24, 30) reflects the setting of very high standards and the excessive importance placed on these high standards for self-evaluation.

The tendency to believe that one’s parents set very high goals comprises the Parent Expectations (PE) scale. (Items #’s: 1, 11, 15, 20, 26).

The perception that one’s parents are (or were) overly critical constitutes the Parental Criticism (PC) scale. (Item #’s: 3, 5, 22, 35).

Doubting of Actions (D) (Item #’s: 17, 28, 32, 33) consists of items from the Maudsley Obsessive-Compulsive Inventory doubting subscale (Rachman & Hodgson, 1980) and reflects the extent to which people doubt their ability to accomplish tasks.

The Organization (O) (Items #’s: 2, 7, 8, 27, 29, 31) subscale is somewhat separate but related to certain dimensions. It measures the tendency to be orderly or organized and reflects an emphasis on order and orderliness which has often been associated with perfectionism.

Norms:

This study used 553 (51% female, 49% male) undergraduates enrolled in introductory psychology at a large Eastern University.

Reliability:
The internal consistency alpha values are the following:
overall perfectionism measure = .90
concern over mistakes = .88
personal standards = .83
parental expectations = .84
parental criticism = .84
doubts about actions = .77
organization = .93

The six scales are highly correlated with one another but the Organization scale showed the weakest pattern of intercorrelation with the other subscales and with the total of the other items in the perfectionism scale.

Validity: The MPS is highly correlated with other measures of perfectionism, specifically the Burns’ Perfectionism Scale (Burns, 1980), the Self-Evaluative (SE) Scale from the IBT (Jones, 1988), the Perfectionism Scale from the EDI (Garner et al., 1983), and the Self-Oriented Perfectionism and Socially-Prescribed Perfectionism scales on Hewitt and Flett’s (1991) Multidimensional Perfectionism Scale.

230
APPENDIX B.

STUDENT LEARNING APPROACH QUESTIONNAIRE (LAQ)
STUDENT DIRECTIONS

Name: ______________________ Age: _____yrs______mths

School: ______________________ Grade/Class: __________________

[ ] male [ ] female (tick 1 box)

Is English the main language spoken at home?
[ ] yes [ ] no (tick 1 box)
If no, write which is the main language spoken at home: _____________

Mother's occupation: ________________
Father's occupation: ________________
Home Address Postcode: ____________

This is a chance to look at yourself. It is NOT a test. There are no right or wrong answers, and everyone will have different answers. Be sure that your answers show what you believe about yourself. PLEASE DO NOT TALK ABOUT YOUR ANSWERS WITH ANYONE ELSE. Your responses will be coded to maintain your anonymity.

- Use the scale below to give your answer/s.
- Underneath each statement circle the number which is closest to what you believe.
- Please give one answer for how you think in English class and another answer for how you think in Maths class for statements numbered 1 - 56.
- Statements numbered 57 - 91 need only one number circled as they are about what you think in general.
- Try to use 3 as little as possible.

**Scale:**

1 = NT (not at all true of me)
2 = NVT (not very true of me)
3 = ST (somewhat true)
4 = T (true of me)
5 = VT (very true of me)

😊 Please remember to check that you have answered every question on every page before handing your survey in.
Thank you. 😊
This is an example.

I like strawberry ice-cream.

<table>
<thead>
<tr>
<th></th>
<th>not at</th>
<th>somewhat</th>
<th>very</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>all true</td>
<td>true</td>
<td>true</td>
</tr>
<tr>
<td>Eng.</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>Maths</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
</tbody>
</table>

Here are some questions about yourself as a student in English and Maths classes. You may think in one way in your English class and in a different way in your Maths class. Please circle the number that best describes what you think in each class.

1. I like schoolwork that I'll learn from even if I make a lot of mistakes.

<table>
<thead>
<tr>
<th></th>
<th>not at</th>
<th>somewhat</th>
<th>very</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>all true</td>
<td>true</td>
<td>true</td>
</tr>
<tr>
<td>Eng.</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>Maths</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
</tbody>
</table>

2. I want to do better than other students in my class.

<table>
<thead>
<tr>
<th></th>
<th>not at</th>
<th>somewhat</th>
<th>very</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>all true</td>
<td>true</td>
<td>true</td>
</tr>
<tr>
<td>Eng.</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>Maths</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
</tbody>
</table>

3. An important reason I do my school work is so that I don't embarrass myself.

<table>
<thead>
<tr>
<th></th>
<th>not at</th>
<th>somewhat</th>
<th>very</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>all true</td>
<td>true</td>
<td>true</td>
</tr>
<tr>
<td>Eng.</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>Maths</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
</tbody>
</table>

4. I'm certain I can master the skills taught in class this year.

<table>
<thead>
<tr>
<th></th>
<th>not at</th>
<th>somewhat</th>
<th>very</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>all true</td>
<td>true</td>
<td>true</td>
</tr>
<tr>
<td>Eng.</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>Maths</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
</tbody>
</table>

5. An important reason why I do my school work is because I like to learn new things.

<table>
<thead>
<tr>
<th></th>
<th>not at</th>
<th>somewhat</th>
<th>very</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>all true</td>
<td>true</td>
<td>true</td>
</tr>
<tr>
<td>Eng.</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>Maths</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
</tbody>
</table>

6. I would feel successful if I did better than most of the other students in my class.

<table>
<thead>
<tr>
<th></th>
<th>not at</th>
<th>somewhat</th>
<th>very</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>all true</td>
<td>true</td>
<td>true</td>
</tr>
<tr>
<td>Eng.</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>Maths</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
</tbody>
</table>

7. It's very important to me that I don't look stupid in my class.

<table>
<thead>
<tr>
<th></th>
<th>not at</th>
<th>somewhat</th>
<th>very</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>all true</td>
<td>true</td>
<td>true</td>
</tr>
<tr>
<td>Eng.</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>Maths</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
</tbody>
</table>

8. I can do even the hardest work in this class if I try.

<table>
<thead>
<tr>
<th></th>
<th>not at</th>
<th>somewhat</th>
<th>very</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>all true</td>
<td>true</td>
<td>true</td>
</tr>
<tr>
<td>Eng.</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>Maths</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
</tbody>
</table>

9. I like school work best when it really makes me think.

<table>
<thead>
<tr>
<th></th>
<th>not at</th>
<th>somewhat</th>
<th>very</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>all true</td>
<td>true</td>
<td>true</td>
</tr>
<tr>
<td>Eng.</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>Maths</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
</tbody>
</table>

10. I'd like to show my teacher that I'm smarter than the other students in this English class.

<table>
<thead>
<tr>
<th></th>
<th>not at</th>
<th>somewhat</th>
<th>very</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>all true</td>
<td>true</td>
<td>true</td>
</tr>
<tr>
<td>Eng.</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>Maths</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
</tbody>
</table>
11. The reason I do my school work is so my teacher doesn't think I know less than others.

<table>
<thead>
<tr>
<th>not at</th>
<th>somewhat</th>
<th>very</th>
</tr>
</thead>
<tbody>
<tr>
<td>all true</td>
<td>true</td>
<td>true</td>
</tr>
</tbody>
</table>

Eng. 1 2 3 4 5

Maths 1 2 3 4 5

12. If I have enough time, I can do a good job on all my school work.

<table>
<thead>
<tr>
<th>not at</th>
<th>somewhat</th>
<th>very</th>
</tr>
</thead>
<tbody>
<tr>
<td>all true</td>
<td>true</td>
<td>true</td>
</tr>
</tbody>
</table>

Eng. 1 2 3 4 5

Maths 1 2 3 4 5

13. An important reason why I do my school work is because I want to get better at it.

<table>
<thead>
<tr>
<th>not at</th>
<th>somewhat</th>
<th>very</th>
</tr>
</thead>
<tbody>
<tr>
<td>all true</td>
<td>true</td>
<td>true</td>
</tr>
</tbody>
</table>

Eng. 1 2 3 4 5

Maths 1 2 3 4 5

14. Doing better than other students in the class is important to me.

<table>
<thead>
<tr>
<th>not at</th>
<th>somewhat</th>
<th>very</th>
</tr>
</thead>
<tbody>
<tr>
<td>all true</td>
<td>true</td>
<td>true</td>
</tr>
</tbody>
</table>

Eng. 1 2 3 4 5

Maths 1 2 3 4 5

15. The reason I do my school work is so that others won't think I'm dumb.

<table>
<thead>
<tr>
<th>not at</th>
<th>somewhat</th>
<th>very</th>
</tr>
</thead>
<tbody>
<tr>
<td>all true</td>
<td>true</td>
<td>true</td>
</tr>
</tbody>
</table>

Eng. 1 2 3 4 5

Maths 1 2 3 4 5

16. I can do almost all the work in my class if I don't give up.

<table>
<thead>
<tr>
<th>not at</th>
<th>somewhat</th>
<th>very</th>
</tr>
</thead>
<tbody>
<tr>
<td>all true</td>
<td>true</td>
<td>true</td>
</tr>
</tbody>
</table>

Eng. 1 2 3 4 5

Maths 1 2 3 4 5

17. One of my main goals is to avoid looking like I can't do my school work.

<table>
<thead>
<tr>
<th>not at</th>
<th>somewhat</th>
<th>very</th>
</tr>
</thead>
<tbody>
<tr>
<td>all true</td>
<td>true</td>
<td>true</td>
</tr>
</tbody>
</table>

Eng. 1 2 3 4 5

Maths 1 2 3 4 5

18. I would feel really good if I were the only one who could answer the teacher's questions in class.

<table>
<thead>
<tr>
<th>not at</th>
<th>somewhat</th>
<th>very</th>
</tr>
</thead>
<tbody>
<tr>
<td>all true</td>
<td>true</td>
<td>true</td>
</tr>
</tbody>
</table>

Eng. 1 2 3 4 5

Maths 1 2 3 4 5

19. Even if the school work is hard, I can learn it.

<table>
<thead>
<tr>
<th>not at</th>
<th>somewhat</th>
<th>very</th>
</tr>
</thead>
<tbody>
<tr>
<td>all true</td>
<td>true</td>
<td>true</td>
</tr>
</tbody>
</table>

Eng. 1 2 3 4 5

Maths 1 2 3 4 5

20. I do my school work because I'm interested in it.

<table>
<thead>
<tr>
<th>not at</th>
<th>somewhat</th>
<th>very</th>
</tr>
</thead>
<tbody>
<tr>
<td>all true</td>
<td>true</td>
<td>true</td>
</tr>
</tbody>
</table>

Eng. 1 2 3 4 5

Maths 1 2 3 4 5

21. It's important to me that the other students in my class think that I am good at my work.

<table>
<thead>
<tr>
<th>not at</th>
<th>somewhat</th>
<th>very</th>
</tr>
</thead>
<tbody>
<tr>
<td>all true</td>
<td>true</td>
<td>true</td>
</tr>
</tbody>
</table>

Eng. 1 2 3 4 5

Maths 1 2 3 4 5

22. I'm certain I can figure out how to do the most difficult school work.

<table>
<thead>
<tr>
<th>not at</th>
<th>somewhat</th>
<th>very</th>
</tr>
</thead>
<tbody>
<tr>
<td>all true</td>
<td>true</td>
<td>true</td>
</tr>
</tbody>
</table>

Eng. 1 2 3 4 5

Maths 1 2 3 4 5
23. No matter how hard I try, there is some school work I'll never understand.

<table>
<thead>
<tr>
<th></th>
<th>not at</th>
<th>somewhat</th>
<th>very</th>
</tr>
</thead>
<tbody>
<tr>
<td>Eng.</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>Maths</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
</tbody>
</table>

24. One reason I would not participate in class is to avoid looking stupid.

<table>
<thead>
<tr>
<th></th>
<th>not at</th>
<th>somewhat</th>
<th>very</th>
</tr>
</thead>
<tbody>
<tr>
<td>Eng.</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>Maths</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
</tbody>
</table>

25. Some students put off doing their school work until the last moment so that if they don't do well on their work, they can say that is the reason. How true is this of you?

<table>
<thead>
<tr>
<th></th>
<th>not at</th>
<th>somewhat</th>
<th>very</th>
</tr>
</thead>
<tbody>
<tr>
<td>Eng.</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>Maths</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
</tbody>
</table>

26. Some students purposely don't try hard in class so that if they don't do well, they can say it is because they didn't try. How true is this of you?

<table>
<thead>
<tr>
<th></th>
<th>not at</th>
<th>somewhat</th>
<th>very</th>
</tr>
</thead>
<tbody>
<tr>
<td>Eng.</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>Maths</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
</tbody>
</table>

27. Some students fool around the night before a test, so that if they don't do well, they can say that is the reason. How true is this of you?

<table>
<thead>
<tr>
<th></th>
<th>not at</th>
<th>somewhat</th>
<th>very</th>
</tr>
</thead>
<tbody>
<tr>
<td>Eng.</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>Maths</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
</tbody>
</table>

28. Some students purposely get involved in lots of activities. Then if they don't do well on their school work, they can say it is because they are involved with other things. How true is this of you?

<table>
<thead>
<tr>
<th></th>
<th>not at</th>
<th>somewhat</th>
<th>very</th>
</tr>
</thead>
<tbody>
<tr>
<td>Eng.</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>Maths</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
</tbody>
</table>

29. Some students let their friends keep them from paying attention in class or from doing their homework. Then, if they don't do well, they can say their friends kept them from working. How true is this of you?

<table>
<thead>
<tr>
<th></th>
<th>not at</th>
<th>somewhat</th>
<th>very</th>
</tr>
</thead>
<tbody>
<tr>
<td>Eng.</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>Maths</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
</tbody>
</table>

30. Some students look for reasons to keep them from studying (not feeling well, having to help their parents, taking care of a brother or sister, etc.). Then if they don't do well on their work, they can say this is the reason. How true is this of you?

<table>
<thead>
<tr>
<th></th>
<th>not at</th>
<th>somewhat</th>
<th>very</th>
</tr>
</thead>
<tbody>
<tr>
<td>Eng.</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>Maths</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
</tbody>
</table>

31. I am so nervous during a test that I cannot remember facts I have learned.

<table>
<thead>
<tr>
<th></th>
<th>not at</th>
<th>somewhat</th>
<th>very</th>
</tr>
</thead>
<tbody>
<tr>
<td>Eng.</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>Maths</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
</tbody>
</table>
32. I have an uneasy, upset feeling when I take a test.

<table>
<thead>
<tr>
<th></th>
<th>not at</th>
<th>somewhat</th>
<th>very</th>
</tr>
</thead>
<tbody>
<tr>
<td>Eng.</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>Maths 1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
</tbody>
</table>

33. I worry a great deal about tests.

<table>
<thead>
<tr>
<th></th>
<th>not at</th>
<th>somewhat</th>
<th>very</th>
</tr>
</thead>
<tbody>
<tr>
<td>Eng.</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>Maths 1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
</tbody>
</table>

34. When I take a test I think about how poorly I am doing.

<table>
<thead>
<tr>
<th></th>
<th>not at</th>
<th>somewhat</th>
<th>very</th>
</tr>
</thead>
<tbody>
<tr>
<td>Eng.</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>Maths 1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
</tbody>
</table>

35. When I study for a test, I try to put together the information from class and from textbook/s.

<table>
<thead>
<tr>
<th></th>
<th>not at</th>
<th>somewhat</th>
<th>very</th>
</tr>
</thead>
<tbody>
<tr>
<td>Eng.</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>Maths 1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
</tbody>
</table>

36. When I do homework, I try to remember what the teacher said in class so I can answer the questions correctly.

<table>
<thead>
<tr>
<th></th>
<th>not at</th>
<th>somewhat</th>
<th>very</th>
</tr>
</thead>
<tbody>
<tr>
<td>Eng.</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>Maths 1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
</tbody>
</table>

37. It is hard for me to decide what the main ideas are in what I read for class.

<table>
<thead>
<tr>
<th></th>
<th>not at</th>
<th>somewhat</th>
<th>very</th>
</tr>
</thead>
<tbody>
<tr>
<td>Eng.</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>Maths 1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
</tbody>
</table>

38. When I study I put important ideas into my own words.

<table>
<thead>
<tr>
<th></th>
<th>not at</th>
<th>somewhat</th>
<th>very</th>
</tr>
</thead>
<tbody>
<tr>
<td>Eng.</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>Maths 1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
</tbody>
</table>

39. I always try to understand what my teacher is saying even if it doesn't make sense.

<table>
<thead>
<tr>
<th></th>
<th>not at</th>
<th>somewhat</th>
<th>very</th>
</tr>
</thead>
<tbody>
<tr>
<td>Eng.</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>Maths 1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
</tbody>
</table>

40. When I study for a test I try to remember as many facts as I can.

<table>
<thead>
<tr>
<th></th>
<th>not at</th>
<th>somewhat</th>
<th>very</th>
</tr>
</thead>
<tbody>
<tr>
<td>Eng.</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>Maths 1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
</tbody>
</table>

41. When studying, I copy my notes again to help me remember material.

<table>
<thead>
<tr>
<th></th>
<th>not at</th>
<th>somewhat</th>
<th>very</th>
</tr>
</thead>
<tbody>
<tr>
<td>Eng.</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>Maths 1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
</tbody>
</table>

42. When I study for a test, I practice saying the important facts over and over to myself.

<table>
<thead>
<tr>
<th></th>
<th>not at</th>
<th>somewhat</th>
<th>very</th>
</tr>
</thead>
<tbody>
<tr>
<td>Eng.</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>Maths 1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
</tbody>
</table>
43. I use what I have learned from old homework assignments and the textbook to do new assignments.

<table>
<thead>
<tr>
<th></th>
<th>not at</th>
<th>somewhat</th>
<th>very</th>
</tr>
</thead>
<tbody>
<tr>
<td>Eng.</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>Maths</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
</tbody>
</table>

44. When I am studying a topic, I try to make everything fit together.

<table>
<thead>
<tr>
<th></th>
<th>not at</th>
<th>somewhat</th>
<th>very</th>
</tr>
</thead>
<tbody>
<tr>
<td>Eng.</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>Maths</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
</tbody>
</table>

45. When I read material for class, I say the words over and over to myself to help me remember.

<table>
<thead>
<tr>
<th></th>
<th>not at</th>
<th>somewhat</th>
<th>very</th>
</tr>
</thead>
<tbody>
<tr>
<td>Eng.</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>Maths</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
</tbody>
</table>

46. I outline the chapters in my textbook/s to help my study.

<table>
<thead>
<tr>
<th></th>
<th>not at</th>
<th>somewhat</th>
<th>very</th>
</tr>
</thead>
<tbody>
<tr>
<td>Eng.</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>Maths</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
</tbody>
</table>

47. When reading I try to connect the things I am reading about with what I already know.

<table>
<thead>
<tr>
<th></th>
<th>not at</th>
<th>somewhat</th>
<th>very</th>
</tr>
</thead>
<tbody>
<tr>
<td>Eng.</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>Maths</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
</tbody>
</table>

48. I ask myself questions to make sure I know the material I have been studying.

<table>
<thead>
<tr>
<th></th>
<th>not at</th>
<th>somewhat</th>
<th>very</th>
</tr>
</thead>
<tbody>
<tr>
<td>Eng.</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>Maths</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
</tbody>
</table>

49. When school work is hard I either give up or study only the easy parts.

<table>
<thead>
<tr>
<th></th>
<th>not at</th>
<th>somewhat</th>
<th>very</th>
</tr>
</thead>
<tbody>
<tr>
<td>Eng.</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>Maths</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
</tbody>
</table>

50. I work on practice exercises and answer end of chapter questions even when I don't have to.

<table>
<thead>
<tr>
<th></th>
<th>not at</th>
<th>somewhat</th>
<th>very</th>
</tr>
</thead>
<tbody>
<tr>
<td>Eng.</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>Maths</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
</tbody>
</table>

51. Even when study materials are dull and uninteresting, I keep working until I finish.

<table>
<thead>
<tr>
<th></th>
<th>not at</th>
<th>somewhat</th>
<th>very</th>
</tr>
</thead>
<tbody>
<tr>
<td>Eng.</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>Maths</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
</tbody>
</table>

52. Before I begin studying I think about the things I will need to do to learn.

<table>
<thead>
<tr>
<th></th>
<th>not at</th>
<th>somewhat</th>
<th>very</th>
</tr>
</thead>
<tbody>
<tr>
<td>Eng.</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>Maths</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
</tbody>
</table>

53. I often find that I have been reading for class but don't know what it is all about.

<table>
<thead>
<tr>
<th></th>
<th>not at</th>
<th>somewhat</th>
<th>very</th>
</tr>
</thead>
<tbody>
<tr>
<td>Eng.</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>Maths</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
</tbody>
</table>

54. I find that when my teacher is talking I think of other things and don't really listen to what is being said.

<table>
<thead>
<tr>
<th></th>
<th>not at</th>
<th>somewhat</th>
<th>very</th>
</tr>
</thead>
<tbody>
<tr>
<td>Eng.</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>Maths</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
</tbody>
</table>
55. When I'm reading I stop once in a while and go over what I have read.

<table>
<thead>
<tr>
<th>not at</th>
<th>somewhat</th>
<th>very</th>
</tr>
</thead>
<tbody>
<tr>
<td>true</td>
<td>true</td>
<td>true</td>
</tr>
</tbody>
</table>

Eng. 1 2 3 4 5

Maths 1 2 3 4 5

56. I work hard to get good marks even when I don't like my class.

<table>
<thead>
<tr>
<th>not at</th>
<th>somewhat</th>
<th>very</th>
</tr>
</thead>
<tbody>
<tr>
<td>true</td>
<td>true</td>
<td>true</td>
</tr>
</tbody>
</table>

Eng. 1 2 3 4 5

Maths 1 2 3 4 5

Here are some general questions about how you feel about your schoolwork. Remember that no-one will see your answers and your name will be replaced with a number so that you will remain anonymous.

57. My parents set very high standards for me.

<table>
<thead>
<tr>
<th>not at</th>
<th>somewhat</th>
<th>very</th>
</tr>
</thead>
<tbody>
<tr>
<td>true</td>
<td>true</td>
<td>true</td>
</tr>
</tbody>
</table>

1 2 3 4 5

58. Organisation is very important to me.

<table>
<thead>
<tr>
<th>not at</th>
<th>somewhat</th>
<th>very</th>
</tr>
</thead>
<tbody>
<tr>
<td>true</td>
<td>true</td>
<td>true</td>
</tr>
</tbody>
</table>

1 2 3 4 5

59. As a child, I was punished for doing things less than perfectly.

<table>
<thead>
<tr>
<th>not at</th>
<th>somewhat</th>
<th>very</th>
</tr>
</thead>
<tbody>
<tr>
<td>true</td>
<td>true</td>
<td>true</td>
</tr>
</tbody>
</table>

1 2 3 4 5

60. If I do not set the highest standards for myself, I am likely to end up a second-rate person.

<table>
<thead>
<tr>
<th>not at</th>
<th>somewhat</th>
<th>very</th>
</tr>
</thead>
<tbody>
<tr>
<td>true</td>
<td>true</td>
<td>true</td>
</tr>
</tbody>
</table>

1 2 3 4 5

61. My parents never try to understand my mistakes.

<table>
<thead>
<tr>
<th>not at</th>
<th>somewhat</th>
<th>very</th>
</tr>
</thead>
<tbody>
<tr>
<td>true</td>
<td>true</td>
<td>true</td>
</tr>
</tbody>
</table>

1 2 3 4 5

62. It is important to me that I be thoroughly competent in everything I do.

<table>
<thead>
<tr>
<th>not at</th>
<th>somewhat</th>
<th>very</th>
</tr>
</thead>
<tbody>
<tr>
<td>true</td>
<td>true</td>
<td>true</td>
</tr>
</tbody>
</table>

1 2 3 4 5

63. I am a neat person.

<table>
<thead>
<tr>
<th>not at</th>
<th>somewhat</th>
<th>very</th>
</tr>
</thead>
<tbody>
<tr>
<td>true</td>
<td>true</td>
<td>true</td>
</tr>
</tbody>
</table>

1 2 3 4 5

64. I try to be an organised person.

<table>
<thead>
<tr>
<th>not at</th>
<th>somewhat</th>
<th>very</th>
</tr>
</thead>
<tbody>
<tr>
<td>true</td>
<td>true</td>
<td>true</td>
</tr>
</tbody>
</table>

1 2 3 4 5

65. If I fail at school, I am a failure as a person.

<table>
<thead>
<tr>
<th>not at</th>
<th>somewhat</th>
<th>very</th>
</tr>
</thead>
<tbody>
<tr>
<td>true</td>
<td>true</td>
<td>true</td>
</tr>
</tbody>
</table>

1 2 3 4 5

66. I should be upset if I make a mistake.

<table>
<thead>
<tr>
<th>not at</th>
<th>somewhat</th>
<th>very</th>
</tr>
</thead>
<tbody>
<tr>
<td>true</td>
<td>true</td>
<td>true</td>
</tr>
</tbody>
</table>

1 2 3 4 5

67. My parents want me to be the best at everything.

<table>
<thead>
<tr>
<th>not at</th>
<th>somewhat</th>
<th>very</th>
</tr>
</thead>
<tbody>
<tr>
<td>true</td>
<td>true</td>
<td>true</td>
</tr>
</tbody>
</table>

1 2 3 4 5

68. I set higher goals than most people.

<table>
<thead>
<tr>
<th>not at</th>
<th>somewhat</th>
<th>very</th>
</tr>
</thead>
<tbody>
<tr>
<td>true</td>
<td>true</td>
<td>true</td>
</tr>
</tbody>
</table>

1 2 3 4 5
69. If someone does a task at work/school better than I, then I feel as if I failed the whole task.

<table>
<thead>
<tr>
<th>not at</th>
<th>somewhat</th>
<th>very</th>
</tr>
</thead>
<tbody>
<tr>
<td>all true</td>
<td>true</td>
<td>true</td>
</tr>
</tbody>
</table>

70. If I fail partly, it is as bad as being a complete failure.

<table>
<thead>
<tr>
<th>not at</th>
<th>somewhat</th>
<th>very</th>
</tr>
</thead>
<tbody>
<tr>
<td>all true</td>
<td>true</td>
<td>true</td>
</tr>
</tbody>
</table>

71. Only outstanding performance is good enough in my family.

<table>
<thead>
<tr>
<th>not at</th>
<th>somewhat</th>
<th>very</th>
</tr>
</thead>
<tbody>
<tr>
<td>all true</td>
<td>true</td>
<td>true</td>
</tr>
</tbody>
</table>

72. I am very good at focusing my efforts on attaining a goal.

<table>
<thead>
<tr>
<th>not at</th>
<th>somewhat</th>
<th>very</th>
</tr>
</thead>
<tbody>
<tr>
<td>all true</td>
<td>true</td>
<td>true</td>
</tr>
</tbody>
</table>

73. Even when I do something very carefully, I often feel that it is not quite right.

<table>
<thead>
<tr>
<th>not at</th>
<th>somewhat</th>
<th>very</th>
</tr>
</thead>
<tbody>
<tr>
<td>all true</td>
<td>true</td>
<td>true</td>
</tr>
</tbody>
</table>

74. I hate being less than the best at things.

<table>
<thead>
<tr>
<th>not at</th>
<th>somewhat</th>
<th>very</th>
</tr>
</thead>
<tbody>
<tr>
<td>all true</td>
<td>true</td>
<td>true</td>
</tr>
</tbody>
</table>

75. I have extremely high goals.

<table>
<thead>
<tr>
<th>not at</th>
<th>somewhat</th>
<th>very</th>
</tr>
</thead>
<tbody>
<tr>
<td>all true</td>
<td>true</td>
<td>true</td>
</tr>
</tbody>
</table>

76. My parents expect excellence from me.

<table>
<thead>
<tr>
<th>not at</th>
<th>somewhat</th>
<th>very</th>
</tr>
</thead>
<tbody>
<tr>
<td>all true</td>
<td>true</td>
<td>true</td>
</tr>
</tbody>
</table>

77. People will probably think less of me if I make a mistake.

<table>
<thead>
<tr>
<th>not at</th>
<th>somewhat</th>
<th>very</th>
</tr>
</thead>
<tbody>
<tr>
<td>all true</td>
<td>true</td>
<td>true</td>
</tr>
</tbody>
</table>

78. I never feel that I can meet my parents' expectations of me.

<table>
<thead>
<tr>
<th>not at</th>
<th>somewhat</th>
<th>very</th>
</tr>
</thead>
<tbody>
<tr>
<td>all true</td>
<td>true</td>
<td>true</td>
</tr>
</tbody>
</table>

79. If I do not do as well as other people, it means that I am an inferior person.

<table>
<thead>
<tr>
<th>not at</th>
<th>somewhat</th>
<th>very</th>
</tr>
</thead>
<tbody>
<tr>
<td>all true</td>
<td>true</td>
<td>true</td>
</tr>
</tbody>
</table>

80. Other people accept lower standards from themselves than I do.

<table>
<thead>
<tr>
<th>not at</th>
<th>somewhat</th>
<th>very</th>
</tr>
</thead>
<tbody>
<tr>
<td>all true</td>
<td>true</td>
<td>true</td>
</tr>
</tbody>
</table>

81. If I do not do well all the time, people will not respect me.

<table>
<thead>
<tr>
<th>not at</th>
<th>somewhat</th>
<th>very</th>
</tr>
</thead>
<tbody>
<tr>
<td>all true</td>
<td>true</td>
<td>true</td>
</tr>
</tbody>
</table>

82. My parents have always had higher expectations for my future than I have.

<table>
<thead>
<tr>
<th>not at</th>
<th>somewhat</th>
<th>very</th>
</tr>
</thead>
<tbody>
<tr>
<td>all true</td>
<td>true</td>
<td>true</td>
</tr>
</tbody>
</table>

83. I try to be a neat person.

<table>
<thead>
<tr>
<th>not at</th>
<th>somewhat</th>
<th>very</th>
</tr>
</thead>
<tbody>
<tr>
<td>all true</td>
<td>true</td>
<td>true</td>
</tr>
</tbody>
</table>

84. I usually have doubts about the simple everyday things that I do.

<table>
<thead>
<tr>
<th>not at</th>
<th>somewhat</th>
<th>very</th>
</tr>
</thead>
<tbody>
<tr>
<td>all true</td>
<td>true</td>
<td>true</td>
</tr>
</tbody>
</table>

239
85. Neatness is very important to me.
   
   not at  somewhat  very
   all true  true  true
   1  2  3  4  5

86. I expect higher performance in my daily tasks than most people.
   
   not at  somewhat  very
   all true  true  true
   1  2  3  4  5

87. I am an organised person.
   
   not at  somewhat  very
   all true  true  true
   1  2  3  4  5

88. I tend to get behind in my work because I repeat things over and over.
   
   not at  somewhat  very
   all true  true  true
   1  2  3  4  5

89. It takes me a long time to do something "right".
   
   not at  somewhat  very
   all true  true  true
   1  2  3  4  5

90. The fewer mistakes I make, the more people will like me.
   
   not at  somewhat  very
   all true  true  true
   1  2  3  4  5

91. I never feel that I can meet my parents' standards.
   
   not at  somewhat  very
   all true  true  true
   1  2  3  4  5

This is the end of the survey. Please check that you have circled a number for each statement on every page.
APPENDIX C.1

LETTER OF INVITATION AND INFORMATION TO SCHOOL PRINCIPALS
Dear Principal,

I am writing to invite your school to participate in a study I am conducting in the coming months. This research study is titled “Academic Achievement Study”. I am a post-graduate research student from the Faculty of Education at the University of Sydney. This research study forms a part of my current Doctor of Philosophy (PhD) program and has been approved by the University Human Ethics Committee. My research will be supervised by Associate Professor Ken Sinclair.

Many parents, teachers and researchers are concerned that some students do not work to the best of their abilities for a number of reasons. The study is primarily about what students think about learning and how they feel about their ability to complete learning tasks. It has particular relevance for schools in identifying possible causes for underachievement in gifted and academically talented students. There is evidence to suggest that perfectionism is a variable that needs careful consideration. It can be a positive force in that it enhances motivation and self-efficacy resulting in high achievement gains. On the other hand, its negative connotations lead to students who are consumed with anxiety and who subsequently employ defence mechanisms of avoidance behaviours such as procrastination and other self-handicapping behaviours. No-one has really been able to establish a relationship between perfectionism and academically talented students. I am particularly interested in establishing if negative perfectionism is a key factor and to investigate ways in which we can help students use their perfectionism in positive ways to achieve happy and successful learning outcomes and performances.

In my investigation I will be asking students in Years 8 and 11 to complete a test of school ability and a number of questionnaires related to these issues. In Phase 1 of the study the students will be asked to complete a test of ability during a normal class period of 60 minutes. One week later, the same students will complete a questionnaire, again during a normal class period. At this second session, class teachers will be asked to complete a questionnaire relating to the learning and personality characteristics of students who they consider to be of above average ability. In Phase 2 of the study, some students will be invited to proceed further as participants in the study. Students who are invited to this phase will be asked to attend an informal interview with me for 30-45 minutes. Also in this phase, parents will be asked to complete a simple questionnaire which should take approximately 20 minutes. The students will take the form home for parents to complete and they will be asked to return these to the school on the following day.

I would like to assure you that all information will be kept strictly confidential, and student and teacher participation is voluntary and dependent upon parental consent. No identities will be revealed to anyone and all responses will be coded so that names do not appear on any report. Any person with concerns or complaints about the conduct of this research study can contact the Manager of Ethics and Biosafety Administration, University of Sydney, on (02)9351 4811. A report of the findings of this research will be made available to the school and parents on request.

I am very appreciative of your interest and consideration of my proposal. Please do not hesitate to contact me if you have any questions or concerns regarding this research project. I will telephone you in the next two weeks to confirm your decision regarding permission to conduct this research study at your school.

Yours sincerely,

Colleen C. Hawkins (Researcher)
APPENDIX C.2

PARENT INFORMATION AND CONSENT FORMS
Dear Parent

I am pleased to inform you that the Principal of your school and your child’s teachers have agreed to participate in a study I am conducting in your child’s school in the coming months. The research study is titled “Academic Achievement Study”. I am a post-graduate research student from the Faculty of Education at the University of Sydney. This research study forms a part of my current Doctor of Philosophy (PhD) program and has been approved by the University Human Ethics Committee. I am now writing to request your consent for your child to participate in the project.

The study is about what students think about learning and how they feel about their ability to complete learning tasks. Many parents, teachers and researchers are concerned that some students do not work to the best of their abilities for a number of reasons. Sometimes they feel that the subject is too difficult, or that they are not able to fulfil what is expected of them, and they often find excuses to delay starting work or to justify poor results or low marks. We are all aware that any class contains students with different levels of ability, interests and motivation. I am interested in finding out how individual students feel about themselves and their learning experiences both in and out of school. I am particularly interested in examining what they actually think and do when asked to complete a particular assignment or a test. Through gaining a better understanding of these things, teachers will be better able to assist their students in achieving happy and successful learning outcomes and performances.

In my investigation I will be asking your child to complete a test of school ability and a number of questionnaires related to these issues. In Phase 1 of the study your child will be asked to complete a test of ability during a normal class period of 60 minutes. Following this, your child will complete three questionnaires, again during a normal class period. In Phase 2 of the study some students will be invited to proceed further as participants in the study. Your child may be invited for this phase which will involve an informal interview with me for 15-20 minutes. In this phase, you, as a parent, will also be asked to complete a simple questionnaire which should take you approximately 20 minutes. Your child will bring the form home for you complete and you will be asked to return it to the school on the following day.

A report of the findings of this research will be given to the school principal, and may be sent to you if you request it.

I would like to assure you that all information will be kept strictly confidential, and your child’s participation is voluntary. Her identity will not be revealed to anyone and all responses will be coded so that names do not appear on any report. Any information your child gives to me will NOT be revealed to teachers or any other school personnel. Any person with concerns or complaints about the conduct of this research study can contact the Manager of Ethics and Biosafety Administration, University of Sydney, on (02)9351 4811.
If you decide to give permission for your child to participate please complete the attached Parent Consent Form. The form confirms that you understand the nature and proceedings of this research, and give your consent for your child to participate in the study. Please be assured that you may withdraw this consent at any time during the research. Similarly your child may withdraw at any time during the study.

I am very appreciative of your interest and consideration of my proposal. Please do not hesitate to contact me if you have any questions or concerns regarding this research project. I would be happy to discuss your queries with you.

Yours sincerely

Colleen C. Hawkins (Researcher)
NAME OF STUDY:  "Academic Achievement Study"

NAME OF RESEARCHER:  Colleen C. Hawkins

I, .................................................................................................................................
(parent's name)

.................................................................................................................................
(address)

have read and understood the Parent information letter and give my consent for my child to participate in the
above-named research study.

I am aware of the nature and proceedings of the study and know it is my right to withdraw my child from the
study at any time.

I know that my child has the right to refuse to participate in the study or to withdraw at any time during the
conduct of the study.

I also understand that the study is strictly confidential.

I hereby give my consent for my child to participate in this research study.

Child's Name ..................................................................................................................

(please print)

Parent's Name ..............................................................................................................

(please print)

Parent's Signature ........................................................................................................

Date ...............................................................................................................................

** Please circle yes or no if you would like to receive a copy of a general report of the
research study. This report may not be available for some time.

YES  NO
APPENDIX C.3

YEAR 11 STUDENT INFORMATION AND CONSENT FORMS
Dear Year 11 Student

The Principal and teachers of your school have given me permission to conduct a research study in the school in the coming months. The study forms part of my current Doctor of Philosophy (PhD) program at the University of Sydney and is called "Academic Achievement Study". I am asking you to agree to participate in my research programme which will explore what students think about learning and how about their ability to complete learning tasks set by teachers. I am interested in finding out how students feel about themselves and their learning experiences both in and out of school. I have a particular interest in investigating the kind of things students think and do when they are asked to complete a particular assignment or test and what they think about their personal expectations and those of their parents and teachers for their learning outcomes.

I will need you to allow me to access your scores on the Otis Lennon Test of School Ability and also your Year 10 School Certificate results. I will also be asking you to complete a questionnaire relating to such things as how you feel about your ability to complete class work, the things you do to prepare for tests, and your perceptions of the expectations you parents and teachers have for your school success. In the final phase of my study, I will be asking ten or twelve students to attend two or three informal interviews with me so that I can extend the results of the survey to a more personalized experience.

I would like to assure you that all information be kept strictly confidential, and that your participation is completely voluntary. No identities will be revealed to anyone and all responses will be coded so that names do not appear on any report. Any person with concerns or complaints about the conduct of this research study can contact the Manager of Ethics and Biosafety Administration, University of Sydney, on (02)9351 4811. A report of the findings of this research will be made available on request.

In conclusion, I’d like you to know that I have been a teacher and school principal myself for many years and I am very committed to making school learning experiences as positive as possible. Through your participation in research studies such as this, you make an enormous contribution to a body of knowledge on which educators draw when designing school programmes and learning environments. If you agree to participate please complete the attached Student Consent Form. The form confirms that you understand the nature and proceedings of this research, and that you agree to take part in the study. You are also assured that you may withdraw at any stage during the study if you so wish.

I would be very grateful for your help with this project and I look forward to your positive response to my invitation to be part of my research study.

Yours sincerely

Colleen C. Hawkins (Researcher)
STUDENT CONSENT FORM

NAME OF STUDY: Academic Achievement Study

NAME OF RESEARCHER : Colleen C. Hawkins

I, .................................................................,

(please print your name)

have read and understood the student information letter and agree to participate in the above-named research study.

I am aware of the nature and proceedings of the study and know it is my right to withdraw from the study at any time.

I also understand that the study is strictly confidential.

Student Signature:........................................Date:..........................
APPENDIX C.4

ETHICS APPROVAL:

THE UNIVERSITY OF SYDNEY ETHICS COMMITTEE

THE NEW SOUTH WALES DEPARTMENT OF EDUCATION AND TRAINING, STRATEGIC INFORMATION AND REPORTING
27 November 1998

Dear Professor Sinclair,

**Title:** A study of the relations between perfectionism and academic achievement in intellectually gifted students

**Ref No:** 98/9/21

Thank you for your correspondence dated 21 October addressing comments made to you by the Committee.

After considering the additional information relating to the above protocol, it was the Committee’s opinion that there were no ethical objections to the project, and therefore recommends approval to proceed. The additional information will be filed with your application.

The procedures outlined in the protocol must be adhered to.

Please note:
In order to comply with the National Health and Medical Research Council guidelines, and in line with the Human Ethics Committee requirements the Chief Investigator’s responsibility is to ensure that:

1. The individual researcher’s protocol complies with the final and Committee approved protocol.
2. Modifications to the protocol cannot proceed until such approval is obtained in writing.
3. The confidentiality and anonymity of all research subjects is maintained at all times, except as required by law.
4. All research subjects are provided with a Subject Information Sheet and Consent Form.
5. The Subject Information Sheet and Consent Form be on University of Sydney letterhead and include the full title of the research project and telephone contacts for the researchers.
6. The following statement appears on the Subject Information Sheet:
   *Any person with concerns or complaints about the conduct of a research study can contact the Manager of Ethics and Biosafety Administration, University of Sydney, on (02) 9351 4811.*
7. The standard University policy concerning storage of data should be followed. While temporary storage of audio-tapes at the researcher’s home or an off-campus site is acceptable during the active transcription phase of the project, permanent storage should be at a secure, University controlled site for a minimum of five years.
8. A progress report is provided by the end of each year. Failure to do so will lead to withdrawal of the approval of the research protocol and re-application to the Committee must occur before recommencing.
9. A report and a copy of the published material is provided at the end of the project.

Yours sincerely,

**Professor B Baker**
Chairman
Human Ethics Committee
Ms Colleen C Hawkins  
School of Educational Psychology  
Literacies and Learning Faculty of Education  
University of Sydney  
NSW  
2006

Dear Ms Hawkins  

I refer to your application to conduct a research project in NSW government schools entitled *A study of the Relations between Perfectionism and Academic Achievement in Intellectually Gifted Students*. I am pleased to inform you that your application has been approved. You may now contact the principals of the nominated schools to seek their participation.

This approval will remain valid until 5 May, 2000.

You should include a copy of this letter with the documents you send to schools. I draw your attention to the following requirements for all researchers in NSW government schools:

- School principals have the right to withdraw the school from the study at any time. The approval of the principal for the specific method of gathering information for the school must also be sought.
- The privacy of the school and the students is to be protected.
- The participation of teachers and students must be voluntary and must be at the school’s convenience.
- Any proposal to publish the outcomes of the study should be discussed with the Research Approvals Officer before publication proceeds.

When your study is completed please forward your report marked to the Research Management Officer, Strategic Information and Reporting, Department of Education and Training, Level 5, 35 Bridge Street, Sydney, NSW 2000.

Yours sincerely

Michael Waterhouse  
Director, Strategic Information and Reporting  
7 May, 1999
Ms Colleen C Hawkins  
School of Educational Psychology  
Literacies and Learning Faculty of Education  
University of Sydney  NSW  2006

Dear Ms Hawkins  

SERAP Number:  99040

I refer to your application for an extension of your study entitled *A study of the Relations between Perfectionism and Academic Achievement in Intellectually Gifted Students* in NSW government schools. I am pleased to inform you that your application has been approved.

This approval will remain valid until 30/12/01.

When your study is completed, please forward your report marked to the Research Approvals Officer, Strategic Research Directorate, Department of Education and Training, Level 6, 35 Bridge Street, Sydney, NSW 2000.

Yours sincerely

Dr Paul Brock  
Director of Strategic Research  
21 May 2001
APPENDIX D.

A PILOT STUDY OF THE PSYCHOMETRIC PROPERTIES OF
THE FROST MULTIDIMENSIONAL PERFECTIONISM SCALE:
CLARIFICATION OF MULTIDIMENSIONALITY AND
PERFECTIONIST TYPOLOGY.

(Currently being revised for publication in the Journal of
Educational Psychology and Measurement) ¹³

¹³ Earlier versions of this paper were also presented at the 2nd International Conference on
Special Education: Inspiration Beyond 2000, Jan. 12-16 2000, Bangkok; The International
Psychometric properties of the FMPS for Australian adolescent girls

A Pilot Study of the Psychometric Properties of the Frost Multidimensional Perfectionism Scale: Clarification of Multidimensionality and Perfectionist Typology

Abstract

The psychometric properties of the 'Multidimensional Perfectionism Scale' (Frost, Marten, Lahart, & Rosenblate, 1990) were investigated, to determine its usefulness as a measurement of perfectionism with Australian secondary school girls, and to find empirical support for the existence of both healthy and unhealthy types of perfectionist students. Participants were 409 female mixed-ability students from Years 7, 8, 10 and 11 in two private secondary schools in Sydney, Australia. Factor analyses yielded four rather than the six factors theorized by Frost et al. Cluster analysis indicated a distinct typology of healthy perfectionists, unhealthy perfectionists and non-perfectionists. Healthy perfectionists were characterized by higher levels on Organization, while unhealthy perfectionists scored higher on the Parental Expectations & Criticism and Concern over Mistakes and Doubts dimensions of perfectionism. Both types of perfectionists scored high on Personal Standards.
Introduction

Empirical studies have embraced a global conceptualization of perfectionism as a dichotomous construct redolent of Hamachek's (1978) description of normal and neurotic perfectionists. The former set high standards and are highly motivated by their need for achievement whilst, at the same time, recognizing and accepting their limitations in an attempt to reach their goals. Hamachek (1978) defined normal perfectionists as “those who derive a very real sense of pleasure from the labors of a painstaking effort and who feel free to be less precise as the situation permits” (p.27). These individuals seek approval in much the same way as everybody else; the positive feeling derived from this approval serves to heighten their own sense of well-being and they are encouraged to continue on and further improve their efforts (p.27).

Neurotic perfectionists, on the other hand, cannot accept any limitations in their efforts to attain the high standards they set for themselves. These individuals are driven more by a fear of failure than the pursuit of excellence, and, as a result, fail to obtain satisfaction either with themselves or their performance (Hill, McIntyre, & Bacharach, 1997; Nugent, 2000; Pacht, 1984). Hamachek (1978) asserts that the efforts of neurotic perfectionists “never seem good enough, at least in their own eyes . . . They are unable to feel satisfaction because in their own eyes they never seem to do things good enough to warrant that feeling” (p.27).

A dual conceptualization of normal or adaptive perfectionism as contrasted with neurotic or maladaptive perfectionism was repeated throughout a number of early writings in the clinical
Psychometric properties of the FMPS for Australian adolescent girls

literature (Adler, 1956; Burns, 1980a; Hamachek, 1978; Hollender, 1965; Pacht, 1984). By the end of the 1980s, this theoretical distinction between adaptive and maladaptive forms of perfectionism captured the attention of researchers who became interested in substantiating the dichotomy through empirical studies.

Measuring Perfectionism

Initial efforts to define and measure perfectionism stressed the multidimensional nature of the construct in the development and validation of measurement instruments (Frost et al., 1990; Hewitt & Flett, 1991; Terry-Short, Owens, Slade, & Dewey, 1995). Among these researchers, there was a collective emphasis on the conceptualization of perfectionists as having excessively high standards. Frost et al. (1990), claimed that these standards are accompanied by critically stringent self-evaluation in the form of doubting one’s actions and being overly concerned with making mistakes. They also posited that perfectionists are unduly sensitive to parental criticism and expectations and tend to be preoccupied with an inflated need for order and organization.

Frost et al.’s (1990) multidimensional view of perfectionism is closely aligned with the complex characteristics and behaviors ascribed to perfectionist school students. These include compulsiveness in work habits, overconcern for details, unrealistic high standards for self and others, indiscriminate acquiescence to external evaluation, and placing over-emphasis on precision, order and organization (Kerr, 1991). Because of this we were particularly interested in the measurement instrument developed by Frost and his colleagues which was named the Multidimensional Perfectionism Scale, and has been validated for both child and adult non-clinical populations (Ablard & Parker, 1997; Hawkins, Watt, & Sinclair, 2000; Kornblum, 2001; Parker & Adkins, 1995a; Parker & Stumpf, 1995; Stöber, 1998). Frost et al.’s (1990)
Multidimensional Perfectionism Scale, hereafter referred to as the 'FMPS'\(^1\) (Flett, Sawatzky, & Hewitt, 1995), was designed to assess six factors measuring perfectionism, based on an extensive review of the literature. These six factors are Concern over Mistakes (CM), Personal Standards (PS), Parental Expectations (PE), Parental Criticism (PC), Doubts about Actions (D) and Organization (O).

The principal factor solution employed by the authors of the FMPS extracted the hypothesized six-factor structure of the instrument, which accounted for 54 percent of the variance. While some authors have found support for this structure using confirmatory factor analyses (Parker & Adkins, 1995a; Parker & Stumpf, 1995), others have argued that the structure does not replicate across different samples (Purdon, Antony, & Swinson, 1999; Rhéaume, Freeston, Dugas, Letarte, & Ladouceur, 1995). Stöber (1998) claimed that neither the CM and D dimensions, nor the PE and PC dimensions were factorially distinct. The convergence of CM with D (CMD) and PE with PC (PEC) resulted in a four factor structure using Horn’s parallel analysis (Horn, 1965). This simple structure was believed to represent a more parsimonious description of perfectionism that was robust across populations (Stumpf & Parker, 2000). Although the same four-factor structure was supported by Stumpf and Parker (2000) using Horn’s parallel analysis with Promax rotation, they have called for further research on the factorial structure of the instrument across diverse samples.

Our observation is that much of the non-clinical work using the FMPS has been conducted with academically gifted participants and college students, and that there is a need to

---

\(^1\) This paper refers to the Multidimensional Perfectionism Scale (Frost et al., 1990), as the FMPS, as suggested by Flett, Sawatzky and Hewitt (1995).
include samples which span a broader ability and age spectrum. We include students from two focal points of their secondary school experience and of all levels of school ability.

There is some debate regarding the inclusion of the Organization subscale as part of a measurement of perfectionism. Frost et al. (1990) did not include O in their overall FMPS perfectionism score due to its weak correlation with the other subscales. However, in their multidimensional conceptualization the authors emphasized the need for order and organization because of the frequency with which it has appeared in the literature as a common characteristic of the perfectionist. On substantive grounds, it would seem that its inclusion is justified. In our data, there was a moderately strong association between the O and PS subscales, lending empirical support for the retention of the O factor.

The calculation of an overall global perfectionism score as suggested by Frost et al. (1990) may be problematic on both theoretical and empirical grounds. A theorized, multidimensional conceptualization of a construct is at odds with the notion of calculating a global or unidimensional score. It would seem unproductive to calculate a global score of perfectionism when the perfectionism scales themselves include content that has both positive and negative concomitants, any combination of which may contribute to the unique profile of a perfectionist individual (Bieling, Israeli, Smith, & Antony, 2003). Additionally, studies incorporating a global score of perfectionism have not reported any empirical confirmation of a one factor solution to analyses of the scores on the FMPS (Frost et al., 1990; Parker, 1997; Parker & Adkins, 1995a; Stöber, 1998). This stance was also taken by Stumpf and Parker (2000), who argued that it makes little sense to compute a single global perfectionism score from the FMPS, given their conclusion that two higher order healthy and unhealthy perfectionism factors best summarize the set of four first order factors.
Measures of Healthy versus Unhealthy Perfectionism

Theorists equate the behavioral consequences of positive strivings (e.g., high standards, persistence and conscientiousness) with a healthy form of perfectionism which, according to Hamachek (1978), contributes to high levels of achievement and motivation (Accordino, Accordino, & Slaney, 2000). In contrast the behavioral consequences of maladaptive self-evaluations are equated with an unhealthy form of perfectionism which leads to feelings of inadequacy (Burns, 1980a), or suffering from negative affect (Blatt, 1995) in achievement situations.

Based on this theoretical duality, previous studies have also suggested an empirical distinction between healthy and unhealthy dimensions of perfectionism. Frost, Heimberg, Holt, Mattia and Neubauer (1993), combined the six subscales from the FMPS with the three subscales from the HMPS (the Multidimensional Perfectionism Scale developed by Hewitt and Flett in 1991) in a principal components factor analysis. Both orthogonal and oblique rotations yielded two distinct higher order factors they named ‘Positive Strivings’ and ‘Maladaptive Evaluation Concern’. Personal Standards, Organization (FMPS), Self-Oriented Perfectionism, and Other-Oriented Perfectionism (HMPS), were associated with the positive factor, while Concern over Mistakes, Parental Criticism, Parental Expectations, Doubts about Actions (FMPS), and Socially-Prescribed Perfectionism (HMPS) formed the negative factor.

---

2 The scale developed by Hewitt and Flett in 1991 was also named the Multidimensional Perfectionism Scale in which 3 major dimensions of perfectionism were conceptualized; self-oriented perfectionism, other-oriented perfectionism, and socially-prescribed perfectionism (Hewitt & Flett, 1991).
Similarly, Stumpf and Parker (2000) argued for two higher order factors based on the exploratory approach of a principal components factor analysis of the 6 subscales of the FMPS, with Personal Standards (PS) and Organization (O) comprising the healthy, and Concern & Doubts (CD) and Parental Pressure (PP) the unhealthy dimensions. Although significance levels were not reported by Stumpf and Parker (2000) for correlations between perfectionism factors and personality outcomes, inspection of the coefficients showed that two of the first order factors, Concern and Doubts (CD) and Parental Pressure (PP), differently predicted self-esteem as measured by the Rosenberg Self-Esteem Scale (Rosenberg, 1965). While CD related moderately strongly to self-esteem (-0.58), PP showed a much lower correlation (-0.28).

Similarly the Organization (O) factor appeared to have a somewhat higher association with the personality characteristics of endurance (0.35), and order (0.35) scales of the Adjective Check List (Gough & Heilbrun Jr., 1983) than with Personal Standards (PS), (0.23) and (0.26), respectively. O and PS also differently predicted conscientiousness. O was related more strongly to conscientiousness (0.52) than PS (0.39).

In addition to the first order component factors for the higher order constructs differently predicting several outcomes, their correlations were not especially strong (.28 for O and PS, .42 for CD and PP), when considered from the proposed positive/negative higher order perspective. Positive correlations found between the healthy factors (PS and O) and conscientiousness, and between the unhealthy factors (CD and PP) and low self-esteem, were presented as evidence for the predictive validity of a healthy and unhealthy dichotomy. This has been taken as further support for the existence of higher order healthy versus unhealthy perfectionism factors on the FMPS.
Psychometric properties of the FMPS for Australian adolescent girls

It is timely that the validity of the proposed higher order healthy and unhealthy perfectionism constructs be assessed in additional studies and across diverse samples through the use of nested confirmatory factor analyses that simultaneously assess the fit of scale items to the first order constructs and these, in turn, to the higher order factors.

A Perfectionist Typology

In contrast to the proposed higher order healthy and unhealthy perfectionism constructs, other researchers have argued for a tripartite typology of perfectionist individuals. Scores on the FMPS have been used in a number of cluster analytic studies of perfectionism in which support has been found for such a typology. Parker (1977) identified two perfectionist clusters and a third non-perfectionist cluster in his study of academically talented youth. He described the first cluster as non-perfectionists, as they obtained low scores on PS, PE & O as well as for total perfectionism (P), which was an aggregate of the four dimensional scores. A healthy perfectionist cluster was indicated by low scores on CM, PC, and D, moderate PS, and high O scores. Students falling into the third cluster group were referred to as dysfunctional perfectionists because they obtained the highest scores on the CM, PS, PE, PC, D subscales as well as total P. The FMPS was also used in a number of studies of college students (Rice & Dellwo, 2002a, 2002b; Rice & Lapsley, 2001; Rice & Mirzadeh, 2000; Slaney, Rice, & Ashby, 2002), who found similar perfectionist clusters (which they named adaptive and maladaptive) as well as a third non-perfectionist cluster.

Two Australian studies have found evidence for this perfectionist typology based on an examination of the four FMPS dimensions as proposed by Stöber (1998). As reported earlier (Hawkins et al., 2000) both the healthy and unhealthy clusters had the highest scores for PS. This
was also the case in a study of college students conducted by Rice and Lapsley (2001). The composition of the perfectionist clusters in Kornblum’s (2001) study of Australian gifted school students was the same as Rice and Mirzadeh (2000) with unhealthy perfectionists obtaining the highest scores on PS, and the healthy cluster reporting moderately high levels of PS and very high need for order and organization. There is, however, a lack of consistency regarding the role of PS in the psyche of the perfectionist individual. How does one account for the fact that across these studies, both healthy and unhealthy groups of perfectionists were characterized by the setting of high personal standards? On the other hand, it was interesting to note that high scores on the Organization scale of the FMPS were consistently obtained by the healthy perfectionist groups across all of these cluster analytic studies.

Although the tri-partite perfectionist typology has been supported across each of these cluster analytic studies, the representation of the dimensional subscales of the FMPS in each cluster contained some notable differences. Higher levels of PS were found in the unhealthy cluster in the Parker (1997) and Rice and Mirzadeh (2000) studies, in both the unhealthy and healthy clusters by Rice and Lapsley (2001), whilst Rice and Dellwo (2002) reported that the healthy cluster obtained the highest scores on this subscale. All four studies reported that the highest scores on O were obtained by the healthy cluster. It was the unhealthy cluster that scored highest on the CM, D, PE and PC subscales, although Rice and Dellwo (2002) found that the healthy cluster had higher PE than PC scores, demonstrating that healthy perfectionists perceived their parents to hold high expectations for their success accompanied by perceived lower levels of criticism. The effect of perceptions of parental influences on self-esteem was also noted by Stumpf and Parker (2000), who found that scores on PE were not as strongly related to lack of

263
self-esteem, as were the scores on PEC. They caution against a possible loss of information if both parental scales are collapsed into one, although this was unproblematic in our study.

There is then, increasing support for a typology of healthy perfectionism, unhealthy perfectionism and non-perfectionism. A number of issues, however, remain unresolved. These include whether high PS typifies both healthy and unhealthy perfectionists, or the healthy cluster alone, whether the O subscale should be included in the measurement of perfectionism, and whether perfectionism itself is better represented by two higher order factors. The relative lack of gender differences reported throughout the literature suggests further the need to investigate whether there are gender specific aspects of the perfectionist typology. There is a continuing need to examine the concept of perfectionism and its measurement in more diverse populations with particular emphasis on the FMPS core components of perfectionism in providing a detailed description of a perfectionist profile.

The Present Study

While a number of empirical studies have examined the presence of perfectionism in school-aged children, these have been limited either to gifted populations, or have tended to focus on negative aspects of perfectionism (Bieling et al., 2003; Einstein, Lovibund, & Gaston, 2000; Kornblum, 2001; LoCicero & Ashby, 2000; Parker, 1997; Parker, Portešová, & Stumpf, 2001; Parker & Stumpf, 1995). We extend on this body of work by examining the dimensionality of the perfectionism construct in a sample of Australian adolescent girls spanning secondary school Years 7 to 11 and incorporating a broader spectrum of student ability.

In Australia, there has been little empirical research into the manifestation of perfectionist behaviors, healthy or unhealthy, in the daily learning experiences of typical secondary school
Psychometric properties of the FMPS for Australian adolescent girls

students. An initial investigation into the construct of perfectionism necessitates an examination of the psychometric properties of a measurement of perfectionism to clarify existing theories on the multidimensional nature of the construct and on the existence of both healthy and unhealthy types of perfectionists. The purpose of this study was therefore to extend previous studies of perfectionism conducted outside Australia, through an examination of the psychometric properties of the FMPS (Frost et al., 1990). Our first objective was to determine the number and nature of the core components of perfectionism as theorized by Frost et al., (1990) and to examine support for the presence of two higher order factors representing positive and negative aspects of perfectionism. We also aimed to examine the typology of perfectionist student and to determine whether holding high personal standards was attributable to both healthy and unhealthy perfectionists.

On the basis of prior cluster analytic studies (Kornblum, 2001; Parker, 1997; Parker et al., 2001; Rice & Dellwo, 2002b; Rice & Lapsley, 2001; Rice & Mirzadeh, 2000; Slaney et al., 2002), we hypothesized that profiles of scores on the dimensions of the FMPS would enable the identification of three distinct cluster groups. It was expected that a healthy perfectionist cluster would emerge in which students scored highest on the PS and O subscales. Unhealthy perfectionists were expected to obtain the highest scores on the CM, D, PE and PC subscales. The non-perfectionist cluster was expected to demonstrate moderate to low levels of perfectionism across all dimensions of the FMPS.
Psychometric properties of the FMPS for Australian adolescent girls

Method

The present study examined the psychometric properties of the Frost Multidimensional Perfectionism Scale (Frost et al., 1990), to assess its usefulness as a measurement of a multidimensional concept of perfectionism in Australian adolescent female students and if perfectionism is best viewed in more broadly defined positive and negative terms. Further, we assessed whether students could be classified into healthy, unhealthy and non-perfectionist groups within this context.

Participants for the study were 409 mixed-ability female students from each of Years 7, 8, 10 and 11 in two private secondary girls’ schools in the Sydney Metropolitan area. The majority of students attending private schools in Sydney are from middle to upper socioeconomic status backgrounds. The present sample also included girls from a number of non-English speaking backgrounds (South East Asia 8.07%; Europe 8.60%; Middle East 1.71%; South Africa .98%; South America .49%), which reflects the multicultural nature of Australian society.

All the girls completed the FMPS (Frost et al., 1990) which consists of 35 statements, to which participants respond on a five-point Likert scale ranging from 1 (not at all true) through to 5 (very true). The self-report questionnaire is designed to produce scores for the six subscales of: Concern over Mistakes (CM), Personal Standards (PS), Parental Expectations (PE), Parental Criticism (PC), Doubts about Actions (D), and Organization (see Table 1). Frost et al. (1990) reported subscale alphas ranging from .77 to .93. The original scale was adapted for the study by changing 7 items that were originally worded in the past tense into the present tense in order to be more meaningful to the participating students’ current experiences. These items specifically related to the respondents’ perceived parental expectations and criticism (e.g., item 11, “My
*parents wanted me to be the best at everything*” was changed to “*My parents want me to be the best at everything.*”).

Following ethical approvals and informed consents, data were obtained during the first half of the academic school year. The researcher and class teachers administered the FMPS to intact class groups. The questionnaire took between 10 and 15 minutes to complete and there were no missing data.

**Data Analysis**

*Dimensions of Perfectionism.*

A combination of exploratory and confirmatory procedures was employed to confirm the factorial stability of the FMP. An exploratory factor analysis (EFA) with maximum likelihood extraction and oblimin rotation was used first to explore the factorial structure of the FMPS as a conservative confirmatory approach (Gorsuch, 1983). Cronbach alpha reliabilities determined internal consistency for the resulting factors. A confirmatory factor analysis (CFA) was subsequently applied to this factor solution, using robust maximum likelihood, where items were specified to load only on their respective factors, error variances were estimated, and no error covariances were permitted. Correlations among the latent constructs were estimated freely. Commonly accepted CFA fit statistics as well as modification indices were taken into account in evaluating the fit of the CFA. To assess the validity of possible higher order ‘positive’ and ‘negative’ perfectionism factors, a nested CFA was conducted. Here, items were specified as indicators for first order factors as in the preceding analysis. ‘Positive’ first order factors were specified as indicated for a higher order ‘positive’ factor, and ‘negative’ first order factors were specified as indicated for a higher order ‘negative’ factor. Correlations among latent constructs

267
Psychometric properties of the FMPS for Australian adolescent girls

were freely estimated, as were error variances, but no error covariances were permitted in initial analyses.

Perfectionist Typology.

Cluster analysis was used to determine whether there was an identifiable typology of perfectionist student based on FMPS factor scores, using Ward’s method and squared Euclidean distance. The selection of number of clusters was based both on the a priori theorization of two perfectionist groups (as theorised by Hamachek, 1978) and a third, non-perfectionist group (Kornblum, 2001; Parker, 1997; Parker et al., 2001; Rice & Dellwo, 2002c; Rice & Lapsley, 2001; Rice & Mirzadeh, 2000; Slaney et al., 2002). Additionally, we implemented an empirical criterion, based on inspection of the cluster dendogram, and relative changes in the fusion coefficient (Hair, Anderson, Tathan, & Black, 1995; Kim & Mueller, 1984). MANOVA tested where differences in cluster group means on perfectionism factors were statistically significant (p<.05), and post hoc comparisons using Tukey’s a and Bonferroni correction located significant differences between cluster pairs.

Results

Dimensions of Perfectionism

Several researchers have been concerned about the factorial instability of the FMPS due to a number of solutions where items did not load on the factors to which they had initially been assigned (Frost et al., 1990; Parker & Adkins, 1995; Purdon et al., 1999; Rhéaume et al., 1995; Stöber, 1998). The question of how many factors to retain in exploratory factor analysis is crucial
to the final solution (Gorsuch, 1983). Our initial exploratory factor analysis which specified six factors did show factorial instability, with some items loading on multiple factors, indicating a possible problem with overextraction.

As in some previous studies, Item 16 'I am very good at focusing my efforts on attaining a goal' (Personal Standards), and Item 18, 'I hate being less that the best at things' (Concern over Mistakes), loaded on more than one factor (see also Parker & Adkins, 1995; Rhéaume et al., 1995; Stöber, 1998). In our analysis, Item 16 displayed almost equal loadings on both Personal Standards (PS, .389) and Organization (O, .343), while Item 18 loaded on both Concern over Mistakes & Doubts (CMD, .421), and Personal Standards (PS, .380). We deleted these two items from further analyses. Although a criterion of eigenvalues greater than unity would suggest six latent variables accounting for 54% of the variance, the last two eigenvalues were close to unity (1.31 and 1.15), and the Cattell Scree Test (Cattell, 1966) indicated only four clear factors (see Figure 1).

![Figure 1. Scree plot for four-factor EFA.](image)

269
Psychometric properties of the FMPS for Australian adolescent girls

A reformulated, 4 factor, 33-item model was subjected to maximum likelihood extraction with oblimin rotation. This four-factor solution accounted for 48% of the variance, and the resulting pattern of factor loadings is shown in Table 1, along with Cronbach alpha measures of internal consistency for each factor. All items for Parental Expectations (PE) and Parental Criticism (PC) loaded on Factor 1, which was subsequently termed Parental Expectations and Criticism (PEC\(^2\)). Factor 2 retained items relating to Organization (O) and Factor 3 items relating to Personal Standards (PS). Items for Concern over Mistakes (CM) and Doubts about Actions (D) items, loaded on Factor 4, subsequently termed Concern over Mistakes and Doubts (CMD\(^2\)).

A subsequent CFA, specifying these four factors (PEC, CMD, PS and O), converged in 11 iterations and exhibited marginal fit (normal theory weighted least squares chi-square = 1409.51 df=489, RMSEA=.07, NFI=.90, NNFI=.93, GFI=.83, AGFI=.80). However, a large modification index (83.92) suggested freeing the error covariance between items 22 and 35. Since the wording of these items was parallel, differing only for the last word (see Table 1), we set this error covariance to be freely estimated. A second CFA was therefore conducted, identical to the first except for the freed error covariance between items 22 and 35. This model converged in 10 iterations, and fit statistics were slightly improved (normal theory weighted least squares chi-square = 1253.68 df=488, RMSEA=.06, NFI=.90, NNFI=.94, GFI=.84, AGFI=.82), with no large modification indices (the largest was 37.28). Factor loadings and measurement errors from

\(^2\) These abbreviations (i.e., CMD & PEC) are taken from Stöber and Joorman (2001). Other researchers use different names and labels for the same combinations. For example, the Parker/Stumpf group calls the combination of Parental Expectations & Parental Criticism ‘Parental Pressure’.
Psychometric properties of the FMPS for Australian adolescent girls

this second CFA are presented in Table 2, and correlations among the latent constructs are shown in Table 3.

Table 1

*FMPS Items, Pattern Matrix and Cronbach Alpha Subscale Reliabilities for Four-factor Solution (Maximum Likelihood Extraction and Oblimin Rotation)*

<table>
<thead>
<tr>
<th>#</th>
<th>Item</th>
<th>PEC α=.85</th>
<th>O α=.87</th>
<th>PS α=.76</th>
<th>CMD α=.83</th>
</tr>
</thead>
<tbody>
<tr>
<td>V20</td>
<td>My parents expect excellence from me</td>
<td>.773</td>
<td>.079</td>
<td>.179</td>
<td>-.100</td>
</tr>
<tr>
<td>V11</td>
<td>My parents want me to be the best at everything</td>
<td>.692</td>
<td>-.021</td>
<td>.174</td>
<td>-.087</td>
</tr>
<tr>
<td>V1</td>
<td>My parents set very high standards for me</td>
<td>.678</td>
<td>.003</td>
<td>.265</td>
<td>-.193</td>
</tr>
<tr>
<td>V35</td>
<td>I never feel that I can meet my parents’ standards</td>
<td>.662</td>
<td>-.007</td>
<td>-.274</td>
<td>.217</td>
</tr>
<tr>
<td>V26</td>
<td>My parents have always had higher expectations for my future than I have</td>
<td>.649</td>
<td>.031</td>
<td>-.194</td>
<td>.062</td>
</tr>
<tr>
<td>V15</td>
<td>Only outstanding performance is good enough in my family</td>
<td>.626</td>
<td>-.053</td>
<td>.091</td>
<td>.085</td>
</tr>
<tr>
<td>V22</td>
<td>I never feel that I can meet my parents’ expectations</td>
<td>.586</td>
<td>-.009</td>
<td>-.260</td>
<td>.262</td>
</tr>
<tr>
<td>V3</td>
<td>As a child, I was punished for doing things less than perfectly</td>
<td>.399</td>
<td>-.053</td>
<td>.013</td>
<td>.145</td>
</tr>
<tr>
<td>V5</td>
<td>My parents never try to understand my mistakes</td>
<td>.341</td>
<td>-.088</td>
<td>-.102</td>
<td>.206</td>
</tr>
<tr>
<td>V7</td>
<td>I am a neat person</td>
<td>.006</td>
<td>.775</td>
<td>.007</td>
<td>-.066</td>
</tr>
<tr>
<td>V29</td>
<td>Neatness is very important to me</td>
<td>.121</td>
<td>.767</td>
<td>.008</td>
<td>.073</td>
</tr>
<tr>
<td>V31</td>
<td>I am an organized person</td>
<td>-.036</td>
<td>.736</td>
<td>.095</td>
<td>-.057</td>
</tr>
<tr>
<td>V2</td>
<td>Organization is very important to me</td>
<td>-.100</td>
<td>.733</td>
<td>.110</td>
<td>.117</td>
</tr>
<tr>
<td>V27</td>
<td>I try to be a neat person</td>
<td>.065</td>
<td>.669</td>
<td>-.074</td>
<td>.028</td>
</tr>
<tr>
<td>V8</td>
<td>I try to be an organized person</td>
<td>-.089</td>
<td>.637</td>
<td>.077</td>
<td>.012</td>
</tr>
<tr>
<td>V12</td>
<td>I set higher goals than most people</td>
<td>-.016</td>
<td>.033</td>
<td>.740</td>
<td>-.005</td>
</tr>
<tr>
<td>V19</td>
<td>I have extremely high goals</td>
<td>.055</td>
<td>.067</td>
<td>.605</td>
<td>-.005</td>
</tr>
<tr>
<td>V30</td>
<td>I expect higher performance in my daily tasks than most people</td>
<td>.154</td>
<td>.071</td>
<td>.599</td>
<td>.058</td>
</tr>
<tr>
<td>V24</td>
<td>Other people seem to accept lower standards from themselves than I do</td>
<td>-.066</td>
<td>.017</td>
<td>.514</td>
<td>.090</td>
</tr>
<tr>
<td>V6</td>
<td>It is important to me that I be thoroughly competent in what I do</td>
<td>.032</td>
<td>.217</td>
<td>.425</td>
<td>-.020</td>
</tr>
<tr>
<td>V4</td>
<td>If I do not set the highest standards for myself, I am likely to end up a second-rate person</td>
<td>.053</td>
<td>.060</td>
<td>.376</td>
<td>.142</td>
</tr>
<tr>
<td>V33</td>
<td>It takes me a long time to do something ‘right’</td>
<td>-.047</td>
<td>-.031</td>
<td>-.123</td>
<td>.588</td>
</tr>
<tr>
<td>V14</td>
<td>If I fail partly, it is as bad as being a complete failure</td>
<td>.012</td>
<td>-.084</td>
<td>.182</td>
<td>.575</td>
</tr>
<tr>
<td>V9</td>
<td>If I fail at school, I am a failure as a person</td>
<td>.096</td>
<td>-.027</td>
<td>.146</td>
<td>.573</td>
</tr>
<tr>
<td>V17</td>
<td>Even when I do something very carefully, I often feel that it is not quite right</td>
<td>-.061</td>
<td>.094</td>
<td>-.061</td>
<td>.556</td>
</tr>
<tr>
<td>V28</td>
<td>I usually have doubts about the simple everyday things that I do</td>
<td>.024</td>
<td>.065</td>
<td>-.031</td>
<td>.531</td>
</tr>
<tr>
<td>V13</td>
<td>If someone does a task at school better than I do, then I feel as if I failed the whole task</td>
<td>.032</td>
<td>-.010</td>
<td>.244</td>
<td>.524</td>
</tr>
<tr>
<td>V23</td>
<td>If I do not do as well as other people, it means I am an inferior being</td>
<td>.106</td>
<td>.101</td>
<td>.054</td>
<td>.517</td>
</tr>
<tr>
<td>V25</td>
<td>If I do not do well all the time, people will not respect me</td>
<td>.086</td>
<td>-.169</td>
<td>.310</td>
<td>.453</td>
</tr>
<tr>
<td>V10</td>
<td>I should be upset if I make a mistake</td>
<td>.038</td>
<td>-.053</td>
<td>.246</td>
<td>.433</td>
</tr>
<tr>
<td>V21</td>
<td>People will probably think less of me if I make a mistake</td>
<td>.126</td>
<td>-.108</td>
<td>.212</td>
<td>.393</td>
</tr>
<tr>
<td>V34</td>
<td>The fewer mistakes I make, the more people will like me</td>
<td>.155</td>
<td>-.087</td>
<td>.138</td>
<td>.388</td>
</tr>
<tr>
<td>V32</td>
<td>I tend to get behind in my work because I repeat things over and over</td>
<td>.040</td>
<td>.025</td>
<td>-.091</td>
<td>.374</td>
</tr>
</tbody>
</table>
Psychometric properties of the FMPS for Australian adolescent girls

Note. PEC = Parental Expectations & Criticism; O = Organization; PS = Personal Standards; CMD = Concern over Mistakes & Doubts.

Table 2

Confirmatory Factor Analysis: Factor Loadings (LX) and Measurement Errors (TD)

(Completely Standardized Solution)

<table>
<thead>
<tr>
<th></th>
<th>#</th>
<th>LX</th>
<th>TD</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Parental Expectations and Criticism (PEC)</strong></td>
<td>V1</td>
<td>.63</td>
<td>.61</td>
</tr>
<tr>
<td></td>
<td>V3</td>
<td>.50</td>
<td>.75</td>
</tr>
<tr>
<td></td>
<td>V5</td>
<td>.45</td>
<td>.80</td>
</tr>
<tr>
<td></td>
<td>V11</td>
<td>.69</td>
<td>.52</td>
</tr>
<tr>
<td></td>
<td>V15</td>
<td>.72</td>
<td>.49</td>
</tr>
<tr>
<td></td>
<td>V20</td>
<td>.76</td>
<td>.43</td>
</tr>
<tr>
<td></td>
<td>V22</td>
<td>.59</td>
<td>.65</td>
</tr>
<tr>
<td></td>
<td>V26</td>
<td>.61</td>
<td>.63</td>
</tr>
<tr>
<td></td>
<td>V35</td>
<td>.65</td>
<td>.58</td>
</tr>
<tr>
<td><strong>Concern over Mistakes and Doubts (CMD)</strong></td>
<td>V9</td>
<td>.68</td>
<td>.54</td>
</tr>
<tr>
<td></td>
<td>V10</td>
<td>.55</td>
<td>.70</td>
</tr>
<tr>
<td></td>
<td>V13</td>
<td>.63</td>
<td>.60</td>
</tr>
<tr>
<td></td>
<td>V14</td>
<td>.65</td>
<td>.57</td>
</tr>
<tr>
<td></td>
<td>V17</td>
<td>.42</td>
<td>.83</td>
</tr>
<tr>
<td></td>
<td>V21</td>
<td>.57</td>
<td>.68</td>
</tr>
<tr>
<td></td>
<td>V23</td>
<td>.59</td>
<td>.66</td>
</tr>
<tr>
<td></td>
<td>V25</td>
<td>.64</td>
<td>.59</td>
</tr>
<tr>
<td></td>
<td>V28</td>
<td>.46</td>
<td>.79</td>
</tr>
<tr>
<td></td>
<td>V32</td>
<td>.32</td>
<td>.90</td>
</tr>
<tr>
<td></td>
<td>V33</td>
<td>.45</td>
<td>.80</td>
</tr>
<tr>
<td></td>
<td>V34</td>
<td>.55</td>
<td>.70</td>
</tr>
<tr>
<td><strong>Personal Standards (PS)</strong></td>
<td>V4</td>
<td>.42</td>
<td>.83</td>
</tr>
<tr>
<td></td>
<td>V6</td>
<td>.51</td>
<td>.75</td>
</tr>
<tr>
<td></td>
<td>V12</td>
<td>.78</td>
<td>.40</td>
</tr>
<tr>
<td></td>
<td>V19</td>
<td>.67</td>
<td>.55</td>
</tr>
<tr>
<td></td>
<td>V24</td>
<td>.56</td>
<td>.69</td>
</tr>
<tr>
<td></td>
<td>V30</td>
<td>.65</td>
<td>.57</td>
</tr>
<tr>
<td><strong>Organization (O)</strong></td>
<td>V2</td>
<td>.77</td>
<td>.41</td>
</tr>
<tr>
<td></td>
<td>V7</td>
<td>.78</td>
<td>.40</td>
</tr>
<tr>
<td></td>
<td>V8</td>
<td>.66</td>
<td>.56</td>
</tr>
<tr>
<td></td>
<td>V27</td>
<td>.63</td>
<td>.61</td>
</tr>
<tr>
<td></td>
<td>V29</td>
<td>.74</td>
<td>.45</td>
</tr>
<tr>
<td></td>
<td>V31</td>
<td>.78</td>
<td>.40</td>
</tr>
</tbody>
</table>
Psychometric properties of the FMPS for Australian adolescent girls

Note. Error covariance of V22 and V35 = .29

Table 3

*Correlations Among Latent Constructs*

<table>
<thead>
<tr>
<th>Factor</th>
<th>PEC</th>
<th>CMD</th>
<th>PS</th>
<th>O</th>
</tr>
</thead>
<tbody>
<tr>
<td>PEC</td>
<td>-</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CMD</td>
<td>.60**</td>
<td>-</td>
<td></td>
<td></td>
</tr>
<tr>
<td>PS</td>
<td>.29**</td>
<td>.40**</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>O</td>
<td>-.08</td>
<td>-.04</td>
<td>.33**</td>
<td>-</td>
</tr>
</tbody>
</table>

Note. PEC = Parental Expectations & Criticism; O = Organization; PS = Personal Standards; CMD = Concern over Mistakes & Doubts

**p < .01

*Higher Order Healthy and Unhealthy Perfectionism*

First order ‘positive’ PS and O factors were specified as equally contributing indicators for a latent ‘positive perfectionism’ factor, and first order PEC and CMD factors specified as equally contributing indicators for a latent ‘negative perfectionism’ factor. Intercorrelations were freely estimated and robust maximum likelihood was again used.

The nested CFA which assessed the validity of higher order ‘healthy’ and ‘unhealthy’ perfectionism factors showed marginal model fit and converged in 34 iterations (normal theory weighted least squares chi-square = 1402.49 df=491, RMSEA=.07,
Psychometric properties of the FMPS for Australian adolescent girls

NFI=.89, NNFI=.93, GFI=.83, AGFI=.81). Cronbach alpha measures of internal consistency were not acceptable, being $\alpha=.45$ for the healthy and $\alpha=.66$ for the unhealthy higher order factor. Table 4 shows first order factor loadings and measurement errors, and higher order factor loadings and uniquenesses from the nested CFA. While these fit indices aid in the evaluation in model fits, there is ultimately a degree of subjectivity and professional judgment in the selection of 'best' models. Inspection of interrelations among 'healthy' PS and O components (.33) and 'unhealthy' CMD and PEC components (.60, see Table 3), shows these were no stronger often than across-construct correlations, and for the healthy perfectionism factor the correlation was not strong in any case. Importantly, this was also the case in the Stumpf and Parker (2000) study, despite their conclusion favoring the two higher order positive and negative factors.

In evaluating hierarchical CFA models, it has been argued by Marsh and colleagues that weak correlations among first order factors imply a weak hierarchy (Marsh, 1987; Marsh & Hocevar, 1985) since most of the reliable variance in the first order factors is unexplained by the higher order factors. This is an important consideration in deciding whether to summarize data using higher order constructs, or to rely on the greater number of first order factors. As shown in Table 3, PS correlated most strongly with CMD, one of the 'negative' perfectionism factors (.40), and correlated similarly with PEC, the other 'negative' factor (.29) and O, a 'positive' factor (.33). Based on the weak correlations within proposed higher order factors relative to across-construct correlations, the unacceptable scale reliabilities, as well as the marginal model fit, the presence of two higher order healthy (PS and O) and unhealthy (CMD and PEC) factors was rejected. Our analyses are therefore based on the four first order factors of PS, O, CMD and PEC.
Table 4

**Psychometric properties of the FMPS for Australian adolescent girls**

<table>
<thead>
<tr>
<th>Higher order Factor</th>
<th>Scale/item</th>
<th>LY</th>
<th>TE</th>
<th>GA</th>
<th>PSI</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Unhealthy perfectionism</strong></td>
<td><em>Parental Expectations and Criticism</em></td>
<td></td>
<td></td>
<td>.74</td>
<td>.46</td>
</tr>
<tr>
<td>$\alpha = .66$</td>
<td><strong>V1</strong></td>
<td>.65</td>
<td>.58</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>V3</strong></td>
<td>.50</td>
<td>.75</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>V5</strong></td>
<td>.44</td>
<td>.80</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>V11</strong></td>
<td>.70</td>
<td>.51</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>V15</strong></td>
<td>.72</td>
<td>.49</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>V20</strong></td>
<td>.77</td>
<td>.41</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>V22</strong></td>
<td>.59</td>
<td>.65</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>V26</strong></td>
<td>.61</td>
<td>.63</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>V35</strong></td>
<td>.65</td>
<td>.59</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>Concern over Mistakes and Doubts</strong></td>
<td></td>
<td></td>
<td>.78</td>
<td>.39</td>
</tr>
<tr>
<td></td>
<td><strong>V9</strong></td>
<td>.64</td>
<td>.59</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>V10</strong></td>
<td>.52</td>
<td>.73</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>V13</strong></td>
<td>.61</td>
<td>.63</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>V14</strong></td>
<td>.63</td>
<td>.60</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>V17</strong></td>
<td>.40</td>
<td>.84</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>V21</strong></td>
<td>.54</td>
<td>.71</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>V23</strong></td>
<td>.57</td>
<td>.68</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>V25</strong></td>
<td>.62</td>
<td>.62</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>V28</strong></td>
<td>.44</td>
<td>.80</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>V32</strong></td>
<td>.31</td>
<td>.91</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>V33</strong></td>
<td>.43</td>
<td>.82</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>V34</strong></td>
<td>.52</td>
<td>.73</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Positive perfectionism</strong></td>
<td><em>Personal Standards</em></td>
<td></td>
<td></td>
<td>.95</td>
<td>.10</td>
</tr>
<tr>
<td>$\alpha = .45$</td>
<td><strong>V4</strong></td>
<td>.31</td>
<td>.91</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>V6</strong></td>
<td>.50</td>
<td>.75</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>V12</strong></td>
<td>.79</td>
<td>.38</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>V19</strong></td>
<td>.68</td>
<td>.54</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>V24</strong></td>
<td>.56</td>
<td>.69</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>V30</strong></td>
<td>.65</td>
<td>.58</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td><em>Organization</em></td>
<td></td>
<td></td>
<td>.72</td>
<td>.48</td>
</tr>
<tr>
<td></td>
<td><strong>V2</strong></td>
<td>.86</td>
<td>.26</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>V7</strong></td>
<td>.86</td>
<td>.27</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>V8</strong></td>
<td>.77</td>
<td>.41</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>V27</strong></td>
<td>.74</td>
<td>.46</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>V29</strong></td>
<td>.84</td>
<td>.30</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>V31</strong></td>
<td>.86</td>
<td>.27</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Note.* Error covariance between V22 and V35 = .30
Perfectionist Typology

In order to examine whether individuals could be classified into healthy (P+), unhealthy (P-), and non-perfectionist (Pn) groups, cluster analysis was employed. This is a multivariate data analytic technique that is useful for identifying homogenous subtypes within a complex data set (Borgen & Barnett, 1987). Individuals’ responses for the four FMPS subtest scores were analyzed using hierarchical cluster analysis, employing Ward's method, designed to optimize the minimum variance within clusters (Ward, 1963). Based on prior research (Komblum, 2001; Parker, 1997; Parker et al., 2001; Rice & Lapsley, 2001; Rice & Mirzadeh, 2000; Slaney et al., 2002), visual inspection of the dendogram, and inspection of relative change in the fusion coefficient with increasing number of clusters (see Figure 2), three clusters were identified. Mean scores for the three clusters on the four first order perfectionism factors are presented in Figure 3.

Figure 2. Fusion coefficients plotted by number of clusters.
Psychometric properties of the FMPS for Australian adolescent girls

Figure 3. Mean perfectionism scores for healthy, unhealthy, and non-perfectionist clusters.

Note. P+ = healthy type, P- = unhealthy type, Pn = non-perfectionist
PEC = Parental Expectations & Criticism, CMD = Concern over Mistakes & Doubts,
PS = Personal Standards, O = Organization

As shown in Figure 3 cluster 1 (P-) students (n=96) were characterized on the FMPS by having the highest scores on Parental Expectations and Criticism, and Concern over Mistakes and Doubts. Since both these factors were associated with negative forms of perfectionism, this cluster was termed unhealthy perfectionists (P-). Cluster 2 (Pn) students (n=106) exhibited the lowest scores of the three clusters, and this cluster was labeled non-perfectionists (Pn). Cluster 3 (P+) students (n=207) demonstrated low scores on the two negative factors (Parental Expectations and Criticism, Concern over Mistakes and
Psychometric properties of the FMPS for Australian adolescent girls

Doubts), high scores on Personal Standards, and the highest scores on Organization. Cluster 3 was therefore labeled healthy perfectionists.

To validate the three-cluster solution, MANOVA was performed on the dependent set of perfectionism subscale scores (Parental Expectations and Criticism, Organization, Personal Standards, Concern over Mistakes and Doubts), with cluster membership as the grouping variable, and Tukey a post hoc tests for paired comparisons using Bonferroni adjustment for experimentwise \( p < .05 \). There was a statistically significant multivariate effect of cluster membership on perfectionism dimensions (\( F(8,806) = 110.22, p < .001 \)) by the Pillai’s Trace Criterion, the most robust in samples with unequal n’s (Tabachnick & Fidell, 1996).

Univariate tests showed significant cluster effects on each of the four perfectionism factors (PEC: \( F(2,406) = 264.96, p < .001 \), CMD: \( F(2,406) = 49.64, p < .001 \), O:

\( F(2,406) = 180.25, p < .001 \), PS: \( F(2,406) = 25.10, p < .001 \). For PEC and CMD, the P- cluster scored significantly higher than P+, and P+ scored significantly higher than Pn (PEC: P-M = 3.54 SD = .66, P+ M = 2.32 SD = .62, Pn M = 1.67 SD = .40; CMD: P-M = 2.71 SD = .74, P+ M = 2.13 SD = .62, Pn M = 1.86 SD = .51). For PS, P- and P+ ratings were similar, and each scored significantly higher than the Pn cluster (P-M = 3.21 SD = .84, P+ M = 3.23 SD = .74, Pn M = 2.59 SD = .88), suggesting high personal standards to be a characteristic of both types of perfectionists. For O, the P+ cluster had significantly and substantially higher scores than both the P- and Pn clusters, whose ratings were similar to each other (P+ M = 4.43 SD = .37, P- M = 3.22 SD = .97, Pn M = 3.19 SD = .74) (indicated by Tukey a post hoc tests, see Figure 3), which suggests Organization may be the positive characteristic which distinguishes healthy from unhealthy perfectionists, along with both ‘negative’ PEC and CMD factors. The
Psychometric properties of the FMPS for Australian adolescent girls

similarity of P+ and P- scores on Personal Standards supports the notion that high PS is a

dominant characteristic of perfectionism and common to both healthy and unhealthy

perfectionists.

Summary

The findings of this study support previous assertions that the FMPS is more stable

with four, not six, underlying dimensions. The loading pattern of the present analysis is in

concurrence with Stöber (1998), Stumpf and Parker (2000), and Kornblum (2001), in which

the CM and D subscales combined to form a new subscale CMD (Concern over Mistakes

and Doubts), and the PE and PC subscales together formed a second new subscale PEC

(Parental Expectations and Criticism).

Higher order healthy and unhealthy perfectionism factors were not found to provide

valid summaries for these four first order factors. The higher order CFA analysis

demonstrated marginal fit, weak within-construct correlations, sizeable across-construct

correlations, and unacceptable alpha reliability coefficients. Higher order positive and

negative perfectionism factors were therefore not supported in our study.

Results of the cluster analysis indicated that scores on the FMPS could be used to
distinguish two types of perfectionist and a third, non-perfectionist type of student in this
sample of Australian girls. The first type was those for whom perfectionism may provide a
healthy stimulus (P+). The second type was characterized by unhealthy Concern over
mistakes and doubts and high levels of parental expectations and criticism (P-). The third
group of students was those for whom perfectionism may be quite irrelevant (Pn). The
clarity of the present four factor solution, together with support for three cluster types of

279
perfectionist students provides a useful cross cultural comparison with existing
examinations of the FMPS in North American studies with gifted and college student
populations (Parker, 1997; Parker et al., 2001; Parker & Stumpf, 1995; Purdon et al., 1999;
Rice & Dellwo, 2002; Rice & Lapsley, 2001; Rice & Mirzadeh, 2000; Stöber, 1998).

Discussion

The Multidimensional Perfectionism Construct

The aim of this study was to investigate the psychometric properties of the FMPS as
a measurement of perfectionism in Australian female secondary school students, and to
examine an empirical typology of perfectionist students. A combination of exploratory and
confirmatory factor analysis established the presence of four underlying dimensions of
perfectionism. This result is consistent with the findings of Stöber (1998) who suggested
that the Frost Multidimensional Perfectionism Scale was 'more perfect' with four
dimensions than the original six as theorized by Frost et al. (1990).

It has been argued that previous studies of perfectionism have emphasized negative
effects and that researchers interested in its positive aspects should continue to include the
Organization subscale in their analyses (Stöber, 1998; Terry-Short et al., 1995). This
subscale was originally dropped by Frost et al. (1990) because of its weak correlation with
the other subscales. In our study, there was a significant relationship between Organization
(0) and Personal Standards (PS), (0.33). A number of researchers have included the FMPS
subscales of O and PS into measures of healthy perfectionism (Frost, Heimberg, Holt,
Mattia, & Neubauer, 1993; Parker & Stumpf, 1995; Rice, Ashby, & Slaney, 1998), whilst
others include *Personal Standards* only (Dunkley, Blankstein, Halsall, & Williams, 2000; Lynd-Stevenson & Hearne, 1999). The results of our study support the retention of the *Organization* subscale, for a number of empirically and theoretically driven reasons. Most importantly, this was the positive factor which discriminated between healthy and unhealthy perfectionists. Anecdotal claims that perfectionists emphasize precision, order and organization (Frost et al., 1990; Hollender, 1965; Kerr, 1991), would therefore appear to relate to characteristics of healthy perfectionists. Indirect support for this hypothesis comes from another Australian study, involving a sample of university students, which found that high organizational perfectionism was associated with low levels of distress (Lynd-Stevenson & Hearne, 1999). This is consistent with our interpretation that holding a high level of organization is a key variable in distinguishing healthy perfectionists from their unhealthy counterparts. In addition, a prime factor in developing the FMPS was the incorporation of the full range of dimensions most commonly cited in the literature when referring to perfectionism. Because emphasis on order and orderliness has often been associated with perfectionism, retention of the *Organization* dimension acknowledges both the positive and negative qualities of perfectionism (Lynd-Stevenson & Hearne, 1999).

Our nested confirmatory factor analysis rigorously assessed whether there was any support for the presence of higher order ‘positive’ and ‘negative’ perfectionism factors. Our findings did not support a dichotomy between healthy and unhealthy higher order perfectionism factors. This was due to low correlations between the ‘healthy’ dimensions of PS and O, the substantially higher across-construct correlations between PS and CMD, similar correlations between PS and PEC to the within-construct correlation between PS and O, marginal model fit, and unacceptable alpha reliabilities. When substantial reliable
variance in first order factors cannot be explained by higher order factors, the practicality of the parsimony they offer is outweighed by more substantive considerations. Higher order factors in such cases do not provide valid descriptions of information provided in the first order factors. Within-construct correlations in Stumpf and Parker's (2000) study were not particularly strong either (0.28 for healthy and 0.42 for unhealthy perfectionism), although there were no strong across-construct correlations in their study. We were unable to determine if the alpha reliability coefficients in the Stumpf and Parker (2000) study were acceptable or as low as in the present study as they were not reported.

It will be important for further studies in diverse student samples to continue to explore the validity of a healthy versus unhealthy dichotomy for the multiple dimensions of perfectionism measured by the FMPS. Conclusions relating to higher order factors would be more directly and securely based on a confirmatory analysis nesting items within theorised constructs and also nesting these first order constructs within theorised higher order constructs. Such a nested analysis would be required to investigate convergent and divergent validity of the proposed factors (see Watt, 2002).

Perfectionist Typology

Results showed that high personal standards were common to students in both the healthy (P+) and unhealthy (P-) perfectionist groups both of which were higher than the non-perfectionist (Pn) group. The P- group was characterized by the highest scores on negative evaluative concerns (as represented in the PEC and CMD subscales), and the P+ group by the higher scores on Organization. Our data indicated that the differences between healthy and unhealthy perfectionists were attributable to differing patterns of scores across
Psychometric properties of the FMPS for Australian adolescent girls

four dimensions of the FMPS measurement of perfectionism. O discriminates between positive differences of P+ and P−, while CMD and PEC discriminate between the negative differences of P+ and P−.

Perfectionist typologies have also been identified in a number of studies across a range of samples. Parker and his colleagues found empirical support for two clusters of perfectionists and one non-perfectionist cluster in a nationally gathered sample of 820 academically talented sixth graders at the Center for Talented Youth of Johns Hopkins University (Parker, 1997). Similar results were found in a number of North American studies using college samples (Rice & Dellwo, ; Rice & Lapsley, 2001; Slaney et al., 2002), in a study of mathematically gifted and typical Czech students (Parker et al., 2001), and in Kornblum’s (2001) study of Australian gifted school students. Taken collectively these studies support the existence of a typology of healthy, unhealthy and non-perfectionist students across diverse samples (Cox, Enns, & Clara, 2002), although the actual profiles of the perfectionist clusters is somewhat varied, likely as a result of the number of dimensions of perfectionism being analyzed in the clustering procedure. The Parker and Rice groups incorporated the six original subscales of the FMPS, while Kornblum (2001), like ourselves, examined four reformulated dimensions of the measure of perfectionism in line with Stöber’s (1998) four factor solution. Kornblum’s (2001) findings were similar to our own; holding high personal standards is common to both healthy and unhealthy perfectionists. An additional empirical confirmation of our interpretation that healthy perfectionists are further characterized by their highest scores on the Organization subscale was evidenced in the results of all of the cluster analytic studies of the FMPS that we have

283
Psychometric properties of the FMPS for Australian adolescent girls

reviewed (Kornblum, 2001; Parker, 1997; Parker et al., 2001; Rice & Dellwo, ; Rice & Lapsley, 2001; Rice & Mirzadeh, 2000; Slaney et al., 2002).

Future Directions and Recommendations

The present study was conducted with female students, which poses a limitation to the generalizability of our findings. Although no significant gender differences have been reported in previous studies using the FMPS (Ablard & Parker, 1997; Adkins & Parker, 1996; Parker & Adkins, 1995; Rice & Lapsley, 2001; Rice & Mirzadeh, 2000; Slaney et al., 2002), with significant, albeit small effect sizes for gender differences reported by Parker et al. (2001), it is important that future research extend our findings using a sample which includes male and female Australian secondary students. Our findings support the use of the reformulated FMPS with four factors: Personal Standards (PS), Organization (O), Parental Expectations and Criticism (PEC), and Concern over Mistakes and Doubts (CMD), in our sample of Australian secondary school girls, which may be used to identify healthy, unhealthy, and non-perfectionist student types. Our findings do not support a simple dichotomy between healthy and unhealthy perfectionism factors defined in terms of PS/O and CMD/PEC respectively. Additional research is needed to explore further the validity of such higher order factors as proposed by Stumpf and Parker (2000). Such investigations will need to use the approach we have outlined in this paper. That is, of adopting nested confirmatory factor analyses to determine whether higher order factors of perfectionism are supported across different samples.

We concur with Stumpf and Parker (2000) that a fruitful direction for future research is to focus on correlates for each of the multiple dimensions of perfectionism.
Given the multidimensionality of the perfectionism construct, it appears neither useful nor informative to base investigations of correlates, antecedents or consequences, on a single *global* perfectionism score. Equally, we believe investigations using higher order summary ‘healthy’ and ‘unhealthy’ perfectionism scores should proceed with caution, given our findings (and those of Stumpf and Parker, 2000), warning against the use of higher order positive and negative constructs.

Our study provides additional empirical evidence to support a typology for healthy, unhealthy and non-perfectionist students, who display different profiles across the four first order dimensions of perfectionism which can be reliably measured by the FMPS.
References


Psychometric properties of the FMPS for Australian adolescent girls


Psychometric properties of the FMPS for Australian adolescent girls


Horn, J. L. (1965). A rationale and test for the number of factors in factor analysis. 
*Psychometrika, 30*, 179-185.

*Handbook of gifted education. (pp. 402-415).* Needham Heights, MA: Allyn and Bacon.


Psychometric properties of the FMPS for Australian adolescent girls


Psychometric properties of the FMPS for Australian adolescent girls


Psychometric properties of the FMPS for Australian adolescent girls


APPENDIX E.

SPSS EFA OUTPUT PATTERN MATRICES (YEARS 8 & 11)
### Pattern Matrix Coefficients Year 8 Sample

<table>
<thead>
<tr>
<th>Factor</th>
<th>CMD</th>
<th>O</th>
<th>PS</th>
<th>PEC</th>
</tr>
</thead>
<tbody>
<tr>
<td>PERF70</td>
<td>.745</td>
<td>.051</td>
<td>-.062</td>
<td>.020</td>
</tr>
<tr>
<td>PERF69</td>
<td>.729</td>
<td>-.016</td>
<td>.010</td>
<td>.096</td>
</tr>
<tr>
<td>PERF79</td>
<td>.645</td>
<td>-.001</td>
<td>-.084</td>
<td>-.003</td>
</tr>
<tr>
<td>PERF86</td>
<td>.641</td>
<td>-.005</td>
<td>-.081</td>
<td>-.008</td>
</tr>
<tr>
<td>PERF65</td>
<td>.640</td>
<td>-.013</td>
<td>.083</td>
<td>-.018</td>
</tr>
<tr>
<td>PERF77</td>
<td>.629</td>
<td>.022</td>
<td>-.089</td>
<td>-.125</td>
</tr>
<tr>
<td>PERF81</td>
<td>.581</td>
<td>.028</td>
<td>-.124</td>
<td>.030</td>
</tr>
<tr>
<td>PERF74</td>
<td>.553</td>
<td>-.035</td>
<td>-.278</td>
<td>-.083</td>
</tr>
<tr>
<td>PERF90</td>
<td>.501</td>
<td>.048</td>
<td>-.048</td>
<td>-.053</td>
</tr>
<tr>
<td>PERF69</td>
<td>.460</td>
<td>-.034</td>
<td>.327</td>
<td>-.078</td>
</tr>
<tr>
<td>PERF84</td>
<td>.453</td>
<td>-.101</td>
<td>.078</td>
<td>-.143</td>
</tr>
<tr>
<td>PERF73</td>
<td>.420</td>
<td>-.082</td>
<td>.106</td>
<td>-.180</td>
</tr>
<tr>
<td>PERF60</td>
<td>.419</td>
<td>-.164</td>
<td>-.215</td>
<td>-.101</td>
</tr>
<tr>
<td>PERF88</td>
<td>.338</td>
<td>-.140</td>
<td>.237</td>
<td>-.136</td>
</tr>
<tr>
<td>PERF85</td>
<td>.000</td>
<td>-.815</td>
<td>.007</td>
<td>-.016</td>
</tr>
<tr>
<td>PERF83</td>
<td>-.029</td>
<td>-.812</td>
<td>.054</td>
<td>-.026</td>
</tr>
<tr>
<td>PERF87</td>
<td>-.016</td>
<td>-.797</td>
<td>-.045</td>
<td>.077</td>
</tr>
<tr>
<td>PERF64</td>
<td>-.029</td>
<td>-.774</td>
<td>.021</td>
<td>.017</td>
</tr>
<tr>
<td>PERF58</td>
<td>.087</td>
<td>-.751</td>
<td>-.041</td>
<td>-.022</td>
</tr>
<tr>
<td>PERF63</td>
<td>-.048</td>
<td>-.742</td>
<td>-.034</td>
<td>.090</td>
</tr>
<tr>
<td>PERF75</td>
<td>.103</td>
<td>-.128</td>
<td>-.712</td>
<td>-.100</td>
</tr>
<tr>
<td>PERF68</td>
<td>.133</td>
<td>-.131</td>
<td>-.699</td>
<td>-.186</td>
</tr>
<tr>
<td>PERF86</td>
<td>.323</td>
<td>-.211</td>
<td>-.568</td>
<td>.049</td>
</tr>
<tr>
<td>PERF80</td>
<td>.277</td>
<td>-.404</td>
<td>-.433</td>
<td>.022</td>
</tr>
<tr>
<td>PERF72</td>
<td>-.040</td>
<td>-.304</td>
<td>-.432</td>
<td>-.026</td>
</tr>
<tr>
<td>PERF76</td>
<td>-.034</td>
<td>-.018</td>
<td>-.222</td>
<td>-.754</td>
</tr>
<tr>
<td>PERF91</td>
<td>.002</td>
<td>.085</td>
<td>.195</td>
<td>-.748</td>
</tr>
<tr>
<td>PERF82</td>
<td>.073</td>
<td>.072</td>
<td>.060</td>
<td>-.731</td>
</tr>
<tr>
<td>PERF78</td>
<td>.099</td>
<td>.040</td>
<td>.146</td>
<td>-.729</td>
</tr>
<tr>
<td>PERF67</td>
<td>.048</td>
<td>-.015</td>
<td>-.120</td>
<td>-.674</td>
</tr>
<tr>
<td>PERF71</td>
<td>.196</td>
<td>.018</td>
<td>-.087</td>
<td>-.658</td>
</tr>
<tr>
<td>PERF61</td>
<td>.013</td>
<td>.014</td>
<td>.080</td>
<td>-.624</td>
</tr>
<tr>
<td>PERF59</td>
<td>.129</td>
<td>-.039</td>
<td>.035</td>
<td>-.601</td>
</tr>
<tr>
<td>PERF57</td>
<td>-.149</td>
<td>.038</td>
<td>-.166</td>
<td>-.560</td>
</tr>
</tbody>
</table>

**Extraction Method:** Maximum Likelihood.

**Rotation Method:** Oblimin with Kaiser Normalization.

a. Rotation converged in 12 iterations.
## Appendices

### Pattern Matrix Coefficients Year 1

<table>
<thead>
<tr>
<th></th>
<th>PEC</th>
<th>O</th>
<th>PS</th>
<th>CMD</th>
</tr>
</thead>
<tbody>
<tr>
<td>PERF76</td>
<td>.793</td>
<td>.028</td>
<td>-.228</td>
<td>-.085</td>
</tr>
<tr>
<td>PERF78</td>
<td>.791</td>
<td>.000</td>
<td>.231</td>
<td>.142</td>
</tr>
<tr>
<td>PERF57</td>
<td>.786</td>
<td>.074</td>
<td>-.213</td>
<td>-.249</td>
</tr>
<tr>
<td>PERF82</td>
<td>.770</td>
<td>-.059</td>
<td>.132</td>
<td>.068</td>
</tr>
<tr>
<td>PERF91</td>
<td>.746</td>
<td>-.043</td>
<td>.185</td>
<td>.127</td>
</tr>
<tr>
<td>PERF67</td>
<td>.740</td>
<td>.017</td>
<td>-.189</td>
<td>-.056</td>
</tr>
<tr>
<td>PERF71</td>
<td>.679</td>
<td>-.007</td>
<td>-.131</td>
<td>.115</td>
</tr>
<tr>
<td>PERF61</td>
<td>.561</td>
<td>-.044</td>
<td>.120</td>
<td>.118</td>
</tr>
<tr>
<td>PERF59</td>
<td>.493</td>
<td>.040</td>
<td>-.068</td>
<td>.150</td>
</tr>
<tr>
<td>PERF83</td>
<td>-.003</td>
<td>.809</td>
<td>.101</td>
<td>.049</td>
</tr>
<tr>
<td>PERF87</td>
<td>-.049</td>
<td>.801</td>
<td>.014</td>
<td>-.024</td>
</tr>
<tr>
<td>PERF64</td>
<td>-.034</td>
<td>.791</td>
<td>-.016</td>
<td>.021</td>
</tr>
<tr>
<td>PERF85</td>
<td>.005</td>
<td>.790</td>
<td>.013</td>
<td>.030</td>
</tr>
<tr>
<td>PERF63</td>
<td>.046</td>
<td>.782</td>
<td>.002</td>
<td>-.078</td>
</tr>
<tr>
<td>PERF58</td>
<td>-.048</td>
<td>.721</td>
<td>-.112</td>
<td>.067</td>
</tr>
<tr>
<td>PERF68</td>
<td>.051</td>
<td>-.019</td>
<td>-.810</td>
<td>.042</td>
</tr>
<tr>
<td>PERF75</td>
<td>.082</td>
<td>.052</td>
<td>-.752</td>
<td>.125</td>
</tr>
<tr>
<td>PERF80</td>
<td>.086</td>
<td>.135</td>
<td>-.699</td>
<td>.239</td>
</tr>
<tr>
<td>PERF80</td>
<td>.086</td>
<td>-.012</td>
<td>-.496</td>
<td>.138</td>
</tr>
<tr>
<td>PERF72</td>
<td>-.013</td>
<td>.244</td>
<td>-.441</td>
<td>-.083</td>
</tr>
<tr>
<td>PERF60</td>
<td>.109</td>
<td>.005</td>
<td>-.349</td>
<td>.344</td>
</tr>
<tr>
<td>PERF79</td>
<td>.015</td>
<td>-.020</td>
<td>-.089</td>
<td>.695</td>
</tr>
<tr>
<td>PERF81</td>
<td>.043</td>
<td>.017</td>
<td>-.117</td>
<td>.663</td>
</tr>
<tr>
<td>PERF90</td>
<td>.007</td>
<td>-.001</td>
<td>.048</td>
<td>.623</td>
</tr>
<tr>
<td>PERF65</td>
<td>-.007</td>
<td>-.028</td>
<td>-.108</td>
<td>.605</td>
</tr>
<tr>
<td>PERF77</td>
<td>.078</td>
<td>-.030</td>
<td>-.150</td>
<td>.603</td>
</tr>
<tr>
<td>PERF69</td>
<td>.034</td>
<td>-.020</td>
<td>-.191</td>
<td>.558</td>
</tr>
<tr>
<td>PERF66</td>
<td>-.003</td>
<td>.020</td>
<td>-.157</td>
<td>.543</td>
</tr>
<tr>
<td>PERF84</td>
<td>.040</td>
<td>-.001</td>
<td>.113</td>
<td>.534</td>
</tr>
<tr>
<td>PERF70</td>
<td>.110</td>
<td>-.022</td>
<td>-.210</td>
<td>.498</td>
</tr>
<tr>
<td>PERF89</td>
<td>.051</td>
<td>.009</td>
<td>.251</td>
<td>.486</td>
</tr>
<tr>
<td>PERF88</td>
<td>.008</td>
<td>.102</td>
<td>.115</td>
<td>.402</td>
</tr>
<tr>
<td>PERF73</td>
<td>.145</td>
<td>.053</td>
<td>-.090</td>
<td>.285</td>
</tr>
</tbody>
</table>

Extraction Method: Maximum Likelihood.
Rotation Method: Oblimin with Kaiser Normalization.

a. Rotation converged in 7 iterations.
APPENDIX F.

SPSS EFA OUTPUT PATTERN MATRIX

(SIX FACTOR SOLUTION)
### EFA PATTERN MATRIX COEFFICIENTS 6 FACTOR SOLUTION

<table>
<thead>
<tr>
<th></th>
<th>PEC</th>
<th>O</th>
<th>PS</th>
<th>CM</th>
<th>NA</th>
<th>D</th>
</tr>
</thead>
<tbody>
<tr>
<td>PERF78</td>
<td>.766</td>
<td>.025</td>
<td>-.186</td>
<td>.032</td>
<td>.010</td>
<td>-.143</td>
</tr>
<tr>
<td>PERF79</td>
<td>.735</td>
<td>-.013</td>
<td>.086</td>
<td>-.004</td>
<td>-.013</td>
<td>.254</td>
</tr>
<tr>
<td>PERF82</td>
<td>.732</td>
<td>-.041</td>
<td>.098</td>
<td>.013</td>
<td>-.106</td>
<td>.042</td>
</tr>
<tr>
<td>PERF91</td>
<td>.719</td>
<td>-.070</td>
<td>.062</td>
<td>-.098</td>
<td>-.034</td>
<td>.268</td>
</tr>
<tr>
<td>PERF67</td>
<td>.715</td>
<td>.031</td>
<td>-.076</td>
<td>.118</td>
<td>.004</td>
<td>-.159</td>
</tr>
<tr>
<td>PERF71</td>
<td>.693</td>
<td>.012</td>
<td>-.010</td>
<td>.240</td>
<td>-.046</td>
<td>-.133</td>
</tr>
<tr>
<td>PERF57</td>
<td>.632</td>
<td>.043</td>
<td>-.184</td>
<td>-.144</td>
<td>.017</td>
<td>-.095</td>
</tr>
<tr>
<td>PERF61</td>
<td>.561</td>
<td>-.036</td>
<td>.064</td>
<td>.047</td>
<td>.000</td>
<td>.119</td>
</tr>
<tr>
<td>PERF59</td>
<td>.551</td>
<td>.055</td>
<td>.007</td>
<td>.082</td>
<td>-.097</td>
<td>.006</td>
</tr>
<tr>
<td>PERF87</td>
<td>-.034</td>
<td>.820</td>
<td>.053</td>
<td>.009</td>
<td>-.020</td>
<td>.067</td>
</tr>
<tr>
<td>PERF83</td>
<td>.016</td>
<td>.816</td>
<td>.064</td>
<td>-.034</td>
<td>-.011</td>
<td>.081</td>
</tr>
<tr>
<td>PERF85</td>
<td>.050</td>
<td>.796</td>
<td>.002</td>
<td>-.035</td>
<td>-.038</td>
<td>.034</td>
</tr>
<tr>
<td>PERF64</td>
<td>-.020</td>
<td>.785</td>
<td>-.018</td>
<td>-.012</td>
<td>.054</td>
<td>-.081</td>
</tr>
<tr>
<td>PERF58</td>
<td>.018</td>
<td>.756</td>
<td>-.015</td>
<td>.130</td>
<td>.017</td>
<td>-.056</td>
</tr>
<tr>
<td>PERF63</td>
<td>-.022</td>
<td>.749</td>
<td>-.021</td>
<td>-.051</td>
<td>.029</td>
<td>.018</td>
</tr>
<tr>
<td>PERF75</td>
<td>.040</td>
<td>-.017</td>
<td>-.850</td>
<td>.019</td>
<td>.076</td>
<td>.008</td>
</tr>
<tr>
<td>PERF68</td>
<td>.048</td>
<td>-.048</td>
<td>.847</td>
<td>-.031</td>
<td>.020</td>
<td>-.020</td>
</tr>
<tr>
<td>PERF86</td>
<td>.023</td>
<td>.107</td>
<td>-.661</td>
<td>.070</td>
<td>-.100</td>
<td>.036</td>
</tr>
<tr>
<td>PERF80</td>
<td>-.017</td>
<td>-.050</td>
<td>-.573</td>
<td>.005</td>
<td>-.075</td>
<td>.073</td>
</tr>
<tr>
<td>PERF74</td>
<td>.079</td>
<td>.018</td>
<td>-.419</td>
<td>.297</td>
<td>-.112</td>
<td>.079</td>
</tr>
<tr>
<td>PERF72</td>
<td>-.011</td>
<td>.247</td>
<td>-.377</td>
<td>-.023</td>
<td>-.027</td>
<td>-.194</td>
</tr>
<tr>
<td>PERF62</td>
<td>-.036</td>
<td>.296</td>
<td>-.373</td>
<td>.074</td>
<td>-.046</td>
<td>-.071</td>
</tr>
<tr>
<td>PERF60</td>
<td>.065</td>
<td>.049</td>
<td>-.340</td>
<td>.122</td>
<td>-.214</td>
<td>.076</td>
</tr>
<tr>
<td>PERF70</td>
<td>.079</td>
<td>-.007</td>
<td>.023</td>
<td>.729</td>
<td>-.031</td>
<td>-.042</td>
</tr>
<tr>
<td>PERF69</td>
<td>-.008</td>
<td>.012</td>
<td>-.048</td>
<td>.662</td>
<td>-.058</td>
<td>.057</td>
</tr>
<tr>
<td>PERF65</td>
<td>.046</td>
<td>.023</td>
<td>.035</td>
<td>.485</td>
<td>-.207</td>
<td>.045</td>
</tr>
<tr>
<td>PERF66</td>
<td>.029</td>
<td>.018</td>
<td>-.099</td>
<td>.468</td>
<td>-.119</td>
<td>.082</td>
</tr>
<tr>
<td>PERF73</td>
<td>.140</td>
<td>.055</td>
<td>-.117</td>
<td>.309</td>
<td>.115</td>
<td>.295</td>
</tr>
<tr>
<td>PERF81</td>
<td>.013</td>
<td>.001</td>
<td>-.066</td>
<td>.067</td>
<td>-.719</td>
<td>-.039</td>
</tr>
<tr>
<td>PERF90</td>
<td>.026</td>
<td>-.013</td>
<td>.008</td>
<td>-.053</td>
<td>-.703</td>
<td>.070</td>
</tr>
<tr>
<td>PERF77</td>
<td>.118</td>
<td>-.002</td>
<td>-.058</td>
<td>.172</td>
<td>-.579</td>
<td>-.032</td>
</tr>
<tr>
<td>PERF79</td>
<td>.038</td>
<td>.007</td>
<td>-.063</td>
<td>.317</td>
<td>-.391</td>
<td>.065</td>
</tr>
<tr>
<td>PERF89</td>
<td>.009</td>
<td>-.012</td>
<td>.007</td>
<td>.101</td>
<td>-.031</td>
<td>.655</td>
</tr>
<tr>
<td>PERF88</td>
<td>.037</td>
<td>.103</td>
<td>-.017</td>
<td>-.054</td>
<td>-.209</td>
<td>.442</td>
</tr>
<tr>
<td>PERF84</td>
<td>.056</td>
<td>.039</td>
<td>-.060</td>
<td>.259</td>
<td>-.030</td>
<td>.421</td>
</tr>
</tbody>
</table>

Extraction Method: Maximum Likelihood.
Rotation Method: Oblimin with Kaiser Normalization.
a. Rotation converged in 11 iterations.

**FACTOR 1** Parental Expectations & Criticism (PEC)
**FACTOR 2** Organisation (O)
**FACTOR 3** Personal Standards (PS)
**FACTOR 4** Concern over Mistakes (CM)
**FACTOR 5** Need for Approval (NA)
**FACTOR 6** Doubts about Actions (D)
APPENDIX G.1

LISREL COMPLETELY STANDARDISED SOLUTION FOR
FOUR THEORISED DIMENSIONS OF PERFECTIONISM
### LAMBDA-X

<table>
<thead>
<tr>
<th>CONCERNS</th>
<th>PARENTS</th>
<th>ORGANISE</th>
<th>STANDARD</th>
</tr>
</thead>
<tbody>
<tr>
<td>PERF57</td>
<td>0.578</td>
<td></td>
<td></td>
</tr>
<tr>
<td>PERF58</td>
<td>0.653</td>
<td></td>
<td></td>
</tr>
<tr>
<td>PERF59</td>
<td>0.557</td>
<td></td>
<td></td>
</tr>
<tr>
<td>PERF60</td>
<td>0.596</td>
<td></td>
<td></td>
</tr>
<tr>
<td>PERF61</td>
<td>0.744</td>
<td></td>
<td></td>
</tr>
<tr>
<td>PERF62</td>
<td>0.779</td>
<td></td>
<td></td>
</tr>
<tr>
<td>PERF63</td>
<td>0.632</td>
<td></td>
<td></td>
</tr>
<tr>
<td>PERF64</td>
<td>0.749</td>
<td></td>
<td></td>
</tr>
<tr>
<td>PERF65</td>
<td>0.616</td>
<td></td>
<td></td>
</tr>
<tr>
<td>PERF66</td>
<td>0.797</td>
<td></td>
<td></td>
</tr>
<tr>
<td>PERF67</td>
<td>0.645</td>
<td></td>
<td></td>
</tr>
<tr>
<td>PERF68</td>
<td>0.673</td>
<td></td>
<td></td>
</tr>
<tr>
<td>PERF69</td>
<td>0.705</td>
<td></td>
<td></td>
</tr>
<tr>
<td>PERF70</td>
<td>0.760</td>
<td></td>
<td></td>
</tr>
<tr>
<td>PERF71</td>
<td>0.685</td>
<td></td>
<td></td>
</tr>
<tr>
<td>PERF72</td>
<td>0.783</td>
<td></td>
<td></td>
</tr>
<tr>
<td>PERF73</td>
<td>0.705</td>
<td></td>
<td></td>
</tr>
<tr>
<td>PERF74</td>
<td>0.656</td>
<td></td>
<td></td>
</tr>
<tr>
<td>PERF75</td>
<td>0.754</td>
<td></td>
<td></td>
</tr>
<tr>
<td>PERF76</td>
<td>0.517</td>
<td></td>
<td></td>
</tr>
<tr>
<td>PERF77</td>
<td>0.799</td>
<td></td>
<td></td>
</tr>
<tr>
<td>PERF78</td>
<td>0.801</td>
<td></td>
<td></td>
</tr>
<tr>
<td>PERF79</td>
<td>0.386</td>
<td></td>
<td></td>
</tr>
<tr>
<td>PERF80</td>
<td>0.407</td>
<td></td>
<td></td>
</tr>
<tr>
<td>PERF81</td>
<td>0.563</td>
<td></td>
<td></td>
</tr>
<tr>
<td>PERF82</td>
<td>0.715</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### PHI

<table>
<thead>
<tr>
<th>CONCERNS</th>
<th>PARENTS</th>
<th>ORGANISE</th>
<th>STANDARD</th>
</tr>
</thead>
<tbody>
<tr>
<td>CONCERNS</td>
<td>1.000</td>
<td></td>
<td></td>
</tr>
<tr>
<td>PARENTS</td>
<td>0.629</td>
<td>1.000</td>
<td></td>
</tr>
<tr>
<td>ORGANISE</td>
<td>0.228</td>
<td>0.073</td>
<td>1.000</td>
</tr>
<tr>
<td>STANDARD</td>
<td>0.510</td>
<td>0.399</td>
<td>0.422</td>
</tr>
<tr>
<td></td>
<td>PERF57</td>
<td>PERF58</td>
<td>PERF59</td>
</tr>
<tr>
<td>--------------</td>
<td>--------</td>
<td>--------</td>
<td>--------</td>
</tr>
<tr>
<td></td>
<td>0.666</td>
<td>0.395</td>
<td>0.574</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>PERF64</th>
<th>PERF65</th>
<th>PERF66</th>
<th>PERF67</th>
<th>PERF68</th>
<th>PERF69</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>0.393</td>
<td>0.601</td>
<td>0.621</td>
<td>0.440</td>
<td>0.317</td>
<td>0.584</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>PERF70</th>
<th>PERF71</th>
<th>PERF72</th>
<th>PERF73</th>
<th>PERF75</th>
<th>PERF76</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>0.547</td>
<td>0.364</td>
<td>0.759</td>
<td>0.783</td>
<td>0.341</td>
<td>0.387</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>PERF77</th>
<th>PERF78</th>
<th>PERF79</th>
<th>PERF80</th>
<th>PERF81</th>
<th>PERF82</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>0.503</td>
<td>0.422</td>
<td>0.530</td>
<td>0.669</td>
<td>0.570</td>
<td>0.432</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>PERF83</th>
<th>PERF84</th>
<th>PERF85</th>
<th>PERF86</th>
<th>PERF87</th>
<th>PERF88</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>0.381</td>
<td>0.733</td>
<td>0.362</td>
<td>0.358</td>
<td>0.358</td>
<td>0.851</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>PERF89</th>
<th>PERF90</th>
<th>PERF91</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>0.835</td>
<td>0.683</td>
<td>0.489</td>
</tr>
</tbody>
</table>

Time used: 43.843 Seconds
APPENDIX G.2

LISREL COMPLETELY STANDARDISED SOLUTION FOR
FOUR THEORISED DIMENSIONS OF PERFECTIONISM
(SPECIFIC ERROR COVARIANCES FREED)
## LAMBDA-X

<table>
<thead>
<tr>
<th>CONCERNS</th>
<th>PARENTS</th>
<th>ORGANISE</th>
<th>STANDARD</th>
</tr>
</thead>
<tbody>
<tr>
<td>PERF57</td>
<td>-</td>
<td>0.558</td>
<td>-</td>
</tr>
<tr>
<td>PERF58</td>
<td>-</td>
<td>-</td>
<td>0.777</td>
</tr>
<tr>
<td>PERF59</td>
<td>-</td>
<td>0.660</td>
<td>-</td>
</tr>
<tr>
<td>PERF60</td>
<td>0.559</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>PERF61</td>
<td>-</td>
<td>0.589</td>
<td>-</td>
</tr>
<tr>
<td>PERF63</td>
<td>-</td>
<td>-</td>
<td>0.744</td>
</tr>
<tr>
<td>PERF64</td>
<td>-</td>
<td>-</td>
<td>0.779</td>
</tr>
<tr>
<td>PERF65</td>
<td>0.633</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>PERF66</td>
<td>0.617</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>PERF67</td>
<td>-</td>
<td>0.764</td>
<td>-</td>
</tr>
<tr>
<td>PERF68</td>
<td>-</td>
<td>-</td>
<td>0.826</td>
</tr>
<tr>
<td>PERF69</td>
<td>0.647</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>PERF70</td>
<td>0.678</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>PERF71</td>
<td>-</td>
<td>0.816</td>
<td>-</td>
</tr>
<tr>
<td>PERF72</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>PERF73</td>
<td>0.462</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>PERF75</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>PERF76</td>
<td>-</td>
<td>0.789</td>
<td>-</td>
</tr>
<tr>
<td>PERF77</td>
<td>0.707</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>PERF78</td>
<td>-</td>
<td>0.717</td>
<td>-</td>
</tr>
<tr>
<td>PERF79</td>
<td>0.686</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>PERF80</td>
<td>-</td>
<td>-</td>
<td>0.575</td>
</tr>
<tr>
<td>PERF81</td>
<td>0.658</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>PERF82</td>
<td>-</td>
<td>0.743</td>
<td>-</td>
</tr>
<tr>
<td>PERF83</td>
<td>-</td>
<td>-</td>
<td>0.787</td>
</tr>
<tr>
<td>PERF84</td>
<td>0.509</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>PERF85</td>
<td>-</td>
<td>-</td>
<td>0.799</td>
</tr>
<tr>
<td>PERF86</td>
<td>-</td>
<td>-</td>
<td>0.801</td>
</tr>
<tr>
<td>PERF87</td>
<td>-</td>
<td>-</td>
<td>0.801</td>
</tr>
<tr>
<td>PERF88</td>
<td>0.365</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>PERF89</td>
<td>0.386</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>PERF90</td>
<td>0.560</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>PERF91</td>
<td>-</td>
<td>0.663</td>
<td>-</td>
</tr>
</tbody>
</table>

## PHI

<table>
<thead>
<tr>
<th>CONCERNS</th>
<th>PARENTS</th>
<th>ORGANISE</th>
<th>STANDARD</th>
</tr>
</thead>
<tbody>
<tr>
<td>CONCERNS</td>
<td>1.000</td>
<td></td>
<td></td>
</tr>
<tr>
<td>PARENTS</td>
<td>0.639</td>
<td>1.000</td>
<td></td>
</tr>
<tr>
<td>ORGANISE</td>
<td>0.228</td>
<td>0.086</td>
<td>1.000</td>
</tr>
<tr>
<td>STANDARD</td>
<td>0.518</td>
<td>0.422</td>
<td>0.422</td>
</tr>
</tbody>
</table>

## THETA-DELTA

<table>
<thead>
<tr>
<th>PERF57</th>
<th>PERF58</th>
<th>PERF59</th>
<th>PERF60</th>
<th>PERF61</th>
<th>PERF63</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.689</td>
<td>-</td>
<td>0.396</td>
<td>-</td>
<td>0.565</td>
<td>-</td>
</tr>
<tr>
<td>-</td>
<td>0.396</td>
<td>-</td>
<td>-</td>
<td>0.687</td>
<td>-</td>
</tr>
<tr>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>0.654</td>
<td>-</td>
</tr>
<tr>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>0.447</td>
</tr>
<tr>
<td>0.120</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

301
<table>
<thead>
<tr>
<th>PERF64</th>
<th>PERF65</th>
<th>PERF66</th>
<th>PERF67</th>
<th>PERF68</th>
<th>PERF69</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>0.393</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PERF65</td>
<td></td>
<td>0.599</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PERF66</td>
<td></td>
<td></td>
<td>0.619</td>
<td></td>
<td></td>
</tr>
<tr>
<td>PERF67</td>
<td></td>
<td></td>
<td></td>
<td>0.416</td>
<td></td>
</tr>
<tr>
<td>PERF68</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>0.317</td>
</tr>
<tr>
<td>PERF69</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>PERF70</th>
<th>PERF71</th>
<th>PERF72</th>
<th>PERF73</th>
<th>PERF75</th>
<th>PERF76</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>0.540</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PERF71</td>
<td></td>
<td>0.335</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PERF72</td>
<td></td>
<td></td>
<td>0.759</td>
<td></td>
<td></td>
</tr>
<tr>
<td>PERF73</td>
<td></td>
<td></td>
<td></td>
<td>0.786</td>
<td></td>
</tr>
<tr>
<td>PERF75</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>0.341</td>
</tr>
<tr>
<td>PERF76</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>PERF77</th>
<th>PERF78</th>
<th>PERF79</th>
<th>PERF80</th>
<th>PERF81</th>
<th>PERF82</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>0.500</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PERF78</td>
<td></td>
<td>0.485</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PERF79</td>
<td></td>
<td></td>
<td>0.530</td>
<td></td>
<td></td>
</tr>
<tr>
<td>PERF80</td>
<td></td>
<td></td>
<td></td>
<td>0.669</td>
<td></td>
</tr>
<tr>
<td>PERF81</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>0.568</td>
</tr>
<tr>
<td>PERF82</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>0.448</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>PERF83</th>
<th>PERF84</th>
<th>PERF85</th>
<th>PERF86</th>
<th>PERF87</th>
<th>PERF88</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>0.381</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PERF83</td>
<td></td>
<td>0.741</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PERF84</td>
<td></td>
<td></td>
<td>0.361</td>
<td></td>
<td></td>
</tr>
<tr>
<td>PERF85</td>
<td></td>
<td></td>
<td></td>
<td>0.358</td>
<td></td>
</tr>
<tr>
<td>PERF86</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>0.358</td>
</tr>
<tr>
<td>PERF87</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>0.867</td>
</tr>
<tr>
<td>PERF88</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>PERF89</th>
<th>PERF90</th>
<th>PERF91</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>0.851</td>
<td></td>
</tr>
<tr>
<td>PERF89</td>
<td></td>
<td>0.686</td>
</tr>
<tr>
<td>PERF90</td>
<td></td>
<td></td>
</tr>
<tr>
<td>PERF91</td>
<td></td>
<td>0.561</td>
</tr>
</tbody>
</table>

Time used: 45.556 Seconds
APPENDIX G.3

LISREL COMPLETELY STANDARDISED SOLUTION FOR
NESTED CONFIRMATORY FACTOR ANALYSIS OF HIGHER
ORDER ‘POSITIVE” AND “NEGATIVE” PERFECTIONISM
FACTORS
### LAMBDA-Y

<table>
<thead>
<tr>
<th></th>
<th>CMD</th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>PEC</td>
<td></td>
<td></td>
</tr>
<tr>
<td>PERF57</td>
<td>- -</td>
<td>0.585</td>
<td>- -</td>
<td>- -</td>
</tr>
<tr>
<td>PERF58</td>
<td>- -</td>
<td>- -</td>
<td>0.821</td>
<td>- -</td>
</tr>
<tr>
<td>PERF59</td>
<td>- -</td>
<td>0.665</td>
<td>- -</td>
<td>- -</td>
</tr>
<tr>
<td>PERF60</td>
<td>0.469</td>
<td>- -</td>
<td>- -</td>
<td>- -</td>
</tr>
<tr>
<td>PERF61</td>
<td>- -</td>
<td>0.593</td>
<td>- -</td>
<td>- -</td>
</tr>
<tr>
<td>PERF63</td>
<td>- -</td>
<td>- -</td>
<td>0.764</td>
<td>- -</td>
</tr>
<tr>
<td>PERF64</td>
<td>- -</td>
<td>- -</td>
<td>0.802</td>
<td>- -</td>
</tr>
<tr>
<td>PERF65</td>
<td>0.577</td>
<td>- -</td>
<td>- -</td>
<td>- -</td>
</tr>
<tr>
<td>PERF66</td>
<td>0.558</td>
<td>- -</td>
<td>- -</td>
<td>- -</td>
</tr>
<tr>
<td>PERF67</td>
<td>- -</td>
<td>0.768</td>
<td>- -</td>
<td>- -</td>
</tr>
<tr>
<td>PERF68</td>
<td>- -</td>
<td>- -</td>
<td>0.800</td>
<td>- -</td>
</tr>
<tr>
<td>PERF69</td>
<td>0.590</td>
<td>- -</td>
<td>- -</td>
<td>- -</td>
</tr>
<tr>
<td>PERF70</td>
<td>0.620</td>
<td>- -</td>
<td>- -</td>
<td>- -</td>
</tr>
<tr>
<td>PERF71</td>
<td>- -</td>
<td>0.818</td>
<td>- -</td>
<td>- -</td>
</tr>
<tr>
<td>PERF72</td>
<td>- -</td>
<td>- -</td>
<td>0.479</td>
<td>- -</td>
</tr>
<tr>
<td>PERF73</td>
<td>0.409</td>
<td>- -</td>
<td>- -</td>
<td>- -</td>
</tr>
<tr>
<td>PERF74</td>
<td>- -</td>
<td>- -</td>
<td>0.806</td>
<td>- -</td>
</tr>
<tr>
<td>PERF75</td>
<td>- -</td>
<td>0.794</td>
<td>- -</td>
<td>- -</td>
</tr>
<tr>
<td>PERF76</td>
<td>0.651</td>
<td>- -</td>
<td>- -</td>
<td>- -</td>
</tr>
<tr>
<td>PERF77</td>
<td>- -</td>
<td>0.722</td>
<td>- -</td>
<td>- -</td>
</tr>
<tr>
<td>PERF78</td>
<td>0.630</td>
<td>- -</td>
<td>- -</td>
<td>- -</td>
</tr>
<tr>
<td>PERF79</td>
<td>- -</td>
<td>- -</td>
<td>0.557</td>
<td>- -</td>
</tr>
<tr>
<td>PERF80</td>
<td>0.599</td>
<td>- -</td>
<td>- -</td>
<td>- -</td>
</tr>
<tr>
<td>PERF81</td>
<td>- -</td>
<td>0.746</td>
<td>- -</td>
<td>- -</td>
</tr>
<tr>
<td>PERF82</td>
<td>- -</td>
<td>0.809</td>
<td>- -</td>
<td>- -</td>
</tr>
<tr>
<td>PERF83</td>
<td>- -</td>
<td>- -</td>
<td>0.821</td>
<td>- -</td>
</tr>
<tr>
<td>PERF84</td>
<td>0.456</td>
<td>- -</td>
<td>- -</td>
<td>- -</td>
</tr>
<tr>
<td>PERF85</td>
<td>- -</td>
<td>- -</td>
<td>0.820</td>
<td>- -</td>
</tr>
<tr>
<td>PERF86</td>
<td>- -</td>
<td>0.322</td>
<td>- -</td>
<td>- -</td>
</tr>
<tr>
<td>PERF87</td>
<td>- -</td>
<td>0.343</td>
<td>- -</td>
<td>- -</td>
</tr>
<tr>
<td>PERF88</td>
<td>- -</td>
<td>0.504</td>
<td>- -</td>
<td>- -</td>
</tr>
<tr>
<td>PERF89</td>
<td>- -</td>
<td>0.667</td>
<td>- -</td>
<td>- -</td>
</tr>
</tbody>
</table>

### GAMMA

<table>
<thead>
<tr>
<th></th>
<th>perf_neg</th>
<th>perf_pos</th>
</tr>
</thead>
<tbody>
<tr>
<td>CMD</td>
<td>0.843</td>
<td>- -</td>
</tr>
<tr>
<td>PEC</td>
<td>0.728</td>
<td>- -</td>
</tr>
<tr>
<td>O</td>
<td>- -</td>
<td>0.656</td>
</tr>
<tr>
<td>PS</td>
<td>- -</td>
<td>0.672</td>
</tr>
</tbody>
</table>
Correlation Matrix of ETA and KSI

<table>
<thead>
<tr>
<th></th>
<th>CMD</th>
<th>PEC</th>
<th>O</th>
<th>PS</th>
<th>perf_neg</th>
<th>perf_pos</th>
</tr>
</thead>
<tbody>
<tr>
<td>CMD</td>
<td>1.000</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PEC</td>
<td>0.614</td>
<td>1.000</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>O</td>
<td>0.350</td>
<td>0.302</td>
<td>1.000</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PS</td>
<td>0.358</td>
<td>0.309</td>
<td>0.441</td>
<td>1.000</td>
<td></td>
<td></td>
</tr>
<tr>
<td>perf_neg</td>
<td>0.843</td>
<td>0.729</td>
<td>0.415</td>
<td>0.425</td>
<td>1.000</td>
<td></td>
</tr>
<tr>
<td>perf_pos</td>
<td>0.533</td>
<td>0.460</td>
<td>0.656</td>
<td>0.672</td>
<td>0.632</td>
<td>1.000</td>
</tr>
</tbody>
</table>

PSI
Note: This matrix is diagonal.

<table>
<thead>
<tr>
<th></th>
<th>CMD</th>
<th>PEC</th>
<th>O</th>
<th>PS</th>
</tr>
</thead>
<tbody>
<tr>
<td>CMD</td>
<td>0.289</td>
<td>0.470</td>
<td>0.570</td>
<td>0.548</td>
</tr>
</tbody>
</table>

THETA-EPS

<table>
<thead>
<tr>
<th></th>
<th>PERF57</th>
<th>PERF58</th>
<th>PERF59</th>
<th>PERF60</th>
<th>PERF61</th>
<th>PERF63</th>
</tr>
</thead>
<tbody>
<tr>
<td>PERF57</td>
<td>0.658</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PERF58</td>
<td></td>
<td>0.326</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PERF59</td>
<td></td>
<td></td>
<td>0.557</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PERF60</td>
<td></td>
<td></td>
<td></td>
<td>0.780</td>
<td></td>
<td></td>
</tr>
<tr>
<td>PERF61</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>0.649</td>
<td></td>
</tr>
<tr>
<td>PERF62</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>0.416</td>
</tr>
<tr>
<td>PERF63</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

THETA-EPS

<table>
<thead>
<tr>
<th></th>
<th>PERF64</th>
<th>PERF65</th>
<th>PERF66</th>
<th>PERF67</th>
<th>PERF68</th>
<th>PERF69</th>
</tr>
</thead>
<tbody>
<tr>
<td>PERF64</td>
<td>0.356</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PERF65</td>
<td></td>
<td>0.667</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PERF66</td>
<td></td>
<td></td>
<td>0.688</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PERF67</td>
<td></td>
<td></td>
<td></td>
<td>0.411</td>
<td></td>
<td></td>
</tr>
<tr>
<td>PERF68</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>0.360</td>
<td></td>
</tr>
<tr>
<td>PERF69</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>0.652</td>
</tr>
</tbody>
</table>
### THETA-EPS

<table>
<thead>
<tr>
<th></th>
<th>PERF70</th>
<th>PERF71</th>
<th>PERF72</th>
<th>PERF73</th>
<th>PERF75</th>
<th>PERF76</th>
</tr>
</thead>
<tbody>
<tr>
<td>PERF70</td>
<td>0.615</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PERF71</td>
<td></td>
<td>0.330</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PERF72</td>
<td></td>
<td></td>
<td>0.771</td>
<td></td>
<td></td>
<td>0.832</td>
</tr>
<tr>
<td>PERF73</td>
<td></td>
<td></td>
<td></td>
<td>0.832</td>
<td></td>
<td>0.350</td>
</tr>
<tr>
<td>PERF74</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>0.350</td>
<td>0.370</td>
</tr>
<tr>
<td>PERF75</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PERF76</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### THETA-EPS

<table>
<thead>
<tr>
<th></th>
<th>PERF77</th>
<th>PERF78</th>
<th>PERF79</th>
<th>PERF80</th>
<th>PERF81</th>
<th>PERF82</th>
</tr>
</thead>
<tbody>
<tr>
<td>PERF77</td>
<td>0.576</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PERF78</td>
<td></td>
<td>0.478</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PERF79</td>
<td></td>
<td></td>
<td>0.603</td>
<td></td>
<td></td>
<td>0.690</td>
</tr>
<tr>
<td>PERF80</td>
<td></td>
<td></td>
<td></td>
<td>0.690</td>
<td></td>
<td>0.641</td>
</tr>
<tr>
<td>PERF81</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>0.641</td>
<td>0.443</td>
</tr>
<tr>
<td>PERF82</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PERF83</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PERF84</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PERF85</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PERF86</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PERF87</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PERF88</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PERF89</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PERF90</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PERF91</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

306
### THETA-EP5

<table>
<thead>
<tr>
<th></th>
<th>PERF83</th>
<th>PERF84</th>
<th>PERF85</th>
<th>PERF86</th>
<th>PERF87</th>
<th>PERF88</th>
</tr>
</thead>
<tbody>
<tr>
<td>PERF83</td>
<td>0.346</td>
<td>-</td>
<td>0.792</td>
<td>-</td>
<td>0.326</td>
<td>-</td>
</tr>
<tr>
<td>PERF84</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>0.390</td>
<td></td>
<td>0.328</td>
</tr>
<tr>
<td>PERF85</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>0.896</td>
<td>0.324</td>
</tr>
<tr>
<td>PERF86</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>PERF87</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>PERF88</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>PERF89</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>PERF90</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>PERF91</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

### THETA-EP5

<table>
<thead>
<tr>
<th></th>
<th>PERF89</th>
<th>PERF90</th>
<th>PERF91</th>
</tr>
</thead>
<tbody>
<tr>
<td>PERF89</td>
<td>0.882</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>PERF90</td>
<td>-</td>
<td>0.746</td>
<td>-</td>
</tr>
<tr>
<td>PERF91</td>
<td>-</td>
<td>-</td>
<td>0.555</td>
</tr>
</tbody>
</table>

Time used: 0.771 Seconds
APPENDIX H.

SPSS CLUSTER ANALYSIS DENDOGRAM OUTPUT
### Appendices

<table>
<thead>
<tr>
<th>CASE Label</th>
<th>Num</th>
</tr>
</thead>
<tbody>
<tr>
<td>186</td>
<td></td>
</tr>
<tr>
<td>762</td>
<td></td>
</tr>
<tr>
<td>389</td>
<td></td>
</tr>
<tr>
<td>525</td>
<td></td>
</tr>
<tr>
<td>171</td>
<td></td>
</tr>
<tr>
<td>781</td>
<td></td>
</tr>
<tr>
<td>637</td>
<td></td>
</tr>
<tr>
<td>643</td>
<td></td>
</tr>
<tr>
<td>784</td>
<td></td>
</tr>
<tr>
<td>178</td>
<td></td>
</tr>
<tr>
<td>641</td>
<td></td>
</tr>
<tr>
<td>373</td>
<td></td>
</tr>
<tr>
<td>751</td>
<td></td>
</tr>
<tr>
<td>130</td>
<td></td>
</tr>
<tr>
<td>567</td>
<td></td>
</tr>
<tr>
<td>739</td>
<td></td>
</tr>
<tr>
<td>323</td>
<td></td>
</tr>
<tr>
<td>443</td>
<td></td>
</tr>
<tr>
<td>236</td>
<td></td>
</tr>
<tr>
<td>772</td>
<td></td>
</tr>
<tr>
<td>374</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td></td>
</tr>
<tr>
<td>65</td>
<td></td>
</tr>
<tr>
<td>451</td>
<td></td>
</tr>
<tr>
<td>505</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td></td>
</tr>
<tr>
<td>141</td>
<td></td>
</tr>
<tr>
<td>320</td>
<td></td>
</tr>
<tr>
<td>247</td>
<td></td>
</tr>
<tr>
<td>671</td>
<td></td>
</tr>
<tr>
<td>212</td>
<td></td>
</tr>
<tr>
<td>376</td>
<td></td>
</tr>
<tr>
<td>724</td>
<td></td>
</tr>
<tr>
<td>588</td>
<td></td>
</tr>
<tr>
<td>440</td>
<td></td>
</tr>
<tr>
<td>622</td>
<td></td>
</tr>
<tr>
<td>95</td>
<td></td>
</tr>
<tr>
<td>24</td>
<td></td>
</tr>
<tr>
<td>522</td>
<td></td>
</tr>
<tr>
<td>562</td>
<td></td>
</tr>
</tbody>
</table>
APPENDIX I.1

SPSS MANOVA OUTPUT

LITERACY ACADEMIC VARIABLES
### General Linear Model - LITERACY ACADEMIC VARIABLES

#### Between-Subjects Factors

<table>
<thead>
<tr>
<th>Variable</th>
<th>Value</th>
<th>Label</th>
<th>N</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ward</td>
<td>1</td>
<td>Unhealthy</td>
<td>297</td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>Healthy</td>
<td>267</td>
</tr>
<tr>
<td></td>
<td>3</td>
<td>Non</td>
<td>182</td>
</tr>
<tr>
<td>ABILITY2</td>
<td>1.00</td>
<td></td>
<td>140</td>
</tr>
<tr>
<td></td>
<td>2.00</td>
<td></td>
<td>161</td>
</tr>
<tr>
<td></td>
<td>3.00</td>
<td></td>
<td>159</td>
</tr>
<tr>
<td></td>
<td>4.00</td>
<td></td>
<td>142</td>
</tr>
<tr>
<td></td>
<td>5.00</td>
<td></td>
<td>144</td>
</tr>
<tr>
<td>LIT2</td>
<td>1.00</td>
<td></td>
<td>148</td>
</tr>
<tr>
<td></td>
<td>2.00</td>
<td></td>
<td>151</td>
</tr>
<tr>
<td></td>
<td>3.00</td>
<td></td>
<td>153</td>
</tr>
<tr>
<td></td>
<td>4.00</td>
<td></td>
<td>160</td>
</tr>
<tr>
<td></td>
<td>5.00</td>
<td></td>
<td>134</td>
</tr>
<tr>
<td>GRADE</td>
<td>1</td>
<td></td>
<td>350</td>
</tr>
<tr>
<td></td>
<td>2</td>
<td></td>
<td>396</td>
</tr>
<tr>
<td>GENDER</td>
<td>1.0</td>
<td>Female</td>
<td>274</td>
</tr>
<tr>
<td></td>
<td>2.0</td>
<td>Male</td>
<td>472</td>
</tr>
<tr>
<td>SCHOOLID</td>
<td>1.0</td>
<td>K</td>
<td>66</td>
</tr>
<tr>
<td></td>
<td>2.0</td>
<td>B</td>
<td>407</td>
</tr>
<tr>
<td></td>
<td>3.0</td>
<td>Kg</td>
<td>217</td>
</tr>
<tr>
<td></td>
<td>4.0</td>
<td>Scg</td>
<td>56</td>
</tr>
<tr>
<td>ESBID</td>
<td>1</td>
<td></td>
<td>603</td>
</tr>
<tr>
<td></td>
<td>2</td>
<td></td>
<td>143</td>
</tr>
<tr>
<td>Effect</td>
<td>Pillai's Trace</td>
<td>Wilks' Lambda</td>
<td>Hotelling's Trace</td>
</tr>
<tr>
<td>-----------------</td>
<td>----------------</td>
<td>---------------</td>
<td>-------------------</td>
</tr>
<tr>
<td>Intercept</td>
<td>.880</td>
<td>911.082(^a)</td>
<td>5.000</td>
</tr>
<tr>
<td>Wilks' Lambda</td>
<td>.120</td>
<td>911.082(^b)</td>
<td>5.000</td>
</tr>
<tr>
<td>Hotelling's Trace</td>
<td>7.324</td>
<td>911.082(^b)</td>
<td>5.000</td>
</tr>
<tr>
<td>Roy's Largest Root</td>
<td>7.324</td>
<td>911.082(^b)</td>
<td>5.000</td>
</tr>
<tr>
<td>CLU3_1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pillai's Trace</td>
<td>.045</td>
<td>2.895</td>
<td>10.000</td>
</tr>
<tr>
<td>Wilks' Lambda</td>
<td>.955</td>
<td>2.893(^b)</td>
<td>10.000</td>
</tr>
<tr>
<td>Hotelling's Trace</td>
<td>.047</td>
<td>2.891</td>
<td>10.000</td>
</tr>
<tr>
<td>Roy's Largest Root</td>
<td>.030</td>
<td>3.706(^c)</td>
<td>5.000</td>
</tr>
<tr>
<td>ABILITY2</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pillai's Trace</td>
<td>.049</td>
<td>1.585</td>
<td>20.000</td>
</tr>
<tr>
<td>Wilks' Lambda</td>
<td>.951</td>
<td>1.570</td>
<td>20.000</td>
</tr>
<tr>
<td>Hotelling's Trace</td>
<td>.051</td>
<td>1.572</td>
<td>20.000</td>
</tr>
<tr>
<td>Roy's Largest Root</td>
<td>.033</td>
<td>4.127(^c)</td>
<td>5.000</td>
</tr>
<tr>
<td>LIT2</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pillai's Trace</td>
<td>.053</td>
<td>1.685</td>
<td>20.000</td>
</tr>
<tr>
<td>Wilks' Lambda</td>
<td>.948</td>
<td>1.688</td>
<td>20.000</td>
</tr>
<tr>
<td>Hotelling's Trace</td>
<td>.054</td>
<td>1.689</td>
<td>20.000</td>
</tr>
<tr>
<td>Roy's Largest Root</td>
<td>.032</td>
<td>3.964(^c)</td>
<td>5.000</td>
</tr>
<tr>
<td>GRADE</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pillai's Trace</td>
<td>.028</td>
<td>3.532(^b)</td>
<td>5.000</td>
</tr>
<tr>
<td>Wilks' Lambda</td>
<td>.972</td>
<td>3.532(^b)</td>
<td>5.000</td>
</tr>
<tr>
<td>Hotelling's Trace</td>
<td>.028</td>
<td>3.532(^b)</td>
<td>5.000</td>
</tr>
<tr>
<td>Roy's Largest Root</td>
<td>.028</td>
<td>3.532(^b)</td>
<td>5.000</td>
</tr>
<tr>
<td>GENDER</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pillai's Trace</td>
<td>.020</td>
<td>2.509(^b)</td>
<td>5.000</td>
</tr>
<tr>
<td>Wilks' Lambda</td>
<td>.980</td>
<td>2.509(^b)</td>
<td>5.000</td>
</tr>
<tr>
<td>Hotelling's Trace</td>
<td>.020</td>
<td>2.509(^b)</td>
<td>5.000</td>
</tr>
<tr>
<td>Roy's Largest Root</td>
<td>.020</td>
<td>2.509(^b)</td>
<td>5.000</td>
</tr>
<tr>
<td>SCHOOLID</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pillai's Trace</td>
<td>.055</td>
<td>2.334</td>
<td>15.000</td>
</tr>
<tr>
<td>Wilks' Lambda</td>
<td>.946</td>
<td>2.345</td>
<td>15.000</td>
</tr>
<tr>
<td>Hotelling's Trace</td>
<td>.057</td>
<td>2.353</td>
<td>15.000</td>
</tr>
<tr>
<td>Roy's Largest Root</td>
<td>.041</td>
<td>5.103(^c)</td>
<td>5.000</td>
</tr>
<tr>
<td>ESBI D</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pillai's Trace</td>
<td>.020</td>
<td>2.489(^b)</td>
<td>5.000</td>
</tr>
<tr>
<td>Wilks' Lambda</td>
<td>.980</td>
<td>2.489(^b)</td>
<td>5.000</td>
</tr>
<tr>
<td>Hotelling's Trace</td>
<td>.020</td>
<td>2.489(^b)</td>
<td>5.000</td>
</tr>
<tr>
<td>Roy's Largest Root</td>
<td>.020</td>
<td>2.489(^b)</td>
<td>5.000</td>
</tr>
<tr>
<td>CLU3_1 * ABILITY2</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pillai's Trace</td>
<td>.060</td>
<td>.950</td>
<td>40.000</td>
</tr>
<tr>
<td>Wilks' Lambda</td>
<td>.941</td>
<td>.950</td>
<td>40.000</td>
</tr>
<tr>
<td>Hotelling's Trace</td>
<td>.061</td>
<td>.951</td>
<td>40.000</td>
</tr>
<tr>
<td>Roy's Largest Root</td>
<td>.032</td>
<td>2.490(^c)</td>
<td>8.000</td>
</tr>
<tr>
<td>CLU3_1 * LIT2</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pillai's Trace</td>
<td>.046</td>
<td>.730</td>
<td>40.000</td>
</tr>
<tr>
<td>Wilks' Lambda</td>
<td>.954</td>
<td>.729</td>
<td>40.000</td>
</tr>
<tr>
<td>Hotelling's Trace</td>
<td>.047</td>
<td>.728</td>
<td>40.000</td>
</tr>
<tr>
<td>Roy's Largest Root</td>
<td>.022</td>
<td>1.759(^c)</td>
<td>8.000</td>
</tr>
<tr>
<td>CLU3_1 * GRADE</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pillai's Trace</td>
<td>.016</td>
<td>1.034</td>
<td>10.000</td>
</tr>
<tr>
<td>Wilks' Lambda</td>
<td>.984</td>
<td>1.033(^b)</td>
<td>10.000</td>
</tr>
<tr>
<td>Hotelling's Trace</td>
<td>.017</td>
<td>1.032</td>
<td>10.000</td>
</tr>
<tr>
<td>Roy's Largest Root</td>
<td>.011</td>
<td>1.380(^c)</td>
<td>5.000</td>
</tr>
<tr>
<td>CLU3_1 * GENDER</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pillai's Trace</td>
<td>.021</td>
<td>1.334</td>
<td>10.000</td>
</tr>
<tr>
<td>Wilks' Lambda</td>
<td>.979</td>
<td>1.333(^b)</td>
<td>10.000</td>
</tr>
<tr>
<td>Hotelling's Trace</td>
<td>.021</td>
<td>1.332</td>
<td>10.000</td>
</tr>
<tr>
<td>Roy's Largest Root</td>
<td>.015</td>
<td>1.908(^c)</td>
<td>5.000</td>
</tr>
<tr>
<td>CLU3_1 * SCHOOLID</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pillai's Trace</td>
<td>.030</td>
<td>.627</td>
<td>30.000</td>
</tr>
<tr>
<td>Wilks' Lambda</td>
<td>.970</td>
<td>.625</td>
<td>30.000</td>
</tr>
<tr>
<td>Hotelling's Trace</td>
<td>.030</td>
<td>.623</td>
<td>30.000</td>
</tr>
<tr>
<td>Roy's Largest Root</td>
<td>.012</td>
<td>1.248(^c)</td>
<td>6.000</td>
</tr>
<tr>
<td>Effect</td>
<td>Value</td>
<td>F</td>
<td>Hypothesis df</td>
</tr>
<tr>
<td>----------------------</td>
<td>--------</td>
<td>-------</td>
<td>---------------</td>
</tr>
<tr>
<td>CLU3_1 * ESBID</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pillai's Trace</td>
<td>.011</td>
<td>.688c</td>
<td>10.000</td>
</tr>
<tr>
<td>Wilks' Lambda</td>
<td>.989</td>
<td>.688b</td>
<td>10.000</td>
</tr>
<tr>
<td>Hotelling's Trace</td>
<td>.011</td>
<td>.687</td>
<td>10.000</td>
</tr>
<tr>
<td>Roy's Largest Root</td>
<td>.009</td>
<td>1.149</td>
<td>5.000</td>
</tr>
<tr>
<td>ABILITY2 * LIT2</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pillai's Trace</td>
<td>.120</td>
<td>.964</td>
<td>80.000</td>
</tr>
<tr>
<td>Wilks' Lambda</td>
<td>.885</td>
<td>.963</td>
<td>80.000</td>
</tr>
<tr>
<td>Hotelling's Trace</td>
<td>.124</td>
<td>.963</td>
<td>80.000</td>
</tr>
<tr>
<td>Roy's Largest Root</td>
<td>.044</td>
<td>1.732</td>
<td>16.000</td>
</tr>
<tr>
<td>ABILITY2 * GRADE</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pillai's Trace</td>
<td>.027</td>
<td>.845</td>
<td>20.000</td>
</tr>
<tr>
<td>Wilks' Lambda</td>
<td>.973</td>
<td>.845</td>
<td>20.000</td>
</tr>
<tr>
<td>Hotelling's Trace</td>
<td>.027</td>
<td>.845</td>
<td>20.000</td>
</tr>
<tr>
<td>Roy's Largest Root</td>
<td>.019</td>
<td>2.331</td>
<td>5.000</td>
</tr>
<tr>
<td>ABILITY2 * GENDER</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pillai's Trace</td>
<td>.022</td>
<td>.694</td>
<td>20.000</td>
</tr>
<tr>
<td>Wilks' Lambda</td>
<td>.978</td>
<td>.693</td>
<td>20.000</td>
</tr>
<tr>
<td>Hotelling's Trace</td>
<td>.022</td>
<td>.693</td>
<td>20.000</td>
</tr>
<tr>
<td>Roy's Largest Root</td>
<td>.014</td>
<td>1.797</td>
<td>5.000</td>
</tr>
<tr>
<td>ABILITY2 * SCHOOLID</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pillai's Trace</td>
<td>.120</td>
<td>1.281</td>
<td>60.000</td>
</tr>
<tr>
<td>Wilks' Lambda</td>
<td>.885</td>
<td>1.283</td>
<td>60.000</td>
</tr>
<tr>
<td>Hotelling's Trace</td>
<td>.124</td>
<td>1.283</td>
<td>60.000</td>
</tr>
<tr>
<td>Roy's Largest Root</td>
<td>.046</td>
<td>2.414</td>
<td>12.000</td>
</tr>
<tr>
<td>ABILITY2 * ESBID</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pillai's Trace</td>
<td>.022</td>
<td>.677</td>
<td>20.000</td>
</tr>
<tr>
<td>Wilks' Lambda</td>
<td>.979</td>
<td>.677</td>
<td>20.000</td>
</tr>
<tr>
<td>Hotelling's Trace</td>
<td>.022</td>
<td>.677</td>
<td>20.000</td>
</tr>
<tr>
<td>Roy's Largest Root</td>
<td>.016</td>
<td>1.967</td>
<td>5.000</td>
</tr>
<tr>
<td>LIT2 * GRADE</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pillai's Trace</td>
<td>.029</td>
<td>.911</td>
<td>20.000</td>
</tr>
<tr>
<td>Wilks' Lambda</td>
<td>.971</td>
<td>.910</td>
<td>20.000</td>
</tr>
<tr>
<td>Hotelling's Trace</td>
<td>.029</td>
<td>.908</td>
<td>20.000</td>
</tr>
<tr>
<td>Roy's Largest Root</td>
<td>.016</td>
<td>1.962</td>
<td>5.000</td>
</tr>
<tr>
<td>LIT2 * GENDER</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pillai's Trace</td>
<td>.036</td>
<td>1.150</td>
<td>20.000</td>
</tr>
<tr>
<td>Wilks' Lambda</td>
<td>.964</td>
<td>1.149</td>
<td>20.000</td>
</tr>
<tr>
<td>Hotelling's Trace</td>
<td>.037</td>
<td>1.147</td>
<td>20.000</td>
</tr>
<tr>
<td>Roy's Largest Root</td>
<td>.019</td>
<td>2.384</td>
<td>5.000</td>
</tr>
<tr>
<td>LIT2 * SCHOOLID</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pillai's Trace</td>
<td>.098</td>
<td>1.045</td>
<td>60.000</td>
</tr>
<tr>
<td>Wilks' Lambda</td>
<td>.905</td>
<td>1.046</td>
<td>60.000</td>
</tr>
<tr>
<td>Hotelling's Trace</td>
<td>.101</td>
<td>1.047</td>
<td>60.000</td>
</tr>
<tr>
<td>Roy's Largest Root</td>
<td>.045</td>
<td>2.344</td>
<td>12.000</td>
</tr>
<tr>
<td>LIT2 * ESBID</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pillai's Trace</td>
<td>.024</td>
<td>.754</td>
<td>20.000</td>
</tr>
<tr>
<td>Wilks' Lambda</td>
<td>.976</td>
<td>.755</td>
<td>20.000</td>
</tr>
<tr>
<td>Hotelling's Trace</td>
<td>.024</td>
<td>.755</td>
<td>20.000</td>
</tr>
<tr>
<td>Roy's Largest Root</td>
<td>.018</td>
<td>2.304</td>
<td>5.000</td>
</tr>
<tr>
<td>GRADE * GENDER</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pillai's Trace</td>
<td>.026</td>
<td>3.271</td>
<td>5.000</td>
</tr>
<tr>
<td>Wilks' Lambda</td>
<td>.974</td>
<td>3.271</td>
<td>5.000</td>
</tr>
<tr>
<td>Hotelling's Trace</td>
<td>.026</td>
<td>3.271</td>
<td>5.000</td>
</tr>
<tr>
<td>Roy's Largest Root</td>
<td>.026</td>
<td>3.271</td>
<td>5.000</td>
</tr>
<tr>
<td>GRADE * SCHOOLID</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pillai's Trace</td>
<td>.027</td>
<td>1.141</td>
<td>15.000</td>
</tr>
<tr>
<td>Wilks' Lambda</td>
<td>.973</td>
<td>1.140</td>
<td>15.000</td>
</tr>
<tr>
<td>Hotelling's Trace</td>
<td>.028</td>
<td>1.140</td>
<td>15.000</td>
</tr>
<tr>
<td>Roy's Largest Root</td>
<td>.017</td>
<td>2.175</td>
<td>5.000</td>
</tr>
<tr>
<td>GRADE * ESBID</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pillai's Trace</td>
<td>.005</td>
<td>.577</td>
<td>5.000</td>
</tr>
<tr>
<td>Wilks' Lambda</td>
<td>.995</td>
<td>.577</td>
<td>5.000</td>
</tr>
<tr>
<td>Hotelling's Trace</td>
<td>.005</td>
<td>.577</td>
<td>5.000</td>
</tr>
<tr>
<td>Roy's Largest Root</td>
<td>.005</td>
<td>.577</td>
<td>5.000</td>
</tr>
</tbody>
</table>
### Multivariate Tests

<table>
<thead>
<tr>
<th>Effect</th>
<th>Value</th>
<th>F</th>
<th>Hypothesis df</th>
<th>Error df</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>GENDER * SCHOOLID</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pillai's Trace</td>
<td>.026</td>
<td>1.642</td>
<td>10.000</td>
<td>1246.000</td>
</tr>
<tr>
<td>Wilks' Lambda</td>
<td>.974</td>
<td>1.643&lt;sup&gt;b&lt;/sup&gt;</td>
<td>10.000</td>
<td>1244.000</td>
</tr>
<tr>
<td>Hotelling's Trace</td>
<td>.026</td>
<td>1.644</td>
<td>10.000</td>
<td>1242.000</td>
</tr>
<tr>
<td>Roy's Largest Root</td>
<td>.021</td>
<td>2.609&lt;sup&gt;c&lt;/sup&gt;</td>
<td>5.000</td>
<td>623.000</td>
</tr>
<tr>
<td><strong>GENDER * ESBID</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pillai's Trace</td>
<td>.002</td>
<td>.311&lt;sup&gt;b&lt;/sup&gt;</td>
<td>5.000</td>
<td>622.000</td>
</tr>
<tr>
<td>Wilks' Lambda</td>
<td>.998</td>
<td>.311&lt;sup&gt;b&lt;/sup&gt;</td>
<td>5.000</td>
<td>622.000</td>
</tr>
<tr>
<td>Hotelling's Trace</td>
<td>.002</td>
<td>.311&lt;sup&gt;b&lt;/sup&gt;</td>
<td>5.000</td>
<td>622.000</td>
</tr>
<tr>
<td>Roy's Largest Root</td>
<td>.002</td>
<td>.311&lt;sup&gt;b&lt;/sup&gt;</td>
<td>5.000</td>
<td>622.000</td>
</tr>
<tr>
<td><strong>SCHOOLID * ESBID</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pillai's Trace</td>
<td>.025</td>
<td>1.029</td>
<td>15.000</td>
<td>1872.000</td>
</tr>
<tr>
<td>Wilks' Lambda</td>
<td>.976</td>
<td>1.028</td>
<td>15.000</td>
<td>1717.470</td>
</tr>
<tr>
<td>Hotelling's Trace</td>
<td>.025</td>
<td>1.028</td>
<td>15.000</td>
<td>1862.000</td>
</tr>
<tr>
<td>Roy's Largest Root</td>
<td>.016</td>
<td>2.001&lt;sup&gt;c&lt;/sup&gt;</td>
<td>5.000</td>
<td>624.000</td>
</tr>
</tbody>
</table>
## Multivariate Tests

<table>
<thead>
<tr>
<th>Effect</th>
<th>Sig.</th>
<th>Partial Eta Squared</th>
<th>Noncent. Parameter</th>
<th>Observed Power</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intercept</td>
<td>.000</td>
<td>.880</td>
<td>4555.411</td>
<td>1.000</td>
</tr>
<tr>
<td></td>
<td>Wilks' Lambda</td>
<td>.000</td>
<td>.880</td>
<td>4555.411</td>
</tr>
<tr>
<td></td>
<td>Hotelling's Trace</td>
<td>.000</td>
<td>.880</td>
<td>4555.411</td>
</tr>
<tr>
<td></td>
<td>Roy's Largest Root</td>
<td>.000</td>
<td>.880</td>
<td>4555.411</td>
</tr>
<tr>
<td>CLU3_1</td>
<td>.001</td>
<td>.023</td>
<td>28.954</td>
<td>.979</td>
</tr>
<tr>
<td></td>
<td>Wilks' Lambda</td>
<td>.001</td>
<td>.023</td>
<td>28.932</td>
</tr>
<tr>
<td></td>
<td>Hotelling's Trace</td>
<td>.001</td>
<td>.023</td>
<td>28.911</td>
</tr>
<tr>
<td></td>
<td>Roy's Largest Root</td>
<td>.003</td>
<td>.028</td>
<td>18.532</td>
</tr>
<tr>
<td>ABILITY2</td>
<td>.052</td>
<td>.012</td>
<td>31.299</td>
<td>.953</td>
</tr>
<tr>
<td></td>
<td>Wilks' Lambda</td>
<td>.051</td>
<td>.012</td>
<td>25.995</td>
</tr>
<tr>
<td></td>
<td>Hotelling's Trace</td>
<td>.051</td>
<td>.013</td>
<td>31.449</td>
</tr>
<tr>
<td></td>
<td>Roy's Largest Root</td>
<td>.001</td>
<td>.032</td>
<td>20.636</td>
</tr>
<tr>
<td>LIT2</td>
<td>.029</td>
<td>.013</td>
<td>33.702</td>
<td>.968</td>
</tr>
<tr>
<td></td>
<td>Wilks' Lambda</td>
<td>.029</td>
<td>.013</td>
<td>27.952</td>
</tr>
<tr>
<td></td>
<td>Hotelling's Trace</td>
<td>.028</td>
<td>.013</td>
<td>33.771</td>
</tr>
<tr>
<td></td>
<td>Roy's Largest Root</td>
<td>.002</td>
<td>.031</td>
<td>19.822</td>
</tr>
<tr>
<td>GRADE</td>
<td>.004</td>
<td>.028</td>
<td>17.662</td>
<td>.919</td>
</tr>
<tr>
<td></td>
<td>Wilks' Lambda</td>
<td>.004</td>
<td>.028</td>
<td>17.662</td>
</tr>
<tr>
<td></td>
<td>Hotelling's Trace</td>
<td>.004</td>
<td>.028</td>
<td>17.662</td>
</tr>
<tr>
<td></td>
<td>Roy's Largest Root</td>
<td>.004</td>
<td>.028</td>
<td>17.662</td>
</tr>
<tr>
<td>GENDER</td>
<td>.029</td>
<td>.020</td>
<td>12.546</td>
<td>.786</td>
</tr>
<tr>
<td></td>
<td>Wilks' Lambda</td>
<td>.029</td>
<td>.020</td>
<td>12.546</td>
</tr>
<tr>
<td></td>
<td>Hotelling's Trace</td>
<td>.029</td>
<td>.020</td>
<td>12.546</td>
</tr>
<tr>
<td></td>
<td>Roy's Largest Root</td>
<td>.029</td>
<td>.020</td>
<td>12.546</td>
</tr>
<tr>
<td>SCHOOLID</td>
<td>.003</td>
<td>.018</td>
<td>35.014</td>
<td>.986</td>
</tr>
<tr>
<td></td>
<td>Wilks' Lambda</td>
<td>.002</td>
<td>.018</td>
<td>32.341</td>
</tr>
<tr>
<td></td>
<td>Hotelling's Trace</td>
<td>.002</td>
<td>.019</td>
<td>35.298</td>
</tr>
<tr>
<td></td>
<td>Roy's Largest Root</td>
<td>.000</td>
<td>.039</td>
<td>25.516</td>
</tr>
<tr>
<td>ESBID</td>
<td>.030</td>
<td>.020</td>
<td>12.444</td>
<td>.782</td>
</tr>
<tr>
<td></td>
<td>Wilks' Lambda</td>
<td>.030</td>
<td>.020</td>
<td>12.444</td>
</tr>
<tr>
<td></td>
<td>Hotelling's Trace</td>
<td>.030</td>
<td>.020</td>
<td>12.444</td>
</tr>
<tr>
<td></td>
<td>Roy's Largest Root</td>
<td>.030</td>
<td>.020</td>
<td>12.444</td>
</tr>
<tr>
<td>CLU3_1 * ABILITY2</td>
<td>.561</td>
<td>.012</td>
<td>37.994</td>
<td>.936</td>
</tr>
<tr>
<td></td>
<td>Wilks' Lambda</td>
<td>.560</td>
<td>.012</td>
<td>33.105</td>
</tr>
<tr>
<td></td>
<td>Hotelling's Trace</td>
<td>.560</td>
<td>.012</td>
<td>36.022</td>
</tr>
<tr>
<td></td>
<td>Roy's Largest Root</td>
<td>.012</td>
<td>.031</td>
<td>19.922</td>
</tr>
<tr>
<td>CLU3_1 * LIT2</td>
<td>.895</td>
<td>.009</td>
<td>29.201</td>
<td>.826</td>
</tr>
<tr>
<td></td>
<td>Wilks' Lambda</td>
<td>.896</td>
<td>.009</td>
<td>25.407</td>
</tr>
<tr>
<td></td>
<td>Hotelling's Trace</td>
<td>.897</td>
<td>.009</td>
<td>29.139</td>
</tr>
<tr>
<td></td>
<td>Roy's Largest Root</td>
<td>.082</td>
<td>.022</td>
<td>14.078</td>
</tr>
<tr>
<td>CLU3_1 * GRADE</td>
<td>.412</td>
<td>.008</td>
<td>10.341</td>
<td>.556</td>
</tr>
<tr>
<td></td>
<td>Wilks' Lambda</td>
<td>.413</td>
<td>.008</td>
<td>10.329</td>
</tr>
<tr>
<td></td>
<td>Hotelling's Trace</td>
<td>.414</td>
<td>.008</td>
<td>10.317</td>
</tr>
<tr>
<td></td>
<td>Roy's Largest Root</td>
<td>.230</td>
<td>.011</td>
<td>6.899</td>
</tr>
<tr>
<td>CLU3_1 * GENDER</td>
<td>.207</td>
<td>.011</td>
<td>13.336</td>
<td>.693</td>
</tr>
<tr>
<td></td>
<td>Wilks' Lambda</td>
<td>.207</td>
<td>.011</td>
<td>13.327</td>
</tr>
<tr>
<td></td>
<td>Hotelling's Trace</td>
<td>.208</td>
<td>.011</td>
<td>13.319</td>
</tr>
<tr>
<td></td>
<td>Roy's Largest Root</td>
<td>.091</td>
<td>.015</td>
<td>9.538</td>
</tr>
<tr>
<td>CLU3_1 * SCHOOLID</td>
<td>.943</td>
<td>.006</td>
<td>18.822</td>
<td>.642</td>
</tr>
<tr>
<td></td>
<td>Wilks' Lambda</td>
<td>.944</td>
<td>.006</td>
<td>14.992</td>
</tr>
<tr>
<td></td>
<td>Hotelling's Trace</td>
<td>.946</td>
<td>.006</td>
<td>18.699</td>
</tr>
<tr>
<td></td>
<td>Roy's Largest Root</td>
<td>.280</td>
<td>.012</td>
<td>7.485</td>
</tr>
<tr>
<td>Effect</td>
<td>Pillai's Trace</td>
<td>Wilks' Lambda</td>
<td>Hotelling's Trace</td>
<td>Roy's Largest Root</td>
</tr>
<tr>
<td>------------------------</td>
<td>---------------</td>
<td>---------------</td>
<td>-------------------</td>
<td>-------------------</td>
</tr>
<tr>
<td>CLU3_1 * ESBIID</td>
<td>.737</td>
<td>.737</td>
<td>.737</td>
<td>.333</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ABILITY2 * LIT2</td>
<td>.571</td>
<td>.572</td>
<td>.574</td>
<td>.037</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ABILITY2 * GRADE</td>
<td>.659</td>
<td>.659</td>
<td>.659</td>
<td>.041</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ABILITY2 * GENDER</td>
<td>.836</td>
<td>.837</td>
<td>.837</td>
<td>.111</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ABILITY2 * SCHOOLID</td>
<td>.072</td>
<td>.072</td>
<td>.071</td>
<td>.005</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ABILITY2 * ESBIID</td>
<td>.853</td>
<td>.853</td>
<td>.853</td>
<td>.082</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>LIT2 * GRADE</td>
<td>.573</td>
<td>.575</td>
<td>.576</td>
<td>.082</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>LIT2 * GENDER</td>
<td>.290</td>
<td>.291</td>
<td>.293</td>
<td>.037</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>LIT2 * SCHOOLID</td>
<td>.383</td>
<td>.381</td>
<td>.379</td>
<td>.006</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>LIT2 * ESBIID</td>
<td>.771</td>
<td>.770</td>
<td>.770</td>
<td>.043</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>GRADE * GENDER</td>
<td>.006</td>
<td>.006</td>
<td>.006</td>
<td>.006</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>GRADE * SCHOOLID</td>
<td>.314</td>
<td>.314</td>
<td>.314</td>
<td>.056</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>GRADE * ESBIID</td>
<td>.717</td>
<td>.717</td>
<td>.717</td>
<td>.717</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
### Multivariate Tests

<table>
<thead>
<tr>
<th>Effect</th>
<th>Sig.</th>
<th>Partial Eta Squared</th>
<th>Noncent. Parameter</th>
<th>Observed Power^a</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>GENDER * SCHOOLID</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pillai's Trace</td>
<td>.090</td>
<td>.013</td>
<td>16.417</td>
<td>.802</td>
</tr>
<tr>
<td>Wilks' Lambda</td>
<td>.089</td>
<td>.013</td>
<td>16.427</td>
<td>.802</td>
</tr>
<tr>
<td>Hotelling's Trace</td>
<td>.089</td>
<td>.013</td>
<td>16.437</td>
<td>.802</td>
</tr>
<tr>
<td>Roy's Largest Root</td>
<td>.024</td>
<td>.021</td>
<td>13.043</td>
<td>.804</td>
</tr>
<tr>
<td><strong>GENDER * ESBID</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pillai's Trace</td>
<td>.907</td>
<td>.002</td>
<td>1.554</td>
<td>.129</td>
</tr>
<tr>
<td>Wilks' Lambda</td>
<td>.907</td>
<td>.002</td>
<td>1.554</td>
<td>.129</td>
</tr>
<tr>
<td>Hotelling's Trace</td>
<td>.907</td>
<td>.002</td>
<td>1.554</td>
<td>.129</td>
</tr>
<tr>
<td>Roy's Largest Root</td>
<td>.907</td>
<td>.002</td>
<td>1.554</td>
<td>.129</td>
</tr>
<tr>
<td><strong>SCHOOLID * ESBID</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pillai's Trace</td>
<td>.421</td>
<td>.008</td>
<td>15.435</td>
<td>.689</td>
</tr>
<tr>
<td>Wilks' Lambda</td>
<td>.422</td>
<td>.008</td>
<td>14.189</td>
<td>.641</td>
</tr>
<tr>
<td>Hotelling's Trace</td>
<td>.423</td>
<td>.008</td>
<td>15.413</td>
<td>.688</td>
</tr>
<tr>
<td>Roy's Largest Root</td>
<td>.077</td>
<td>.016</td>
<td>10.005</td>
<td>.673</td>
</tr>
</tbody>
</table>

---

a. Computed using alpha = .05  
b. Exact statistic  
c. The statistic is an upper bound on F that yields a lower bound on the significance level.  
d. Design: Intercept+CLU3_1+ABILITY2+LIT2+GRADE+GENDER+SCHOOLID+ESBID+CLU3_1*ABILITY2+CLU3_1*LIT2+CLU3_1*GRADE+CLU3_1*GENDER+CLU3_1*SCHOOLID+CLU3_1*ESBID+ABILITY2*LIT2+ABILITY2*GRADE+ABILITY2*GENDER+ABILITY2*SCHOOLID+ABILITY2*ESBID+LIT2*GRADE+LIT2*GENDER+LIT2*SCHOOLID+LIT2*ESBID+GRADE*GENDER+GRADE*SCHOOLID+GRADE*ESBID+GENDER*SCHOOLID+GENDER*ESBID+SCHOOLID*ESBID
## Tests of Between-Subjects Effects

<table>
<thead>
<tr>
<th>Source</th>
<th>Dependent Variable</th>
<th>Type III Sum of Squares</th>
<th>df</th>
<th>Mean Square</th>
<th>F</th>
</tr>
</thead>
<tbody>
<tr>
<td>Corrected Model</td>
<td>ACEFFLIT</td>
<td>106.696b</td>
<td>119</td>
<td>.913</td>
<td>2.424</td>
</tr>
<tr>
<td></td>
<td>LSTRALIT</td>
<td>90.406c</td>
<td>119</td>
<td>.760</td>
<td>2.376</td>
</tr>
<tr>
<td></td>
<td>SREGLIT</td>
<td>86.743d</td>
<td>119</td>
<td>.729</td>
<td>1.952</td>
</tr>
<tr>
<td></td>
<td>ASHANLIT</td>
<td>102.872e</td>
<td>119</td>
<td>.864</td>
<td>1.627</td>
</tr>
<tr>
<td></td>
<td>TANXLIT</td>
<td>247.291f</td>
<td>119</td>
<td>2.078</td>
<td>2.296</td>
</tr>
<tr>
<td>Intercept</td>
<td>ACEFFLIT</td>
<td>691.490</td>
<td>1</td>
<td>691.490</td>
<td>1834.840</td>
</tr>
<tr>
<td></td>
<td>LSTRALIT</td>
<td>692.901</td>
<td>1</td>
<td>692.901</td>
<td>2166.755</td>
</tr>
<tr>
<td></td>
<td>SREGLIT</td>
<td>575.640</td>
<td>1</td>
<td>575.640</td>
<td>1541.834</td>
</tr>
<tr>
<td></td>
<td>ASHANLIT</td>
<td>183.149</td>
<td>1</td>
<td>183.149</td>
<td>344.797</td>
</tr>
<tr>
<td></td>
<td>TANXLIT</td>
<td>446.794</td>
<td>1</td>
<td>446.794</td>
<td>491.485</td>
</tr>
<tr>
<td>CLU3_1</td>
<td>ACEFFLIT</td>
<td>3.555</td>
<td>2</td>
<td>1.777</td>
<td>4.716</td>
</tr>
<tr>
<td></td>
<td>LSTRALIT</td>
<td>2.887</td>
<td>2</td>
<td>1.443</td>
<td>4.513</td>
</tr>
<tr>
<td></td>
<td>SREGLIT</td>
<td>5.680</td>
<td>2</td>
<td>2.840</td>
<td>7.607</td>
</tr>
<tr>
<td></td>
<td>ASHANLIT</td>
<td>1.789</td>
<td>2</td>
<td>.894</td>
<td>1.684</td>
</tr>
<tr>
<td></td>
<td>TANXLIT</td>
<td>3.294</td>
<td>2</td>
<td>1.647</td>
<td>1.812</td>
</tr>
<tr>
<td>ABILITY2</td>
<td>ACEFFLIT</td>
<td>3.383</td>
<td>4</td>
<td>.846</td>
<td>2.244</td>
</tr>
<tr>
<td></td>
<td>LSTRALIT</td>
<td>1.491</td>
<td>4</td>
<td>.373</td>
<td>1.165</td>
</tr>
<tr>
<td></td>
<td>SREGLIT</td>
<td>1.390</td>
<td>4</td>
<td>.347</td>
<td>.931</td>
</tr>
<tr>
<td></td>
<td>ASHANLIT</td>
<td>1.983</td>
<td>4</td>
<td>.491</td>
<td>.924</td>
</tr>
<tr>
<td></td>
<td>TANXLIT</td>
<td>2.118</td>
<td>4</td>
<td>.530</td>
<td>.563</td>
</tr>
<tr>
<td>LIT2</td>
<td>ACEFFLIT</td>
<td>4.478</td>
<td>4</td>
<td>1.120</td>
<td>2.971</td>
</tr>
<tr>
<td></td>
<td>LSTRALIT</td>
<td>.261</td>
<td>4</td>
<td>6.520E-02</td>
<td>.204</td>
</tr>
<tr>
<td></td>
<td>SREGLIT</td>
<td>.788</td>
<td>4</td>
<td>.197</td>
<td>.528</td>
</tr>
<tr>
<td></td>
<td>ASHANLIT</td>
<td>4.579</td>
<td>4</td>
<td>1.145</td>
<td>2.155</td>
</tr>
<tr>
<td></td>
<td>TANXLIT</td>
<td>6.550</td>
<td>4</td>
<td>1.637</td>
<td>1.801</td>
</tr>
<tr>
<td>GRADE</td>
<td>ACEFFLIT</td>
<td>.212</td>
<td>1</td>
<td>.212</td>
<td>.564</td>
</tr>
<tr>
<td></td>
<td>LSTRALIT</td>
<td>5.546E-02</td>
<td>1</td>
<td>5.546E-02</td>
<td>.173</td>
</tr>
<tr>
<td></td>
<td>SREGLIT</td>
<td>4.200</td>
<td>1</td>
<td>4.200</td>
<td>11.249</td>
</tr>
<tr>
<td></td>
<td>ASHANLIT</td>
<td>.383</td>
<td>1</td>
<td>.383</td>
<td>.722</td>
</tr>
<tr>
<td></td>
<td>TANXLIT</td>
<td>1.082</td>
<td>1</td>
<td>1.082</td>
<td>1.190</td>
</tr>
<tr>
<td>GENDER</td>
<td>ACEFFLIT</td>
<td>.680</td>
<td>1</td>
<td>.680</td>
<td>1.804</td>
</tr>
<tr>
<td></td>
<td>LSTRALIT</td>
<td>3.448</td>
<td>1</td>
<td>3.448</td>
<td>10.784</td>
</tr>
<tr>
<td></td>
<td>SREGLIT</td>
<td>1.883</td>
<td>1</td>
<td>1.883</td>
<td>5.043</td>
</tr>
<tr>
<td></td>
<td>ASHANLIT</td>
<td>3.772E-02</td>
<td>1</td>
<td>3.772E-02</td>
<td>.071</td>
</tr>
<tr>
<td></td>
<td>TANXLIT</td>
<td>1.048</td>
<td>1</td>
<td>1.048</td>
<td>1.153</td>
</tr>
<tr>
<td>SCHOOLID</td>
<td>ACEFFLIT</td>
<td>8.864</td>
<td>3</td>
<td>2.955</td>
<td>7.840</td>
</tr>
<tr>
<td></td>
<td>LSTRALIT</td>
<td>.775</td>
<td>3</td>
<td>.258</td>
<td>.808</td>
</tr>
<tr>
<td></td>
<td>SREGLIT</td>
<td>.873</td>
<td>3</td>
<td>.291</td>
<td>.780</td>
</tr>
<tr>
<td></td>
<td>ASHANLIT</td>
<td>.515</td>
<td>3</td>
<td>.172</td>
<td>.323</td>
</tr>
<tr>
<td></td>
<td>TANXLIT</td>
<td>2.810</td>
<td>3</td>
<td>.937</td>
<td>1.030</td>
</tr>
<tr>
<td>ESBID</td>
<td>ACEFFLIT</td>
<td>3.265</td>
<td>1</td>
<td>3.265</td>
<td>8.683</td>
</tr>
<tr>
<td></td>
<td>LSTRALIT</td>
<td>6.662E-02</td>
<td>1</td>
<td>6.662E-02</td>
<td>.208</td>
</tr>
<tr>
<td></td>
<td>SREGLIT</td>
<td>.158</td>
<td>1</td>
<td>.158</td>
<td>.423</td>
</tr>
<tr>
<td></td>
<td>ASHANLIT</td>
<td>.140</td>
<td>1</td>
<td>.140</td>
<td>.263</td>
</tr>
<tr>
<td></td>
<td>TANXLIT</td>
<td>2.468</td>
<td>1</td>
<td>2.468</td>
<td>2.715</td>
</tr>
<tr>
<td>CLU3_1 * ABILITY2</td>
<td>ACEFFLIT</td>
<td>3.431</td>
<td>8</td>
<td>.429</td>
<td>1.138</td>
</tr>
<tr>
<td></td>
<td>LSTRALIT</td>
<td>.302</td>
<td>8</td>
<td>4.898E-02</td>
<td>.153</td>
</tr>
<tr>
<td></td>
<td>SREGLIT</td>
<td>2.479</td>
<td>8</td>
<td>.310</td>
<td>.830</td>
</tr>
<tr>
<td></td>
<td>ASHANLIT</td>
<td>1.525</td>
<td>8</td>
<td>.191</td>
<td>.359</td>
</tr>
<tr>
<td></td>
<td>TANXLIT</td>
<td>12.666</td>
<td>8</td>
<td>1.583</td>
<td>1.742</td>
</tr>
<tr>
<td>Source</td>
<td>Dependent Variable</td>
<td>Type III Sum of Squares</td>
<td>df</td>
<td>Mean Square</td>
<td>F</td>
</tr>
<tr>
<td>------------------------</td>
<td>-------------------</td>
<td>-------------------------</td>
<td>----</td>
<td>-------------</td>
<td>------</td>
</tr>
<tr>
<td><strong>CLU3_1 * LIT2</strong></td>
<td>ACEFFLIT</td>
<td>1.852</td>
<td>8</td>
<td>.233</td>
<td>.818</td>
</tr>
<tr>
<td></td>
<td>LSTRALIT</td>
<td>1.857</td>
<td>8</td>
<td>.232</td>
<td>.726</td>
</tr>
<tr>
<td></td>
<td>SREGLIT</td>
<td>2.136</td>
<td>8</td>
<td>.267</td>
<td>.715</td>
</tr>
<tr>
<td></td>
<td>TANXLIT</td>
<td>8.302</td>
<td>8</td>
<td>1.038</td>
<td>1.142</td>
</tr>
<tr>
<td><strong>CLU3_1 * GRADE</strong></td>
<td>ACEFFLIT</td>
<td>1.752</td>
<td>2</td>
<td>.876</td>
<td>2.324</td>
</tr>
<tr>
<td></td>
<td>LSTRALIT</td>
<td>.986</td>
<td>2</td>
<td>.493</td>
<td>1.542</td>
</tr>
<tr>
<td></td>
<td>SREGLIT</td>
<td>.765</td>
<td>2</td>
<td>.383</td>
<td>1.025</td>
</tr>
<tr>
<td></td>
<td>ASHANDLIT</td>
<td>1.503</td>
<td>2</td>
<td>.752</td>
<td>1.415</td>
</tr>
<tr>
<td></td>
<td>TANXLIT</td>
<td>1.776</td>
<td>2</td>
<td>.888</td>
<td>.977</td>
</tr>
<tr>
<td><strong>CLU3_1 * GENDER</strong></td>
<td>ACEFFLIT</td>
<td>1.405</td>
<td>2</td>
<td>.702</td>
<td>1.864</td>
</tr>
<tr>
<td></td>
<td>LSTRALIT</td>
<td>.499</td>
<td>2</td>
<td>.250</td>
<td>.781</td>
</tr>
<tr>
<td></td>
<td>SREGLIT</td>
<td>.888</td>
<td>2</td>
<td>.944</td>
<td>2.528</td>
</tr>
<tr>
<td></td>
<td>ASHANDLIT</td>
<td>9.157E-02</td>
<td>2</td>
<td>4.579E-02</td>
<td>.086</td>
</tr>
<tr>
<td></td>
<td>TANXLIT</td>
<td>2.929</td>
<td>2</td>
<td>1.465</td>
<td>1.611</td>
</tr>
<tr>
<td><strong>CLU3_1 * SCHOOLID</strong></td>
<td>ACEFFLIT</td>
<td>2.589</td>
<td>6</td>
<td>.431</td>
<td>1.145</td>
</tr>
<tr>
<td></td>
<td>LSTRALIT</td>
<td>1.026</td>
<td>6</td>
<td>.171</td>
<td>.535</td>
</tr>
<tr>
<td></td>
<td>SREGLIT</td>
<td>1.450</td>
<td>6</td>
<td>.242</td>
<td>.647</td>
</tr>
<tr>
<td></td>
<td>ASHANDLIT</td>
<td>.988</td>
<td>6</td>
<td>.185</td>
<td>.310</td>
</tr>
<tr>
<td></td>
<td>TANXLIT</td>
<td>2.291</td>
<td>6</td>
<td>.382</td>
<td>.420</td>
</tr>
<tr>
<td><strong>CLU3_1 * ESBID</strong></td>
<td>ACEFFLIT</td>
<td>.607</td>
<td>2</td>
<td>.304</td>
<td>.806</td>
</tr>
<tr>
<td></td>
<td>LSTRALIT</td>
<td>1.143E-02</td>
<td>2</td>
<td>5.713E-03</td>
<td>.018</td>
</tr>
<tr>
<td></td>
<td>SREGLIT</td>
<td>.121</td>
<td>2</td>
<td>6.061E-02</td>
<td>.162</td>
</tr>
<tr>
<td></td>
<td>ASHANDLIT</td>
<td>.898</td>
<td>2</td>
<td>.449</td>
<td>.845</td>
</tr>
<tr>
<td></td>
<td>TANXLIT</td>
<td>3.996</td>
<td>2</td>
<td>1.998</td>
<td>2.198</td>
</tr>
<tr>
<td><strong>ABILITY2 * LIT2</strong></td>
<td>ACEFFLIT</td>
<td>5.230</td>
<td>16</td>
<td>.327</td>
<td>.867</td>
</tr>
<tr>
<td></td>
<td>LSTRALIT</td>
<td>4.312</td>
<td>16</td>
<td>.270</td>
<td>.843</td>
</tr>
<tr>
<td></td>
<td>SREGLIT</td>
<td>5.223</td>
<td>16</td>
<td>.326</td>
<td>.874</td>
</tr>
<tr>
<td></td>
<td>ASHANDLIT</td>
<td>10.442</td>
<td>16</td>
<td>.653</td>
<td>1.229</td>
</tr>
<tr>
<td></td>
<td>TANXLIT</td>
<td>16.385</td>
<td>16</td>
<td>1.024</td>
<td>1.126</td>
</tr>
<tr>
<td><strong>ABILITY2 * GRADE</strong></td>
<td>ACEFFLIT</td>
<td>2.110</td>
<td>4</td>
<td>.527</td>
<td>1.400</td>
</tr>
<tr>
<td></td>
<td>LSTRALIT</td>
<td>6.274E-02</td>
<td>4</td>
<td>1.569E-02</td>
<td>.049</td>
</tr>
<tr>
<td></td>
<td>SREGLIT</td>
<td>.119</td>
<td>4</td>
<td>2.966E-02</td>
<td>.079</td>
</tr>
<tr>
<td></td>
<td>ASHANDLIT</td>
<td>3.296</td>
<td>4</td>
<td>.824</td>
<td>1.551</td>
</tr>
<tr>
<td></td>
<td>TANXLIT</td>
<td>3.058</td>
<td>4</td>
<td>.785</td>
<td>.841</td>
</tr>
<tr>
<td><strong>ABILITY2 * GENDER</strong></td>
<td>ACEFFLIT</td>
<td>.780</td>
<td>4</td>
<td>.195</td>
<td>.517</td>
</tr>
<tr>
<td></td>
<td>LSTRALIT</td>
<td>1.414</td>
<td>4</td>
<td>.354</td>
<td>1.106</td>
</tr>
<tr>
<td></td>
<td>SREGLIT</td>
<td>2.401</td>
<td>4</td>
<td>.600</td>
<td>1.608</td>
</tr>
<tr>
<td></td>
<td>ASHANDLIT</td>
<td>.706</td>
<td>4</td>
<td>.176</td>
<td>.332</td>
</tr>
<tr>
<td></td>
<td>TANXLIT</td>
<td>1.376</td>
<td>4</td>
<td>.344</td>
<td>.378</td>
</tr>
<tr>
<td><strong>ABILITY2 * SCHOOLID</strong></td>
<td>ACEFFLIT</td>
<td>9.040</td>
<td>12</td>
<td>.753</td>
<td>1.999</td>
</tr>
<tr>
<td></td>
<td>LSTRALIT</td>
<td>3.200</td>
<td>12</td>
<td>.267</td>
<td>.834</td>
</tr>
<tr>
<td></td>
<td>SREGLIT</td>
<td>3.045</td>
<td>12</td>
<td>.254</td>
<td>.680</td>
</tr>
<tr>
<td></td>
<td>ASHANDLIT</td>
<td>3.857</td>
<td>12</td>
<td>.321</td>
<td>.605</td>
</tr>
<tr>
<td></td>
<td>TANXLIT</td>
<td>17.947</td>
<td>12</td>
<td>1.496</td>
<td>1.645</td>
</tr>
<tr>
<td><strong>ABILITY2 * ESBID</strong></td>
<td>ACEFFLIT</td>
<td>1.361</td>
<td>4</td>
<td>.340</td>
<td>.903</td>
</tr>
<tr>
<td></td>
<td>LSTRALIT</td>
<td>.168</td>
<td>4</td>
<td>4.210E-02</td>
<td>.132</td>
</tr>
<tr>
<td></td>
<td>SREGLIT</td>
<td>.781</td>
<td>4</td>
<td>.195</td>
<td>.523</td>
</tr>
<tr>
<td></td>
<td>ASHANDLIT</td>
<td>1.140</td>
<td>4</td>
<td>.285</td>
<td>.537</td>
</tr>
<tr>
<td></td>
<td>TANXLIT</td>
<td>2.401</td>
<td>4</td>
<td>.600</td>
<td>.660</td>
</tr>
<tr>
<td>Source</td>
<td>Dependent Variable</td>
<td>Type III Sum of Squares</td>
<td>df</td>
<td>Mean Square</td>
<td>F</td>
</tr>
<tr>
<td>-------------------</td>
<td>--------------------</td>
<td>-------------------------</td>
<td>----</td>
<td>-------------</td>
<td>-----</td>
</tr>
<tr>
<td>LIT2 * GRADE</td>
<td>ACEFFLIT</td>
<td>2.128</td>
<td>4</td>
<td>.532</td>
<td>1.411</td>
</tr>
<tr>
<td></td>
<td>LSTRALIT</td>
<td>2.381</td>
<td>4</td>
<td>.595</td>
<td>1.862</td>
</tr>
<tr>
<td></td>
<td>SREGLIT</td>
<td>1.169</td>
<td>4</td>
<td>.292</td>
<td>.783</td>
</tr>
<tr>
<td></td>
<td>ASHANLIT</td>
<td>1.500</td>
<td>4</td>
<td>.375</td>
<td>.706</td>
</tr>
<tr>
<td></td>
<td>TANXLIT</td>
<td>.145</td>
<td>4</td>
<td>3.628E-02</td>
<td>.040</td>
</tr>
<tr>
<td>LIT2 * GENDER</td>
<td>ACEFFLIT</td>
<td>1.670</td>
<td>4</td>
<td>.418</td>
<td>1.108</td>
</tr>
<tr>
<td></td>
<td>LSTRALIT</td>
<td>.715</td>
<td>4</td>
<td>.179</td>
<td>.559</td>
</tr>
<tr>
<td></td>
<td>SREGLIT</td>
<td>2.591</td>
<td>4</td>
<td>.648</td>
<td>1.735</td>
</tr>
<tr>
<td></td>
<td>ASHANLIT</td>
<td>1.403</td>
<td>4</td>
<td>.351</td>
<td>.660</td>
</tr>
<tr>
<td></td>
<td>TANXLIT</td>
<td>5.051</td>
<td>4</td>
<td>1.263</td>
<td>1.389</td>
</tr>
<tr>
<td>LIT2 * SCHOOLID</td>
<td>ACEFFLIT</td>
<td>7.841</td>
<td>12</td>
<td>.653</td>
<td>1.734</td>
</tr>
<tr>
<td></td>
<td>LSTRALIT</td>
<td>1.918</td>
<td>12</td>
<td>.160</td>
<td>.500</td>
</tr>
<tr>
<td></td>
<td>SREGLIT</td>
<td>2.557</td>
<td>12</td>
<td>.213</td>
<td>.571</td>
</tr>
<tr>
<td></td>
<td>ASHANLIT</td>
<td>5.250</td>
<td>12</td>
<td>.438</td>
<td>.825</td>
</tr>
<tr>
<td></td>
<td>TANXLIT</td>
<td>16.090</td>
<td>12</td>
<td>1.341</td>
<td>1.475</td>
</tr>
<tr>
<td>LIT2 * ES PID</td>
<td>ACEFFLIT</td>
<td>.396</td>
<td>4</td>
<td>9.904E-02</td>
<td>.263</td>
</tr>
<tr>
<td></td>
<td>LSTRALIT</td>
<td>1.226</td>
<td>4</td>
<td>.307</td>
<td>.959</td>
</tr>
<tr>
<td></td>
<td>SREGLIT</td>
<td>1.738</td>
<td>4</td>
<td>.434</td>
<td>1.164</td>
</tr>
<tr>
<td></td>
<td>ASHANLIT</td>
<td>1.342</td>
<td>4</td>
<td>.336</td>
<td>.632</td>
</tr>
<tr>
<td></td>
<td>TANXLIT</td>
<td>5.352</td>
<td>4</td>
<td>1.338</td>
<td>1.472</td>
</tr>
<tr>
<td>GRADE * GENDER</td>
<td>ACEFFLIT</td>
<td>.272</td>
<td>1</td>
<td>.272</td>
<td>.723</td>
</tr>
<tr>
<td></td>
<td>LSTRALIT</td>
<td>2.880</td>
<td>1</td>
<td>2.880</td>
<td>9.005</td>
</tr>
<tr>
<td></td>
<td>SREGLIT</td>
<td>.929</td>
<td>1</td>
<td>.929</td>
<td>2.488</td>
</tr>
<tr>
<td></td>
<td>ASHANLIT</td>
<td>4.442E-02</td>
<td>1</td>
<td>4.442E-02</td>
<td>.084</td>
</tr>
<tr>
<td></td>
<td>TANXLIT</td>
<td>5.963</td>
<td>1</td>
<td>5.963</td>
<td>6.560</td>
</tr>
<tr>
<td>GRADE * SCHOOLID</td>
<td>ACEFFLIT</td>
<td>.194</td>
<td>3</td>
<td>6.475E-02</td>
<td>.172</td>
</tr>
<tr>
<td></td>
<td>LSTRALIT</td>
<td>1.161</td>
<td>3</td>
<td>.387</td>
<td>1.211</td>
</tr>
<tr>
<td></td>
<td>SREGLIT</td>
<td>1.995</td>
<td>3</td>
<td>.665</td>
<td>1.781</td>
</tr>
<tr>
<td></td>
<td>ASHANLIT</td>
<td>1.759</td>
<td>3</td>
<td>.586</td>
<td>1.104</td>
</tr>
<tr>
<td></td>
<td>TANXLIT</td>
<td>4.609</td>
<td>3</td>
<td>1.536</td>
<td>1.690</td>
</tr>
<tr>
<td>GRADE * ES PID</td>
<td>ACEFFLIT</td>
<td>.342</td>
<td>1</td>
<td>.342</td>
<td>.907</td>
</tr>
<tr>
<td></td>
<td>LSTRALIT</td>
<td>.151</td>
<td>1</td>
<td>.151</td>
<td>.473</td>
</tr>
<tr>
<td></td>
<td>SREGLIT</td>
<td>1.392E-02</td>
<td>1</td>
<td>1.392E-02</td>
<td>.037</td>
</tr>
<tr>
<td></td>
<td>ASHANLIT</td>
<td>.564</td>
<td>1</td>
<td>.564</td>
<td>1.062</td>
</tr>
<tr>
<td></td>
<td>TANXLIT</td>
<td>.403</td>
<td>1</td>
<td>.403</td>
<td>.444</td>
</tr>
<tr>
<td>GENDER * SCHOOLID</td>
<td>ACEFFLIT</td>
<td>.793</td>
<td>2</td>
<td>.396</td>
<td>1.052</td>
</tr>
<tr>
<td></td>
<td>LSTRALIT</td>
<td>2.396</td>
<td>2</td>
<td>1.198</td>
<td>3.746</td>
</tr>
<tr>
<td></td>
<td>SREGLIT</td>
<td>1.271</td>
<td>2</td>
<td>.636</td>
<td>1.703</td>
</tr>
<tr>
<td></td>
<td>ASHANLIT</td>
<td>2.695E-02</td>
<td>2</td>
<td>1.348E-02</td>
<td>.025</td>
</tr>
<tr>
<td></td>
<td>TANXLIT</td>
<td>7.586</td>
<td>2</td>
<td>3.733</td>
<td>4.172</td>
</tr>
<tr>
<td>GENDER * ES PID</td>
<td>ACEFFLIT</td>
<td>.239</td>
<td>1</td>
<td>.239</td>
<td>.635</td>
</tr>
<tr>
<td></td>
<td>LSTRALIT</td>
<td>2.429E-03</td>
<td>1</td>
<td>2.429E-03</td>
<td>.008</td>
</tr>
<tr>
<td></td>
<td>SREGLIT</td>
<td>6.220E-02</td>
<td>1</td>
<td>6.220E-02</td>
<td>.167</td>
</tr>
<tr>
<td></td>
<td>ASHANLIT</td>
<td>1.325E-02</td>
<td>1</td>
<td>1.325E-02</td>
<td>.025</td>
</tr>
<tr>
<td></td>
<td>TANXLIT</td>
<td>.785</td>
<td>1</td>
<td>.785</td>
<td>.864</td>
</tr>
<tr>
<td>SCHOOLID * ES PID</td>
<td>ACEFFLIT</td>
<td>2.076</td>
<td>3</td>
<td>.692</td>
<td>1.836</td>
</tr>
<tr>
<td></td>
<td>LSTRALIT</td>
<td>1.440</td>
<td>3</td>
<td>.480</td>
<td>1.501</td>
</tr>
<tr>
<td></td>
<td>SREGLIT</td>
<td>.454</td>
<td>3</td>
<td>.151</td>
<td>.405</td>
</tr>
<tr>
<td></td>
<td>ASHANLIT</td>
<td>234</td>
<td>3</td>
<td>7.784E-02</td>
<td>.147</td>
</tr>
<tr>
<td></td>
<td>TANXLIT</td>
<td>3.849</td>
<td>3</td>
<td>1.283</td>
<td>1.411</td>
</tr>
<tr>
<td>Source</td>
<td>Dependent Variable</td>
<td>Type III Sum of Squares</td>
<td>df</td>
<td>Mean Square</td>
<td>F</td>
</tr>
<tr>
<td>------------</td>
<td>--------------------</td>
<td>-------------------------</td>
<td>----</td>
<td>-------------</td>
<td>----</td>
</tr>
<tr>
<td>Error</td>
<td>ACEFLIT</td>
<td>235.919</td>
<td>626</td>
<td>.377</td>
<td></td>
</tr>
<tr>
<td></td>
<td>LSTRALIT</td>
<td>200.187</td>
<td>626</td>
<td>.320</td>
<td></td>
</tr>
<tr>
<td></td>
<td>SREGLIT</td>
<td>233.715</td>
<td>626</td>
<td>.373</td>
<td></td>
</tr>
<tr>
<td></td>
<td>ASHANLIT</td>
<td>332.518</td>
<td>626</td>
<td>.531</td>
<td></td>
</tr>
<tr>
<td></td>
<td>TANXLT</td>
<td>569.078</td>
<td>626</td>
<td>.909</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>ACEFLIT</td>
<td>10835.776</td>
<td>746</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>LSTRALIT</td>
<td>9451.722</td>
<td>746</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>SREGLIT</td>
<td>7952.531</td>
<td>746</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>ASHANLIT</td>
<td>2868.778</td>
<td>746</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>TANXLT</td>
<td>6583.813</td>
<td>746</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Corrected Total</td>
<td>ACEFLIT</td>
<td>344.615</td>
<td>745</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>LSTRALIT</td>
<td>290.593</td>
<td>745</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>SREGLIT</td>
<td>320.458</td>
<td>745</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>ASHANLIT</td>
<td>435.390</td>
<td>745</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>TANXLT</td>
<td>816.369</td>
<td>745</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Source</td>
<td>Dependent Variable</td>
<td>Sig.</td>
<td>Partial Eta Squared</td>
<td>Noncent. Parameter</td>
<td>Observed Power</td>
</tr>
<tr>
<td>-----------------</td>
<td>--------------------</td>
<td>------</td>
<td>---------------------</td>
<td>--------------------</td>
<td>----------------</td>
</tr>
<tr>
<td>Corrected Model</td>
<td>ACEFFLIT</td>
<td>.000</td>
<td>.315</td>
<td>286.421</td>
<td>1.000</td>
</tr>
<tr>
<td></td>
<td>LSTRALIT</td>
<td>.000</td>
<td>.311</td>
<td>282.705</td>
<td>1.000</td>
</tr>
<tr>
<td></td>
<td>SREGLIT</td>
<td>.000</td>
<td>.271</td>
<td>232.338</td>
<td>1.000</td>
</tr>
<tr>
<td></td>
<td>ASHANLIT</td>
<td>.000</td>
<td>.236</td>
<td>193.667</td>
<td>1.000</td>
</tr>
<tr>
<td></td>
<td>TANXLIT</td>
<td>.000</td>
<td>.303</td>
<td>272.027</td>
<td>1.000</td>
</tr>
<tr>
<td>Intercept</td>
<td>ACEFFLIT</td>
<td>.000</td>
<td>.746</td>
<td>1834.840</td>
<td>1.000</td>
</tr>
<tr>
<td></td>
<td>LSTRALIT</td>
<td>.000</td>
<td>.776</td>
<td>2166.755</td>
<td>1.000</td>
</tr>
<tr>
<td></td>
<td>SREGLIT</td>
<td>.000</td>
<td>.711</td>
<td>1541.834</td>
<td>1.000</td>
</tr>
<tr>
<td></td>
<td>ASHANLIT</td>
<td>.000</td>
<td>.355</td>
<td>344.797</td>
<td>1.000</td>
</tr>
<tr>
<td></td>
<td>TANXLIT</td>
<td>.000</td>
<td>.440</td>
<td>491.485</td>
<td>1.000</td>
</tr>
<tr>
<td>CLU3_1</td>
<td>ACEFFLIT</td>
<td>.009</td>
<td>.015</td>
<td>9.433</td>
<td>.789</td>
</tr>
<tr>
<td></td>
<td>LSTRALIT</td>
<td>.011</td>
<td>.014</td>
<td>9.027</td>
<td>.770</td>
</tr>
<tr>
<td></td>
<td>SREGLIT</td>
<td>.001</td>
<td>.024</td>
<td>15.214</td>
<td>.946</td>
</tr>
<tr>
<td></td>
<td>ASHANLIT</td>
<td>.187</td>
<td>.005</td>
<td>3.367</td>
<td>.355</td>
</tr>
<tr>
<td></td>
<td>TANXLIT</td>
<td>.164</td>
<td>.006</td>
<td>3.623</td>
<td>.379</td>
</tr>
<tr>
<td>ABILITY2</td>
<td>ACEFFLIT</td>
<td>.063</td>
<td>.014</td>
<td>8.976</td>
<td>.658</td>
</tr>
<tr>
<td></td>
<td>LSTRALIT</td>
<td>.325</td>
<td>.007</td>
<td>4.661</td>
<td>.368</td>
</tr>
<tr>
<td></td>
<td>SREGLIT</td>
<td>.446</td>
<td>.006</td>
<td>3.722</td>
<td>.297</td>
</tr>
<tr>
<td></td>
<td>ASHANLIT</td>
<td>.450</td>
<td>.006</td>
<td>3.695</td>
<td>.295</td>
</tr>
<tr>
<td></td>
<td>TANXLIT</td>
<td>.675</td>
<td>.004</td>
<td>2.330</td>
<td>.194</td>
</tr>
<tr>
<td>LIT2</td>
<td>ACEFFLIT</td>
<td>.019</td>
<td>.019</td>
<td>11.883</td>
<td>.795</td>
</tr>
<tr>
<td></td>
<td>LSTRALIT</td>
<td>.936</td>
<td>.001</td>
<td>8.16</td>
<td>.094</td>
</tr>
<tr>
<td></td>
<td>SREGLIT</td>
<td>.715</td>
<td>.003</td>
<td>2.111</td>
<td>.178</td>
</tr>
<tr>
<td></td>
<td>ASHANLIT</td>
<td>.073</td>
<td>.014</td>
<td>8.620</td>
<td>.638</td>
</tr>
<tr>
<td></td>
<td>TANXLIT</td>
<td>.127</td>
<td>.011</td>
<td>7.205</td>
<td>.550</td>
</tr>
<tr>
<td>GRADE</td>
<td>ACEFFLIT</td>
<td>.453</td>
<td>.001</td>
<td>1.564</td>
<td>.116</td>
</tr>
<tr>
<td></td>
<td>LSTRALIT</td>
<td>.677</td>
<td>.000</td>
<td>.173</td>
<td>.070</td>
</tr>
<tr>
<td></td>
<td>SREGLIT</td>
<td>.001</td>
<td>.018</td>
<td>11.249</td>
<td>.918</td>
</tr>
<tr>
<td></td>
<td>ASHANLIT</td>
<td>.396</td>
<td>.001</td>
<td>.722</td>
<td>.136</td>
</tr>
<tr>
<td></td>
<td>TANXLIT</td>
<td>.276</td>
<td>.002</td>
<td>1.190</td>
<td>.193</td>
</tr>
<tr>
<td>GENDER</td>
<td>ACEFFLIT</td>
<td>.180</td>
<td>.003</td>
<td>1.804</td>
<td>.288</td>
</tr>
<tr>
<td></td>
<td>LSTRALIT</td>
<td>.001</td>
<td>.017</td>
<td>10.784</td>
<td>.906</td>
</tr>
<tr>
<td></td>
<td>SREGLIT</td>
<td>.025</td>
<td>.008</td>
<td>5.043</td>
<td>.611</td>
</tr>
<tr>
<td></td>
<td>ASHANLIT</td>
<td>.790</td>
<td>.000</td>
<td>.071</td>
<td>.058</td>
</tr>
<tr>
<td></td>
<td>TANXLIT</td>
<td>.283</td>
<td>.002</td>
<td>1.153</td>
<td>.188</td>
</tr>
<tr>
<td>SCHOOLID</td>
<td>ACEFFLIT</td>
<td>.000</td>
<td>.036</td>
<td>23.521</td>
<td>.990</td>
</tr>
<tr>
<td></td>
<td>LSTRALIT</td>
<td>.490</td>
<td>.004</td>
<td>2.423</td>
<td>.225</td>
</tr>
<tr>
<td></td>
<td>SREGLIT</td>
<td>.506</td>
<td>.004</td>
<td>2.339</td>
<td>.219</td>
</tr>
<tr>
<td></td>
<td>ASHANLIT</td>
<td>.809</td>
<td>.002</td>
<td>.969</td>
<td>.113</td>
</tr>
<tr>
<td></td>
<td>TANXLIT</td>
<td>.379</td>
<td>.005</td>
<td>3.091</td>
<td>.281</td>
</tr>
<tr>
<td>ESBIID</td>
<td>ACEFFLIT</td>
<td>.003</td>
<td>.014</td>
<td>8.663</td>
<td>.836</td>
</tr>
<tr>
<td></td>
<td>LSTRALIT</td>
<td>.648</td>
<td>.000</td>
<td>.208</td>
<td>.074</td>
</tr>
<tr>
<td></td>
<td>SREGLIT</td>
<td>.516</td>
<td>.001</td>
<td>.423</td>
<td>.099</td>
</tr>
<tr>
<td></td>
<td>ASHANLIT</td>
<td>.608</td>
<td>.000</td>
<td>.263</td>
<td>.081</td>
</tr>
<tr>
<td></td>
<td>TANXLIT</td>
<td>.100</td>
<td>.004</td>
<td>2.715</td>
<td>.377</td>
</tr>
<tr>
<td>CLU3_1 * ABILITY2</td>
<td>ACEFFLIT</td>
<td>.335</td>
<td>.014</td>
<td>9.105</td>
<td>.533</td>
</tr>
<tr>
<td></td>
<td>LSTRALIT</td>
<td>.999</td>
<td>.002</td>
<td>1.225</td>
<td>.095</td>
</tr>
<tr>
<td></td>
<td>SREGLIT</td>
<td>.576</td>
<td>.010</td>
<td>6.640</td>
<td>.391</td>
</tr>
<tr>
<td></td>
<td>ASHANLIT</td>
<td>.942</td>
<td>.005</td>
<td>2.872</td>
<td>.173</td>
</tr>
<tr>
<td></td>
<td>TANXLIT</td>
<td>.086</td>
<td>.022</td>
<td>13.933</td>
<td>.757</td>
</tr>
<tr>
<td>Source</td>
<td>Dependent Variable</td>
<td>Sig</td>
<td>Partial Eta Squared</td>
<td>Noncent. Parameter</td>
<td>Observed Power*</td>
</tr>
<tr>
<td>-----------------</td>
<td>--------------------</td>
<td>------</td>
<td>---------------------</td>
<td>--------------------</td>
<td>-----------------</td>
</tr>
<tr>
<td>CLU3_1 * LIT2</td>
<td>ACEFLIT</td>
<td>.763</td>
<td>.008</td>
<td>4.941</td>
<td>.289</td>
</tr>
<tr>
<td></td>
<td>LSTRALIT</td>
<td>.699</td>
<td>.009</td>
<td>5.806</td>
<td>.341</td>
</tr>
<tr>
<td></td>
<td>SREGLIT</td>
<td>.978</td>
<td>.009</td>
<td>5.722</td>
<td>.336</td>
</tr>
<tr>
<td></td>
<td>ASHANLIT</td>
<td>.931</td>
<td>.005</td>
<td>3.038</td>
<td>.182</td>
</tr>
<tr>
<td></td>
<td>TANXLIT</td>
<td>.333</td>
<td>.014</td>
<td>9.132</td>
<td>.535</td>
</tr>
<tr>
<td>CLU3_1 * GRADE</td>
<td>ACEFLIT</td>
<td>.099</td>
<td>.007</td>
<td>4.648</td>
<td>.471</td>
</tr>
<tr>
<td></td>
<td>LSTRALIT</td>
<td>.215</td>
<td>.005</td>
<td>3.085</td>
<td>.328</td>
</tr>
<tr>
<td></td>
<td>SREGLIT</td>
<td>.359</td>
<td>.003</td>
<td>2.050</td>
<td>.229</td>
</tr>
<tr>
<td></td>
<td>ASHANLIT</td>
<td>.244</td>
<td>.004</td>
<td>2.830</td>
<td>.304</td>
</tr>
<tr>
<td></td>
<td>TANXLIT</td>
<td>.377</td>
<td>.003</td>
<td>1.953</td>
<td>.220</td>
</tr>
<tr>
<td>CLU3_1 * GENDER</td>
<td>ACEFLIT</td>
<td>.156</td>
<td>.006</td>
<td>3.728</td>
<td>.389</td>
</tr>
<tr>
<td></td>
<td>LSTRALIT</td>
<td>.458</td>
<td>.002</td>
<td>1.562</td>
<td>.183</td>
</tr>
<tr>
<td></td>
<td>SREGLIT</td>
<td>.810</td>
<td>.008</td>
<td>5.056</td>
<td>.506</td>
</tr>
<tr>
<td></td>
<td>ASHANLIT</td>
<td>.917</td>
<td>.000</td>
<td>.172</td>
<td>.063</td>
</tr>
<tr>
<td></td>
<td>TANXLIT</td>
<td>.200</td>
<td>.005</td>
<td>3.222</td>
<td>.341</td>
</tr>
<tr>
<td>CLU3_1 * SCHOOLID</td>
<td>ACEFLIT</td>
<td>.335</td>
<td>.011</td>
<td>6.870</td>
<td>.455</td>
</tr>
<tr>
<td></td>
<td>LSTRALIT</td>
<td>.782</td>
<td>.005</td>
<td>3.208</td>
<td>.217</td>
</tr>
<tr>
<td></td>
<td>SREGLIT</td>
<td>.692</td>
<td>.006</td>
<td>3.884</td>
<td>.260</td>
</tr>
<tr>
<td></td>
<td>ASHANLIT</td>
<td>.932</td>
<td>.003</td>
<td>1.860</td>
<td>.137</td>
</tr>
<tr>
<td></td>
<td>TANXLIT</td>
<td>.866</td>
<td>.004</td>
<td>2.520</td>
<td>.175</td>
</tr>
<tr>
<td>CLU3_1 * ESBD</td>
<td>ACEFLIT</td>
<td>.447</td>
<td>.003</td>
<td>1.612</td>
<td>.188</td>
</tr>
<tr>
<td></td>
<td>LSTRALIT</td>
<td>.992</td>
<td>.000</td>
<td>.036</td>
<td>.053</td>
</tr>
<tr>
<td></td>
<td>SREGLIT</td>
<td>.850</td>
<td>.001</td>
<td>.325</td>
<td>.075</td>
</tr>
<tr>
<td></td>
<td>ASHANLIT</td>
<td>.430</td>
<td>.003</td>
<td>1.691</td>
<td>.195</td>
</tr>
<tr>
<td></td>
<td>TANXLIT</td>
<td>.112</td>
<td>.007</td>
<td>4.396</td>
<td>.449</td>
</tr>
<tr>
<td>ABILITY2 * LIT2</td>
<td>ACEFLIT</td>
<td>.608</td>
<td>.022</td>
<td>13.878</td>
<td>.607</td>
</tr>
<tr>
<td></td>
<td>LSTRALIT</td>
<td>.637</td>
<td>.021</td>
<td>13.485</td>
<td>.590</td>
</tr>
<tr>
<td></td>
<td>SREGLIT</td>
<td>.600</td>
<td>.022</td>
<td>13.989</td>
<td>.611</td>
</tr>
<tr>
<td></td>
<td>ASHANLIT</td>
<td>.240</td>
<td>.030</td>
<td>19.858</td>
<td>.900</td>
</tr>
<tr>
<td></td>
<td>TANXLIT</td>
<td>.336</td>
<td>.028</td>
<td>18.024</td>
<td>.754</td>
</tr>
<tr>
<td>ABILITY2 * GRADE</td>
<td>ACEFLIT</td>
<td>.233</td>
<td>.009</td>
<td>5.598</td>
<td>.498</td>
</tr>
<tr>
<td></td>
<td>LSTRALIT</td>
<td>.995</td>
<td>.000</td>
<td>.196</td>
<td>.060</td>
</tr>
<tr>
<td></td>
<td>SREGLIT</td>
<td>.989</td>
<td>.001</td>
<td>.318</td>
<td>.066</td>
</tr>
<tr>
<td></td>
<td>ASHANLIT</td>
<td>.186</td>
<td>.010</td>
<td>6.206</td>
<td>.482</td>
</tr>
<tr>
<td></td>
<td>TANXLIT</td>
<td>.499</td>
<td>.005</td>
<td>3.364</td>
<td>.270</td>
</tr>
<tr>
<td>ABILITY2 * GENDER</td>
<td>ACEFLIT</td>
<td>.723</td>
<td>.003</td>
<td>2.070</td>
<td>.175</td>
</tr>
<tr>
<td></td>
<td>LSTRALIT</td>
<td>.353</td>
<td>.007</td>
<td>4.422</td>
<td>.350</td>
</tr>
<tr>
<td></td>
<td>SREGLIT</td>
<td>.171</td>
<td>.010</td>
<td>6.430</td>
<td>.497</td>
</tr>
<tr>
<td></td>
<td>ASHANLIT</td>
<td>.856</td>
<td>.002</td>
<td>1.329</td>
<td>.126</td>
</tr>
<tr>
<td></td>
<td>TANXLIT</td>
<td>.824</td>
<td>.002</td>
<td>1.514</td>
<td>.138</td>
</tr>
<tr>
<td>ABILITY2 * SCHOOLID</td>
<td>ACEFLIT</td>
<td>.022</td>
<td>.037</td>
<td>23.987</td>
<td>.926</td>
</tr>
<tr>
<td></td>
<td>LSTRALIT</td>
<td>.615</td>
<td>.016</td>
<td>10.008</td>
<td>.497</td>
</tr>
<tr>
<td></td>
<td>SREGLIT</td>
<td>.772</td>
<td>.013</td>
<td>8.156</td>
<td>.403</td>
</tr>
<tr>
<td></td>
<td>ASHANLIT</td>
<td>.839</td>
<td>.011</td>
<td>7.261</td>
<td>.356</td>
</tr>
<tr>
<td></td>
<td>TANXLIT</td>
<td>.075</td>
<td>.031</td>
<td>19.742</td>
<td>.853</td>
</tr>
<tr>
<td>ABILITY2 * ESBD</td>
<td>ACEFLIT</td>
<td>.462</td>
<td>.006</td>
<td>3.610</td>
<td>.288</td>
</tr>
<tr>
<td></td>
<td>LSTRALIT</td>
<td>.971</td>
<td>.001</td>
<td>.527</td>
<td>.077</td>
</tr>
<tr>
<td></td>
<td>SREGLIT</td>
<td>.719</td>
<td>.003</td>
<td>2.093</td>
<td>.177</td>
</tr>
<tr>
<td></td>
<td>ASHANLIT</td>
<td>.709</td>
<td>.003</td>
<td>2.146</td>
<td>.181</td>
</tr>
<tr>
<td></td>
<td>TANXLIT</td>
<td>.520</td>
<td>.004</td>
<td>2.641</td>
<td>.216</td>
</tr>
<tr>
<td>Source</td>
<td>Dependent Variable</td>
<td>Sig.</td>
<td>Partial Eta Squared</td>
<td>Noncent. Parameter</td>
<td>Observed Power*</td>
</tr>
<tr>
<td>-------------</td>
<td>-------------------</td>
<td>------</td>
<td>---------------------</td>
<td>-------------------</td>
<td>----------------</td>
</tr>
<tr>
<td>LIT2 * GRADE</td>
<td>ACEFLIT</td>
<td>.229</td>
<td>.009</td>
<td>5.646</td>
<td>.441</td>
</tr>
<tr>
<td></td>
<td>LSTRALIT</td>
<td>.116</td>
<td>.012</td>
<td>7.446</td>
<td>.566</td>
</tr>
<tr>
<td></td>
<td>SREGLIT</td>
<td>.536</td>
<td>.005</td>
<td>3.132</td>
<td>.252</td>
</tr>
<tr>
<td></td>
<td>ASHANLIT</td>
<td>.588</td>
<td>.004</td>
<td>2.824</td>
<td>.229</td>
</tr>
<tr>
<td></td>
<td>TANXLIT</td>
<td>.997</td>
<td>.000</td>
<td>1.160</td>
<td>.058</td>
</tr>
<tr>
<td>LIT2 * GENDER</td>
<td>ACEFLIT</td>
<td>.352</td>
<td>.007</td>
<td>4.432</td>
<td>.351</td>
</tr>
<tr>
<td></td>
<td>LSTRALIT</td>
<td>.692</td>
<td>.004</td>
<td>2.237</td>
<td>.187</td>
</tr>
<tr>
<td></td>
<td>SREGLIT</td>
<td>.141</td>
<td>.011</td>
<td>6.941</td>
<td>.532</td>
</tr>
<tr>
<td></td>
<td>ASHANLIT</td>
<td>.620</td>
<td>.004</td>
<td>2.641</td>
<td>.216</td>
</tr>
<tr>
<td></td>
<td>TANXLIT</td>
<td>.236</td>
<td>.009</td>
<td>5.556</td>
<td>.433</td>
</tr>
<tr>
<td>LIT2 * SCHOOLID</td>
<td>ACEFLIT</td>
<td>.056</td>
<td>.032</td>
<td>20.805</td>
<td>.875</td>
</tr>
<tr>
<td></td>
<td>LSTRALIT</td>
<td>.915</td>
<td>.009</td>
<td>5.999</td>
<td>.292</td>
</tr>
<tr>
<td></td>
<td>SREGLIT</td>
<td>.866</td>
<td>.011</td>
<td>6.848</td>
<td>.335</td>
</tr>
<tr>
<td></td>
<td>ASHANLIT</td>
<td>.624</td>
<td>.016</td>
<td>9.902</td>
<td>.482</td>
</tr>
<tr>
<td></td>
<td>TANXLIT</td>
<td>.129</td>
<td>.027</td>
<td>17.700</td>
<td>.802</td>
</tr>
<tr>
<td>LIT2 * ESBID</td>
<td>ACEFLIT</td>
<td>.902</td>
<td>.002</td>
<td>1.051</td>
<td>.108</td>
</tr>
<tr>
<td></td>
<td>LSTRALIT</td>
<td>.430</td>
<td>.006</td>
<td>3.835</td>
<td>.305</td>
</tr>
<tr>
<td></td>
<td>SREGLIT</td>
<td>.326</td>
<td>.007</td>
<td>4.655</td>
<td>.367</td>
</tr>
<tr>
<td></td>
<td>ASHANLIT</td>
<td>.840</td>
<td>.004</td>
<td>2.527</td>
<td>.208</td>
</tr>
<tr>
<td></td>
<td>TANXLIT</td>
<td>.209</td>
<td>.009</td>
<td>5.888</td>
<td>.459</td>
</tr>
<tr>
<td>GRADE * GENDER</td>
<td>ACEFLIT</td>
<td>.396</td>
<td>.001</td>
<td>.723</td>
<td>.136</td>
</tr>
<tr>
<td></td>
<td>LSTRALIT</td>
<td>.003</td>
<td>.014</td>
<td>9.095</td>
<td>.850</td>
</tr>
<tr>
<td></td>
<td>SREGLIT</td>
<td>.115</td>
<td>.004</td>
<td>2.488</td>
<td>.350</td>
</tr>
<tr>
<td></td>
<td>ASHANLIT</td>
<td>.773</td>
<td>.000</td>
<td>.084</td>
<td>.060</td>
</tr>
<tr>
<td></td>
<td>TANXLIT</td>
<td>.011</td>
<td>.010</td>
<td>6.560</td>
<td>.725</td>
</tr>
<tr>
<td>GRADE * SCHOOLID</td>
<td>ACEFLIT</td>
<td>.915</td>
<td>.001</td>
<td>5.155</td>
<td>.082</td>
</tr>
<tr>
<td></td>
<td>LSTRALIT</td>
<td>.305</td>
<td>.006</td>
<td>3.632</td>
<td>.326</td>
</tr>
<tr>
<td></td>
<td>SREGLIT</td>
<td>.150</td>
<td>.008</td>
<td>5.343</td>
<td>.465</td>
</tr>
<tr>
<td></td>
<td>ASHANLIT</td>
<td>.347</td>
<td>.005</td>
<td>3.312</td>
<td>.299</td>
</tr>
<tr>
<td></td>
<td>TANXLIT</td>
<td>.168</td>
<td>.008</td>
<td>5.070</td>
<td>.444</td>
</tr>
<tr>
<td>GRADE * ESBID</td>
<td>ACEFLIT</td>
<td>.341</td>
<td>.001</td>
<td>.907</td>
<td>.158</td>
</tr>
<tr>
<td></td>
<td>LSTRALIT</td>
<td>.492</td>
<td>.001</td>
<td>.473</td>
<td>.106</td>
</tr>
<tr>
<td></td>
<td>SREGLIT</td>
<td>.847</td>
<td>.000</td>
<td>.037</td>
<td>.054</td>
</tr>
<tr>
<td></td>
<td>ASHANLIT</td>
<td>.303</td>
<td>.002</td>
<td>1.062</td>
<td>.177</td>
</tr>
<tr>
<td></td>
<td>TANXLIT</td>
<td>.506</td>
<td>.001</td>
<td>.444</td>
<td>.102</td>
</tr>
<tr>
<td>GENDER * SCHOOLID</td>
<td>ACEFLIT</td>
<td>.350</td>
<td>.003</td>
<td>2.103</td>
<td>.234</td>
</tr>
<tr>
<td></td>
<td>LSTRALIT</td>
<td>.024</td>
<td>.012</td>
<td>7.491</td>
<td>.685</td>
</tr>
<tr>
<td></td>
<td>SREGLIT</td>
<td>.183</td>
<td>.006</td>
<td>3.405</td>
<td>.369</td>
</tr>
<tr>
<td></td>
<td>ASHANLIT</td>
<td>.975</td>
<td>.000</td>
<td>.051</td>
<td>.054</td>
</tr>
<tr>
<td></td>
<td>TANXLIT</td>
<td>.016</td>
<td>.013</td>
<td>8.344</td>
<td>.755</td>
</tr>
<tr>
<td>GENDER * ESBID</td>
<td>ACEFLIT</td>
<td>.426</td>
<td>.001</td>
<td>.635</td>
<td>.125</td>
</tr>
<tr>
<td></td>
<td>LSTRALIT</td>
<td>.931</td>
<td>.000</td>
<td>.008</td>
<td>.051</td>
</tr>
<tr>
<td></td>
<td>SREGLIT</td>
<td>.683</td>
<td>.000</td>
<td>.167</td>
<td>.069</td>
</tr>
<tr>
<td></td>
<td>ASHANLIT</td>
<td>.875</td>
<td>.000</td>
<td>.025</td>
<td>.053</td>
</tr>
<tr>
<td></td>
<td>TANXLIT</td>
<td>.353</td>
<td>.001</td>
<td>.864</td>
<td>.153</td>
</tr>
<tr>
<td>SCHOOLID * ESBID</td>
<td>ACEFLIT</td>
<td>.139</td>
<td>.009</td>
<td>5.508</td>
<td>.478</td>
</tr>
<tr>
<td></td>
<td>LSTRALIT</td>
<td>.213</td>
<td>.007</td>
<td>4.503</td>
<td>.398</td>
</tr>
<tr>
<td></td>
<td>SREGLIT</td>
<td>.749</td>
<td>.002</td>
<td>1.216</td>
<td>.131</td>
</tr>
<tr>
<td></td>
<td>ASHANLIT</td>
<td>.932</td>
<td>.001</td>
<td>.440</td>
<td>.077</td>
</tr>
<tr>
<td></td>
<td>TANXLIT</td>
<td>.238</td>
<td>.007</td>
<td>4.234</td>
<td>.376</td>
</tr>
</tbody>
</table>
### Tests of Between-Subjects Effects

<table>
<thead>
<tr>
<th>Source</th>
<th>Dependent Variable</th>
<th>Sig.</th>
<th>Partial Eta Squared</th>
<th>Noncent. Parameter</th>
<th>Observed Power&lt;sup&gt;a&lt;/sup&gt;</th>
</tr>
</thead>
<tbody>
<tr>
<td>Error</td>
<td>ACEFFLIT</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>LSTRALIT</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>SREGLIT</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>ASHANLIT</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>TANXLIT</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>ACEFFLIT</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>LSTRALIT</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>SREGLIT</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>ASHANLIT</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>TANXLIT</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Corrected Total</td>
<td>ACEFFLIT</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>LSTRALIT</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>SREGLIT</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>ASHANLIT</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>TANXLIT</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<sup>a</sup> Computed using alpha = .05

b. R Squared = .315 (Adjusted R Squared = .185)
c. R Squared = .311 (Adjusted R Squared = .180)
d. R Squared = .271 (Adjusted R Squared = .132)
e. R Squared = .238 (Adjusted R Squared = .091)
f. R Squared = .303 (Adjusted R Squared = .170)
APPENDIX I.2

SPSS MANOVA OUTPUT

NUMERACY ACADEMIC VARIABLES
### General Linear Model - NUMERACY ACADEMIC VARIABLES

#### Between-Subjects Factors

<table>
<thead>
<tr>
<th>Factor</th>
<th>Value</th>
<th>Label</th>
<th>N</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ward</td>
<td>1</td>
<td>Unhealthy</td>
<td>296</td>
</tr>
<tr>
<td>Method</td>
<td>2</td>
<td>Healthy</td>
<td>268</td>
</tr>
<tr>
<td></td>
<td>3</td>
<td>Non</td>
<td>181</td>
</tr>
<tr>
<td>ABILITY2</td>
<td>1.00</td>
<td></td>
<td>140</td>
</tr>
<tr>
<td></td>
<td>2.00</td>
<td></td>
<td>158</td>
</tr>
<tr>
<td></td>
<td>3.00</td>
<td></td>
<td>159</td>
</tr>
<tr>
<td></td>
<td>4.00</td>
<td></td>
<td>142</td>
</tr>
<tr>
<td></td>
<td>5.00</td>
<td></td>
<td>146</td>
</tr>
<tr>
<td>NUM2</td>
<td>1.00</td>
<td></td>
<td>147</td>
</tr>
<tr>
<td></td>
<td>2.00</td>
<td></td>
<td>151</td>
</tr>
<tr>
<td></td>
<td>3.00</td>
<td></td>
<td>161</td>
</tr>
<tr>
<td></td>
<td>4.00</td>
<td></td>
<td>147</td>
</tr>
<tr>
<td></td>
<td>5.00</td>
<td></td>
<td>139</td>
</tr>
<tr>
<td>GRADE</td>
<td>1</td>
<td></td>
<td>347</td>
</tr>
<tr>
<td></td>
<td>2</td>
<td></td>
<td>398</td>
</tr>
<tr>
<td>GENDER</td>
<td>1.0</td>
<td>Female</td>
<td>275</td>
</tr>
<tr>
<td></td>
<td>2.0</td>
<td>Male</td>
<td>470</td>
</tr>
<tr>
<td>SCHOOLID</td>
<td>1.0</td>
<td>K</td>
<td>67</td>
</tr>
<tr>
<td></td>
<td>2.0</td>
<td>B</td>
<td>405</td>
</tr>
<tr>
<td></td>
<td>3.0</td>
<td>Kg</td>
<td>217</td>
</tr>
<tr>
<td></td>
<td>4.0</td>
<td>Scgs</td>
<td>56</td>
</tr>
<tr>
<td>ESBID</td>
<td>1</td>
<td></td>
<td>603</td>
</tr>
<tr>
<td></td>
<td>2</td>
<td></td>
<td>142</td>
</tr>
</tbody>
</table>
### Multivariate Tests

<table>
<thead>
<tr>
<th>Effect</th>
<th>Pillai’s Trace</th>
<th>Value</th>
<th>F</th>
<th>Hypothesis df</th>
<th>Error df</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intercept</td>
<td></td>
<td>.852</td>
<td>717.445</td>
<td>5.000</td>
<td>621.000</td>
</tr>
<tr>
<td></td>
<td>Wilks’ Lambda</td>
<td>.148</td>
<td>717.445</td>
<td>5.000</td>
<td>621.000</td>
</tr>
<tr>
<td></td>
<td>Hotelling’s Trace</td>
<td>5.777</td>
<td>717.445</td>
<td>5.000</td>
<td>621.000</td>
</tr>
<tr>
<td></td>
<td>Roy’s Largest Root</td>
<td>5.777</td>
<td>717.445</td>
<td>5.000</td>
<td>621.000</td>
</tr>
<tr>
<td>CLU3_1</td>
<td></td>
<td>.060</td>
<td>3.856</td>
<td>10.000</td>
<td>1244.000</td>
</tr>
<tr>
<td></td>
<td>Wilks’ Lambda</td>
<td>.940</td>
<td>3.870</td>
<td>10.000</td>
<td>1242.000</td>
</tr>
<tr>
<td></td>
<td>Hotelling’s Trace</td>
<td>.063</td>
<td>3.884</td>
<td>10.000</td>
<td>1240.000</td>
</tr>
<tr>
<td></td>
<td>Roy’s Largest Root</td>
<td>.050</td>
<td>6.183</td>
<td>5.000</td>
<td>822.000</td>
</tr>
<tr>
<td>ABILITY2</td>
<td></td>
<td>.023</td>
<td>.732</td>
<td>20.000</td>
<td>2496.000</td>
</tr>
<tr>
<td></td>
<td>Wilks’ Lambda</td>
<td>.977</td>
<td>.732</td>
<td>20.000</td>
<td>2060.574</td>
</tr>
<tr>
<td></td>
<td>Hotelling’s Trace</td>
<td>.024</td>
<td>.731</td>
<td>20.000</td>
<td>2478.000</td>
</tr>
<tr>
<td></td>
<td>Roy’s Largest Root</td>
<td>.015</td>
<td>1.835</td>
<td>5.000</td>
<td>624.000</td>
</tr>
<tr>
<td>NUM2</td>
<td></td>
<td>.044</td>
<td>1.377</td>
<td>20.000</td>
<td>2496.000</td>
</tr>
<tr>
<td></td>
<td>Wilks’ Lambda</td>
<td>.957</td>
<td>1.378</td>
<td>20.000</td>
<td>2060.574</td>
</tr>
<tr>
<td></td>
<td>Hotelling’s Trace</td>
<td>.044</td>
<td>1.378</td>
<td>20.000</td>
<td>2478.000</td>
</tr>
<tr>
<td></td>
<td>Roy’s Largest Root</td>
<td>.024</td>
<td>3.048</td>
<td>5.000</td>
<td>624.000</td>
</tr>
<tr>
<td>GRADE</td>
<td></td>
<td>.021</td>
<td>2.682</td>
<td>5.000</td>
<td>621.000</td>
</tr>
<tr>
<td></td>
<td>Wilks’ Lambda</td>
<td>.379</td>
<td>2.682</td>
<td>5.000</td>
<td>621.000</td>
</tr>
<tr>
<td></td>
<td>Hotelling’s Trace</td>
<td>.022</td>
<td>2.682</td>
<td>5.000</td>
<td>621.000</td>
</tr>
<tr>
<td></td>
<td>Roy’s Largest Root</td>
<td>.022</td>
<td>2.682</td>
<td>5.000</td>
<td>621.000</td>
</tr>
<tr>
<td>GENDER</td>
<td></td>
<td>.009</td>
<td>1.186</td>
<td>5.000</td>
<td>621.000</td>
</tr>
<tr>
<td></td>
<td>Wilks’ Lambda</td>
<td>.991</td>
<td>1.186</td>
<td>5.000</td>
<td>621.000</td>
</tr>
<tr>
<td></td>
<td>Hotelling’s Trace</td>
<td>.010</td>
<td>1.186</td>
<td>5.000</td>
<td>621.000</td>
</tr>
<tr>
<td></td>
<td>Roy’s Largest Root</td>
<td>.010</td>
<td>1.186</td>
<td>5.000</td>
<td>621.000</td>
</tr>
<tr>
<td>SCHOOLID</td>
<td></td>
<td>.020</td>
<td>.818</td>
<td>15.000</td>
<td>1859.000</td>
</tr>
<tr>
<td></td>
<td>Wilks’ Lambda</td>
<td>.981</td>
<td>.816</td>
<td>15.000</td>
<td>1714.709</td>
</tr>
<tr>
<td></td>
<td>Hotelling’s Trace</td>
<td>.020</td>
<td>.814</td>
<td>15.000</td>
<td>1859.000</td>
</tr>
<tr>
<td></td>
<td>Roy’s Largest Root</td>
<td>.011</td>
<td>1.332</td>
<td>5.000</td>
<td>623.000</td>
</tr>
<tr>
<td>ESID</td>
<td></td>
<td>.008</td>
<td>1.024</td>
<td>5.000</td>
<td>621.000</td>
</tr>
<tr>
<td></td>
<td>Wilks’ Lambda</td>
<td>.992</td>
<td>1.024</td>
<td>5.000</td>
<td>621.000</td>
</tr>
<tr>
<td></td>
<td>Hotelling’s Trace</td>
<td>.008</td>
<td>1.024</td>
<td>5.000</td>
<td>621.000</td>
</tr>
<tr>
<td></td>
<td>Roy’s Largest Root</td>
<td>.008</td>
<td>1.024</td>
<td>5.000</td>
<td>621.000</td>
</tr>
<tr>
<td>CLU3_1 * ABILITY2</td>
<td>Pillai’s Trace</td>
<td>.044</td>
<td>.689</td>
<td>40.000</td>
<td>3125.000</td>
</tr>
<tr>
<td></td>
<td>Wilks’ Lambda</td>
<td>.957</td>
<td>.687</td>
<td>40.000</td>
<td>2709.671</td>
</tr>
<tr>
<td></td>
<td>Hotelling’s Trace</td>
<td>.044</td>
<td>.685</td>
<td>40.000</td>
<td>3097.000</td>
</tr>
<tr>
<td></td>
<td>Roy’s Largest Root</td>
<td>.018</td>
<td>1.398</td>
<td>8.000</td>
<td>625.000</td>
</tr>
<tr>
<td>CLU3_1 * NUM2</td>
<td>Pillai’s Trace</td>
<td>.057</td>
<td>.900</td>
<td>40.000</td>
<td>3125.000</td>
</tr>
<tr>
<td></td>
<td>Wilks’ Lambda</td>
<td>.944</td>
<td>.898</td>
<td>40.000</td>
<td>2709.671</td>
</tr>
<tr>
<td></td>
<td>Hotelling’s Trace</td>
<td>.058</td>
<td>.897</td>
<td>40.000</td>
<td>3097.000</td>
</tr>
<tr>
<td></td>
<td>Roy’s Largest Root</td>
<td>.025</td>
<td>1.939</td>
<td>8.000</td>
<td>625.000</td>
</tr>
<tr>
<td>CLU3_1 * GRADE</td>
<td>Pillai’s Trace</td>
<td>.021</td>
<td>1.303</td>
<td>10.000</td>
<td>1244.000</td>
</tr>
<tr>
<td></td>
<td>Wilks’ Lambda</td>
<td>.979</td>
<td>1.303</td>
<td>10.000</td>
<td>1242.000</td>
</tr>
<tr>
<td></td>
<td>Hotelling’s Trace</td>
<td>.021</td>
<td>1.302</td>
<td>10.000</td>
<td>1240.000</td>
</tr>
<tr>
<td></td>
<td>Roy’s Largest Root</td>
<td>.016</td>
<td>2.026</td>
<td>5.000</td>
<td>622.000</td>
</tr>
<tr>
<td>CLU3_1 * GENDER</td>
<td>Pillai’s Trace</td>
<td>.019</td>
<td>1.168</td>
<td>10.000</td>
<td>1244.000</td>
</tr>
<tr>
<td></td>
<td>Wilks’ Lambda</td>
<td>.981</td>
<td>1.168</td>
<td>10.000</td>
<td>1242.000</td>
</tr>
<tr>
<td></td>
<td>Hotelling’s Trace</td>
<td>.019</td>
<td>1.167</td>
<td>10.000</td>
<td>1240.000</td>
</tr>
<tr>
<td></td>
<td>Roy’s Largest Root</td>
<td>.014</td>
<td>1.719</td>
<td>5.000</td>
<td>622.000</td>
</tr>
<tr>
<td>CLU3_1 * SCHOOLID</td>
<td>Pillai’s Trace</td>
<td>.034</td>
<td>.719</td>
<td>30.000</td>
<td>3125.000</td>
</tr>
<tr>
<td></td>
<td>Wilks’ Lambda</td>
<td>.986</td>
<td>.717</td>
<td>30.000</td>
<td>2486.000</td>
</tr>
<tr>
<td></td>
<td>Hotelling’s Trace</td>
<td>.035</td>
<td>.716</td>
<td>30.000</td>
<td>3097.000</td>
</tr>
<tr>
<td></td>
<td>Roy’s Largest Root</td>
<td>.015</td>
<td>1.549</td>
<td>6.000</td>
<td>625.000</td>
</tr>
<tr>
<td>Effect</td>
<td>Pillai's Trace</td>
<td>Wilks' Lambda</td>
<td>Hotelling's Trace</td>
<td>Roy's Largest Root</td>
<td></td>
</tr>
<tr>
<td>-----------------</td>
<td>----------------</td>
<td>---------------</td>
<td>-------------------</td>
<td>--------------------</td>
<td></td>
</tr>
<tr>
<td><strong>CLU3_1 * ESBID</strong></td>
<td>Value</td>
<td>F</td>
<td>Hypothesis df</td>
<td>Error df</td>
<td></td>
</tr>
<tr>
<td></td>
<td>.009</td>
<td>.583b</td>
<td>10.000</td>
<td>1244.000</td>
<td></td>
</tr>
<tr>
<td></td>
<td>.991</td>
<td>.583b</td>
<td>10.000</td>
<td>1242.000</td>
<td></td>
</tr>
<tr>
<td></td>
<td>.009</td>
<td>.583c</td>
<td>10.000</td>
<td>1240.000</td>
<td></td>
</tr>
<tr>
<td></td>
<td>.009</td>
<td>1.135c</td>
<td>5.000</td>
<td>622.000</td>
<td></td>
</tr>
<tr>
<td><strong>ABILITY2 * NUM2</strong></td>
<td>Value</td>
<td>F</td>
<td>Hypothesis df</td>
<td>Error df</td>
<td></td>
</tr>
<tr>
<td>Pillai's Trace</td>
<td>.138</td>
<td>1.107</td>
<td>80.000</td>
<td>3125.000</td>
<td></td>
</tr>
<tr>
<td>Wilks' Lambda</td>
<td>.869</td>
<td>1.110</td>
<td>80.000</td>
<td>2993.775</td>
<td></td>
</tr>
<tr>
<td>Hotelling's Trace</td>
<td>.144</td>
<td>1.113</td>
<td>80.000</td>
<td>3097.000</td>
<td></td>
</tr>
<tr>
<td>Roy's Largest Root</td>
<td>.065</td>
<td>2.536c</td>
<td>16.000</td>
<td>625.000</td>
<td></td>
</tr>
<tr>
<td><strong>ABILITY2 * GRADE</strong></td>
<td>Value</td>
<td>F</td>
<td>Hypothesis df</td>
<td>Error df</td>
<td></td>
</tr>
<tr>
<td>Pillai's Trace</td>
<td>.018</td>
<td>.488</td>
<td>20.000</td>
<td>2486.000</td>
<td></td>
</tr>
<tr>
<td>Wilks' Lambda</td>
<td>.985</td>
<td>.486</td>
<td>20.000</td>
<td>2060.574</td>
<td></td>
</tr>
<tr>
<td>Hotelling's Trace</td>
<td>.016</td>
<td>.485</td>
<td>20.000</td>
<td>2478.000</td>
<td></td>
</tr>
<tr>
<td>Roy's Largest Root</td>
<td>.007</td>
<td>.876c</td>
<td>5.000</td>
<td>624.000</td>
<td></td>
</tr>
<tr>
<td><strong>ABILITY2 * GENDER</strong></td>
<td>Value</td>
<td>F</td>
<td>Hypothesis df</td>
<td>Error df</td>
<td></td>
</tr>
<tr>
<td>Pillai's Trace</td>
<td>.022</td>
<td>.705</td>
<td>20.000</td>
<td>2496.000</td>
<td></td>
</tr>
<tr>
<td>Wilks' Lambda</td>
<td>.978</td>
<td>.704</td>
<td>20.000</td>
<td>2060.574</td>
<td></td>
</tr>
<tr>
<td>Hotelling's Trace</td>
<td>.023</td>
<td>.704</td>
<td>20.000</td>
<td>2478.000</td>
<td></td>
</tr>
<tr>
<td>Roy's Largest Root</td>
<td>.015</td>
<td>1.885b</td>
<td>5.000</td>
<td>624.000</td>
<td></td>
</tr>
<tr>
<td><strong>ABILITY2 * SCHOOLID</strong></td>
<td>Value</td>
<td>F</td>
<td>Hypothesis df</td>
<td>Error df</td>
<td></td>
</tr>
<tr>
<td>Pillai's Trace</td>
<td>.117</td>
<td>1.243</td>
<td>60.000</td>
<td>3125.000</td>
<td></td>
</tr>
<tr>
<td>Wilks' Lambda</td>
<td>.888</td>
<td>1.241</td>
<td>60.000</td>
<td>2911.679</td>
<td></td>
</tr>
<tr>
<td>Hotelling's Trace</td>
<td>.120</td>
<td>1.239</td>
<td>60.000</td>
<td>3097.000</td>
<td></td>
</tr>
<tr>
<td>Roy's Largest Root</td>
<td>.042</td>
<td>2.210c</td>
<td>12.000</td>
<td>625.000</td>
<td></td>
</tr>
<tr>
<td><strong>ABILITY2 * ESBID</strong></td>
<td>Value</td>
<td>F</td>
<td>Hypothesis df</td>
<td>Error df</td>
<td></td>
</tr>
<tr>
<td>Pillai's Trace</td>
<td>.033</td>
<td>1.026</td>
<td>20.000</td>
<td>2496.000</td>
<td></td>
</tr>
<tr>
<td>Wilks' Lambda</td>
<td>.968</td>
<td>1.028</td>
<td>20.000</td>
<td>2060.574</td>
<td></td>
</tr>
<tr>
<td>Hotelling's Trace</td>
<td>.033</td>
<td>1.030</td>
<td>20.000</td>
<td>2478.000</td>
<td></td>
</tr>
<tr>
<td>Roy's Largest Root</td>
<td>.024</td>
<td>3.032c</td>
<td>5.000</td>
<td>624.000</td>
<td></td>
</tr>
<tr>
<td><strong>NUM2 * GRADE</strong></td>
<td>Value</td>
<td>F</td>
<td>Hypothesis df</td>
<td>Error df</td>
<td></td>
</tr>
<tr>
<td>Pillai's Trace</td>
<td>.036</td>
<td>1.121</td>
<td>20.000</td>
<td>2496.000</td>
<td></td>
</tr>
<tr>
<td>Wilks' Lambda</td>
<td>.965</td>
<td>1.122</td>
<td>20.000</td>
<td>2060.574</td>
<td></td>
</tr>
<tr>
<td>Hotelling's Trace</td>
<td>.036</td>
<td>1.123</td>
<td>20.000</td>
<td>2478.000</td>
<td></td>
</tr>
<tr>
<td>Roy's Largest Root</td>
<td>.024</td>
<td>3.030c</td>
<td>5.000</td>
<td>624.000</td>
<td></td>
</tr>
<tr>
<td><strong>NUM2 * GENDER</strong></td>
<td>Value</td>
<td>F</td>
<td>Hypothesis df</td>
<td>Error df</td>
<td></td>
</tr>
<tr>
<td>Pillai's Trace</td>
<td>.030</td>
<td>.947</td>
<td>20.000</td>
<td>2496.000</td>
<td></td>
</tr>
<tr>
<td>Wilks' Lambda</td>
<td>.970</td>
<td>.945</td>
<td>20.000</td>
<td>2060.574</td>
<td></td>
</tr>
<tr>
<td>Hotelling's Trace</td>
<td>.030</td>
<td>.944</td>
<td>20.000</td>
<td>2478.000</td>
<td></td>
</tr>
<tr>
<td>Roy's Largest Root</td>
<td>.014</td>
<td>1.775b</td>
<td>5.000</td>
<td>624.000</td>
<td></td>
</tr>
<tr>
<td><strong>NUM2 * SCHOOLID</strong></td>
<td>Value</td>
<td>F</td>
<td>Hypothesis df</td>
<td>Error df</td>
<td></td>
</tr>
<tr>
<td>Pillai's Trace</td>
<td>.095</td>
<td>1.004</td>
<td>60.000</td>
<td>3125.000</td>
<td></td>
</tr>
<tr>
<td>Wilks' Lambda</td>
<td>.909</td>
<td>1.003</td>
<td>60.000</td>
<td>2911.679</td>
<td></td>
</tr>
<tr>
<td>Hotelling's Trace</td>
<td>.097</td>
<td>1.002</td>
<td>60.000</td>
<td>3097.000</td>
<td></td>
</tr>
<tr>
<td>Roy's Largest Root</td>
<td>.038</td>
<td>1.980b</td>
<td>12.000</td>
<td>625.000</td>
<td></td>
</tr>
<tr>
<td><strong>NUM2 * ESBID</strong></td>
<td>Value</td>
<td>F</td>
<td>Hypothesis df</td>
<td>Error df</td>
<td></td>
</tr>
<tr>
<td>Pillai's Trace</td>
<td>.040</td>
<td>1.258</td>
<td>20.000</td>
<td>2496.000</td>
<td></td>
</tr>
<tr>
<td>Wilks' Lambda</td>
<td>.960</td>
<td>1.271</td>
<td>20.000</td>
<td>2060.574</td>
<td></td>
</tr>
<tr>
<td>Hotelling's Trace</td>
<td>.041</td>
<td>1.273</td>
<td>20.000</td>
<td>2478.000</td>
<td></td>
</tr>
<tr>
<td>Roy's Largest Root</td>
<td>.028</td>
<td>3.549c</td>
<td>5.000</td>
<td>624.000</td>
<td></td>
</tr>
<tr>
<td><strong>GRADE * GENDER</strong></td>
<td>Value</td>
<td>F</td>
<td>Hypothesis df</td>
<td>Error df</td>
<td></td>
</tr>
<tr>
<td>Pillai's Trace</td>
<td>.032</td>
<td>4.138b</td>
<td>3.000</td>
<td>621.000</td>
<td></td>
</tr>
<tr>
<td>Wilks' Lambda</td>
<td>.968</td>
<td>4.138b</td>
<td>3.000</td>
<td>621.000</td>
<td></td>
</tr>
<tr>
<td>Hotelling's Trace</td>
<td>.033</td>
<td>4.138b</td>
<td>3.000</td>
<td>621.000</td>
<td></td>
</tr>
<tr>
<td>Roy's Largest Root</td>
<td>.033</td>
<td>4.138b</td>
<td>3.000</td>
<td>621.000</td>
<td></td>
</tr>
<tr>
<td><strong>GRADE * SCHOOLID</strong></td>
<td>Value</td>
<td>F</td>
<td>Hypothesis df</td>
<td>Error df</td>
<td></td>
</tr>
<tr>
<td>Pillai's Trace</td>
<td>.036</td>
<td>1.509</td>
<td>15.000</td>
<td>1869.000</td>
<td></td>
</tr>
<tr>
<td>Wilks' Lambda</td>
<td>.964</td>
<td>1.510</td>
<td>15.000</td>
<td>1714.709</td>
<td></td>
</tr>
<tr>
<td>Hotelling's Trace</td>
<td>.037</td>
<td>1.510</td>
<td>15.000</td>
<td>1859.000</td>
<td></td>
</tr>
<tr>
<td>Roy's Largest Root</td>
<td>.023</td>
<td>2.925b</td>
<td>5.000</td>
<td>623.000</td>
<td></td>
</tr>
<tr>
<td><strong>GRADE * ESBID</strong></td>
<td>Value</td>
<td>F</td>
<td>Hypothesis df</td>
<td>Error df</td>
<td></td>
</tr>
<tr>
<td>Pillai's Trace</td>
<td>.004</td>
<td>.453b</td>
<td>5.000</td>
<td>621.000</td>
<td></td>
</tr>
<tr>
<td>Wilks' Lambda</td>
<td>.996</td>
<td>.453b</td>
<td>5.000</td>
<td>621.000</td>
<td></td>
</tr>
<tr>
<td>Hotelling's Trace</td>
<td>.004</td>
<td>.453b</td>
<td>5.000</td>
<td>621.000</td>
<td></td>
</tr>
<tr>
<td>Roy's Largest Root</td>
<td>.004</td>
<td>.453b</td>
<td>5.000</td>
<td>621.000</td>
<td></td>
</tr>
<tr>
<td>Effect</td>
<td>Value</td>
<td>F</td>
<td>Hypothesis df</td>
<td>Error df</td>
<td></td>
</tr>
<tr>
<td>-----------------</td>
<td>-------</td>
<td>-------</td>
<td>---------------</td>
<td>----------</td>
<td></td>
</tr>
<tr>
<td>GENDER * SCHOOLID</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pillai's Trace</td>
<td>0.022</td>
<td>1.406</td>
<td>10.000</td>
<td>1244.000</td>
<td></td>
</tr>
<tr>
<td>Wilks' Lambda</td>
<td>0.978</td>
<td>1.411&lt;sup&gt;b&lt;/sup&gt;</td>
<td>10.000</td>
<td>1242.000</td>
<td></td>
</tr>
<tr>
<td>Hotelling's Trace</td>
<td>0.023</td>
<td>1.416</td>
<td>10.000</td>
<td>1240.000</td>
<td></td>
</tr>
<tr>
<td>Roy's Largest Root</td>
<td>0.022</td>
<td>2.782&lt;sup&gt;c&lt;/sup&gt;</td>
<td>5.000</td>
<td>622.000</td>
<td></td>
</tr>
<tr>
<td>GENDER * ESBID</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pillai's Trace</td>
<td>0.003</td>
<td>0.409&lt;sup&gt;b&lt;/sup&gt;</td>
<td>5.000</td>
<td>621.000</td>
<td></td>
</tr>
<tr>
<td>Wilks' Lambda</td>
<td>0.997</td>
<td>0.409&lt;sup&gt;b&lt;/sup&gt;</td>
<td>5.000</td>
<td>621.000</td>
<td></td>
</tr>
<tr>
<td>Hotelling's Trace</td>
<td>0.003</td>
<td>0.409&lt;sup&gt;b&lt;/sup&gt;</td>
<td>5.000</td>
<td>621.000</td>
<td></td>
</tr>
<tr>
<td>Roy's Largest Root</td>
<td>0.003</td>
<td>0.409&lt;sup&gt;b&lt;/sup&gt;</td>
<td>5.000</td>
<td>621.000</td>
<td></td>
</tr>
<tr>
<td>SCHOOLID * ESBID</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pillai's Trace</td>
<td>0.029</td>
<td>1.211</td>
<td>15.000</td>
<td>1869.000</td>
<td></td>
</tr>
<tr>
<td>Wilks' Lambda</td>
<td>0.971</td>
<td>1.210</td>
<td>15.000</td>
<td>1714.709</td>
<td></td>
</tr>
<tr>
<td>Hotelling's Trace</td>
<td>0.029</td>
<td>1.208</td>
<td>15.000</td>
<td>1859.000</td>
<td></td>
</tr>
<tr>
<td>Roy's Largest Root</td>
<td>0.017</td>
<td>2.165&lt;sup&gt;c&lt;/sup&gt;</td>
<td>5.000</td>
<td>623.000</td>
<td></td>
</tr>
<tr>
<td>Effect</td>
<td>Sig.</td>
<td>Partial Eta Squared</td>
<td>Noncent. Parameter</td>
<td>Observed Power</td>
<td></td>
</tr>
<tr>
<td>-------------------</td>
<td>------</td>
<td>---------------------</td>
<td>--------------------</td>
<td>----------------</td>
<td></td>
</tr>
<tr>
<td>Intercept</td>
<td>.000</td>
<td>.852</td>
<td>3587.224</td>
<td>1.000</td>
<td></td>
</tr>
<tr>
<td>Wilks' Lambda</td>
<td>.000</td>
<td>.852</td>
<td>3587.224</td>
<td>1.000</td>
<td></td>
</tr>
<tr>
<td>Hotelling's Trace</td>
<td>.000</td>
<td>.852</td>
<td>3587.224</td>
<td>1.000</td>
<td></td>
</tr>
<tr>
<td>Roy's Largest Root</td>
<td>.000</td>
<td>.852</td>
<td>3587.224</td>
<td>1.000</td>
<td></td>
</tr>
<tr>
<td>CLU3_1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pillai's Trace</td>
<td>.000</td>
<td>.030</td>
<td>38.558</td>
<td>.997</td>
<td></td>
</tr>
<tr>
<td>Wilks' Lambda</td>
<td>.000</td>
<td>.030</td>
<td>38.699</td>
<td>.997</td>
<td></td>
</tr>
<tr>
<td>Hotelling's Trace</td>
<td>.000</td>
<td>.030</td>
<td>38.840</td>
<td>.997</td>
<td></td>
</tr>
<tr>
<td>Roy's Largest Root</td>
<td>.000</td>
<td>.047</td>
<td>30.913</td>
<td>.986</td>
<td></td>
</tr>
<tr>
<td>ABILITY2</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pillai's Trace</td>
<td>.796</td>
<td>.006</td>
<td>14.644</td>
<td>.594</td>
<td></td>
</tr>
<tr>
<td>Wilks' Lambda</td>
<td>.796</td>
<td>.006</td>
<td>12.125</td>
<td>.490</td>
<td></td>
</tr>
<tr>
<td>Hotelling's Trace</td>
<td>.797</td>
<td>.006</td>
<td>14.625</td>
<td>.593</td>
<td></td>
</tr>
<tr>
<td>Roy's Largest Root</td>
<td>.104</td>
<td>.014</td>
<td>9.177</td>
<td>.629</td>
<td></td>
</tr>
<tr>
<td>NUM2</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pillai's Trace</td>
<td>.122</td>
<td>.011</td>
<td>27.532</td>
<td>.916</td>
<td></td>
</tr>
<tr>
<td>Wilks' Lambda</td>
<td>.122</td>
<td>.011</td>
<td>22.826</td>
<td>.839</td>
<td></td>
</tr>
<tr>
<td>Hotelling's Trace</td>
<td>.121</td>
<td>.011</td>
<td>27.568</td>
<td>.917</td>
<td></td>
</tr>
<tr>
<td>Roy's Largest Root</td>
<td>.010</td>
<td>.024</td>
<td>15.239</td>
<td>.869</td>
<td></td>
</tr>
<tr>
<td>GRADE</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pillai's Trace</td>
<td>.021</td>
<td>.021</td>
<td>13.408</td>
<td>.816</td>
<td></td>
</tr>
<tr>
<td>Wilks' Lambda</td>
<td>.021</td>
<td>.021</td>
<td>13.408</td>
<td>.816</td>
<td></td>
</tr>
<tr>
<td>Hotelling's Trace</td>
<td>.021</td>
<td>.021</td>
<td>13.408</td>
<td>.816</td>
<td></td>
</tr>
<tr>
<td>Roy's Largest Root</td>
<td>.021</td>
<td>.021</td>
<td>13.408</td>
<td>.816</td>
<td></td>
</tr>
<tr>
<td>GENDER</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pillai's Trace</td>
<td>.314</td>
<td>.009</td>
<td>5.931</td>
<td>.424</td>
<td></td>
</tr>
<tr>
<td>Wilks' Lambda</td>
<td>.314</td>
<td>.009</td>
<td>5.931</td>
<td>.424</td>
<td></td>
</tr>
<tr>
<td>Hotelling's Trace</td>
<td>.314</td>
<td>.009</td>
<td>5.931</td>
<td>.424</td>
<td></td>
</tr>
<tr>
<td>Roy's Largest Root</td>
<td>.314</td>
<td>.009</td>
<td>5.931</td>
<td>.424</td>
<td></td>
</tr>
<tr>
<td>SCHOOLID</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pillai's Trace</td>
<td>.659</td>
<td>.007</td>
<td>12.264</td>
<td>.560</td>
<td></td>
</tr>
<tr>
<td>Wilks' Lambda</td>
<td>.661</td>
<td>.007</td>
<td>11.260</td>
<td>.515</td>
<td></td>
</tr>
<tr>
<td>Hotelling's Trace</td>
<td>.662</td>
<td>.007</td>
<td>12.216</td>
<td>.558</td>
<td></td>
</tr>
<tr>
<td>Roy's Largest Root</td>
<td>.249</td>
<td>.011</td>
<td>6.660</td>
<td>.474</td>
<td></td>
</tr>
<tr>
<td>ESBID</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pillai's Trace</td>
<td>.403</td>
<td>.008</td>
<td>5.120</td>
<td>.368</td>
<td></td>
</tr>
<tr>
<td>Wilks' Lambda</td>
<td>.403</td>
<td>.008</td>
<td>5.120</td>
<td>.368</td>
<td></td>
</tr>
<tr>
<td>Hotelling's Trace</td>
<td>.403</td>
<td>.008</td>
<td>5.120</td>
<td>.368</td>
<td></td>
</tr>
<tr>
<td>Roy's Largest Root</td>
<td>.403</td>
<td>.008</td>
<td>5.120</td>
<td>.368</td>
<td></td>
</tr>
<tr>
<td>CLU3_1 * ABILITY2</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pillai's Trace</td>
<td>.931</td>
<td>.009</td>
<td>27.549</td>
<td>.795</td>
<td></td>
</tr>
<tr>
<td>Wilks' Lambda</td>
<td>.933</td>
<td>.009</td>
<td>23.936</td>
<td>.712</td>
<td></td>
</tr>
<tr>
<td>Hotelling's Trace</td>
<td>.934</td>
<td>.009</td>
<td>27.412</td>
<td>.792</td>
<td></td>
</tr>
<tr>
<td>Roy's Largest Root</td>
<td>.194</td>
<td>.018</td>
<td>11.185</td>
<td>.641</td>
<td></td>
</tr>
<tr>
<td>CLU3_1 * NUM2</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pillai's Trace</td>
<td>.651</td>
<td>.011</td>
<td>35.994</td>
<td>.919</td>
<td></td>
</tr>
<tr>
<td>Wilks' Lambda</td>
<td>.653</td>
<td>.011</td>
<td>31.301</td>
<td>.860</td>
<td></td>
</tr>
<tr>
<td>Hotelling's Trace</td>
<td>.656</td>
<td>.011</td>
<td>35.879</td>
<td>.918</td>
<td></td>
</tr>
<tr>
<td>Roy's Largest Root</td>
<td>.052</td>
<td>.024</td>
<td>15.512</td>
<td>.809</td>
<td></td>
</tr>
<tr>
<td>CLU3_1 * GRADE</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pillai's Trace</td>
<td>.224</td>
<td>.010</td>
<td>13.025</td>
<td>.680</td>
<td></td>
</tr>
<tr>
<td>Wilks' Lambda</td>
<td>.224</td>
<td>.010</td>
<td>13.025</td>
<td>.680</td>
<td></td>
</tr>
<tr>
<td>Hotelling's Trace</td>
<td>.224</td>
<td>.010</td>
<td>13.025</td>
<td>.680</td>
<td></td>
</tr>
<tr>
<td>Roy's Largest Root</td>
<td>.073</td>
<td>.016</td>
<td>10.132</td>
<td>.680</td>
<td></td>
</tr>
<tr>
<td>CLU3_1 * GENDER</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pillai's Trace</td>
<td>.308</td>
<td>.009</td>
<td>11.684</td>
<td>.621</td>
<td></td>
</tr>
<tr>
<td>Wilks' Lambda</td>
<td>.308</td>
<td>.009</td>
<td>11.677</td>
<td>.621</td>
<td></td>
</tr>
<tr>
<td>Hotelling's Trace</td>
<td>.309</td>
<td>.009</td>
<td>11.671</td>
<td>.621</td>
<td></td>
</tr>
<tr>
<td>Roy's Largest Root</td>
<td>.128</td>
<td>.014</td>
<td>8.597</td>
<td>.596</td>
<td></td>
</tr>
<tr>
<td>CLU3_1 * SCHOOLID</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pillai's Trace</td>
<td>.869</td>
<td>.007</td>
<td>21.568</td>
<td>.723</td>
<td></td>
</tr>
<tr>
<td>Wilks' Lambda</td>
<td>.870</td>
<td>.007</td>
<td>17.197</td>
<td>.587</td>
<td></td>
</tr>
<tr>
<td>Hotelling's Trace</td>
<td>.872</td>
<td>.007</td>
<td>21.472</td>
<td>.720</td>
<td></td>
</tr>
<tr>
<td>Roy's Largest Root</td>
<td>.160</td>
<td>.015</td>
<td>9.293</td>
<td>.601</td>
<td></td>
</tr>
<tr>
<td>Effect</td>
<td>Sig.</td>
<td>Partial Eta Squared</td>
<td>Noncent. Parameter</td>
<td>Observed Powera</td>
<td></td>
</tr>
<tr>
<td>-------------------</td>
<td>------</td>
<td>---------------------</td>
<td>--------------------</td>
<td>-----------------</td>
<td></td>
</tr>
<tr>
<td>CLU3_1 * ESBID</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pillai's Trace</td>
<td>.829</td>
<td>.005</td>
<td>5.830</td>
<td>.311</td>
<td></td>
</tr>
<tr>
<td>Wilks' Lambda</td>
<td>.829</td>
<td>.005</td>
<td>5.832</td>
<td>.311</td>
<td></td>
</tr>
<tr>
<td>Hotelling's Trace</td>
<td>.829</td>
<td>.005</td>
<td>5.835</td>
<td>.311</td>
<td></td>
</tr>
<tr>
<td>Roy's Largest Root</td>
<td>.340</td>
<td>.009</td>
<td>5.675</td>
<td>.407</td>
<td></td>
</tr>
<tr>
<td>ABILITY2 * NUM2</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pillai's Trace</td>
<td>.243</td>
<td>.028</td>
<td>88.570</td>
<td>.999</td>
<td></td>
</tr>
<tr>
<td>Wilks' Lambda</td>
<td>.238</td>
<td>.028</td>
<td>85.458</td>
<td>.999</td>
<td></td>
</tr>
<tr>
<td>Hotelling's Trace</td>
<td>.233</td>
<td>.028</td>
<td>89.038</td>
<td>1.000</td>
<td></td>
</tr>
<tr>
<td>Roy's Largest Root</td>
<td>.001</td>
<td>.061</td>
<td>40.584</td>
<td>.994</td>
<td></td>
</tr>
<tr>
<td>ABILITY2 * GRADE</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pillai's Trace</td>
<td>.972</td>
<td>.004</td>
<td>9.752</td>
<td>.388</td>
<td></td>
</tr>
<tr>
<td>Wilks' Lambda</td>
<td>.973</td>
<td>.004</td>
<td>8.060</td>
<td>.315</td>
<td></td>
</tr>
<tr>
<td>Hotelling's Trace</td>
<td>.973</td>
<td>.004</td>
<td>9.704</td>
<td>.388</td>
<td></td>
</tr>
<tr>
<td>Roy's Largest Root</td>
<td>.497</td>
<td>.007</td>
<td>4.381</td>
<td>.316</td>
<td></td>
</tr>
<tr>
<td>ABILITY2 * GENDER</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pillai's Trace</td>
<td>.825</td>
<td>.006</td>
<td>14.106</td>
<td>.573</td>
<td></td>
</tr>
<tr>
<td>Wilks' Lambda</td>
<td>.825</td>
<td>.006</td>
<td>11.676</td>
<td>.471</td>
<td></td>
</tr>
<tr>
<td>Hotelling's Trace</td>
<td>.826</td>
<td>.006</td>
<td>14.079</td>
<td>.571</td>
<td></td>
</tr>
<tr>
<td>Roy's Largest Root</td>
<td>.095</td>
<td>.015</td>
<td>9.423</td>
<td>.643</td>
<td></td>
</tr>
<tr>
<td>ABILITY2 * SCHOOLID</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pillai's Trace</td>
<td>.100</td>
<td>.023</td>
<td>74.607</td>
<td>.999</td>
<td></td>
</tr>
<tr>
<td>Wilks' Lambda</td>
<td>.102</td>
<td>.023</td>
<td>69.699</td>
<td>.998</td>
<td></td>
</tr>
<tr>
<td>Hotelling's Trace</td>
<td>.104</td>
<td>.023</td>
<td>74.333</td>
<td>.999</td>
<td></td>
</tr>
<tr>
<td>Roy's Largest Root</td>
<td>.010</td>
<td>.041</td>
<td>26.525</td>
<td>.952</td>
<td></td>
</tr>
<tr>
<td>ABILITY2 * ESBID</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pillai's Trace</td>
<td>.426</td>
<td>.008</td>
<td>20.526</td>
<td>.785</td>
<td></td>
</tr>
<tr>
<td>Wilks' Lambda</td>
<td>.424</td>
<td>.008</td>
<td>17.037</td>
<td>.680</td>
<td></td>
</tr>
<tr>
<td>Hotelling's Trace</td>
<td>.422</td>
<td>.008</td>
<td>20.599</td>
<td>.788</td>
<td></td>
</tr>
<tr>
<td>Roy's Largest Root</td>
<td>.010</td>
<td>.024</td>
<td>15.158</td>
<td>.887</td>
<td></td>
</tr>
<tr>
<td>NUM2 * GRADE</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pillai's Trace</td>
<td>.319</td>
<td>.009</td>
<td>22.424</td>
<td>.831</td>
<td></td>
</tr>
<tr>
<td>Wilks' Lambda</td>
<td>.318</td>
<td>.009</td>
<td>18.596</td>
<td>.730</td>
<td></td>
</tr>
<tr>
<td>Hotelling's Trace</td>
<td>.317</td>
<td>.009</td>
<td>22.464</td>
<td>.832</td>
<td></td>
</tr>
<tr>
<td>Roy's Largest Root</td>
<td>.010</td>
<td>.024</td>
<td>15.152</td>
<td>.887</td>
<td></td>
</tr>
<tr>
<td>NUM2 * GENDER</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pillai's Trace</td>
<td>.526</td>
<td>.008</td>
<td>18.941</td>
<td>.742</td>
<td></td>
</tr>
<tr>
<td>Wilks' Lambda</td>
<td>.528</td>
<td>.008</td>
<td>15.666</td>
<td>.632</td>
<td></td>
</tr>
<tr>
<td>Hotelling's Trace</td>
<td>.530</td>
<td>.008</td>
<td>18.875</td>
<td>.740</td>
<td></td>
</tr>
<tr>
<td>Roy's Largest Root</td>
<td>.116</td>
<td>.014</td>
<td>8.876</td>
<td>.612</td>
<td></td>
</tr>
<tr>
<td>NUM2 * SCHOOLID</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pillai's Trace</td>
<td>.469</td>
<td>.019</td>
<td>60.217</td>
<td>.999</td>
<td></td>
</tr>
<tr>
<td>Wilks' Lambda</td>
<td>.470</td>
<td>.019</td>
<td>56.327</td>
<td>.994</td>
<td></td>
</tr>
<tr>
<td>Hotelling's Trace</td>
<td>.471</td>
<td>.019</td>
<td>60.147</td>
<td>.991</td>
<td></td>
</tr>
<tr>
<td>Roy's Largest Root</td>
<td>.024</td>
<td>.037</td>
<td>23.759</td>
<td>.923</td>
<td></td>
</tr>
<tr>
<td>NUM2 * ESBID</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pillai's Trace</td>
<td>.190</td>
<td>.010</td>
<td>25.353</td>
<td>.886</td>
<td></td>
</tr>
<tr>
<td>Wilks' Lambda</td>
<td>.188</td>
<td>.010</td>
<td>21.047</td>
<td>.798</td>
<td></td>
</tr>
<tr>
<td>Hotelling's Trace</td>
<td>.186</td>
<td>.010</td>
<td>25.453</td>
<td>.887</td>
<td></td>
</tr>
<tr>
<td>Roy's Largest Root</td>
<td>.004</td>
<td>.028</td>
<td>17.744</td>
<td>.920</td>
<td></td>
</tr>
<tr>
<td>GRADE * GENDER</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pillai's Trace</td>
<td>.001</td>
<td>.032</td>
<td>20.690</td>
<td>.957</td>
<td></td>
</tr>
<tr>
<td>Wilks' Lambda</td>
<td>.001</td>
<td>.032</td>
<td>20.690</td>
<td>.957</td>
<td></td>
</tr>
<tr>
<td>Hotelling's Trace</td>
<td>.001</td>
<td>.032</td>
<td>20.690</td>
<td>.957</td>
<td></td>
</tr>
<tr>
<td>Roy's Largest Root</td>
<td>.001</td>
<td>.032</td>
<td>20.690</td>
<td>.957</td>
<td></td>
</tr>
<tr>
<td>GRADE * SCHOOLID</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pillai's Trace</td>
<td>.093</td>
<td>.012</td>
<td>22.638</td>
<td>.882</td>
<td></td>
</tr>
<tr>
<td>Wilks' Lambda</td>
<td>.093</td>
<td>.012</td>
<td>20.830</td>
<td>.846</td>
<td></td>
</tr>
<tr>
<td>Hotelling's Trace</td>
<td>.093</td>
<td>.012</td>
<td>22.648</td>
<td>.882</td>
<td></td>
</tr>
<tr>
<td>Roy's Largest Root</td>
<td>.013</td>
<td>.023</td>
<td>14.623</td>
<td>.853</td>
<td></td>
</tr>
<tr>
<td>GRADE * ESBID</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pillai's Trace</td>
<td>.811</td>
<td>.004</td>
<td>2.267</td>
<td>.173</td>
<td></td>
</tr>
<tr>
<td>Wilks' Lambda</td>
<td>.811</td>
<td>.004</td>
<td>2.267</td>
<td>.173</td>
<td></td>
</tr>
<tr>
<td>Hotelling's Trace</td>
<td>.811</td>
<td>.004</td>
<td>2.267</td>
<td>.173</td>
<td></td>
</tr>
<tr>
<td>Roy's Largest Root</td>
<td>.811</td>
<td>.004</td>
<td>2.267</td>
<td>.173</td>
<td></td>
</tr>
<tr>
<td>Effect</td>
<td>Pillai's Trace</td>
<td>Wilks' Lambda</td>
<td>Hotelling's Trace</td>
<td>Roy's Largest Root</td>
<td>Sig.</td>
</tr>
<tr>
<td>------------------------</td>
<td>----------------</td>
<td>---------------</td>
<td>-------------------</td>
<td>--------------------</td>
<td>-------</td>
</tr>
<tr>
<td>GENDER * SCHOOLID</td>
<td>.172</td>
<td>.170</td>
<td>.157</td>
<td>.017</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>GENDER * ESBID</td>
<td>.843</td>
<td>.843</td>
<td>.843</td>
<td>.843</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SCHOOLID * ESBID</td>
<td>.255</td>
<td>.256</td>
<td>.257</td>
<td>.056</td>
<td></td>
</tr>
</tbody>
</table>

a. Computed using alpha = .05
b. Exact statistic
c. The statistic is an upper bound on F that yields a lower bound on the significance level.
d. Design: Intercept+CLU3_1+ABILITY2+NUM2+GRADE+GENDER+SCHOOLID+ESBID+CLU3_1*ABILITY2+CLU3_1*NUM2+CLU3_1*GRADE+CLU3_1*GENDER+CLU3_1*SCHOOLID+CLU3_1*ESBID+ABILITY2*NUM2+ABILITY2*GRADE+ABILITY2*GENDER+ABILITY2*SCHOOLID+ABILITY2*ESBID+NUM2*GRADE+NUM2*GENDER+NUM2*SCHOOLID+NUM2*ESBID+GRADE*GENDER+GRADE*SCHOOLID+GRADE*ESBID+GENDER*SCHOOLID+GENDER*ESBID+SCHOOLID*ESBID
<table>
<thead>
<tr>
<th>Source</th>
<th>Dependent Variable</th>
<th>Type III Sum of Squares</th>
<th>df</th>
<th>Mean Square</th>
<th>F</th>
</tr>
</thead>
<tbody>
<tr>
<td>Corrected Model</td>
<td>ACEFNUM</td>
<td>129.998</td>
<td>119</td>
<td>1.092</td>
<td>2.456</td>
</tr>
<tr>
<td></td>
<td>LSTRANUM</td>
<td>89.211c</td>
<td>119</td>
<td>.750</td>
<td>2.234</td>
</tr>
<tr>
<td></td>
<td>SREGNUM</td>
<td>109.877d</td>
<td>119</td>
<td>.923</td>
<td>2.047</td>
</tr>
<tr>
<td></td>
<td>ASHANNUM</td>
<td>97.483e</td>
<td>119</td>
<td>.819</td>
<td>1.357</td>
</tr>
<tr>
<td></td>
<td>TANXNUM</td>
<td>264.548f</td>
<td>119</td>
<td>2.223</td>
<td>2.467</td>
</tr>
<tr>
<td>Intercept</td>
<td>ACEFNUM</td>
<td>687.748</td>
<td>1</td>
<td>687.748</td>
<td>1546.386</td>
</tr>
<tr>
<td></td>
<td>LSTRANUM</td>
<td>599.790</td>
<td>1</td>
<td>599.790</td>
<td>1787.625</td>
</tr>
<tr>
<td></td>
<td>SREGNUM</td>
<td>537.318</td>
<td>1</td>
<td>537.318</td>
<td>1191.106</td>
</tr>
<tr>
<td></td>
<td>ASHANNUM</td>
<td>150.113</td>
<td>1</td>
<td>150.113</td>
<td>248.728</td>
</tr>
<tr>
<td></td>
<td>TANXNUM</td>
<td>411.198</td>
<td>1</td>
<td>411.198</td>
<td>456.380</td>
</tr>
<tr>
<td>CLU3_1</td>
<td>ACEFNUM</td>
<td>7.612</td>
<td>2</td>
<td>3.806</td>
<td>8.558</td>
</tr>
<tr>
<td></td>
<td>LSTRANUM</td>
<td>5.990</td>
<td>2</td>
<td>2.995</td>
<td>8.927</td>
</tr>
<tr>
<td></td>
<td>SREGNUM</td>
<td>7.954</td>
<td>2</td>
<td>3.977</td>
<td>8.816</td>
</tr>
<tr>
<td></td>
<td>ASHANNUM</td>
<td>4.374</td>
<td>2</td>
<td>2.187</td>
<td>3.624</td>
</tr>
<tr>
<td></td>
<td>TANXNUM</td>
<td>5.627</td>
<td>2</td>
<td>2.814</td>
<td>3.123</td>
</tr>
<tr>
<td>ABILITY2</td>
<td>ACEFNUM</td>
<td>.644</td>
<td>4</td>
<td>.161</td>
<td>.362</td>
</tr>
<tr>
<td></td>
<td>LSTRANUM</td>
<td>1.641</td>
<td>4</td>
<td>.410</td>
<td>1.223</td>
</tr>
<tr>
<td></td>
<td>SREGNUM</td>
<td>.589</td>
<td>4</td>
<td>.147</td>
<td>.326</td>
</tr>
<tr>
<td></td>
<td>ASHANNUM</td>
<td>.288</td>
<td>4</td>
<td>7.190E-02</td>
<td>.119</td>
</tr>
<tr>
<td></td>
<td>TANXNUM</td>
<td>1.594</td>
<td>4</td>
<td>.399</td>
<td>.442</td>
</tr>
<tr>
<td>NUM2</td>
<td>ACEFNUM</td>
<td>5.196</td>
<td>4</td>
<td>1.299</td>
<td>2.921</td>
</tr>
<tr>
<td></td>
<td>LSTRANUM</td>
<td>2.177</td>
<td>4</td>
<td>.544</td>
<td>1.622</td>
</tr>
<tr>
<td></td>
<td>SREGNUM</td>
<td>2.426</td>
<td>4</td>
<td>.607</td>
<td>1.345</td>
</tr>
<tr>
<td></td>
<td>ASHANNUM</td>
<td>1.345</td>
<td>4</td>
<td>.336</td>
<td>.557</td>
</tr>
<tr>
<td></td>
<td>TANXNUM</td>
<td>8.071</td>
<td>4</td>
<td>2.018</td>
<td>2.240</td>
</tr>
<tr>
<td>GRADE</td>
<td>ACEFNUM</td>
<td>4.069</td>
<td>1</td>
<td>4.069</td>
<td>9.149</td>
</tr>
<tr>
<td></td>
<td>LSTRANUM</td>
<td>.395</td>
<td>1</td>
<td>.395</td>
<td>1.176</td>
</tr>
<tr>
<td></td>
<td>SREGNUM</td>
<td>2.397</td>
<td>1</td>
<td>2.397</td>
<td>5.314</td>
</tr>
<tr>
<td></td>
<td>ASHANNUM</td>
<td>.317</td>
<td>1</td>
<td>.317</td>
<td>.525</td>
</tr>
<tr>
<td></td>
<td>TANXNUM</td>
<td>1.320</td>
<td>1</td>
<td>1.320</td>
<td>1.465</td>
</tr>
<tr>
<td>GENDER</td>
<td>ACEFNUM</td>
<td>.785</td>
<td>1</td>
<td>.785</td>
<td>1.765</td>
</tr>
<tr>
<td></td>
<td>LSTRANUM</td>
<td>.720</td>
<td>1</td>
<td>.720</td>
<td>2.144</td>
</tr>
<tr>
<td></td>
<td>SREGNUM</td>
<td>1.190E-02</td>
<td>1</td>
<td>1.190E-02</td>
<td>.026</td>
</tr>
<tr>
<td></td>
<td>ASHANNUM</td>
<td>7.985E-02</td>
<td>1</td>
<td>7.985E-02</td>
<td>.132</td>
</tr>
<tr>
<td></td>
<td>TANXNUM</td>
<td>.193</td>
<td>1</td>
<td>.193</td>
<td>.215</td>
</tr>
<tr>
<td>SCHOOLID</td>
<td>ACEFNUM</td>
<td>1.860</td>
<td>3</td>
<td>.620</td>
<td>1.394</td>
</tr>
<tr>
<td></td>
<td>LSTRANUM</td>
<td>.945</td>
<td>3</td>
<td>.315</td>
<td>.939</td>
</tr>
<tr>
<td></td>
<td>SREGNUM</td>
<td>1.549</td>
<td>3</td>
<td>.516</td>
<td>1.145</td>
</tr>
<tr>
<td></td>
<td>ASHANNUM</td>
<td>.435</td>
<td>3</td>
<td>.145</td>
<td>.240</td>
</tr>
<tr>
<td></td>
<td>TANXNUM</td>
<td>2.952</td>
<td>3</td>
<td>.984</td>
<td>1.092</td>
</tr>
<tr>
<td>ESBID</td>
<td>ACEFNUM</td>
<td>2.410E-03</td>
<td>1</td>
<td>2.410E-03</td>
<td>.005</td>
</tr>
<tr>
<td></td>
<td>LSTRANUM</td>
<td>1.260E-02</td>
<td>1</td>
<td>1.260E-02</td>
<td>.038</td>
</tr>
<tr>
<td></td>
<td>SREGNUM</td>
<td>1.415</td>
<td>1</td>
<td>1.415</td>
<td>3.137</td>
</tr>
<tr>
<td></td>
<td>ASHANNUM</td>
<td>3.254E-03</td>
<td>1</td>
<td>3.254E-03</td>
<td>.005</td>
</tr>
<tr>
<td></td>
<td>TANXNUM</td>
<td>.180</td>
<td>1</td>
<td>.180</td>
<td>.200</td>
</tr>
<tr>
<td>CLU3_1*ABILITY2</td>
<td>ACEFNUM</td>
<td>3.105</td>
<td>8</td>
<td>.388</td>
<td>.873</td>
</tr>
<tr>
<td></td>
<td>LSTRANUM</td>
<td>1.660</td>
<td>8</td>
<td>.208</td>
<td>.619</td>
</tr>
<tr>
<td></td>
<td>SREGNUM</td>
<td>2.156</td>
<td>8</td>
<td>.270</td>
<td>.597</td>
</tr>
<tr>
<td></td>
<td>ASHANNUM</td>
<td>2.591</td>
<td>8</td>
<td>.324</td>
<td>.537</td>
</tr>
<tr>
<td></td>
<td>TANXNUM</td>
<td>7.494</td>
<td>8</td>
<td>.937</td>
<td>1.040</td>
</tr>
<tr>
<td>Source</td>
<td>Dependent Variable</td>
<td>Type III Sum of Squares</td>
<td>df</td>
<td>Mean Square</td>
<td>F</td>
</tr>
<tr>
<td>----------------</td>
<td>--------------------</td>
<td>-------------------------</td>
<td>----</td>
<td>-------------</td>
<td>------</td>
</tr>
<tr>
<td>CLU3_1 * NUM2</td>
<td>ACEFFNUM</td>
<td>5.713</td>
<td>8</td>
<td>.714</td>
<td>1.608</td>
</tr>
<tr>
<td></td>
<td>LSTRANUM</td>
<td>2.583</td>
<td>8</td>
<td>.323</td>
<td>.962</td>
</tr>
<tr>
<td></td>
<td>SREGNUM</td>
<td>3.911</td>
<td>8</td>
<td>.489</td>
<td>1.084</td>
</tr>
<tr>
<td></td>
<td>ASHANNUM</td>
<td>1.034</td>
<td>8</td>
<td>.129</td>
<td>.214</td>
</tr>
<tr>
<td></td>
<td>TANXNUM</td>
<td>2.577</td>
<td>8</td>
<td>.322</td>
<td>.358</td>
</tr>
<tr>
<td>CLU3_1 * GRADE</td>
<td>ACEFFNUM</td>
<td>.561</td>
<td>2</td>
<td>.281</td>
<td>.631</td>
</tr>
<tr>
<td></td>
<td>LSTRANUM</td>
<td>1.591</td>
<td>2</td>
<td>.796</td>
<td>2.372</td>
</tr>
<tr>
<td></td>
<td>SREGNUM</td>
<td>.824</td>
<td>2</td>
<td>.412</td>
<td>.913</td>
</tr>
<tr>
<td></td>
<td>ASHANNUM</td>
<td>.956</td>
<td>2</td>
<td>.478</td>
<td>.782</td>
</tr>
<tr>
<td></td>
<td>TANXNUM</td>
<td>3.045</td>
<td>2</td>
<td>1.522</td>
<td>1.690</td>
</tr>
<tr>
<td>CLU3_1 * GENDER</td>
<td>ACEFFNUM</td>
<td>.424</td>
<td>2</td>
<td>.212</td>
<td>.477</td>
</tr>
<tr>
<td></td>
<td>LSTRANUM</td>
<td>.796</td>
<td>2</td>
<td>.398</td>
<td>1.186</td>
</tr>
<tr>
<td></td>
<td>SREGNUM</td>
<td>1.145</td>
<td>2</td>
<td>.573</td>
<td>1.269</td>
</tr>
<tr>
<td></td>
<td>ASHANNUM</td>
<td>1.801</td>
<td>2</td>
<td>.901</td>
<td>1.492</td>
</tr>
<tr>
<td></td>
<td>TANXNUM</td>
<td>.826</td>
<td>2</td>
<td>.413</td>
<td>.458</td>
</tr>
<tr>
<td>CLU3_1 * SCHOOLID</td>
<td>ACEFFNUM</td>
<td>3.500</td>
<td>6</td>
<td>.583</td>
<td>1.311</td>
</tr>
<tr>
<td></td>
<td>LSTRANUM</td>
<td>.453</td>
<td>6</td>
<td>7.554E-02</td>
<td>.225</td>
</tr>
<tr>
<td></td>
<td>SREGNUM</td>
<td>2.144</td>
<td>6</td>
<td>.357</td>
<td>.792</td>
</tr>
<tr>
<td></td>
<td>ASHANNUM</td>
<td>2.285</td>
<td>6</td>
<td>.381</td>
<td>.631</td>
</tr>
<tr>
<td></td>
<td>TANXNUM</td>
<td>2.815</td>
<td>6</td>
<td>.469</td>
<td>.521</td>
</tr>
<tr>
<td>CLU3_1 * ESBID</td>
<td>ACEFFNUM</td>
<td>.512</td>
<td>2</td>
<td>.256</td>
<td>.575</td>
</tr>
<tr>
<td></td>
<td>LSTRANUM</td>
<td>.193</td>
<td>2</td>
<td>9.647E-02</td>
<td>.288</td>
</tr>
<tr>
<td></td>
<td>SREGNUM</td>
<td>.390</td>
<td>2</td>
<td>.195</td>
<td>.433</td>
</tr>
<tr>
<td></td>
<td>ASHANNUM</td>
<td>2.754</td>
<td>2</td>
<td>1.377</td>
<td>2.282</td>
</tr>
<tr>
<td></td>
<td>TANXNUM</td>
<td>1.309</td>
<td>2</td>
<td>.654</td>
<td>.728</td>
</tr>
<tr>
<td>ABILITY2 * NUM2</td>
<td>ACEFFNUM</td>
<td>3.487</td>
<td>16</td>
<td>.218</td>
<td>.490</td>
</tr>
<tr>
<td></td>
<td>LSTRANUM</td>
<td>7.402</td>
<td>16</td>
<td>.463</td>
<td>1.379</td>
</tr>
<tr>
<td></td>
<td>SREGNUM</td>
<td>4.730</td>
<td>16</td>
<td>.296</td>
<td>.655</td>
</tr>
<tr>
<td></td>
<td>ASHANNUM</td>
<td>8.409</td>
<td>16</td>
<td>.526</td>
<td>.871</td>
</tr>
<tr>
<td></td>
<td>TANXNUM</td>
<td>25.366</td>
<td>16</td>
<td>1.585</td>
<td>1.769</td>
</tr>
<tr>
<td>ABILITY2 * GRADE</td>
<td>ACEFFNUM</td>
<td>.335</td>
<td>4</td>
<td>8.384E-02</td>
<td>.189</td>
</tr>
<tr>
<td></td>
<td>LSTRANUM</td>
<td>.352</td>
<td>4</td>
<td>8.809E-02</td>
<td>.263</td>
</tr>
<tr>
<td></td>
<td>SREGNUM</td>
<td>.363</td>
<td>4</td>
<td>9.064E-02</td>
<td>.201</td>
</tr>
<tr>
<td></td>
<td>ASHANNUM</td>
<td>1.681</td>
<td>4</td>
<td>.420</td>
<td>.697</td>
</tr>
<tr>
<td></td>
<td>TANXNUM</td>
<td>3.202</td>
<td>4</td>
<td>.800</td>
<td>.888</td>
</tr>
<tr>
<td>ABILITY2 * GENDER</td>
<td>ACEFFNUM</td>
<td>.837</td>
<td>4</td>
<td>.209</td>
<td>.470</td>
</tr>
<tr>
<td></td>
<td>LSTRANUM</td>
<td>1.702</td>
<td>4</td>
<td>.426</td>
<td>1.268</td>
</tr>
<tr>
<td></td>
<td>SREGNUM</td>
<td>2.592</td>
<td>4</td>
<td>.648</td>
<td>1.436</td>
</tr>
<tr>
<td></td>
<td>ASHANNUM</td>
<td>.629</td>
<td>4</td>
<td>.157</td>
<td>.261</td>
</tr>
<tr>
<td></td>
<td>TANXNUM</td>
<td>1.501</td>
<td>4</td>
<td>.375</td>
<td>.416</td>
</tr>
<tr>
<td>ABILITY2 * SCHOOLID</td>
<td>ACEFFNUM</td>
<td>8.733</td>
<td>12</td>
<td>.728</td>
<td>1.636</td>
</tr>
<tr>
<td></td>
<td>LSTRANUM</td>
<td>3.875</td>
<td>12</td>
<td>.323</td>
<td>.962</td>
</tr>
<tr>
<td></td>
<td>SREGNUM</td>
<td>4.511</td>
<td>12</td>
<td>.376</td>
<td>.833</td>
</tr>
<tr>
<td></td>
<td>ASHANNUM</td>
<td>6.229</td>
<td>12</td>
<td>.519</td>
<td>.860</td>
</tr>
<tr>
<td></td>
<td>TANXNUM</td>
<td>22.628</td>
<td>12</td>
<td>1.886</td>
<td>2.093</td>
</tr>
<tr>
<td>ABILITY2 * ESBID</td>
<td>ACEFFNUM</td>
<td>2.015</td>
<td>4</td>
<td>.504</td>
<td>1.133</td>
</tr>
<tr>
<td></td>
<td>LSTRANUM</td>
<td>.616</td>
<td>4</td>
<td>.154</td>
<td>.459</td>
</tr>
<tr>
<td></td>
<td>SREGNUM</td>
<td>2.020</td>
<td>4</td>
<td>.505</td>
<td>1.120</td>
</tr>
<tr>
<td></td>
<td>ASHANNUM</td>
<td>.288</td>
<td>4</td>
<td>7.200E-02</td>
<td>.119</td>
</tr>
<tr>
<td></td>
<td>TANXNUM</td>
<td>4.805</td>
<td>4</td>
<td>1.226</td>
<td>1.361</td>
</tr>
</tbody>
</table>
## Tests of Between-Subjects Effects

<table>
<thead>
<tr>
<th>Source</th>
<th>Dependent Variable</th>
<th>Type III Sum of Squares</th>
<th>df</th>
<th>Mean Square</th>
<th>F</th>
</tr>
</thead>
<tbody>
<tr>
<td>NUM2 * GRADE</td>
<td>ACEFFNUM</td>
<td>3.076</td>
<td>4</td>
<td>.769</td>
<td>1.729</td>
</tr>
<tr>
<td></td>
<td>LSTRANUM</td>
<td>3.081</td>
<td>4</td>
<td>.770</td>
<td>2.296</td>
</tr>
<tr>
<td></td>
<td>SREGNUM</td>
<td>4.042</td>
<td>4</td>
<td>1.010</td>
<td>2.240</td>
</tr>
<tr>
<td></td>
<td>ASHANNUM</td>
<td>3.073</td>
<td>4</td>
<td>.766</td>
<td>1.273</td>
</tr>
<tr>
<td></td>
<td>TANXNUM</td>
<td>3.132</td>
<td>4</td>
<td>.783</td>
<td>.859</td>
</tr>
<tr>
<td>NUM2 * GENDER</td>
<td>ACEFFNUM</td>
<td>2.557</td>
<td>4</td>
<td>.639</td>
<td>1.437</td>
</tr>
<tr>
<td></td>
<td>LSTRANUM</td>
<td>.847</td>
<td>4</td>
<td>.212</td>
<td>.631</td>
</tr>
<tr>
<td></td>
<td>SREGNUM</td>
<td>1.517</td>
<td>4</td>
<td>.379</td>
<td>.841</td>
</tr>
<tr>
<td></td>
<td>ASHANNUM</td>
<td>.514</td>
<td>4</td>
<td>.128</td>
<td>.213</td>
</tr>
<tr>
<td></td>
<td>TANXNUM</td>
<td>3.914</td>
<td>4</td>
<td>.978</td>
<td>1.086</td>
</tr>
<tr>
<td>NUM2 * SCHOOLID</td>
<td>ACEFFNUM</td>
<td>4.686</td>
<td>12</td>
<td>.381</td>
<td>.856</td>
</tr>
<tr>
<td></td>
<td>LSTRANUM</td>
<td>4.679</td>
<td>12</td>
<td>.390</td>
<td>1.162</td>
</tr>
<tr>
<td></td>
<td>SREGNUM</td>
<td>5.024</td>
<td>12</td>
<td>.419</td>
<td>.928</td>
</tr>
<tr>
<td></td>
<td>ASHANNUM</td>
<td>6.074</td>
<td>12</td>
<td>.506</td>
<td>.839</td>
</tr>
<tr>
<td></td>
<td>TANXNUM</td>
<td>9.163</td>
<td>12</td>
<td>.764</td>
<td>.847</td>
</tr>
<tr>
<td>NUM2 * ESBid</td>
<td>ACEFFNUM</td>
<td>5.159</td>
<td>4</td>
<td>1.290</td>
<td>2.900</td>
</tr>
<tr>
<td></td>
<td>LSTRANUM</td>
<td>1.929</td>
<td>4</td>
<td>.482</td>
<td>1.437</td>
</tr>
<tr>
<td></td>
<td>SREGNUM</td>
<td>2.776</td>
<td>4</td>
<td>.694</td>
<td>1.538</td>
</tr>
<tr>
<td></td>
<td>ASHANNUM</td>
<td>3.133</td>
<td>4</td>
<td>.783</td>
<td>1.298</td>
</tr>
<tr>
<td></td>
<td>TANXNUM</td>
<td>2.239</td>
<td>4</td>
<td>.560</td>
<td>.621</td>
</tr>
<tr>
<td>GRADE * GENDER</td>
<td>ACEFFNUM</td>
<td>4.105E-02</td>
<td>1</td>
<td>4.105E-02</td>
<td>.092</td>
</tr>
<tr>
<td></td>
<td>LSTRANUM</td>
<td>4.577</td>
<td>1</td>
<td>4.577</td>
<td>13.643</td>
</tr>
<tr>
<td></td>
<td>SREGNUM</td>
<td>1.588</td>
<td>1</td>
<td>1.588</td>
<td>3.520</td>
</tr>
<tr>
<td></td>
<td>ASHANNUM</td>
<td>.196</td>
<td>1</td>
<td>.196</td>
<td>.325</td>
</tr>
<tr>
<td></td>
<td>TANXNUM</td>
<td>5.622</td>
<td>1</td>
<td>5.622</td>
<td>6.240</td>
</tr>
<tr>
<td>GRADE * SCHOOLID</td>
<td>ACEFFNUM</td>
<td>1.043</td>
<td>3</td>
<td>.348</td>
<td>.782</td>
</tr>
<tr>
<td></td>
<td>LSTRANUM</td>
<td>3.012</td>
<td>3</td>
<td>1.004</td>
<td>2.993</td>
</tr>
<tr>
<td></td>
<td>SREGNUM</td>
<td>2.980</td>
<td>3</td>
<td>.993</td>
<td>2.202</td>
</tr>
<tr>
<td></td>
<td>ASHANNUM</td>
<td>2.521</td>
<td>3</td>
<td>.840</td>
<td>1.392</td>
</tr>
<tr>
<td></td>
<td>TANXNUM</td>
<td>2.566</td>
<td>3</td>
<td>.855</td>
<td>.949</td>
</tr>
<tr>
<td>GRADE * ESBid</td>
<td>ACEFFNUM</td>
<td>.110</td>
<td>1</td>
<td>.110</td>
<td>.247</td>
</tr>
<tr>
<td></td>
<td>LSTRANUM</td>
<td>.293</td>
<td>1</td>
<td>.293</td>
<td>.673</td>
</tr>
<tr>
<td></td>
<td>SREGNUM</td>
<td>3.307E-02</td>
<td>1</td>
<td>3.307E-02</td>
<td>.073</td>
</tr>
<tr>
<td></td>
<td>ASHANNUM</td>
<td>4.910E-02</td>
<td>1</td>
<td>4.910E-02</td>
<td>.081</td>
</tr>
<tr>
<td></td>
<td>TANXNUM</td>
<td>1.509E-02</td>
<td>1</td>
<td>1.509E-02</td>
<td>.017</td>
</tr>
<tr>
<td>GENDER * SCHOOLID</td>
<td>ACEFFNUM</td>
<td>.357</td>
<td>2</td>
<td>.178</td>
<td>.401</td>
</tr>
<tr>
<td></td>
<td>LSTRANUM</td>
<td>1.806</td>
<td>2</td>
<td>.903</td>
<td>2.692</td>
</tr>
<tr>
<td></td>
<td>SREGNUM</td>
<td>.758</td>
<td>2</td>
<td>.379</td>
<td>.840</td>
</tr>
<tr>
<td></td>
<td>ASHANNUM</td>
<td>1.285</td>
<td>2</td>
<td>.643</td>
<td>1.065</td>
</tr>
<tr>
<td></td>
<td>TANXNUM</td>
<td>3.881</td>
<td>2</td>
<td>1.941</td>
<td>2.154</td>
</tr>
<tr>
<td>GENDER * ESBid</td>
<td>ACEFFNUM</td>
<td>5.635E-02</td>
<td>1</td>
<td>5.635E-02</td>
<td>.127</td>
</tr>
<tr>
<td></td>
<td>LSTRANUM</td>
<td>4.090E-03</td>
<td>1</td>
<td>4.090E-03</td>
<td>.012</td>
</tr>
<tr>
<td></td>
<td>SREGNUM</td>
<td>4.530E-02</td>
<td>1</td>
<td>4.530E-02</td>
<td>.100</td>
</tr>
<tr>
<td></td>
<td>ASHANNUM</td>
<td>.140</td>
<td>1</td>
<td>.140</td>
<td>.232</td>
</tr>
<tr>
<td></td>
<td>TANXNUM</td>
<td>1.074</td>
<td>1</td>
<td>1.074</td>
<td>1.192</td>
</tr>
<tr>
<td>SCHOOLID * ESBid</td>
<td>ACEFFNUM</td>
<td>1.219</td>
<td>3</td>
<td>.406</td>
<td>.913</td>
</tr>
<tr>
<td></td>
<td>LSTRANUM</td>
<td>1.391</td>
<td>3</td>
<td>.464</td>
<td>1.381</td>
</tr>
<tr>
<td></td>
<td>SREGNUM</td>
<td>.383</td>
<td>3</td>
<td>.128</td>
<td>.283</td>
</tr>
<tr>
<td></td>
<td>ASHANNUM</td>
<td>2.362</td>
<td>3</td>
<td>.787</td>
<td>1.304</td>
</tr>
<tr>
<td></td>
<td>TANXNUM</td>
<td>4.234</td>
<td>3</td>
<td>1.411</td>
<td>1.567</td>
</tr>
<tr>
<td>Source</td>
<td>Dependent Variable</td>
<td>Type III Sum of Squares</td>
<td>df</td>
<td>Mean Square</td>
<td>F</td>
</tr>
<tr>
<td>-------------</td>
<td>--------------------</td>
<td>-------------------------</td>
<td>----</td>
<td>-------------</td>
<td>-----</td>
</tr>
<tr>
<td>Error</td>
<td>ACEFFNUM</td>
<td>277.966</td>
<td>625</td>
<td>.445</td>
<td></td>
</tr>
<tr>
<td></td>
<td>LSTRANUM</td>
<td>209.702</td>
<td>625</td>
<td>.336</td>
<td></td>
</tr>
<tr>
<td></td>
<td>SREGNUM</td>
<td>281.943</td>
<td>625</td>
<td>.451</td>
<td></td>
</tr>
<tr>
<td></td>
<td>ASHANNUM</td>
<td>377.201</td>
<td>625</td>
<td>.604</td>
<td></td>
</tr>
<tr>
<td></td>
<td>TANXNUM</td>
<td>563.126</td>
<td>625</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>ACEFFNUM</td>
<td>10761.408</td>
<td>745</td>
<td>.901</td>
<td></td>
</tr>
<tr>
<td></td>
<td>LSTRANUM</td>
<td>9594.751</td>
<td>745</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>SREGNUM</td>
<td>8293.235</td>
<td>745</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>ASHANNUM</td>
<td>2930.667</td>
<td>745</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>TANXNUM</td>
<td>7168.750</td>
<td>745</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Corrected Total</td>
<td>ACEFFNUM</td>
<td>407.964</td>
<td>744</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>LSTRANUM</td>
<td>298.913</td>
<td>744</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>SREGNUM</td>
<td>391.819</td>
<td>744</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>ASHANNUM</td>
<td>474.684</td>
<td>744</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>TANXNUM</td>
<td>827.673</td>
<td>744</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Source</td>
<td>Dependent Variable</td>
<td>Sig.</td>
<td>Partial Eta Squared</td>
<td>Noncent. Parameter</td>
<td>Observed Power*</td>
</tr>
<tr>
<td>-----------------</td>
<td>--------------------</td>
<td>------</td>
<td>---------------------</td>
<td>--------------------</td>
<td>-----------------</td>
</tr>
<tr>
<td>Corrected Model</td>
<td>ACEFFNUM</td>
<td>.000</td>
<td>.319</td>
<td>282.299</td>
<td>1.000</td>
</tr>
<tr>
<td></td>
<td>LSTRANUM</td>
<td>.000</td>
<td>.298</td>
<td>265.887</td>
<td>1.000</td>
</tr>
<tr>
<td></td>
<td>SREGNUM</td>
<td>.000</td>
<td>.280</td>
<td>243.571</td>
<td>1.000</td>
</tr>
<tr>
<td></td>
<td>ASHANNUM</td>
<td>.012</td>
<td>.205</td>
<td>161.524</td>
<td>1.000</td>
</tr>
<tr>
<td></td>
<td>TANXNUM</td>
<td>.000</td>
<td>.320</td>
<td>293.615</td>
<td>1.000</td>
</tr>
<tr>
<td>Intercept</td>
<td>ACEFFNUM</td>
<td>.000</td>
<td>.712</td>
<td>1546.386</td>
<td>1.000</td>
</tr>
<tr>
<td></td>
<td>LSTRANUM</td>
<td>.000</td>
<td>.741</td>
<td>1787.625</td>
<td>1.000</td>
</tr>
<tr>
<td></td>
<td>SREGNUM</td>
<td>.000</td>
<td>.656</td>
<td>1191.106</td>
<td>1.000</td>
</tr>
<tr>
<td></td>
<td>ASHANNUM</td>
<td>.000</td>
<td>.285</td>
<td>248.728</td>
<td>1.000</td>
</tr>
<tr>
<td></td>
<td>TANXNUM</td>
<td>.000</td>
<td>.422</td>
<td>456.380</td>
<td>1.000</td>
</tr>
<tr>
<td>CLU3_1</td>
<td>ACEFFNUM</td>
<td>.000</td>
<td>.027</td>
<td>17.115</td>
<td>.967</td>
</tr>
<tr>
<td></td>
<td>LSTRANUM</td>
<td>.000</td>
<td>.028</td>
<td>17.854</td>
<td>.973</td>
</tr>
<tr>
<td></td>
<td>SREGNUM</td>
<td>.000</td>
<td>.027</td>
<td>17.632</td>
<td>.971</td>
</tr>
<tr>
<td></td>
<td>ASHANNUM</td>
<td>.027</td>
<td>.011</td>
<td>7.247</td>
<td>.669</td>
</tr>
<tr>
<td></td>
<td>TANXNUM</td>
<td>.045</td>
<td>.010</td>
<td>6.245</td>
<td>.600</td>
</tr>
<tr>
<td>ABILITY2</td>
<td>ACEFFNUM</td>
<td>.836</td>
<td>.002</td>
<td>1.448</td>
<td>.133</td>
</tr>
<tr>
<td></td>
<td>LSTRANUM</td>
<td>.300</td>
<td>.008</td>
<td>4.892</td>
<td>.365</td>
</tr>
<tr>
<td></td>
<td>SREGNUM</td>
<td>.860</td>
<td>.002</td>
<td>1.305</td>
<td>.124</td>
</tr>
<tr>
<td></td>
<td>ASHANNUM</td>
<td>.976</td>
<td>.001</td>
<td>.477</td>
<td>.075</td>
</tr>
<tr>
<td></td>
<td>TANXNUM</td>
<td>.777</td>
<td>.003</td>
<td>1.759</td>
<td>.155</td>
</tr>
<tr>
<td>NUM2</td>
<td>ACEFFNUM</td>
<td>.021</td>
<td>.018</td>
<td>11.683</td>
<td>.787</td>
</tr>
<tr>
<td></td>
<td>LSTRANUM</td>
<td>.167</td>
<td>.010</td>
<td>6.489</td>
<td>.501</td>
</tr>
<tr>
<td></td>
<td>SREGNUM</td>
<td>.252</td>
<td>.009</td>
<td>5.378</td>
<td>.421</td>
</tr>
<tr>
<td></td>
<td>ASHANNUM</td>
<td>.694</td>
<td>.004</td>
<td>2.228</td>
<td>.186</td>
</tr>
<tr>
<td></td>
<td>TANXNUM</td>
<td>.063</td>
<td>.014</td>
<td>8.958</td>
<td>.657</td>
</tr>
<tr>
<td>GRADE</td>
<td>ACEFFNUM</td>
<td>.003</td>
<td>.014</td>
<td>9.149</td>
<td>.855</td>
</tr>
<tr>
<td></td>
<td>LSTRANUM</td>
<td>.279</td>
<td>.002</td>
<td>1.176</td>
<td>.191</td>
</tr>
<tr>
<td></td>
<td>SREGNUM</td>
<td>.021</td>
<td>.008</td>
<td>5.314</td>
<td>.634</td>
</tr>
<tr>
<td></td>
<td>ASHANNUM</td>
<td>.469</td>
<td>.001</td>
<td>.525</td>
<td>.112</td>
</tr>
<tr>
<td></td>
<td>TANXNUM</td>
<td>.227</td>
<td>.002</td>
<td>1.485</td>
<td>.227</td>
</tr>
<tr>
<td>GENDER</td>
<td>ACEFFNUM</td>
<td>.185</td>
<td>.003</td>
<td>1.765</td>
<td>.264</td>
</tr>
<tr>
<td></td>
<td>LSTRANUM</td>
<td>.144</td>
<td>.003</td>
<td>2.144</td>
<td>.310</td>
</tr>
<tr>
<td></td>
<td>SREGNUM</td>
<td>.871</td>
<td>.000</td>
<td>.026</td>
<td>.053</td>
</tr>
<tr>
<td></td>
<td>ASHANNUM</td>
<td>.716</td>
<td>.000</td>
<td>.132</td>
<td>.065</td>
</tr>
<tr>
<td></td>
<td>TANXNUM</td>
<td>.643</td>
<td>.000</td>
<td>.215</td>
<td>.075</td>
</tr>
<tr>
<td>SCHOOLID</td>
<td>ACEFFNUM</td>
<td>.244</td>
<td>.007</td>
<td>4.182</td>
<td>.372</td>
</tr>
<tr>
<td></td>
<td>LSTRANUM</td>
<td>.421</td>
<td>.004</td>
<td>2.817</td>
<td>.258</td>
</tr>
<tr>
<td></td>
<td>SREGNUM</td>
<td>.330</td>
<td>.005</td>
<td>3.434</td>
<td>.309</td>
</tr>
<tr>
<td></td>
<td>ASHANNUM</td>
<td>.868</td>
<td>.001</td>
<td>.721</td>
<td>.096</td>
</tr>
<tr>
<td></td>
<td>TANXNUM</td>
<td>.352</td>
<td>.005</td>
<td>3.276</td>
<td>.296</td>
</tr>
<tr>
<td>ESBI D</td>
<td>ACEFFNUM</td>
<td>.941</td>
<td>.000</td>
<td>.005</td>
<td>.051</td>
</tr>
<tr>
<td></td>
<td>LSTRANUM</td>
<td>.846</td>
<td>.000</td>
<td>.038</td>
<td>.054</td>
</tr>
<tr>
<td></td>
<td>SREGNUM</td>
<td>.077</td>
<td>.005</td>
<td>3.137</td>
<td>.424</td>
</tr>
<tr>
<td></td>
<td>ASHANNUM</td>
<td>.941</td>
<td>.000</td>
<td>.005</td>
<td>.051</td>
</tr>
<tr>
<td></td>
<td>TANXNUM</td>
<td>.655</td>
<td>.000</td>
<td>.200</td>
<td>.073</td>
</tr>
<tr>
<td>CLU3_1 * ABILITY2</td>
<td>ACEFFNUM</td>
<td>.539</td>
<td>.011</td>
<td>6.982</td>
<td>.411</td>
</tr>
<tr>
<td></td>
<td>LSTRANUM</td>
<td>.763</td>
<td>.008</td>
<td>4.949</td>
<td>.290</td>
</tr>
<tr>
<td></td>
<td>SREGNUM</td>
<td>.780</td>
<td>.008</td>
<td>4.780</td>
<td>.280</td>
</tr>
<tr>
<td></td>
<td>ASHANNUM</td>
<td>.829</td>
<td>.007</td>
<td>4.292</td>
<td>.251</td>
</tr>
<tr>
<td></td>
<td>TANXNUM</td>
<td>.404</td>
<td>.013</td>
<td>8.318</td>
<td>.489</td>
</tr>
<tr>
<td>Source</td>
<td>Dependent Variable</td>
<td>Sig.</td>
<td>Partial Eta Squared</td>
<td>Noncent. Parameter</td>
<td>Observed Power*</td>
</tr>
<tr>
<td>----------------</td>
<td>--------------------</td>
<td>-------</td>
<td>---------------------</td>
<td>--------------------</td>
<td>-----------------</td>
</tr>
<tr>
<td>CLU3_1 * NUM2</td>
<td>ACEFFNUM</td>
<td>.120</td>
<td>.020</td>
<td>12.845</td>
<td>.714</td>
</tr>
<tr>
<td></td>
<td>LSTRANUM</td>
<td>.464</td>
<td>.012</td>
<td>7.699</td>
<td>.453</td>
</tr>
<tr>
<td></td>
<td>SREGNUM</td>
<td>.373</td>
<td>.014</td>
<td>8.670</td>
<td>.509</td>
</tr>
<tr>
<td></td>
<td>ASHANNUM</td>
<td>.988</td>
<td>.003</td>
<td>1.713</td>
<td>.117</td>
</tr>
<tr>
<td></td>
<td>TANXNUM</td>
<td>.942</td>
<td>.005</td>
<td>2.860</td>
<td>.173</td>
</tr>
<tr>
<td>CLU3_1 * GRADE</td>
<td>ACEFFNUM</td>
<td>.532</td>
<td>.002</td>
<td>1.262</td>
<td>.156</td>
</tr>
<tr>
<td></td>
<td>LSTRANUM</td>
<td>.094</td>
<td>.008</td>
<td>4.743</td>
<td>.480</td>
</tr>
<tr>
<td></td>
<td>SREGNUM</td>
<td>.402</td>
<td>.003</td>
<td>1.826</td>
<td>.208</td>
</tr>
<tr>
<td></td>
<td>ASHANNUM</td>
<td>.453</td>
<td>.003</td>
<td>1.584</td>
<td>.185</td>
</tr>
<tr>
<td></td>
<td>TANXNUM</td>
<td>.185</td>
<td>.005</td>
<td>3.380</td>
<td>.356</td>
</tr>
<tr>
<td>CLU3_1 * GENDER</td>
<td>ACEFFNUM</td>
<td>.621</td>
<td>.002</td>
<td>1.953</td>
<td>.128</td>
</tr>
<tr>
<td></td>
<td>LSTRANUM</td>
<td>.306</td>
<td>.004</td>
<td>2.371</td>
<td>.260</td>
</tr>
<tr>
<td></td>
<td>SREGNUM</td>
<td>.282</td>
<td>.004</td>
<td>2.538</td>
<td>.276</td>
</tr>
<tr>
<td></td>
<td>ASHANNUM</td>
<td>.226</td>
<td>.005</td>
<td>2.984</td>
<td>.319</td>
</tr>
<tr>
<td></td>
<td>TANXNUM</td>
<td>.632</td>
<td>.001</td>
<td>1.917</td>
<td>.125</td>
</tr>
<tr>
<td>CLU3_1 * SCHOOLID</td>
<td>ACEFFNUM</td>
<td>.250</td>
<td>.012</td>
<td>7.869</td>
<td>.518</td>
</tr>
<tr>
<td></td>
<td>LSTRANUM</td>
<td>.969</td>
<td>.002</td>
<td>1.351</td>
<td>.110</td>
</tr>
<tr>
<td></td>
<td>SREGNUM</td>
<td>.576</td>
<td>.008</td>
<td>4.753</td>
<td>.316</td>
</tr>
<tr>
<td></td>
<td>ASHANNUM</td>
<td>.705</td>
<td>.006</td>
<td>3.787</td>
<td>.253</td>
</tr>
<tr>
<td></td>
<td>TANXNUM</td>
<td>.793</td>
<td>.005</td>
<td>3.125</td>
<td>.212</td>
</tr>
<tr>
<td>CLU3_1 * ESBD</td>
<td>ACEFFNUM</td>
<td>.563</td>
<td>.002</td>
<td>1.150</td>
<td>.146</td>
</tr>
<tr>
<td></td>
<td>LSTRANUM</td>
<td>.750</td>
<td>.001</td>
<td>1.575</td>
<td>.096</td>
</tr>
<tr>
<td></td>
<td>SREGNUM</td>
<td>.649</td>
<td>.001</td>
<td>1.866</td>
<td>.120</td>
</tr>
<tr>
<td></td>
<td>ASHANNUM</td>
<td>.103</td>
<td>.007</td>
<td>4.563</td>
<td>.464</td>
</tr>
<tr>
<td></td>
<td>TANXNUM</td>
<td>.484</td>
<td>.002</td>
<td>1.452</td>
<td>.173</td>
</tr>
<tr>
<td>ABILITY2 * NUM2</td>
<td>ACEFFNUM</td>
<td>.952</td>
<td>.012</td>
<td>7.840</td>
<td>.334</td>
</tr>
<tr>
<td></td>
<td>LSTRANUM</td>
<td>.146</td>
<td>.034</td>
<td>22.061</td>
<td>.855</td>
</tr>
<tr>
<td></td>
<td>SREGNUM</td>
<td>.838</td>
<td>.017</td>
<td>10.486</td>
<td>.459</td>
</tr>
<tr>
<td></td>
<td>ASHANNUM</td>
<td>.604</td>
<td>.022</td>
<td>13.933</td>
<td>.609</td>
</tr>
<tr>
<td></td>
<td>TANXNUM</td>
<td>.033</td>
<td>.043</td>
<td>28.153</td>
<td>.942</td>
</tr>
<tr>
<td>ABILITY2 * GRADE</td>
<td>ACEFFNUM</td>
<td>.944</td>
<td>.001</td>
<td>.754</td>
<td>.090</td>
</tr>
<tr>
<td></td>
<td>LSTRANUM</td>
<td>.902</td>
<td>.002</td>
<td>1.050</td>
<td>.108</td>
</tr>
<tr>
<td></td>
<td>SREGNUM</td>
<td>.938</td>
<td>.001</td>
<td>.804</td>
<td>.093</td>
</tr>
<tr>
<td></td>
<td>ASHANNUM</td>
<td>.595</td>
<td>.004</td>
<td>2.786</td>
<td>.227</td>
</tr>
<tr>
<td></td>
<td>TANXNUM</td>
<td>.470</td>
<td>.006</td>
<td>3.553</td>
<td>.284</td>
</tr>
<tr>
<td>ABILITY2 * GENDER</td>
<td>ACEFFNUM</td>
<td>.757</td>
<td>.003</td>
<td>1.882</td>
<td>.162</td>
</tr>
<tr>
<td></td>
<td>LSTRANUM</td>
<td>.281</td>
<td>.008</td>
<td>5.074</td>
<td>.399</td>
</tr>
<tr>
<td></td>
<td>SREGNUM</td>
<td>.220</td>
<td>.009</td>
<td>5.746</td>
<td>.448</td>
</tr>
<tr>
<td></td>
<td>ASHANNUM</td>
<td>.903</td>
<td>.002</td>
<td>1.043</td>
<td>.108</td>
</tr>
<tr>
<td></td>
<td>TANXNUM</td>
<td>.797</td>
<td>.003</td>
<td>1.665</td>
<td>.148</td>
</tr>
<tr>
<td>ABILITY2 * SCHOOLID</td>
<td>ACEFFNUM</td>
<td>.077</td>
<td>.030</td>
<td>19.636</td>
<td>.851</td>
</tr>
<tr>
<td></td>
<td>LSTRANUM</td>
<td>.484</td>
<td>.018</td>
<td>11.549</td>
<td>.571</td>
</tr>
<tr>
<td></td>
<td>SREGNUM</td>
<td>.616</td>
<td>.016</td>
<td>10.001</td>
<td>.497</td>
</tr>
<tr>
<td></td>
<td>ASHANNUM</td>
<td>.588</td>
<td>.016</td>
<td>10.322</td>
<td>.512</td>
</tr>
<tr>
<td></td>
<td>TANXNUM</td>
<td>.16</td>
<td>.039</td>
<td>10.114</td>
<td>.939</td>
</tr>
<tr>
<td>ABILITY2 * ESBD</td>
<td>ACEFFNUM</td>
<td>.340</td>
<td>.007</td>
<td>4.531</td>
<td>.358</td>
</tr>
<tr>
<td></td>
<td>LSTRANUM</td>
<td>.766</td>
<td>.003</td>
<td>1.835</td>
<td>.159</td>
</tr>
<tr>
<td></td>
<td>SREGNUM</td>
<td>.346</td>
<td>.007</td>
<td>4.479</td>
<td>.354</td>
</tr>
<tr>
<td></td>
<td>ASHANNUM</td>
<td>.976</td>
<td>.001</td>
<td>.477</td>
<td>.075</td>
</tr>
<tr>
<td></td>
<td>TANXNUM</td>
<td>.246</td>
<td>.009</td>
<td>5.444</td>
<td>.428</td>
</tr>
<tr>
<td>Source</td>
<td>Dependent Variable</td>
<td>Sig.</td>
<td>Partial Eta Squared</td>
<td>Noncent. Parameter</td>
<td>Observed Power</td>
</tr>
<tr>
<td>-----------------</td>
<td>--------------------</td>
<td>------</td>
<td>---------------------</td>
<td>--------------------</td>
<td>----------------</td>
</tr>
<tr>
<td>NUM2 * GRADE</td>
<td>ACEFFNUM</td>
<td>.142</td>
<td>.011</td>
<td>6.915</td>
<td>.531</td>
</tr>
<tr>
<td></td>
<td>LSTRANUM</td>
<td>.058</td>
<td>.014</td>
<td>9.183</td>
<td>.670</td>
</tr>
<tr>
<td></td>
<td>SREGNUM</td>
<td>.063</td>
<td>.014</td>
<td>8.959</td>
<td>.657</td>
</tr>
<tr>
<td></td>
<td>ASHANNUM</td>
<td>.279</td>
<td>.008</td>
<td>5.091</td>
<td>.400</td>
</tr>
<tr>
<td></td>
<td>TANXNUM</td>
<td>.482</td>
<td>.006</td>
<td>3.476</td>
<td>.278</td>
</tr>
<tr>
<td>NUM2 * GENDER</td>
<td>ACEFFNUM</td>
<td>.220</td>
<td>.009</td>
<td>5.749</td>
<td>.449</td>
</tr>
<tr>
<td></td>
<td>LSTRANUM</td>
<td>.640</td>
<td>.004</td>
<td>2.524</td>
<td>.208</td>
</tr>
<tr>
<td></td>
<td>SREGNUM</td>
<td>.499</td>
<td>.005</td>
<td>3.364</td>
<td>.270</td>
</tr>
<tr>
<td></td>
<td>ASHANNUM</td>
<td>.931</td>
<td>.001</td>
<td>.851</td>
<td>.096</td>
</tr>
<tr>
<td></td>
<td>TANXNUM</td>
<td>.362</td>
<td>.007</td>
<td>4.344</td>
<td>.344</td>
</tr>
<tr>
<td>NUM2 * SCHOOLID</td>
<td>ACEFFNUM</td>
<td>.593</td>
<td>.016</td>
<td>10.267</td>
<td>.610</td>
</tr>
<tr>
<td></td>
<td>LSTRANUM</td>
<td>.307</td>
<td>.022</td>
<td>13.947</td>
<td>.675</td>
</tr>
<tr>
<td></td>
<td>SREGNUM</td>
<td>.518</td>
<td>.018</td>
<td>11.136</td>
<td>.552</td>
</tr>
<tr>
<td></td>
<td>ASHANNUM</td>
<td>.610</td>
<td>.016</td>
<td>10.065</td>
<td>.500</td>
</tr>
<tr>
<td></td>
<td>TANXNUM</td>
<td>.601</td>
<td>.016</td>
<td>10.169</td>
<td>.505</td>
</tr>
<tr>
<td>NUM2 * ESBID</td>
<td>ACEFFNUM</td>
<td>.021</td>
<td>.018</td>
<td>11.600</td>
<td>.784</td>
</tr>
<tr>
<td></td>
<td>LSTRANUM</td>
<td>.220</td>
<td>.009</td>
<td>5.749</td>
<td>.449</td>
</tr>
<tr>
<td></td>
<td>SREGNUM</td>
<td>.189</td>
<td>.010</td>
<td>6.153</td>
<td>.478</td>
</tr>
<tr>
<td></td>
<td>ASHANNUM</td>
<td>.270</td>
<td>.008</td>
<td>5.191</td>
<td>.408</td>
</tr>
<tr>
<td></td>
<td>TANXNUM</td>
<td>.648</td>
<td>.004</td>
<td>2.485</td>
<td>.205</td>
</tr>
<tr>
<td>GRADE * GENDER</td>
<td>ACEFFNUM</td>
<td>.761</td>
<td>.000</td>
<td>.092</td>
<td>.061</td>
</tr>
<tr>
<td></td>
<td>LSTRANUM</td>
<td>.000</td>
<td>.021</td>
<td>13.643</td>
<td>.958</td>
</tr>
<tr>
<td></td>
<td>SREGNUM</td>
<td>.061</td>
<td>.006</td>
<td>3.520</td>
<td>.466</td>
</tr>
<tr>
<td></td>
<td>ASHANNUM</td>
<td>.569</td>
<td>.001</td>
<td>.325</td>
<td>.088</td>
</tr>
<tr>
<td></td>
<td>TANXNUM</td>
<td>.013</td>
<td>.010</td>
<td>6.240</td>
<td>.703</td>
</tr>
<tr>
<td>GRADE * SCHOOLID</td>
<td>ACEFFNUM</td>
<td>.504</td>
<td>.004</td>
<td>2.345</td>
<td>.219</td>
</tr>
<tr>
<td></td>
<td>LSTRANUM</td>
<td>.030</td>
<td>.014</td>
<td>8.978</td>
<td>.707</td>
</tr>
<tr>
<td></td>
<td>SREGNUM</td>
<td>.087</td>
<td>.010</td>
<td>6.605</td>
<td>.559</td>
</tr>
<tr>
<td></td>
<td>ASHANNUM</td>
<td>.244</td>
<td>.007</td>
<td>4.177</td>
<td>.371</td>
</tr>
<tr>
<td></td>
<td>TANXNUM</td>
<td>.416</td>
<td>.005</td>
<td>2.848</td>
<td>.260</td>
</tr>
<tr>
<td>GRADE * ESBID</td>
<td>ACEFFNUM</td>
<td>.619</td>
<td>.000</td>
<td>.247</td>
<td>.079</td>
</tr>
<tr>
<td></td>
<td>LSTRANUM</td>
<td>.350</td>
<td>.001</td>
<td>.873</td>
<td>.154</td>
</tr>
<tr>
<td></td>
<td>SREGNUM</td>
<td>.787</td>
<td>.000</td>
<td>.073</td>
<td>.058</td>
</tr>
<tr>
<td></td>
<td>ASHANNUM</td>
<td>.776</td>
<td>.000</td>
<td>.081</td>
<td>.059</td>
</tr>
<tr>
<td></td>
<td>TANXNUM</td>
<td>.897</td>
<td>.000</td>
<td>.017</td>
<td>.052</td>
</tr>
<tr>
<td>GENDER * SCHOOLID</td>
<td>ACEFFNUM</td>
<td>.670</td>
<td>.001</td>
<td>.802</td>
<td>.115</td>
</tr>
<tr>
<td></td>
<td>LSTRANUM</td>
<td>.069</td>
<td>.009</td>
<td>5.384</td>
<td>.533</td>
</tr>
<tr>
<td></td>
<td>SREGNUM</td>
<td>.432</td>
<td>.003</td>
<td>1.681</td>
<td>.194</td>
</tr>
<tr>
<td></td>
<td>ASHANNUM</td>
<td>.345</td>
<td>.003</td>
<td>2.130</td>
<td>.237</td>
</tr>
<tr>
<td></td>
<td>TANXNUM</td>
<td>.117</td>
<td>.007</td>
<td>4.308</td>
<td>.441</td>
</tr>
<tr>
<td>GENDER * ESBID</td>
<td>ACEFFNUM</td>
<td>.722</td>
<td>.000</td>
<td>.127</td>
<td>.065</td>
</tr>
<tr>
<td></td>
<td>LSTRANUM</td>
<td>.912</td>
<td>.000</td>
<td>.012</td>
<td>.051</td>
</tr>
<tr>
<td></td>
<td>SREGNUM</td>
<td>.751</td>
<td>.000</td>
<td>.100</td>
<td>.062</td>
</tr>
<tr>
<td></td>
<td>ASHANNUM</td>
<td>.630</td>
<td>.000</td>
<td>.232</td>
<td>.077</td>
</tr>
<tr>
<td></td>
<td>TANXNUM</td>
<td>.275</td>
<td>.002</td>
<td>1.192</td>
<td>.193</td>
</tr>
<tr>
<td>SCHOOLID * ESBID</td>
<td>ACEFFNUM</td>
<td>.434</td>
<td>.004</td>
<td>2.740</td>
<td>.251</td>
</tr>
<tr>
<td></td>
<td>LSTRANUM</td>
<td>.247</td>
<td>.007</td>
<td>4.144</td>
<td>.368</td>
</tr>
<tr>
<td></td>
<td>SREGNUM</td>
<td>.838</td>
<td>.001</td>
<td>.849</td>
<td>.105</td>
</tr>
<tr>
<td></td>
<td>ASHANNUM</td>
<td>.272</td>
<td>.006</td>
<td>3.913</td>
<td>.349</td>
</tr>
<tr>
<td></td>
<td>TANXNUM</td>
<td>.186</td>
<td>.007</td>
<td>4.700</td>
<td>.414</td>
</tr>
<tr>
<td>Source</td>
<td>Dependent Variable</td>
<td>Sig.</td>
<td>Partial Eta Squared</td>
<td>Noncent. Parameter</td>
<td>Observed Power^a</td>
</tr>
<tr>
<td>-----------------</td>
<td>--------------------</td>
<td>------</td>
<td>---------------------</td>
<td>--------------------</td>
<td>------------------</td>
</tr>
<tr>
<td>Error</td>
<td>ACEFFNUM</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>LSTRANUM</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>SREGNUM</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>ASHANNUM</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>TANXNUM</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>ACEFFNUM</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>LSTRANUM</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>SREGNUM</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>ASHANNUM</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>TANXNUM</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Corrected Total</td>
<td>ACEFFNUM</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>LSTRANUM</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>SREGNUM</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>ASHANNUM</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>TANXNUM</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

a. Computed using alpha = .05
b. R Squared = .319 (Adjusted R Squared = .189)
c. R Squared = .298 (Adjusted R Squared = .165)
d. R Squared = .280 (Adjusted R Squared = .143)
e. R Squared = .205 (Adjusted R Squared = .054)
f. R Squared = .320 (Adjusted R Squared = .190)
APPENDIX I.3

SPSS MANOVA OUTPUT

LITERACY GOAL ORIENTATIONS
### General Linear Model - LITERACY GOAL ORIENTATIONS

#### Between-Subjects Factors

<table>
<thead>
<tr>
<th>Factor</th>
<th>Value</th>
<th>Label</th>
<th>N</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ward</td>
<td>1</td>
<td>Unhealthy</td>
<td>294</td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>Healthy</td>
<td>260</td>
</tr>
<tr>
<td></td>
<td>3</td>
<td>Non</td>
<td>183</td>
</tr>
<tr>
<td>ABILITY2</td>
<td>1.00</td>
<td></td>
<td>139</td>
</tr>
<tr>
<td></td>
<td>2.00</td>
<td></td>
<td>162</td>
</tr>
<tr>
<td></td>
<td>3.00</td>
<td></td>
<td>159</td>
</tr>
<tr>
<td></td>
<td>4.00</td>
<td></td>
<td>141</td>
</tr>
<tr>
<td></td>
<td>5.00</td>
<td></td>
<td>145</td>
</tr>
<tr>
<td>NUM2</td>
<td>1.00</td>
<td></td>
<td>149</td>
</tr>
<tr>
<td></td>
<td>2.00</td>
<td></td>
<td>150</td>
</tr>
<tr>
<td></td>
<td>3.00</td>
<td></td>
<td>160</td>
</tr>
<tr>
<td></td>
<td>4.00</td>
<td></td>
<td>148</td>
</tr>
<tr>
<td></td>
<td>5.00</td>
<td></td>
<td>139</td>
</tr>
<tr>
<td>GRADE</td>
<td>1</td>
<td>Female</td>
<td>347</td>
</tr>
<tr>
<td></td>
<td>2</td>
<td></td>
<td>399</td>
</tr>
<tr>
<td>GENDER</td>
<td>1.0</td>
<td>Female</td>
<td>276</td>
</tr>
<tr>
<td></td>
<td>2.0</td>
<td>Male</td>
<td>470</td>
</tr>
<tr>
<td>SCHOOLID</td>
<td>1.0</td>
<td>K</td>
<td>67</td>
</tr>
<tr>
<td></td>
<td>2.0</td>
<td>B</td>
<td>407</td>
</tr>
<tr>
<td></td>
<td>3.0</td>
<td>Kg</td>
<td>217</td>
</tr>
<tr>
<td></td>
<td>4.0</td>
<td>Scgs</td>
<td>55</td>
</tr>
<tr>
<td>ESBID</td>
<td>1</td>
<td></td>
<td>603</td>
</tr>
<tr>
<td></td>
<td>2</td>
<td></td>
<td>143</td>
</tr>
<tr>
<td>Effect</td>
<td>Pillai's Trace</td>
<td>Value</td>
<td>F</td>
</tr>
<tr>
<td>-----------------</td>
<td>----------------</td>
<td>-------</td>
<td>-------</td>
</tr>
<tr>
<td>Intercept</td>
<td></td>
<td>.748</td>
<td>618.629&lt;sup&gt;b&lt;/sup&gt;</td>
</tr>
<tr>
<td></td>
<td>Wilks' Lambda</td>
<td>.252</td>
<td>618.629&lt;sup&gt;b&lt;/sup&gt;</td>
</tr>
<tr>
<td></td>
<td>Hotelling's Trace</td>
<td>2.974</td>
<td>618.629&lt;sup&gt;b&lt;/sup&gt;</td>
</tr>
<tr>
<td></td>
<td>Roy's Largest Root</td>
<td>2.974</td>
<td>618.629&lt;sup&gt;b&lt;/sup&gt;</td>
</tr>
<tr>
<td>CLU3_1</td>
<td>Pillai's Trace</td>
<td>.058</td>
<td>6.272</td>
</tr>
<tr>
<td></td>
<td>Wilks' Lambda</td>
<td>.942</td>
<td>6.291&lt;sup&gt;b&lt;/sup&gt;</td>
</tr>
<tr>
<td></td>
<td>Hotelling's Trace</td>
<td>.061</td>
<td>6.310</td>
</tr>
<tr>
<td></td>
<td>Roy's Largest Root</td>
<td>.047</td>
<td>9.872&lt;sup&gt;c&lt;/sup&gt;</td>
</tr>
<tr>
<td>ABILITY2</td>
<td>Pillai's Trace</td>
<td>.021</td>
<td>1.082</td>
</tr>
<tr>
<td></td>
<td>Wilks' Lambda</td>
<td>.960</td>
<td>1.080</td>
</tr>
<tr>
<td></td>
<td>Hotelling's Trace</td>
<td>.021</td>
<td>1.079</td>
</tr>
<tr>
<td></td>
<td>Roy's Largest Root</td>
<td>.011</td>
<td>1.758&lt;sup&gt;c&lt;/sup&gt;</td>
</tr>
<tr>
<td>NUM2</td>
<td>Pillai's Trace</td>
<td>.029</td>
<td>1.518</td>
</tr>
<tr>
<td></td>
<td>Wilks' Lambda</td>
<td>.971</td>
<td>1.521</td>
</tr>
<tr>
<td></td>
<td>Hotelling's Trace</td>
<td>.029</td>
<td>1.522</td>
</tr>
<tr>
<td></td>
<td>Roy's Largest Root</td>
<td>.022</td>
<td>3.463&lt;sup&gt;c&lt;/sup&gt;</td>
</tr>
<tr>
<td>GRADE</td>
<td>Pillai's Trace</td>
<td>.010</td>
<td>2.175&lt;sup&gt;b&lt;/sup&gt;</td>
</tr>
<tr>
<td></td>
<td>Wilks' Lambda</td>
<td>.990</td>
<td>2.175&lt;sup&gt;b&lt;/sup&gt;</td>
</tr>
<tr>
<td></td>
<td>Hotelling's Trace</td>
<td>.010</td>
<td>2.175&lt;sup&gt;b&lt;/sup&gt;</td>
</tr>
<tr>
<td></td>
<td>Roy's Largest Root</td>
<td>.010</td>
<td>2.175&lt;sup&gt;b&lt;/sup&gt;</td>
</tr>
<tr>
<td>GENDER</td>
<td>Pillai's Trace</td>
<td>.004</td>
<td>.887&lt;sup&gt;b&lt;/sup&gt;</td>
</tr>
<tr>
<td></td>
<td>Wilks' Lambda</td>
<td>.996</td>
<td>.887&lt;sup&gt;b&lt;/sup&gt;</td>
</tr>
<tr>
<td></td>
<td>Hotelling's Trace</td>
<td>.004</td>
<td>.887&lt;sup&gt;b&lt;/sup&gt;</td>
</tr>
<tr>
<td></td>
<td>Roy's Largest Root</td>
<td>.004</td>
<td>.887&lt;sup&gt;b&lt;/sup&gt;</td>
</tr>
<tr>
<td>SCHOOLID</td>
<td>Pillai's Trace</td>
<td>.015</td>
<td>1.083</td>
</tr>
<tr>
<td></td>
<td>Wilks' Lambda</td>
<td>.985</td>
<td>1.083</td>
</tr>
<tr>
<td></td>
<td>Hotelling's Trace</td>
<td>.016</td>
<td>1.082</td>
</tr>
<tr>
<td></td>
<td>Roy's Largest Root</td>
<td>.012</td>
<td>2.539&lt;sup&gt;c&lt;/sup&gt;</td>
</tr>
<tr>
<td>ESBID</td>
<td>Pillai's Trace</td>
<td>.008</td>
<td>1.575&lt;sup&gt;b&lt;/sup&gt;</td>
</tr>
<tr>
<td></td>
<td>Wilks' Lambda</td>
<td>.992</td>
<td>1.575&lt;sup&gt;b&lt;/sup&gt;</td>
</tr>
<tr>
<td></td>
<td>Hotelling's Trace</td>
<td>.008</td>
<td>1.575&lt;sup&gt;b&lt;/sup&gt;</td>
</tr>
<tr>
<td></td>
<td>Roy's Largest Root</td>
<td>.008</td>
<td>1.575&lt;sup&gt;b&lt;/sup&gt;</td>
</tr>
<tr>
<td>CLU3_1 * ABILITY2</td>
<td>Pillai's Trace</td>
<td>.044</td>
<td>1.156</td>
</tr>
<tr>
<td></td>
<td>Wilks' Lambda</td>
<td>.957</td>
<td>1.156</td>
</tr>
<tr>
<td></td>
<td>Hotelling's Trace</td>
<td>.045</td>
<td>1.155</td>
</tr>
<tr>
<td></td>
<td>Roy's Largest Root</td>
<td>.024</td>
<td>1.841&lt;sup&gt;c&lt;/sup&gt;</td>
</tr>
<tr>
<td>CLU3_1 * NUM2</td>
<td>Pillai's Trace</td>
<td>.052</td>
<td>1.387</td>
</tr>
<tr>
<td></td>
<td>Wilks' Lambda</td>
<td>.949</td>
<td>1.387</td>
</tr>
<tr>
<td></td>
<td>Hotelling's Trace</td>
<td>.053</td>
<td>1.386</td>
</tr>
<tr>
<td></td>
<td>Roy's Largest Root</td>
<td>.029</td>
<td>2.233&lt;sup&gt;c&lt;/sup&gt;</td>
</tr>
<tr>
<td>CLU3_1 * GRADE</td>
<td>Pillai's Trace</td>
<td>.020</td>
<td>2.084</td>
</tr>
<tr>
<td></td>
<td>Wilks' Lambda</td>
<td>.980</td>
<td>2.085&lt;sup&gt;b&lt;/sup&gt;</td>
</tr>
<tr>
<td></td>
<td>Hotelling's Trace</td>
<td>.020</td>
<td>2.085</td>
</tr>
<tr>
<td></td>
<td>Roy's Largest Root</td>
<td>.016</td>
<td>3.319&lt;sup&gt;c&lt;/sup&gt;</td>
</tr>
<tr>
<td>CLU3_1 * GENDER</td>
<td>Pillai's Trace</td>
<td>.015</td>
<td>1.623</td>
</tr>
<tr>
<td></td>
<td>Wilks' Lambda</td>
<td>.985</td>
<td>1.624&lt;sup&gt;b&lt;/sup&gt;</td>
</tr>
<tr>
<td></td>
<td>Hotelling's Trace</td>
<td>.016</td>
<td>1.624</td>
</tr>
<tr>
<td></td>
<td>Roy's Largest Root</td>
<td>.013</td>
<td>2.781&lt;sup&gt;c&lt;/sup&gt;</td>
</tr>
<tr>
<td>CLU3_1 * SCHOOLID</td>
<td>Pillai's Trace</td>
<td>.039</td>
<td>1.359</td>
</tr>
<tr>
<td></td>
<td>Wilks' Lambda</td>
<td>.962</td>
<td>1.359</td>
</tr>
<tr>
<td></td>
<td>Hotelling's Trace</td>
<td>.039</td>
<td>1.358</td>
</tr>
<tr>
<td></td>
<td>Roy's Largest Root</td>
<td>.021</td>
<td>2.205&lt;sup&gt;c&lt;/sup&gt;</td>
</tr>
<tr>
<td>Effect</td>
<td>Pillai's Trace</td>
<td>Wilks' Lambda</td>
<td>Hotelling's Trace</td>
</tr>
<tr>
<td>-----------------</td>
<td>----------------</td>
<td>---------------</td>
<td>-------------------</td>
</tr>
<tr>
<td><strong>CLU3_1 * ESBI</strong>D</td>
<td>.005</td>
<td>.480</td>
<td>6.00</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>.956</td>
<td>.480&lt;sup&gt;b&lt;/sup&gt;</td>
</tr>
<tr>
<td></td>
<td></td>
<td>.055</td>
<td>.480</td>
</tr>
<tr>
<td></td>
<td></td>
<td>.004</td>
<td>.859&lt;sup&gt;c&lt;/sup&gt;</td>
</tr>
<tr>
<td><strong>ABILITY2 * NUM2</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>.079</td>
<td>1.058</td>
<td>48.00</td>
</tr>
<tr>
<td></td>
<td>.923</td>
<td>1.061</td>
<td>48.00</td>
</tr>
<tr>
<td></td>
<td>.082</td>
<td>1.064</td>
<td>48.00</td>
</tr>
<tr>
<td></td>
<td>.048</td>
<td>1.874&lt;sup&gt;c&lt;/sup&gt;</td>
<td>16.00</td>
</tr>
<tr>
<td><strong>ABILITY2 * GRADE</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>.015</td>
<td>.809</td>
<td>12.00</td>
</tr>
<tr>
<td></td>
<td>.985</td>
<td>.808</td>
<td>12.00</td>
</tr>
<tr>
<td></td>
<td>.016</td>
<td>.807</td>
<td>12.00</td>
</tr>
<tr>
<td></td>
<td>.011</td>
<td>1.677&lt;sup&gt;c&lt;/sup&gt;</td>
<td>4.00</td>
</tr>
<tr>
<td><strong>ABILITY2 * GENDER</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>.021</td>
<td>1.122</td>
<td>12.00</td>
</tr>
<tr>
<td></td>
<td>.979</td>
<td>1.125</td>
<td>12.00</td>
</tr>
<tr>
<td></td>
<td>.022</td>
<td>1.127</td>
<td>12.00</td>
</tr>
<tr>
<td></td>
<td>.019</td>
<td>3.042&lt;sup&gt;c&lt;/sup&gt;</td>
<td>4.00</td>
</tr>
<tr>
<td><strong>ABILITY2 * SCHOOLID</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>.037</td>
<td>.654</td>
<td>36.00</td>
</tr>
<tr>
<td></td>
<td>.963</td>
<td>.653</td>
<td>36.00</td>
</tr>
<tr>
<td></td>
<td>.038</td>
<td>.652</td>
<td>36.00</td>
</tr>
<tr>
<td></td>
<td>.020</td>
<td>1.048&lt;sup&gt;c&lt;/sup&gt;</td>
<td>12.00</td>
</tr>
<tr>
<td><strong>ABILITY2 * ESBI</strong>D</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>.018</td>
<td>.927</td>
<td>12.00</td>
</tr>
<tr>
<td></td>
<td>.982</td>
<td>.926</td>
<td>12.00</td>
</tr>
<tr>
<td></td>
<td>.018</td>
<td>.924</td>
<td>12.00</td>
</tr>
<tr>
<td></td>
<td>.011</td>
<td>1.784&lt;sup&gt;c&lt;/sup&gt;</td>
<td>4.00</td>
</tr>
<tr>
<td><strong>NUM2 * GRADE</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>.011</td>
<td>.590</td>
<td>12.00</td>
</tr>
<tr>
<td></td>
<td>.989</td>
<td>.589</td>
<td>12.00</td>
</tr>
<tr>
<td></td>
<td>.011</td>
<td>.588</td>
<td>12.00</td>
</tr>
<tr>
<td></td>
<td>.008</td>
<td>1.297&lt;sup&gt;c&lt;/sup&gt;</td>
<td>4.00</td>
</tr>
<tr>
<td><strong>NUM2 * GENDER</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>.017</td>
<td>.873</td>
<td>12.00</td>
</tr>
<tr>
<td></td>
<td>.983</td>
<td>.874</td>
<td>12.00</td>
</tr>
<tr>
<td></td>
<td>.017</td>
<td>.874</td>
<td>12.00</td>
</tr>
<tr>
<td></td>
<td>.014</td>
<td>2.209&lt;sup&gt;c&lt;/sup&gt;</td>
<td>4.00</td>
</tr>
<tr>
<td><strong>NUM2 * SCHOOLID</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>.056</td>
<td>.998</td>
<td>36.00</td>
</tr>
<tr>
<td></td>
<td>.944</td>
<td>1.000</td>
<td>36.00</td>
</tr>
<tr>
<td></td>
<td>.058</td>
<td>1.002</td>
<td>36.00</td>
</tr>
<tr>
<td></td>
<td>.038</td>
<td>1.966&lt;sup&gt;c&lt;/sup&gt;</td>
<td>12.00</td>
</tr>
<tr>
<td><strong>NUM2 * ESBI</strong>D</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>.024</td>
<td>1.247</td>
<td>12.00</td>
</tr>
<tr>
<td></td>
<td>.976</td>
<td>1.247</td>
<td>12.00</td>
</tr>
<tr>
<td></td>
<td>.024</td>
<td>1.247</td>
<td>12.00</td>
</tr>
<tr>
<td></td>
<td>.017</td>
<td>2.732&lt;sup&gt;c&lt;/sup&gt;</td>
<td>4.00</td>
</tr>
<tr>
<td><strong>GRADE * GENDER</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>.008</td>
<td>1.578&lt;sup&gt;b&lt;/sup&gt;</td>
<td>3.00</td>
</tr>
<tr>
<td></td>
<td>.992</td>
<td>1.578&lt;sup&gt;b&lt;/sup&gt;</td>
<td>3.00</td>
</tr>
<tr>
<td></td>
<td>.008</td>
<td>1.578&lt;sup&gt;b&lt;/sup&gt;</td>
<td>3.00</td>
</tr>
<tr>
<td></td>
<td>.008</td>
<td>1.578&lt;sup&gt;b&lt;/sup&gt;</td>
<td>3.00</td>
</tr>
<tr>
<td><strong>GRADE * SCHOOLID</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>.015</td>
<td>1.065</td>
<td>9.00</td>
</tr>
<tr>
<td></td>
<td>.985</td>
<td>1.065</td>
<td>9.00</td>
</tr>
<tr>
<td></td>
<td>.015</td>
<td>1.064</td>
<td>9.00</td>
</tr>
<tr>
<td></td>
<td>.012</td>
<td>2.506&lt;sup&gt;c&lt;/sup&gt;</td>
<td>3.00</td>
</tr>
<tr>
<td><strong>GRADE * ESBI</strong>D</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>.001</td>
<td>.174&lt;sup&gt;b&lt;/sup&gt;</td>
<td>3.00</td>
</tr>
<tr>
<td></td>
<td>.999</td>
<td>.174&lt;sup&gt;b&lt;/sup&gt;</td>
<td>3.00</td>
</tr>
<tr>
<td></td>
<td>.001</td>
<td>.174&lt;sup&gt;b&lt;/sup&gt;</td>
<td>3.00</td>
</tr>
<tr>
<td></td>
<td>.001</td>
<td>.174&lt;sup&gt;b&lt;/sup&gt;</td>
<td>3.00</td>
</tr>
</tbody>
</table>
## Multivariate Tests

<table>
<thead>
<tr>
<th>Effect</th>
<th>Pillai's Trace</th>
<th>Value</th>
<th>F</th>
<th>Hypothesis df</th>
<th>Error df</th>
</tr>
</thead>
<tbody>
<tr>
<td>GENDER * SCHOOLID</td>
<td></td>
<td>.008</td>
<td>.866</td>
<td>6.000</td>
<td>1250.000</td>
</tr>
<tr>
<td>Wilks' Lambda</td>
<td></td>
<td>.992</td>
<td>.866(^b)</td>
<td>6.000</td>
<td>1248.000</td>
</tr>
<tr>
<td>Hotelling's Trace</td>
<td></td>
<td>.008</td>
<td>.864</td>
<td>6.000</td>
<td>1246.000</td>
</tr>
<tr>
<td>Roy's Largest Root</td>
<td></td>
<td>.006</td>
<td>1.156(^c)</td>
<td>3.000</td>
<td>625.000</td>
</tr>
<tr>
<td>GENDER * ESBID</td>
<td></td>
<td>.002</td>
<td>.313(^b)</td>
<td>3.000</td>
<td>624.000</td>
</tr>
<tr>
<td>Wilks' Lambda</td>
<td></td>
<td>.998</td>
<td>.313(^b)</td>
<td>3.000</td>
<td>624.000</td>
</tr>
<tr>
<td>Hotelling's Trace</td>
<td></td>
<td>.002</td>
<td>.313(^b)</td>
<td>3.000</td>
<td>624.000</td>
</tr>
<tr>
<td>Roy's Largest Root</td>
<td></td>
<td>.002</td>
<td>.313(^b)</td>
<td>3.000</td>
<td>624.000</td>
</tr>
<tr>
<td>SCHOOLID * ESBID</td>
<td></td>
<td>.009</td>
<td>.828</td>
<td>9.000</td>
<td>1878.000</td>
</tr>
<tr>
<td>Wilks' Lambda</td>
<td></td>
<td>.991</td>
<td>.627</td>
<td>9.000</td>
<td>1518.803</td>
</tr>
<tr>
<td>Hotelling's Trace</td>
<td></td>
<td>.009</td>
<td>.627</td>
<td>9.000</td>
<td>1868.000</td>
</tr>
<tr>
<td>Roy's Largest Root</td>
<td></td>
<td>.007</td>
<td>1.484(^c)</td>
<td>3.000</td>
<td>626.000</td>
</tr>
<tr>
<td>Effect</td>
<td>Sig</td>
<td>Partial Eta Squared</td>
<td>Noncent. Parameter</td>
<td>Observed Power^b</td>
<td></td>
</tr>
<tr>
<td>-----------------</td>
<td>------</td>
<td>---------------------</td>
<td>--------------------</td>
<td>------------------</td>
<td></td>
</tr>
<tr>
<td>intercept</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pillai's Trace</td>
<td>.000</td>
<td>.748</td>
<td>1855.886</td>
<td>1.000</td>
<td></td>
</tr>
<tr>
<td>Wilks' Lambda</td>
<td>.000</td>
<td>.748</td>
<td>1855.886</td>
<td>1.000</td>
<td></td>
</tr>
<tr>
<td>Hotelling's Trace</td>
<td>.000</td>
<td>.748</td>
<td>1855.886</td>
<td>1.000</td>
<td></td>
</tr>
<tr>
<td>Roy's Largest Root</td>
<td>.000</td>
<td>.748</td>
<td>1855.886</td>
<td>1.000</td>
<td></td>
</tr>
<tr>
<td>CLU3_1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pillai's Trace</td>
<td>.000</td>
<td>.029</td>
<td>37.630</td>
<td>.999</td>
<td></td>
</tr>
<tr>
<td>Wilks' Lambda</td>
<td>.000</td>
<td>.029</td>
<td>37.744</td>
<td>.999</td>
<td></td>
</tr>
<tr>
<td>Hotelling's Trace</td>
<td>.000</td>
<td>.029</td>
<td>37.859</td>
<td>.999</td>
<td></td>
</tr>
<tr>
<td>Roy's Largest Root</td>
<td>.000</td>
<td>.045</td>
<td>29.616</td>
<td>.998</td>
<td></td>
</tr>
<tr>
<td>ABILITY2</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pillai's Trace</td>
<td>.371</td>
<td>.007</td>
<td>12.983</td>
<td>.641</td>
<td></td>
</tr>
<tr>
<td>Wilks' Lambda</td>
<td>.372</td>
<td>.007</td>
<td>11.429</td>
<td>.571</td>
<td></td>
</tr>
<tr>
<td>Hotelling's Trace</td>
<td>.374</td>
<td>.007</td>
<td>12.945</td>
<td>.640</td>
<td></td>
</tr>
<tr>
<td>Roy's Largest Root</td>
<td>.136</td>
<td>.011</td>
<td>7.033</td>
<td>.539</td>
<td></td>
</tr>
<tr>
<td>NUM2</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pillai's Trace</td>
<td>.110</td>
<td>.010</td>
<td>18.216</td>
<td>.821</td>
<td></td>
</tr>
<tr>
<td>Wilks' Lambda</td>
<td>.110</td>
<td>.010</td>
<td>16.081</td>
<td>.758</td>
<td></td>
</tr>
<tr>
<td>Hotelling's Trace</td>
<td>.109</td>
<td>.010</td>
<td>18.266</td>
<td>.823</td>
<td></td>
</tr>
<tr>
<td>Roy's Largest Root</td>
<td>.008</td>
<td>.022</td>
<td>13.851</td>
<td>.859</td>
<td></td>
</tr>
<tr>
<td>GRADE</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pillai's Trace</td>
<td>.090</td>
<td>.010</td>
<td>6.525</td>
<td>.564</td>
<td></td>
</tr>
<tr>
<td>Wilks' Lambda</td>
<td>.090</td>
<td>.010</td>
<td>6.525</td>
<td>.554</td>
<td></td>
</tr>
<tr>
<td>Hotelling's Trace</td>
<td>.090</td>
<td>.010</td>
<td>6.525</td>
<td>.554</td>
<td></td>
</tr>
<tr>
<td>Roy's Largest Root</td>
<td>.090</td>
<td>.010</td>
<td>6.525</td>
<td>.554</td>
<td></td>
</tr>
<tr>
<td>GENDER</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pillai's Trace</td>
<td>.458</td>
<td>.004</td>
<td>2.602</td>
<td>.240</td>
<td></td>
</tr>
<tr>
<td>Wilks' Lambda</td>
<td>.458</td>
<td>.004</td>
<td>2.602</td>
<td>.240</td>
<td></td>
</tr>
<tr>
<td>Hotelling's Trace</td>
<td>.458</td>
<td>.004</td>
<td>2.602</td>
<td>.240</td>
<td></td>
</tr>
<tr>
<td>Roy's Largest Root</td>
<td>.458</td>
<td>.004</td>
<td>2.602</td>
<td>.240</td>
<td></td>
</tr>
<tr>
<td>SCHOOLID</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pillai's Trace</td>
<td>.372</td>
<td>.005</td>
<td>9.747</td>
<td>.548</td>
<td></td>
</tr>
<tr>
<td>Wilks' Lambda</td>
<td>.372</td>
<td>.005</td>
<td>7.901</td>
<td>.446</td>
<td></td>
</tr>
<tr>
<td>Hotelling's Trace</td>
<td>.373</td>
<td>.005</td>
<td>9.740</td>
<td>.548</td>
<td></td>
</tr>
<tr>
<td>Roy's Largest Root</td>
<td>.056</td>
<td>.012</td>
<td>7.618</td>
<td>.627</td>
<td></td>
</tr>
<tr>
<td>ESID</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pillai's Trace</td>
<td>.194</td>
<td>.008</td>
<td>4.725</td>
<td>.416</td>
<td></td>
</tr>
<tr>
<td>Wilks' Lambda</td>
<td>.194</td>
<td>.008</td>
<td>4.725</td>
<td>.416</td>
<td></td>
</tr>
<tr>
<td>Hotelling's Trace</td>
<td>.194</td>
<td>.008</td>
<td>4.725</td>
<td>.416</td>
<td></td>
</tr>
<tr>
<td>Roy's Largest Root</td>
<td>.194</td>
<td>.008</td>
<td>4.725</td>
<td>.416</td>
<td></td>
</tr>
<tr>
<td>CLU3_1 * ABILITY2</td>
<td>.272</td>
<td>.015</td>
<td>27.753</td>
<td>.894</td>
<td></td>
</tr>
<tr>
<td>Pillai's Trace</td>
<td>.273</td>
<td>.015</td>
<td>26.808</td>
<td>.879</td>
<td></td>
</tr>
<tr>
<td>Wilks' Lambda</td>
<td>.274</td>
<td>.015</td>
<td>27.717</td>
<td>.893</td>
<td></td>
</tr>
<tr>
<td>Hotelling's Trace</td>
<td>.087</td>
<td>.023</td>
<td>14.726</td>
<td>.784</td>
<td></td>
</tr>
<tr>
<td>Roy's Largest Root</td>
<td>.100</td>
<td>.017</td>
<td>33.294</td>
<td>.952</td>
<td></td>
</tr>
<tr>
<td>CLU3_1 * NUM2</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pillai's Trace</td>
<td>.052</td>
<td>.010</td>
<td>12.507</td>
<td>.756</td>
<td></td>
</tr>
<tr>
<td>Wilks' Lambda</td>
<td>.052</td>
<td>.010</td>
<td>12.508</td>
<td>.756</td>
<td></td>
</tr>
<tr>
<td>Hotelling's Trace</td>
<td>.052</td>
<td>.010</td>
<td>12.510</td>
<td>.756</td>
<td></td>
</tr>
<tr>
<td>Roy's Largest Root</td>
<td>.020</td>
<td>.016</td>
<td>9.956</td>
<td>.756</td>
<td></td>
</tr>
<tr>
<td>CLU3_1 * GRADE</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pillai's Trace</td>
<td>.137</td>
<td>.008</td>
<td>9.738</td>
<td>.627</td>
<td></td>
</tr>
<tr>
<td>Wilks' Lambda</td>
<td>.137</td>
<td>.008</td>
<td>9.741</td>
<td>.628</td>
<td></td>
</tr>
<tr>
<td>Hotelling's Trace</td>
<td>.137</td>
<td>.008</td>
<td>9.745</td>
<td>.628</td>
<td></td>
</tr>
<tr>
<td>Roy's Largest Root</td>
<td>.040</td>
<td>.013</td>
<td>8.343</td>
<td>.671</td>
<td></td>
</tr>
<tr>
<td>CLU3_1 * GENDER</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pillai's Trace</td>
<td>.142</td>
<td>.013</td>
<td>24.470</td>
<td>.886</td>
<td></td>
</tr>
<tr>
<td>Wilks' Lambda</td>
<td>.142</td>
<td>.013</td>
<td>23.056</td>
<td>.861</td>
<td></td>
</tr>
<tr>
<td>Hotelling's Trace</td>
<td>.143</td>
<td>.013</td>
<td>24.449</td>
<td>.888</td>
<td></td>
</tr>
<tr>
<td>Roy's Largest Root</td>
<td>.041</td>
<td>.021</td>
<td>13.227</td>
<td>.781</td>
<td></td>
</tr>
<tr>
<td>Effect</td>
<td>Sig</td>
<td>Partial Eta Squared</td>
<td>Noncent. Parameter</td>
<td>Observed Power</td>
<td></td>
</tr>
<tr>
<td>-------------------</td>
<td>------</td>
<td>---------------------</td>
<td>--------------------</td>
<td>-----------------</td>
<td></td>
</tr>
<tr>
<td>CLU3_1 * ESBIID</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pillai's Trace</td>
<td>.823</td>
<td>.002</td>
<td>2.882</td>
<td>.198</td>
<td></td>
</tr>
<tr>
<td>Wilks' Lambda</td>
<td>.824</td>
<td>.002</td>
<td>2.880</td>
<td>.197</td>
<td></td>
</tr>
<tr>
<td>Hotelling's Trace</td>
<td>.824</td>
<td>.002</td>
<td>2.877</td>
<td>.197</td>
<td></td>
</tr>
<tr>
<td>Roy's Largest Root</td>
<td>.462</td>
<td>.004</td>
<td>2.578</td>
<td>.238</td>
<td></td>
</tr>
<tr>
<td>ABILITY2 * NUM2</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pillai's Trace</td>
<td>.367</td>
<td>.026</td>
<td>50.786</td>
<td>.981</td>
<td></td>
</tr>
<tr>
<td>Wilks' Lambda</td>
<td>.362</td>
<td>.026</td>
<td>50.481</td>
<td>.981</td>
<td></td>
</tr>
<tr>
<td>Hotelling's Trace</td>
<td>.357</td>
<td>.027</td>
<td>51.058</td>
<td>.982</td>
<td></td>
</tr>
<tr>
<td>Roy's Largest Root</td>
<td>.020</td>
<td>.046</td>
<td>29.986</td>
<td>.957</td>
<td></td>
</tr>
<tr>
<td>ABILITY2 * GRADE</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pillai's Trace</td>
<td>.641</td>
<td>.005</td>
<td>9.709</td>
<td>.467</td>
<td></td>
</tr>
<tr>
<td>Wilks' Lambda</td>
<td>.642</td>
<td>.005</td>
<td>8.550</td>
<td>.428</td>
<td></td>
</tr>
<tr>
<td>Hotelling's Trace</td>
<td>.643</td>
<td>.005</td>
<td>9.688</td>
<td>.486</td>
<td></td>
</tr>
<tr>
<td>Roy's Largest Root</td>
<td>.154</td>
<td>.011</td>
<td>6.709</td>
<td>.517</td>
<td></td>
</tr>
<tr>
<td>ABILITY2 * GENDER</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pillai's Trace</td>
<td>.337</td>
<td>.007</td>
<td>13.464</td>
<td>.662</td>
<td></td>
</tr>
<tr>
<td>Wilks' Lambda</td>
<td>.335</td>
<td>.007</td>
<td>11.899</td>
<td>.593</td>
<td></td>
</tr>
<tr>
<td>Hotelling's Trace</td>
<td>.333</td>
<td>.007</td>
<td>13.529</td>
<td>.664</td>
<td></td>
</tr>
<tr>
<td>Roy's Largest Root</td>
<td>.017</td>
<td>.019</td>
<td>12.168</td>
<td>.805</td>
<td></td>
</tr>
<tr>
<td>ABILITY2 * SCHOOLID</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pillai's Trace</td>
<td>.944</td>
<td>.012</td>
<td>23.532</td>
<td>.728</td>
<td></td>
</tr>
<tr>
<td>Wilks' Lambda</td>
<td>.945</td>
<td>.012</td>
<td>23.143</td>
<td>.716</td>
<td></td>
</tr>
<tr>
<td>Hotelling's Trace</td>
<td>.945</td>
<td>.012</td>
<td>23.472</td>
<td>.725</td>
<td></td>
</tr>
<tr>
<td>Roy's Largest Root</td>
<td>.402</td>
<td>.020</td>
<td>12.578</td>
<td>.618</td>
<td></td>
</tr>
<tr>
<td>ABILITY2 * ESBIID</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pillai's Trace</td>
<td>.519</td>
<td>.006</td>
<td>11.119</td>
<td>.557</td>
<td></td>
</tr>
<tr>
<td>Wilks' Lambda</td>
<td>.520</td>
<td>.006</td>
<td>9.791</td>
<td>.491</td>
<td></td>
</tr>
<tr>
<td>Hotelling's Trace</td>
<td>.521</td>
<td>.006</td>
<td>11.093</td>
<td>.556</td>
<td></td>
</tr>
<tr>
<td>Roy's Largest Root</td>
<td>.130</td>
<td>.011</td>
<td>7.135</td>
<td>.545</td>
<td></td>
</tr>
<tr>
<td>NUM2 * GRADE</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pillai's Trace</td>
<td>.852</td>
<td>.004</td>
<td>7.076</td>
<td>.351</td>
<td></td>
</tr>
<tr>
<td>Wilks' Lambda</td>
<td>.853</td>
<td>.004</td>
<td>6.230</td>
<td>.307</td>
<td></td>
</tr>
<tr>
<td>Hotelling's Trace</td>
<td>.853</td>
<td>.004</td>
<td>7.058</td>
<td>.350</td>
<td></td>
</tr>
<tr>
<td>Roy's Largest Root</td>
<td>.270</td>
<td>.008</td>
<td>5.189</td>
<td>.407</td>
<td></td>
</tr>
<tr>
<td>NUM2 * GENDER</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pillai's Trace</td>
<td>.574</td>
<td>.006</td>
<td>10.476</td>
<td>.526</td>
<td></td>
</tr>
<tr>
<td>Wilks' Lambda</td>
<td>.574</td>
<td>.006</td>
<td>9.241</td>
<td>.463</td>
<td></td>
</tr>
<tr>
<td>Hotelling's Trace</td>
<td>.573</td>
<td>.006</td>
<td>10.488</td>
<td>.526</td>
<td></td>
</tr>
<tr>
<td>Roy's Largest Root</td>
<td>.067</td>
<td>.014</td>
<td>8.838</td>
<td>.651</td>
<td></td>
</tr>
<tr>
<td>NUM2 * SCHOOLID</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pillai's Trace</td>
<td>.472</td>
<td>.019</td>
<td>35.937</td>
<td>.930</td>
<td></td>
</tr>
<tr>
<td>Wilks' Lambda</td>
<td>.470</td>
<td>.019</td>
<td>35.449</td>
<td>.926</td>
<td></td>
</tr>
<tr>
<td>Hotelling's Trace</td>
<td>.467</td>
<td>.019</td>
<td>36.061</td>
<td>.931</td>
<td></td>
</tr>
<tr>
<td>Roy's Largest Root</td>
<td>.025</td>
<td>.036</td>
<td>23.591</td>
<td>.920</td>
<td></td>
</tr>
<tr>
<td>NUM2 * ESBIID</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pillai's Trace</td>
<td>.245</td>
<td>.008</td>
<td>14.860</td>
<td>.720</td>
<td></td>
</tr>
<tr>
<td>Wilks' Lambda</td>
<td>.245</td>
<td>.008</td>
<td>13.190</td>
<td>.550</td>
<td></td>
</tr>
<tr>
<td>Hotelling's Trace</td>
<td>.245</td>
<td>.008</td>
<td>14.863</td>
<td>.720</td>
<td></td>
</tr>
<tr>
<td>Roy's Largest Root</td>
<td>.028</td>
<td>.017</td>
<td>10.928</td>
<td>.755</td>
<td></td>
</tr>
<tr>
<td>GRADE * GENDER</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pillai's Trace</td>
<td>.193</td>
<td>.008</td>
<td>4.735</td>
<td>.417</td>
<td></td>
</tr>
<tr>
<td>Wilks' Lambda</td>
<td>.193</td>
<td>.008</td>
<td>4.735</td>
<td>.417</td>
<td></td>
</tr>
<tr>
<td>Hotelling's Trace</td>
<td>.193</td>
<td>.008</td>
<td>4.735</td>
<td>.417</td>
<td></td>
</tr>
<tr>
<td>Roy's Largest Root</td>
<td>.193</td>
<td>.008</td>
<td>4.735</td>
<td>.417</td>
<td></td>
</tr>
<tr>
<td>GRADE * SCHOOLID</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pillai's Trace</td>
<td>.386</td>
<td>.005</td>
<td>9.584</td>
<td>.540</td>
<td></td>
</tr>
<tr>
<td>Wilks' Lambda</td>
<td>.386</td>
<td>.005</td>
<td>7.770</td>
<td>.439</td>
<td></td>
</tr>
<tr>
<td>Hotelling's Trace</td>
<td>.386</td>
<td>.005</td>
<td>9.580</td>
<td>.540</td>
<td></td>
</tr>
<tr>
<td>Roy's Largest Root</td>
<td>.058</td>
<td>.012</td>
<td>7.619</td>
<td>.621</td>
<td></td>
</tr>
<tr>
<td>GRADE * ESBIID</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pillai's Trace</td>
<td>.914</td>
<td>.001</td>
<td>5.222</td>
<td>.082</td>
<td></td>
</tr>
<tr>
<td>Wilks' Lambda</td>
<td>.914</td>
<td>.001</td>
<td>5.222</td>
<td>.082</td>
<td></td>
</tr>
<tr>
<td>Hotelling's Trace</td>
<td>.914</td>
<td>.001</td>
<td>5.222</td>
<td>.082</td>
<td></td>
</tr>
<tr>
<td>Roy's Largest Root</td>
<td>.914</td>
<td>.001</td>
<td>5.222</td>
<td>.082</td>
<td></td>
</tr>
<tr>
<td>Effect</td>
<td>Pillai's Trace</td>
<td>Wilks' Lambda</td>
<td>Hotelling's Trace</td>
<td>Roy's Largest Root</td>
<td></td>
</tr>
<tr>
<td>---------------</td>
<td>----------------</td>
<td>---------------</td>
<td>-------------------</td>
<td>-------------------</td>
<td></td>
</tr>
<tr>
<td>GENDER * SCHOOLID</td>
<td>.519 (.004)</td>
<td>.520 (.004)</td>
<td>.521 (.004)</td>
<td>.326 (.006)</td>
<td></td>
</tr>
<tr>
<td>GENDER * ESBID</td>
<td>.816 (.002)</td>
<td>.816 (.002)</td>
<td>.816 (.002)</td>
<td>.816 (.002)</td>
<td></td>
</tr>
<tr>
<td>SCHOOLID * ESBID</td>
<td>.774 (.003)</td>
<td>.775 (.003)</td>
<td>.775 (.003)</td>
<td>.215 (.007)</td>
<td></td>
</tr>
</tbody>
</table>

a. Computed using alpha = .05

b. Exact statistic
c. The statistic is an upper bound on F that yields a lower bound on the significance level.
d. Design: Intercept + CLU3_1 + ABILITY2 + NUM2 + GRADE + GENDER + SCHOOLID + ESBID + CLU3_1 * ABILITY2 + CLU3_1 * NUM2 + CLU3_1 * GRADE + CLU3_1 * GENDER + CLU3_1 * SCHOOLID + CLU3_1 * ESBID + ABILITY2 * NUM2 + ABILITY2 * GRADE + ABILITY2 * GENDER + ABILITY2 * SCHOOLID + ABILITY2 * ESBID + NUM2 * GRADE + NUM2 * GENDER + NUM2 * SCHOOLID + NUM2 * ESBID + GRADE * GENDER + GRADE * SCHOOLID + GRADE * ESBID + GENDER * SCHOOLID + GENDER * ESBID + SCHOOLID + ESBID
Tests of Between-Subjects Effects

<table>
<thead>
<tr>
<th>Source</th>
<th>Dependent Variable</th>
<th>Type III Sum of Squares</th>
<th>df</th>
<th>Mean Square</th>
<th>F</th>
</tr>
</thead>
<tbody>
<tr>
<td>Corrected Model</td>
<td>TGOALIT</td>
<td>115.751$^b$</td>
<td>119</td>
<td>.973</td>
<td>1.913</td>
</tr>
<tr>
<td></td>
<td>PERFAPPL</td>
<td>121.441$^c$</td>
<td>119</td>
<td>1.021</td>
<td>1.857</td>
</tr>
<tr>
<td></td>
<td>PERAVALIT</td>
<td>162.691$^{d}$</td>
<td>119</td>
<td>1.367</td>
<td>2.192</td>
</tr>
<tr>
<td>Intercept</td>
<td>TGOALIT</td>
<td>601.249</td>
<td>1</td>
<td>601.249</td>
<td>1182.215</td>
</tr>
<tr>
<td></td>
<td>PERFAPPL</td>
<td>621.805</td>
<td>1</td>
<td>621.805</td>
<td>1131.255</td>
</tr>
<tr>
<td></td>
<td>PERAVALIT</td>
<td>315.069</td>
<td>1</td>
<td>315.069</td>
<td>505.265</td>
</tr>
<tr>
<td>CLU3_1</td>
<td>TGOALIT</td>
<td>7.255</td>
<td>2</td>
<td>3.627</td>
<td>7.132</td>
</tr>
<tr>
<td></td>
<td>PERFAPPL</td>
<td>14.485</td>
<td>2</td>
<td>7.233</td>
<td>13.158</td>
</tr>
<tr>
<td></td>
<td>PERAVALIT</td>
<td>5.409</td>
<td>2</td>
<td>2.704</td>
<td>4.337</td>
</tr>
<tr>
<td>ABILITY2</td>
<td>TGOALIT</td>
<td>2.055</td>
<td>4</td>
<td>.514</td>
<td>1.010</td>
</tr>
<tr>
<td></td>
<td>PERFAPPL</td>
<td>3.365</td>
<td>4</td>
<td>.841</td>
<td>1.530</td>
</tr>
<tr>
<td></td>
<td>PERAVALIT</td>
<td>3.010</td>
<td>4</td>
<td>.753</td>
<td>1.207</td>
</tr>
<tr>
<td>NUM2</td>
<td>TGOALIT</td>
<td>1.377</td>
<td>4</td>
<td>.344</td>
<td>.677</td>
</tr>
<tr>
<td></td>
<td>PERFAPPL</td>
<td>7.186</td>
<td>4</td>
<td>1.797</td>
<td>3.269</td>
</tr>
<tr>
<td></td>
<td>PERAVALIT</td>
<td>4.699</td>
<td>4</td>
<td>1.175</td>
<td>1.884</td>
</tr>
<tr>
<td>GRADE</td>
<td>TGOALIT</td>
<td>.109</td>
<td>1</td>
<td>.109</td>
<td>.215</td>
</tr>
<tr>
<td></td>
<td>PERFAPPL</td>
<td>1.706</td>
<td>1</td>
<td>1.706</td>
<td>3.105</td>
</tr>
<tr>
<td></td>
<td>PERAVALIT</td>
<td>3.625</td>
<td>1</td>
<td>3.625</td>
<td>5.814</td>
</tr>
<tr>
<td>GENDER</td>
<td>TGOALIT</td>
<td>1.103</td>
<td>1</td>
<td>1.103</td>
<td>2.169</td>
</tr>
<tr>
<td></td>
<td>PERFAPPL</td>
<td>2.335E-02</td>
<td>1</td>
<td>2.335E-02</td>
<td>.042</td>
</tr>
<tr>
<td></td>
<td>PERAVALIT</td>
<td>.118</td>
<td>1</td>
<td>.118</td>
<td>.190</td>
</tr>
<tr>
<td>SCHOOLID</td>
<td>TGOALIT</td>
<td>2.172</td>
<td>3</td>
<td>.724</td>
<td>1.423</td>
</tr>
<tr>
<td></td>
<td>PERFAPPL</td>
<td>3.509</td>
<td>3</td>
<td>1.170</td>
<td>2.128</td>
</tr>
<tr>
<td></td>
<td>PERAVALIT</td>
<td>.687</td>
<td>3</td>
<td>.229</td>
<td>.367</td>
</tr>
<tr>
<td>ESBID</td>
<td>TGOALIT</td>
<td>2.387E-02</td>
<td>1</td>
<td>2.387E-02</td>
<td>.047</td>
</tr>
<tr>
<td></td>
<td>PERFAPPL</td>
<td>8.310E-05</td>
<td>1</td>
<td>8.310E-05</td>
<td>.000</td>
</tr>
<tr>
<td></td>
<td>PERAVALIT</td>
<td>2.423</td>
<td>1</td>
<td>2.423</td>
<td>3.886</td>
</tr>
<tr>
<td>CLU3_1 * ABILITY2</td>
<td>TGOALIT</td>
<td>3.342</td>
<td>8</td>
<td>.418</td>
<td>.821</td>
</tr>
<tr>
<td></td>
<td>PERFAPPL</td>
<td>3.724</td>
<td>8</td>
<td>.465</td>
<td>.847</td>
</tr>
<tr>
<td></td>
<td>PERAVALIT</td>
<td>5.247</td>
<td>8</td>
<td>.656</td>
<td>1.052</td>
</tr>
<tr>
<td>CLU3_1 * NUM2</td>
<td>TGOALIT</td>
<td>5.579</td>
<td>8</td>
<td>.697</td>
<td>1.371</td>
</tr>
<tr>
<td></td>
<td>PERFAPPL</td>
<td>3.081</td>
<td>8</td>
<td>.385</td>
<td>.701</td>
</tr>
<tr>
<td></td>
<td>PERAVALIT</td>
<td>10.681</td>
<td>8</td>
<td>1.335</td>
<td>2.141</td>
</tr>
<tr>
<td>CLU3_1 * GRADE</td>
<td>TGOALIT</td>
<td>2.461</td>
<td>2</td>
<td>1.230</td>
<td>2.419</td>
</tr>
<tr>
<td></td>
<td>PERFAPPL</td>
<td>4.399</td>
<td>2</td>
<td>2.200</td>
<td>4.002</td>
</tr>
<tr>
<td></td>
<td>PERAVALIT</td>
<td>.387</td>
<td>2</td>
<td>.194</td>
<td>.310</td>
</tr>
<tr>
<td>CLU3_1 * GENDER</td>
<td>TGOALIT</td>
<td>.816</td>
<td>2</td>
<td>.308</td>
<td>.606</td>
</tr>
<tr>
<td></td>
<td>PERFAPPL</td>
<td>1.532</td>
<td>2</td>
<td>.766</td>
<td>1.394</td>
</tr>
<tr>
<td></td>
<td>PERAVALIT</td>
<td>1.868</td>
<td>2</td>
<td>.934</td>
<td>1.497</td>
</tr>
<tr>
<td>CLU3_1 * SCHOOLID</td>
<td>TGOALIT</td>
<td>4.627</td>
<td>6</td>
<td>.771</td>
<td>1.516</td>
</tr>
<tr>
<td></td>
<td>PERFAPPL</td>
<td>5.703</td>
<td>6</td>
<td>.950</td>
<td>1.729</td>
</tr>
<tr>
<td></td>
<td>PERAVALIT</td>
<td>6.427</td>
<td>6</td>
<td>1.071</td>
<td>1.718</td>
</tr>
<tr>
<td>CLU3_1 * ESBID</td>
<td>TGOALIT</td>
<td>.115</td>
<td>2</td>
<td>5.767E-02</td>
<td>.113</td>
</tr>
<tr>
<td></td>
<td>PERFAPPL</td>
<td>.881</td>
<td>2</td>
<td>.441</td>
<td>.802</td>
</tr>
<tr>
<td></td>
<td>PERAVALIT</td>
<td>.104</td>
<td>2</td>
<td>5.181E-02</td>
<td>.083</td>
</tr>
<tr>
<td>ABILITY2 * NUM2</td>
<td>TGOALIT</td>
<td>4.625</td>
<td>16</td>
<td>.289</td>
<td>.568</td>
</tr>
<tr>
<td></td>
<td>PERFAPPL</td>
<td>9.744</td>
<td>16</td>
<td>.609</td>
<td>1.108</td>
</tr>
<tr>
<td></td>
<td>PERAVALIT</td>
<td>14.980</td>
<td>16</td>
<td>.936</td>
<td>1.501</td>
</tr>
<tr>
<td>ABILITY2 * GRADE</td>
<td>TGOALIT</td>
<td>1.726</td>
<td>4</td>
<td>.431</td>
<td>.848</td>
</tr>
<tr>
<td></td>
<td>PERFAPPL</td>
<td>1.682</td>
<td>4</td>
<td>.421</td>
<td>.785</td>
</tr>
<tr>
<td></td>
<td>PERAVALIT</td>
<td>.603</td>
<td>4</td>
<td>.151</td>
<td>.242</td>
</tr>
<tr>
<td>ABILITY2 * GENDER</td>
<td>TGOALIT</td>
<td>2.222</td>
<td>4</td>
<td>.556</td>
<td>1.092</td>
</tr>
<tr>
<td></td>
<td>PERFAPPL</td>
<td>2.438</td>
<td>4</td>
<td>.610</td>
<td>1.109</td>
</tr>
<tr>
<td></td>
<td>PERAVALIT</td>
<td>1.901</td>
<td>4</td>
<td>.475</td>
<td>.762</td>
</tr>
</tbody>
</table>
### Tests of Between-Subjects Effects

<table>
<thead>
<tr>
<th>Source</th>
<th>Dependent Variable</th>
<th>Type III Sum of Squares</th>
<th>df</th>
<th>Mean Square</th>
<th>F</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>ABILITY2 * SCHOOLID</strong></td>
<td>TGOALIT</td>
<td>5.965</td>
<td>12</td>
<td>.497</td>
<td>.977</td>
</tr>
<tr>
<td></td>
<td>PERFAPPL</td>
<td>3.609</td>
<td>12</td>
<td>.301</td>
<td>.547</td>
</tr>
<tr>
<td></td>
<td>PERAVLIT</td>
<td>3.845</td>
<td>12</td>
<td>.320</td>
<td>.514</td>
</tr>
<tr>
<td><strong>ABILITY2 * ESBI D</strong></td>
<td>TGOALIT</td>
<td>2.308</td>
<td>4</td>
<td>.577</td>
<td>1.134</td>
</tr>
<tr>
<td></td>
<td>PERFAPPL</td>
<td>1.386</td>
<td>4</td>
<td>.346</td>
<td>.630</td>
</tr>
<tr>
<td></td>
<td>PERAVLIT</td>
<td>2.833</td>
<td>4</td>
<td>.708</td>
<td>1.136</td>
</tr>
<tr>
<td><strong>NUM2 * GRADE</strong></td>
<td>TGOALIT</td>
<td>.557</td>
<td>4</td>
<td>.139</td>
<td>.274</td>
</tr>
<tr>
<td></td>
<td>PERFAPPL</td>
<td>1.178</td>
<td>4</td>
<td>.294</td>
<td>.536</td>
</tr>
<tr>
<td></td>
<td>PERAVLIT</td>
<td>1.295</td>
<td>4</td>
<td>.324</td>
<td>.619</td>
</tr>
<tr>
<td><strong>NUM2 * GENDER</strong></td>
<td>TGOALIT</td>
<td>.699</td>
<td>4</td>
<td>.175</td>
<td>.343</td>
</tr>
<tr>
<td></td>
<td>PERFAPPL</td>
<td>3.854</td>
<td>4</td>
<td>.963</td>
<td>1.753</td>
</tr>
<tr>
<td></td>
<td>PERAVLIT</td>
<td>1.636</td>
<td>4</td>
<td>.409</td>
<td>.658</td>
</tr>
<tr>
<td><strong>NUM2 * SCHOOLID</strong></td>
<td>TGOALIT</td>
<td>4.464</td>
<td>12</td>
<td>.375</td>
<td>.736</td>
</tr>
<tr>
<td></td>
<td>PERFAPPL</td>
<td>8.109</td>
<td>12</td>
<td>.676</td>
<td>1.229</td>
</tr>
<tr>
<td></td>
<td>PERAVLIT</td>
<td>6.152</td>
<td>12</td>
<td>.513</td>
<td>.822</td>
</tr>
<tr>
<td><strong>NUM2 * ESBI D</strong></td>
<td>TGOALIT</td>
<td>.971</td>
<td>4</td>
<td>.243</td>
<td>.477</td>
</tr>
<tr>
<td></td>
<td>PERFAPPL</td>
<td>4.298</td>
<td>4</td>
<td>1.075</td>
<td>1.955</td>
</tr>
<tr>
<td></td>
<td>PERAVLIT</td>
<td>4.774</td>
<td>4</td>
<td>1.193</td>
<td>1.914</td>
</tr>
<tr>
<td><strong>GRADE * GENDER</strong></td>
<td>TGOALIT</td>
<td>2.290</td>
<td>1</td>
<td>2.290</td>
<td>4.502</td>
</tr>
<tr>
<td></td>
<td>PERFAPPL</td>
<td>4.661E-02</td>
<td>1</td>
<td>4.661E-02</td>
<td>.085</td>
</tr>
<tr>
<td></td>
<td>PERAVLIT</td>
<td>.161</td>
<td>1</td>
<td>.161</td>
<td>.258</td>
</tr>
<tr>
<td><strong>GRADE * SCHOOLID</strong></td>
<td>TGOALIT</td>
<td>2.652</td>
<td>3</td>
<td>.884</td>
<td>1.738</td>
</tr>
<tr>
<td></td>
<td>PERFAPPL</td>
<td>.664</td>
<td>3</td>
<td>.221</td>
<td>.403</td>
</tr>
<tr>
<td></td>
<td>PERAVLIT</td>
<td>.463</td>
<td>3</td>
<td>.154</td>
<td>.247</td>
</tr>
<tr>
<td><strong>GRADE * ESBI D</strong></td>
<td>TGOALIT</td>
<td>7.578E-02</td>
<td>1</td>
<td>7.578E-02</td>
<td>.149</td>
</tr>
<tr>
<td></td>
<td>PERFAPPL</td>
<td>5.416E-02</td>
<td>1</td>
<td>5.416E-02</td>
<td>.099</td>
</tr>
<tr>
<td></td>
<td>PERAVLIT</td>
<td>.152</td>
<td>1</td>
<td>.152</td>
<td>.244</td>
</tr>
<tr>
<td><strong>GENDER * SCHOOLID</strong></td>
<td>TGOALIT</td>
<td>1.655</td>
<td>2</td>
<td>.828</td>
<td>1.627</td>
</tr>
<tr>
<td></td>
<td>PERFAPPL</td>
<td>.419</td>
<td>2</td>
<td>.209</td>
<td>.381</td>
</tr>
<tr>
<td></td>
<td>PERAVLIT</td>
<td>1.220</td>
<td>2</td>
<td>.610</td>
<td>.979</td>
</tr>
<tr>
<td><strong>GENDER * ESBI D</strong></td>
<td>TGOALIT</td>
<td>4.052E-02</td>
<td>1</td>
<td>4.052E-02</td>
<td>.080</td>
</tr>
<tr>
<td></td>
<td>PERFAPPL</td>
<td>.473</td>
<td>1</td>
<td>.473</td>
<td>.860</td>
</tr>
<tr>
<td></td>
<td>PERAVLIT</td>
<td>.256</td>
<td>1</td>
<td>.256</td>
<td>.410</td>
</tr>
<tr>
<td><strong>SCHOOLID * ESBI D</strong></td>
<td>TGOALIT</td>
<td>2.213</td>
<td>3</td>
<td>.738</td>
<td>1.450</td>
</tr>
<tr>
<td></td>
<td>PERFAPPL</td>
<td>.591</td>
<td>3</td>
<td>.197</td>
<td>.359</td>
</tr>
<tr>
<td></td>
<td>PERAVLIT</td>
<td>.359</td>
<td>3</td>
<td>.120</td>
<td>.192</td>
</tr>
<tr>
<td><strong>Error</strong></td>
<td>TGOALIT</td>
<td>318.370</td>
<td>626</td>
<td>.509</td>
<td></td>
</tr>
<tr>
<td></td>
<td>PERFAPPL</td>
<td>344.087</td>
<td>626</td>
<td>.550</td>
<td></td>
</tr>
<tr>
<td></td>
<td>PERAVLIT</td>
<td>390.355</td>
<td>626</td>
<td>.624</td>
<td></td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>TGOALIT</td>
<td>9501.360</td>
<td>746</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>PERFAPPL</td>
<td>10279.917</td>
<td>746</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>PERAVLIT</td>
<td>4872.917</td>
<td>746</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Corrected Total</strong></td>
<td>TGOALIT</td>
<td>434.121</td>
<td>745</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>PERFAPPL</td>
<td>465.528</td>
<td>745</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>PERAVLIT</td>
<td>553.046</td>
<td>745</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

369
## Tests of Between-Subjects Effects

<table>
<thead>
<tr>
<th>Source</th>
<th>Dependent Variable</th>
<th>Sig.</th>
<th>Partial Eta Squared</th>
<th>Noncent. Parameter</th>
<th>Observed Power*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Corrected Model</td>
<td>TGOALIT</td>
<td>.000</td>
<td>.267</td>
<td>227.596</td>
<td>1.000</td>
</tr>
<tr>
<td></td>
<td>PERFAPPL</td>
<td>.000</td>
<td>.251</td>
<td>220.938</td>
<td>1.000</td>
</tr>
<tr>
<td></td>
<td>PERAVLIT</td>
<td>.000</td>
<td>.294</td>
<td>260.903</td>
<td>1.000</td>
</tr>
<tr>
<td>Intercept</td>
<td>TGOALIT</td>
<td>.000</td>
<td>.654</td>
<td>1162.215</td>
<td>1.000</td>
</tr>
<tr>
<td></td>
<td>PERFAPPL</td>
<td>.000</td>
<td>.644</td>
<td>1131.255</td>
<td>1.000</td>
</tr>
<tr>
<td></td>
<td>PERAVLIT</td>
<td>.000</td>
<td>.447</td>
<td>505.265</td>
<td>1.000</td>
</tr>
<tr>
<td>CLU3_1</td>
<td>TGOALIT</td>
<td>.001</td>
<td>.022</td>
<td>14.265</td>
<td>.931</td>
</tr>
<tr>
<td></td>
<td>PERFAPPL</td>
<td>.000</td>
<td>.040</td>
<td>26.317</td>
<td>.998</td>
</tr>
<tr>
<td></td>
<td>PERAVLIT</td>
<td>.013</td>
<td>.014</td>
<td>8.674</td>
<td>.752</td>
</tr>
<tr>
<td>ABILITY2</td>
<td>TGOALIT</td>
<td>.402</td>
<td>.006</td>
<td>4.040</td>
<td>.321</td>
</tr>
<tr>
<td></td>
<td>PERFAPPL</td>
<td>.192</td>
<td>.010</td>
<td>6.122</td>
<td>.476</td>
</tr>
<tr>
<td></td>
<td>PERAVLIT</td>
<td>.307</td>
<td>.008</td>
<td>4.827</td>
<td>.380</td>
</tr>
<tr>
<td>NUM2</td>
<td>TGOALIT</td>
<td>.608</td>
<td>.004</td>
<td>2.708</td>
<td>.221</td>
</tr>
<tr>
<td></td>
<td>PERFAPPL</td>
<td>.011</td>
<td>.020</td>
<td>13.074</td>
<td>.836</td>
</tr>
<tr>
<td></td>
<td>PERAVLIT</td>
<td>.112</td>
<td>.012</td>
<td>7.535</td>
<td>.672</td>
</tr>
<tr>
<td>GRADE</td>
<td>TGOALIT</td>
<td>.643</td>
<td>.000</td>
<td>.215</td>
<td>.075</td>
</tr>
<tr>
<td></td>
<td>PERFAPPL</td>
<td>.079</td>
<td>.005</td>
<td>3.105</td>
<td>.421</td>
</tr>
<tr>
<td></td>
<td>PERAVLIT</td>
<td>.016</td>
<td>.009</td>
<td>5.814</td>
<td>.673</td>
</tr>
<tr>
<td>GENDER</td>
<td>TGOALIT</td>
<td>.141</td>
<td>.003</td>
<td>2.169</td>
<td>.312</td>
</tr>
<tr>
<td></td>
<td>PERFAPPL</td>
<td>.837</td>
<td>.000</td>
<td>.042</td>
<td>.055</td>
</tr>
<tr>
<td></td>
<td>PERAVLIT</td>
<td>.663</td>
<td>.000</td>
<td>.190</td>
<td>.072</td>
</tr>
<tr>
<td>SCHOOLID</td>
<td>TGOALIT</td>
<td>.235</td>
<td>.007</td>
<td>4.270</td>
<td>.379</td>
</tr>
<tr>
<td></td>
<td>PERFAPPL</td>
<td>.095</td>
<td>.010</td>
<td>6.385</td>
<td>.543</td>
</tr>
<tr>
<td></td>
<td>PERAVLIT</td>
<td>.777</td>
<td>.002</td>
<td>1.102</td>
<td>.123</td>
</tr>
<tr>
<td>ESBID</td>
<td>TGOALIT</td>
<td>.829</td>
<td>.000</td>
<td>.047</td>
<td>.055</td>
</tr>
<tr>
<td></td>
<td>PERFAPPL</td>
<td>.990</td>
<td>.000</td>
<td>.000</td>
<td>.050</td>
</tr>
<tr>
<td></td>
<td>PERAVLIT</td>
<td>.049</td>
<td>.006</td>
<td>3.886</td>
<td>.503</td>
</tr>
<tr>
<td>CLU3_1 * ABILITY2</td>
<td>TGOALIT</td>
<td>.584</td>
<td>.010</td>
<td>6.571</td>
<td>.387</td>
</tr>
<tr>
<td></td>
<td>PERFAPPL</td>
<td>.562</td>
<td>.011</td>
<td>6.777</td>
<td>.399</td>
</tr>
<tr>
<td></td>
<td>PERAVLIT</td>
<td>.396</td>
<td>.013</td>
<td>8.415</td>
<td>.495</td>
</tr>
<tr>
<td>CLU3_1 * NUM2</td>
<td>TGOALIT</td>
<td>.206</td>
<td>.017</td>
<td>10.970</td>
<td>.630</td>
</tr>
<tr>
<td></td>
<td>PERFAPPL</td>
<td>.691</td>
<td>.009</td>
<td>5.606</td>
<td>.329</td>
</tr>
<tr>
<td></td>
<td>PERAVLIT</td>
<td>.030</td>
<td>.027</td>
<td>17.129</td>
<td>.654</td>
</tr>
<tr>
<td>CLU3_1 * GRADE</td>
<td>TGOALIT</td>
<td>.090</td>
<td>.008</td>
<td>4.839</td>
<td>.488</td>
</tr>
<tr>
<td></td>
<td>PERFAPPL</td>
<td>.019</td>
<td>.013</td>
<td>8.003</td>
<td>.716</td>
</tr>
<tr>
<td></td>
<td>PERAVLIT</td>
<td>.733</td>
<td>.001</td>
<td>.621</td>
<td>.099</td>
</tr>
<tr>
<td>CLU3_1 * GENDER</td>
<td>TGOALIT</td>
<td>.546</td>
<td>.002</td>
<td>1.211</td>
<td>.151</td>
</tr>
<tr>
<td></td>
<td>PERFAPPL</td>
<td>.249</td>
<td>.004</td>
<td>2.788</td>
<td>.300</td>
</tr>
<tr>
<td></td>
<td>PERAVLIT</td>
<td>.224</td>
<td>.005</td>
<td>2.995</td>
<td>.320</td>
</tr>
<tr>
<td>CLU3_1 * SCHOOLID</td>
<td>TGOALIT</td>
<td>.170</td>
<td>.014</td>
<td>9.098</td>
<td>.590</td>
</tr>
<tr>
<td></td>
<td>PERFAPPL</td>
<td>.112</td>
<td>.016</td>
<td>10.375</td>
<td>.658</td>
</tr>
<tr>
<td></td>
<td>PERAVLIT</td>
<td>.114</td>
<td>.016</td>
<td>10.307</td>
<td>.654</td>
</tr>
<tr>
<td>CLU3_1 * ESBID</td>
<td>TGOALIT</td>
<td>.893</td>
<td>.000</td>
<td>.227</td>
<td>.067</td>
</tr>
<tr>
<td></td>
<td>PERFAPPL</td>
<td>.449</td>
<td>.003</td>
<td>1.603</td>
<td>.187</td>
</tr>
<tr>
<td></td>
<td>PERAVLIT</td>
<td>.920</td>
<td>.000</td>
<td>.166</td>
<td>.063</td>
</tr>
<tr>
<td>ABILITY2 * NUM2</td>
<td>TGOALIT</td>
<td>.908</td>
<td>.014</td>
<td>9.994</td>
<td>.394</td>
</tr>
<tr>
<td></td>
<td>PERFAPPL</td>
<td>.343</td>
<td>.028</td>
<td>17.728</td>
<td>.745</td>
</tr>
<tr>
<td></td>
<td>PERAVLIT</td>
<td>.093</td>
<td>.037</td>
<td>24.023</td>
<td>.891</td>
</tr>
<tr>
<td>ABILITY2 * GRADE</td>
<td>TGOALIT</td>
<td>.495</td>
<td>.005</td>
<td>3.393</td>
<td>.272</td>
</tr>
<tr>
<td></td>
<td>PERFAPPL</td>
<td>.548</td>
<td>.005</td>
<td>3.080</td>
<td>.247</td>
</tr>
<tr>
<td></td>
<td>PERAVLIT</td>
<td>.915</td>
<td>.002</td>
<td>.967</td>
<td>.103</td>
</tr>
<tr>
<td>ABILITY2 * GENDER</td>
<td>TGOALIT</td>
<td>.359</td>
<td>.007</td>
<td>4.370</td>
<td>.346</td>
</tr>
<tr>
<td></td>
<td>PERFAPPL</td>
<td>.351</td>
<td>.007</td>
<td>4.436</td>
<td>.351</td>
</tr>
<tr>
<td></td>
<td>PERAVLIT</td>
<td>.550</td>
<td>.005</td>
<td>3.049</td>
<td>.246</td>
</tr>
</tbody>
</table>
### Tests of Between-Subjects Effects

<table>
<thead>
<tr>
<th>Source</th>
<th>Dependent Variable</th>
<th>Sig.</th>
<th>Partial Eta Squared</th>
<th>Noncent. Parameter</th>
<th>Observed Power</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>ABILITY2 * SCHOOLID</strong></td>
<td>TGOALIT</td>
<td>.469</td>
<td>.018</td>
<td>11.729</td>
<td>.580</td>
</tr>
<tr>
<td></td>
<td>PERFAPPL</td>
<td>.884</td>
<td>.010</td>
<td>6.668</td>
<td>.320</td>
</tr>
<tr>
<td></td>
<td>PERAVLIT</td>
<td>.906</td>
<td>.010</td>
<td>6.168</td>
<td>.300</td>
</tr>
<tr>
<td><strong>ABILITY2 * ESBid</strong></td>
<td>TGOALIT</td>
<td>.339</td>
<td>.007</td>
<td>4.538</td>
<td>.359</td>
</tr>
<tr>
<td></td>
<td>PERFAPPL</td>
<td>.641</td>
<td>.004</td>
<td>2.521</td>
<td>.207</td>
</tr>
<tr>
<td></td>
<td>PERAVLIT</td>
<td>.339</td>
<td>.007</td>
<td>4.543</td>
<td>.359</td>
</tr>
<tr>
<td><strong>NUM2 * GRADE</strong></td>
<td>TGOALIT</td>
<td>.895</td>
<td>.002</td>
<td>1.095</td>
<td>.111</td>
</tr>
<tr>
<td></td>
<td>PERFAPPL</td>
<td>.710</td>
<td>.003</td>
<td>2.142</td>
<td>.180</td>
</tr>
<tr>
<td></td>
<td>PERAVLIT</td>
<td>.722</td>
<td>.003</td>
<td>2.077</td>
<td>.176</td>
</tr>
<tr>
<td><strong>NUM2 * GENDER</strong></td>
<td>TGOALIT</td>
<td>.849</td>
<td>.002</td>
<td>1.374</td>
<td>.128</td>
</tr>
<tr>
<td></td>
<td>PERFAPPL</td>
<td>.137</td>
<td>.011</td>
<td>7.011</td>
<td>.537</td>
</tr>
<tr>
<td></td>
<td>PERAVLIT</td>
<td>.623</td>
<td>.004</td>
<td>2.623</td>
<td>.215</td>
</tr>
<tr>
<td><strong>NUM2 * SCHOOLID</strong></td>
<td>TGOALIT</td>
<td>.716</td>
<td>.014</td>
<td>8.837</td>
<td>.438</td>
</tr>
<tr>
<td></td>
<td>PERFAPPL</td>
<td>.258</td>
<td>.023</td>
<td>14.753</td>
<td>.706</td>
</tr>
<tr>
<td></td>
<td>PERAVLIT</td>
<td>.628</td>
<td>.016</td>
<td>9.866</td>
<td>.490</td>
</tr>
<tr>
<td><strong>NUM2 * ESBid</strong></td>
<td>TGOALIT</td>
<td>.752</td>
<td>.003</td>
<td>1.909</td>
<td>.164</td>
</tr>
<tr>
<td></td>
<td>PERFAPPL</td>
<td>.100</td>
<td>.012</td>
<td>7.819</td>
<td>.590</td>
</tr>
<tr>
<td></td>
<td>PERAVLIT</td>
<td>.106</td>
<td>.012</td>
<td>7.655</td>
<td>.579</td>
</tr>
<tr>
<td><strong>GRADE * GENDER</strong></td>
<td>TGOALIT</td>
<td>.034</td>
<td>.007</td>
<td>4.502</td>
<td>.563</td>
</tr>
<tr>
<td></td>
<td>PERFAPPL</td>
<td>.771</td>
<td>.000</td>
<td>0.85</td>
<td>.060</td>
</tr>
<tr>
<td></td>
<td>PERAVLIT</td>
<td>.612</td>
<td>.000</td>
<td>2.58</td>
<td>.080</td>
</tr>
<tr>
<td><strong>GRADE * SCHOOLID</strong></td>
<td>TGOALIT</td>
<td>.158</td>
<td>.008</td>
<td>5.214</td>
<td>.455</td>
</tr>
<tr>
<td></td>
<td>PERFAPPL</td>
<td>.751</td>
<td>.002</td>
<td>1.208</td>
<td>.130</td>
</tr>
<tr>
<td></td>
<td>PERAVLIT</td>
<td>.863</td>
<td>.001</td>
<td>0.742</td>
<td>.097</td>
</tr>
<tr>
<td><strong>GRADE * ESBid</strong></td>
<td>TGOALIT</td>
<td>.700</td>
<td>.000</td>
<td>0.149</td>
<td>.067</td>
</tr>
<tr>
<td></td>
<td>PERFAPPL</td>
<td>.754</td>
<td>.000</td>
<td>0.999</td>
<td>.061</td>
</tr>
<tr>
<td></td>
<td>PERAVLIT</td>
<td>.622</td>
<td>.000</td>
<td>0.244</td>
<td>.078</td>
</tr>
<tr>
<td><strong>GENDER * SCHOOLID</strong></td>
<td>TGOALIT</td>
<td>.197</td>
<td>.005</td>
<td>3.255</td>
<td>.344</td>
</tr>
<tr>
<td></td>
<td>PERFAPPL</td>
<td>.683</td>
<td>.001</td>
<td>0.762</td>
<td>.112</td>
</tr>
<tr>
<td></td>
<td>PERAVLIT</td>
<td>.376</td>
<td>.003</td>
<td>1.957</td>
<td>.221</td>
</tr>
<tr>
<td><strong>GENDER * ESBid</strong></td>
<td>TGOALIT</td>
<td>.778</td>
<td>.000</td>
<td>0.800</td>
<td>.059</td>
</tr>
<tr>
<td></td>
<td>PERFAPPL</td>
<td>.354</td>
<td>.001</td>
<td>0.860</td>
<td>.153</td>
</tr>
<tr>
<td></td>
<td>PERAVLIT</td>
<td>.522</td>
<td>.001</td>
<td>0.410</td>
<td>.098</td>
</tr>
<tr>
<td><strong>SCHOOLID * ESBid</strong></td>
<td>TGOALIT</td>
<td>.227</td>
<td>.007</td>
<td>4.351</td>
<td>.385</td>
</tr>
<tr>
<td></td>
<td>PERFAPPL</td>
<td>.783</td>
<td>.002</td>
<td>1.076</td>
<td>.121</td>
</tr>
<tr>
<td></td>
<td>PERAVLIT</td>
<td>.902</td>
<td>.001</td>
<td>0.575</td>
<td>.086</td>
</tr>
</tbody>
</table>

Error
- TGOALIT
- PERFAPPL
- PERAVLIT

Total
- TGOALIT
- PERFAPPL
- PERAVLIT

Corrected Total
- TGOALIT
- PERFAPPL
- PERAVLIT

---

a. Computed using alpha = .05
b. R Squared = .267 (Adjusted R Squared = .127)
c. R Squared = .261 (Adjusted R Squared = .120)
d. R Squared = .294 (Adjusted R Squared = .160)
APPENDIX I.4

SPSS MANOVA

NUMERACY GOAL ORIENTATIONS
## Between-Subjects Factors

<table>
<thead>
<tr>
<th></th>
<th>Value Label</th>
<th>N</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ward</td>
<td>1</td>
<td>290</td>
</tr>
<tr>
<td>Method</td>
<td>2</td>
<td>263</td>
</tr>
<tr>
<td></td>
<td>3</td>
<td>179</td>
</tr>
<tr>
<td>ABILITY2</td>
<td>1.00</td>
<td>137</td>
</tr>
<tr>
<td></td>
<td>2.00</td>
<td>156</td>
</tr>
<tr>
<td></td>
<td>3.00</td>
<td>156</td>
</tr>
<tr>
<td></td>
<td>4.00</td>
<td>137</td>
</tr>
<tr>
<td></td>
<td>5.00</td>
<td>146</td>
</tr>
<tr>
<td>NUM2</td>
<td>1.00</td>
<td>149</td>
</tr>
<tr>
<td></td>
<td>2.00</td>
<td>145</td>
</tr>
<tr>
<td></td>
<td>3.00</td>
<td>154</td>
</tr>
<tr>
<td></td>
<td>4.00</td>
<td>146</td>
</tr>
<tr>
<td></td>
<td>5.00</td>
<td>138</td>
</tr>
<tr>
<td>GRADE</td>
<td>1</td>
<td>348</td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>384</td>
</tr>
<tr>
<td>GENDER</td>
<td>1.0</td>
<td>Female 270</td>
</tr>
<tr>
<td></td>
<td>2.0</td>
<td>Male 462</td>
</tr>
<tr>
<td>SCHOOLID</td>
<td>1.0</td>
<td>K 86</td>
</tr>
<tr>
<td></td>
<td>2.0</td>
<td>B 398</td>
</tr>
<tr>
<td></td>
<td>3.0</td>
<td>Kg 215</td>
</tr>
<tr>
<td></td>
<td>4.0</td>
<td>Scgs 53</td>
</tr>
<tr>
<td>ESBID</td>
<td>1</td>
<td>591</td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>141</td>
</tr>
<tr>
<td>Effect</td>
<td>Value</td>
<td>F</td>
</tr>
<tr>
<td>---------------</td>
<td>-------</td>
<td>-----------</td>
</tr>
<tr>
<td>Intercept</td>
<td>.748</td>
<td>604.131b</td>
</tr>
<tr>
<td></td>
<td>.252</td>
<td>604.131b</td>
</tr>
<tr>
<td></td>
<td>2.971</td>
<td>604.131b</td>
</tr>
<tr>
<td></td>
<td>2.971</td>
<td>604.131b</td>
</tr>
<tr>
<td>CLU3_1</td>
<td>.048</td>
<td>4.979</td>
</tr>
<tr>
<td></td>
<td>.953</td>
<td>4.975b</td>
</tr>
<tr>
<td></td>
<td>.049</td>
<td>4.970</td>
</tr>
<tr>
<td></td>
<td>.031</td>
<td>6.256c</td>
</tr>
<tr>
<td>ABILITY2</td>
<td>.021</td>
<td>1.081</td>
</tr>
<tr>
<td></td>
<td>.979</td>
<td>1.060</td>
</tr>
<tr>
<td></td>
<td>.021</td>
<td>1.079</td>
</tr>
<tr>
<td></td>
<td>.013</td>
<td>2.036c</td>
</tr>
<tr>
<td>NUM2</td>
<td>.040</td>
<td>2.046</td>
</tr>
<tr>
<td></td>
<td>.961</td>
<td>2.050</td>
</tr>
<tr>
<td></td>
<td>.040</td>
<td>2.052</td>
</tr>
<tr>
<td></td>
<td>.026</td>
<td>4.051c</td>
</tr>
<tr>
<td>GRADE</td>
<td>.014</td>
<td>2.827b</td>
</tr>
<tr>
<td></td>
<td>.986</td>
<td>2.827b</td>
</tr>
<tr>
<td></td>
<td>.014</td>
<td>2.827b</td>
</tr>
<tr>
<td></td>
<td>.014</td>
<td>2.827b</td>
</tr>
<tr>
<td>GENDER</td>
<td>.002</td>
<td>.489b</td>
</tr>
<tr>
<td></td>
<td>.998</td>
<td>.489b</td>
</tr>
<tr>
<td></td>
<td>.002</td>
<td>.489b</td>
</tr>
<tr>
<td></td>
<td>.002</td>
<td>.489b</td>
</tr>
<tr>
<td>SCHOOLID</td>
<td>.017</td>
<td>1.172</td>
</tr>
<tr>
<td></td>
<td>.983</td>
<td>1.173</td>
</tr>
<tr>
<td></td>
<td>.017</td>
<td>1.174</td>
</tr>
<tr>
<td></td>
<td>.015</td>
<td>2.981c</td>
</tr>
<tr>
<td>ESBID</td>
<td>.015</td>
<td>3.054b</td>
</tr>
<tr>
<td></td>
<td>.985</td>
<td>3.054b</td>
</tr>
<tr>
<td></td>
<td>.015</td>
<td>3.054b</td>
</tr>
<tr>
<td></td>
<td>.015</td>
<td>3.054b</td>
</tr>
<tr>
<td>CLU3_1 * ABILITY2</td>
<td>.065</td>
<td>1.698</td>
</tr>
<tr>
<td></td>
<td>.936</td>
<td>1.699</td>
</tr>
<tr>
<td></td>
<td>.067</td>
<td>1.700</td>
</tr>
<tr>
<td></td>
<td>.038</td>
<td>2.945c</td>
</tr>
<tr>
<td>CLU3_1 * NUM2</td>
<td>.055</td>
<td>1.432</td>
</tr>
<tr>
<td></td>
<td>.946</td>
<td>1.435</td>
</tr>
<tr>
<td></td>
<td>.057</td>
<td>1.439</td>
</tr>
<tr>
<td></td>
<td>.036</td>
<td>2.735c</td>
</tr>
<tr>
<td>CLU3_1 * GRADE</td>
<td>.009</td>
<td>.921</td>
</tr>
<tr>
<td></td>
<td>.991</td>
<td>.920b</td>
</tr>
<tr>
<td></td>
<td>.009</td>
<td>.919</td>
</tr>
<tr>
<td></td>
<td>.006</td>
<td>1.323c</td>
</tr>
<tr>
<td>CLU3_1 * GENDER</td>
<td>.013</td>
<td>1.308</td>
</tr>
<tr>
<td></td>
<td>.987</td>
<td>1.308b</td>
</tr>
<tr>
<td></td>
<td>.013</td>
<td>1.308</td>
</tr>
<tr>
<td></td>
<td>.011</td>
<td>2.233c</td>
</tr>
<tr>
<td>CLU3_1 * SCHOOLID</td>
<td>.022</td>
<td>.737</td>
</tr>
<tr>
<td></td>
<td>.979</td>
<td>.737</td>
</tr>
<tr>
<td></td>
<td>.022</td>
<td>.737</td>
</tr>
<tr>
<td></td>
<td>.015</td>
<td>1.540c</td>
</tr>
<tr>
<td>Effect</td>
<td>Value</td>
<td>F</td>
</tr>
<tr>
<td>-------------------------</td>
<td>--------</td>
<td>-------</td>
</tr>
<tr>
<td><strong>CLU3_1 * ESBID</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pillai's Trace</td>
<td>.006</td>
<td>.582</td>
</tr>
<tr>
<td>Wilks' Lambda</td>
<td>.994</td>
<td>.581</td>
</tr>
<tr>
<td>Hotelling's Trace</td>
<td>.006</td>
<td>.581</td>
</tr>
<tr>
<td>Roy's Largest Root</td>
<td>.005</td>
<td>1.056</td>
</tr>
<tr>
<td><strong>ABILITY2 * NUM2</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pillai's Trace</td>
<td>.075</td>
<td>.975</td>
</tr>
<tr>
<td>Wilks' Lambda</td>
<td>.927</td>
<td>.974</td>
</tr>
<tr>
<td>Hotelling's Trace</td>
<td>.077</td>
<td>.973</td>
</tr>
<tr>
<td>Roy's Largest Root</td>
<td>.037</td>
<td>1.419</td>
</tr>
<tr>
<td><strong>ABILITY2 * GRADE</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pillai's Trace</td>
<td>.020</td>
<td>1.025</td>
</tr>
<tr>
<td>Wilks' Lambda</td>
<td>.980</td>
<td>1.026</td>
</tr>
<tr>
<td>Hotelling's Trace</td>
<td>.020</td>
<td>1.027</td>
</tr>
<tr>
<td>Roy's Largest Root</td>
<td>.017</td>
<td>2.562</td>
</tr>
<tr>
<td><strong>ABILITY2 * GENDER</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pillai's Trace</td>
<td>.030</td>
<td>1.521</td>
</tr>
<tr>
<td>Wilks' Lambda</td>
<td>.971</td>
<td>1.531</td>
</tr>
<tr>
<td>Hotelling's Trace</td>
<td>.030</td>
<td>1.540</td>
</tr>
<tr>
<td>Roy's Largest Root</td>
<td>.029</td>
<td>4.451</td>
</tr>
<tr>
<td><strong>ABILITY2 * SCHOOLID</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pillai's Trace</td>
<td>.067</td>
<td>.983</td>
</tr>
<tr>
<td>Wilks' Lambda</td>
<td>.944</td>
<td>.981</td>
</tr>
<tr>
<td>Hotelling's Trace</td>
<td>.058</td>
<td>.979</td>
</tr>
<tr>
<td>Roy's Largest Root</td>
<td>.025</td>
<td>1.298</td>
</tr>
<tr>
<td><strong>ABILITY2 * ESBID</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pillai's Trace</td>
<td>.024</td>
<td>1.250</td>
</tr>
<tr>
<td>Wilks' Lambda</td>
<td>.976</td>
<td>1.251</td>
</tr>
<tr>
<td>Hotelling's Trace</td>
<td>.025</td>
<td>1.250</td>
</tr>
<tr>
<td>Roy's Largest Root</td>
<td>.017</td>
<td>2.638</td>
</tr>
<tr>
<td><strong>NUM2 * GRADE</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pillai's Trace</td>
<td>.013</td>
<td>.673</td>
</tr>
<tr>
<td>Wilks' Lambda</td>
<td>.987</td>
<td>.673</td>
</tr>
<tr>
<td>Hotelling's Trace</td>
<td>.013</td>
<td>.673</td>
</tr>
<tr>
<td>Roy's Largest Root</td>
<td>.011</td>
<td>1.682</td>
</tr>
<tr>
<td><strong>NUM2 * GENDER</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pillai's Trace</td>
<td>.020</td>
<td>1.012</td>
</tr>
<tr>
<td>Wilks' Lambda</td>
<td>.980</td>
<td>1.010</td>
</tr>
<tr>
<td>Hotelling's Trace</td>
<td>.020</td>
<td>1.009</td>
</tr>
<tr>
<td>Roy's Largest Root</td>
<td>.013</td>
<td>1.915</td>
</tr>
<tr>
<td><strong>NUM2 * SCHOOLID</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pillai's Trace</td>
<td>.065</td>
<td>1.124</td>
</tr>
<tr>
<td>Wilks' Lambda</td>
<td>.937</td>
<td>1.122</td>
</tr>
<tr>
<td>Hotelling's Trace</td>
<td>.066</td>
<td>1.120</td>
</tr>
<tr>
<td>Roy's Largest Root</td>
<td>.028</td>
<td>1.411</td>
</tr>
<tr>
<td><strong>NUM2 * ESBID</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pillai's Trace</td>
<td>.028</td>
<td>1.424</td>
</tr>
<tr>
<td>Wilks' Lambda</td>
<td>.972</td>
<td>1.425</td>
</tr>
<tr>
<td>Hotelling's Trace</td>
<td>.028</td>
<td>1.426</td>
</tr>
<tr>
<td>Roy's Largest Root</td>
<td>.020</td>
<td>3.065</td>
</tr>
<tr>
<td><strong>GRADE * GENDER</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pillai's Trace</td>
<td>.008</td>
<td>1.718</td>
</tr>
<tr>
<td>Wilks' Lambda</td>
<td>.992</td>
<td>1.718</td>
</tr>
<tr>
<td>Hotelling's Trace</td>
<td>.008</td>
<td>1.718</td>
</tr>
<tr>
<td>Roy's Largest Root</td>
<td>.008</td>
<td>1.718</td>
</tr>
<tr>
<td><strong>GRADE * SCHOOLID</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pillai's Trace</td>
<td>.017</td>
<td>1.176</td>
</tr>
<tr>
<td>Wilks' Lambda</td>
<td>.983</td>
<td>1.177</td>
</tr>
<tr>
<td>Hotelling's Trace</td>
<td>.017</td>
<td>1.176</td>
</tr>
<tr>
<td>Roy's Largest Root</td>
<td>.016</td>
<td>3.037</td>
</tr>
<tr>
<td><strong>GRADE * ESBID</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pillai's Trace</td>
<td>.001</td>
<td>.245</td>
</tr>
<tr>
<td>Wilks' Lambda</td>
<td>.999</td>
<td>.245</td>
</tr>
<tr>
<td>Hotelling's Trace</td>
<td>.001</td>
<td>.245</td>
</tr>
<tr>
<td>Roy's Largest Root</td>
<td>.001</td>
<td>.245</td>
</tr>
<tr>
<td>Effect</td>
<td>Value</td>
<td>F</td>
</tr>
<tr>
<td>----------------</td>
<td>-------</td>
<td>-------</td>
</tr>
<tr>
<td><strong>GENDER * SCHOOLID</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pillai's Trace</td>
<td>.003</td>
<td>.337</td>
</tr>
<tr>
<td>Wilks' Lambda</td>
<td>.997</td>
<td>.337</td>
</tr>
<tr>
<td>Hotelling's Trace</td>
<td>.003</td>
<td>.337</td>
</tr>
<tr>
<td>Roy's Largest Root</td>
<td>.003</td>
<td>.602</td>
</tr>
<tr>
<td><strong>GENDER * ESBID</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pillai's Trace</td>
<td>.002</td>
<td>.418</td>
</tr>
<tr>
<td>Wilks' Lambda</td>
<td>.998</td>
<td>.418</td>
</tr>
<tr>
<td>Hotelling's Trace</td>
<td>.002</td>
<td>.418</td>
</tr>
<tr>
<td>Roy's Largest Root</td>
<td>.002</td>
<td>.418</td>
</tr>
<tr>
<td><strong>SCHOOLID * ESBID</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pillai's Trace</td>
<td>.005</td>
<td>.344</td>
</tr>
<tr>
<td>Wilks' Lambda</td>
<td>.995</td>
<td>.343</td>
</tr>
<tr>
<td>Hotelling's Trace</td>
<td>.005</td>
<td>.342</td>
</tr>
<tr>
<td>Roy's Largest Root</td>
<td>.003</td>
<td>.572</td>
</tr>
<tr>
<td>Effect</td>
<td>Sig.</td>
<td>Partial Eta Squared</td>
</tr>
<tr>
<td>-------------</td>
<td>------</td>
<td>---------------------</td>
</tr>
<tr>
<td>Intercept</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>.000</td>
<td>.748</td>
</tr>
<tr>
<td></td>
<td>.000</td>
<td>.748</td>
</tr>
<tr>
<td></td>
<td>.000</td>
<td>.748</td>
</tr>
<tr>
<td></td>
<td>.000</td>
<td>.748</td>
</tr>
<tr>
<td>CLU3_1</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>.000</td>
<td>.024</td>
</tr>
<tr>
<td></td>
<td>.000</td>
<td>.024</td>
</tr>
<tr>
<td></td>
<td>.000</td>
<td>.024</td>
</tr>
<tr>
<td></td>
<td>.000</td>
<td>.030</td>
</tr>
<tr>
<td>ABILITY2</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>.372</td>
<td>.007</td>
</tr>
<tr>
<td></td>
<td>.373</td>
<td>.007</td>
</tr>
<tr>
<td></td>
<td>.374</td>
<td>.007</td>
</tr>
<tr>
<td></td>
<td>.088</td>
<td>.013</td>
</tr>
<tr>
<td>NUM2</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>.018</td>
<td>.013</td>
</tr>
<tr>
<td></td>
<td>.017</td>
<td>.013</td>
</tr>
<tr>
<td></td>
<td>.017</td>
<td>.013</td>
</tr>
<tr>
<td></td>
<td>.003</td>
<td>.026</td>
</tr>
<tr>
<td>GRADE</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>.038</td>
<td>.014</td>
</tr>
<tr>
<td></td>
<td>.038</td>
<td>.014</td>
</tr>
<tr>
<td></td>
<td>.038</td>
<td>.014</td>
</tr>
<tr>
<td></td>
<td>.038</td>
<td>.014</td>
</tr>
<tr>
<td>GENDER</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>.690</td>
<td>.002</td>
</tr>
<tr>
<td></td>
<td>.690</td>
<td>.002</td>
</tr>
<tr>
<td></td>
<td>.690</td>
<td>.002</td>
</tr>
<tr>
<td></td>
<td>.690</td>
<td>.002</td>
</tr>
<tr>
<td>SCHOOLID</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>.309</td>
<td>.006</td>
</tr>
<tr>
<td></td>
<td>.308</td>
<td>.006</td>
</tr>
<tr>
<td></td>
<td>.308</td>
<td>.006</td>
</tr>
<tr>
<td></td>
<td>.031</td>
<td>.014</td>
</tr>
<tr>
<td>ESBID</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>.028</td>
<td>.015</td>
</tr>
<tr>
<td></td>
<td>.028</td>
<td>.015</td>
</tr>
<tr>
<td></td>
<td>.028</td>
<td>.015</td>
</tr>
<tr>
<td></td>
<td>.028</td>
<td>.015</td>
</tr>
<tr>
<td>CLU3_1 * ABILITY2</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>.019</td>
<td>.022</td>
</tr>
<tr>
<td></td>
<td>.019</td>
<td>.022</td>
</tr>
<tr>
<td></td>
<td>.019</td>
<td>.022</td>
</tr>
<tr>
<td></td>
<td>.003</td>
<td>.037</td>
</tr>
<tr>
<td>CLU3_1 * NUM2</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>.080</td>
<td>.018</td>
</tr>
<tr>
<td></td>
<td>.079</td>
<td>.018</td>
</tr>
<tr>
<td></td>
<td>.078</td>
<td>.019</td>
</tr>
<tr>
<td></td>
<td>.006</td>
<td>.035</td>
</tr>
<tr>
<td>CLU3_1 * GRADE</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>.479</td>
<td>.005</td>
</tr>
<tr>
<td></td>
<td>.480</td>
<td>.005</td>
</tr>
<tr>
<td></td>
<td>.480</td>
<td>.005</td>
</tr>
<tr>
<td></td>
<td>.266</td>
<td>.006</td>
</tr>
<tr>
<td>CLU3_1 * GENDER</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>.250</td>
<td>.006</td>
</tr>
<tr>
<td></td>
<td>.250</td>
<td>.006</td>
</tr>
<tr>
<td></td>
<td>.251</td>
<td>.006</td>
</tr>
<tr>
<td></td>
<td>.083</td>
<td>.011</td>
</tr>
<tr>
<td>CLU3_1 * SCHOOLID</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>.774</td>
<td>.007</td>
</tr>
<tr>
<td></td>
<td>.775</td>
<td>.007</td>
</tr>
<tr>
<td></td>
<td>.775</td>
<td>.007</td>
</tr>
<tr>
<td></td>
<td>.162</td>
<td>.015</td>
</tr>
<tr>
<td>Effect</td>
<td>Sig.</td>
<td>Partial Eta Squared</td>
</tr>
<tr>
<td>------------------</td>
<td>------</td>
<td>----------------------</td>
</tr>
<tr>
<td><strong>CLU3_1 * ESBI2</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pillai's Trace</td>
<td>.745</td>
<td>.003</td>
</tr>
<tr>
<td>Wilks' Lambda</td>
<td>.745</td>
<td>.003</td>
</tr>
<tr>
<td>Hotelling's Trace</td>
<td>.746</td>
<td>.003</td>
</tr>
<tr>
<td>Roy's Largest Root</td>
<td>.367</td>
<td>.005</td>
</tr>
<tr>
<td><strong>ABILITY2 * NUM2</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pillai's Trace</td>
<td>.523</td>
<td>.025</td>
</tr>
<tr>
<td>Wilks' Lambda</td>
<td>.524</td>
<td>.025</td>
</tr>
<tr>
<td>Hotelling's Trace</td>
<td>.526</td>
<td>.025</td>
</tr>
<tr>
<td>Roy's Largest Root</td>
<td>.127</td>
<td>.036</td>
</tr>
<tr>
<td><strong>ABILITY2 * GRADE</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pillai's Trace</td>
<td>.422</td>
<td>.007</td>
</tr>
<tr>
<td>Wilks' Lambda</td>
<td>.421</td>
<td>.007</td>
</tr>
<tr>
<td>Hotelling's Trace</td>
<td>.421</td>
<td>.007</td>
</tr>
<tr>
<td>Roy's Largest Root</td>
<td>.037</td>
<td>.016</td>
</tr>
<tr>
<td><strong>ABILITY2 * GENDER</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pillai's Trace</td>
<td>.109</td>
<td>.010</td>
</tr>
<tr>
<td>Wilks' Lambda</td>
<td>.106</td>
<td>.010</td>
</tr>
<tr>
<td>Hotelling's Trace</td>
<td>.103</td>
<td>.010</td>
</tr>
<tr>
<td>Roy's Largest Root</td>
<td>.001</td>
<td>.028</td>
</tr>
<tr>
<td><strong>ABILITY2 * SCHOOL2</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pillai's Trace</td>
<td>.498</td>
<td>.019</td>
</tr>
<tr>
<td>Wilks' Lambda</td>
<td>.501</td>
<td>.019</td>
</tr>
<tr>
<td>Hotelling's Trace</td>
<td>.504</td>
<td>.019</td>
</tr>
<tr>
<td>Roy's Largest Root</td>
<td>.215</td>
<td>.025</td>
</tr>
<tr>
<td><strong>ABILITY2 * ESBI2</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pillai's Trace</td>
<td>.242</td>
<td>.008</td>
</tr>
<tr>
<td>Wilks' Lambda</td>
<td>.242</td>
<td>.008</td>
</tr>
<tr>
<td>Hotelling's Trace</td>
<td>.242</td>
<td>.008</td>
</tr>
<tr>
<td>Roy's Largest Root</td>
<td>.033</td>
<td>.017</td>
</tr>
<tr>
<td><strong>NUM2 * GRADE</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pillai's Trace</td>
<td>.779</td>
<td>.004</td>
</tr>
<tr>
<td>Wilks' Lambda</td>
<td>.779</td>
<td>.004</td>
</tr>
<tr>
<td>Hotelling's Trace</td>
<td>.779</td>
<td>.004</td>
</tr>
<tr>
<td>Roy's Largest Root</td>
<td>.153</td>
<td>.011</td>
</tr>
<tr>
<td><strong>NUM2 * GENDER</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pillai's Trace</td>
<td>.435</td>
<td>.007</td>
</tr>
<tr>
<td>Wilks' Lambda</td>
<td>.436</td>
<td>.007</td>
</tr>
<tr>
<td>Hotelling's Trace</td>
<td>.438</td>
<td>.007</td>
</tr>
<tr>
<td>Roy's Largest Root</td>
<td>.106</td>
<td>.012</td>
</tr>
<tr>
<td><strong>NUM2 * SCHOOL2</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pillai's Trace</td>
<td>.282</td>
<td>.022</td>
</tr>
<tr>
<td>Wilks' Lambda</td>
<td>.285</td>
<td>.022</td>
</tr>
<tr>
<td>Hotelling's Trace</td>
<td>.288</td>
<td>.022</td>
</tr>
<tr>
<td>Roy's Largest Root</td>
<td>.156</td>
<td>.027</td>
</tr>
<tr>
<td><strong>NUM2 * ESBI2</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pillai's Trace</td>
<td>.147</td>
<td>.009</td>
</tr>
<tr>
<td>Wilks' Lambda</td>
<td>.147</td>
<td>.009</td>
</tr>
<tr>
<td>Hotelling's Trace</td>
<td>.147</td>
<td>.009</td>
</tr>
<tr>
<td>Roy's Largest Root</td>
<td>.016</td>
<td>.020</td>
</tr>
<tr>
<td><strong>GRADE * GENDER</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pillai's Trace</td>
<td>.162</td>
<td>.008</td>
</tr>
<tr>
<td>Wilks' Lambda</td>
<td>.162</td>
<td>.008</td>
</tr>
<tr>
<td>Hotelling's Trace</td>
<td>.162</td>
<td>.008</td>
</tr>
<tr>
<td>Roy's Largest Root</td>
<td>.162</td>
<td>.008</td>
</tr>
<tr>
<td><strong>GRADE * SCHOOL2</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pillai's Trace</td>
<td>.306</td>
<td>.006</td>
</tr>
<tr>
<td>Wilks' Lambda</td>
<td>.305</td>
<td>.006</td>
</tr>
<tr>
<td>Hotelling's Trace</td>
<td>.305</td>
<td>.006</td>
</tr>
<tr>
<td>Roy's Largest Root</td>
<td>.029</td>
<td>.015</td>
</tr>
<tr>
<td><strong>GRADE * ESBI2</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pillai's Trace</td>
<td>.865</td>
<td>.001</td>
</tr>
<tr>
<td>Wilks' Lambda</td>
<td>.865</td>
<td>.001</td>
</tr>
<tr>
<td>Hotelling's Trace</td>
<td>.865</td>
<td>.001</td>
</tr>
<tr>
<td>Roy's Largest Root</td>
<td>.865</td>
<td>.001</td>
</tr>
<tr>
<td>Effect</td>
<td>Pillai's Trace</td>
<td>Wilks' Lambda</td>
</tr>
<tr>
<td>--------------------</td>
<td>----------------</td>
<td>---------------</td>
</tr>
<tr>
<td>GENDER * SCHOOLID</td>
<td>.917</td>
<td>.917</td>
</tr>
<tr>
<td></td>
<td>Hotelling's Trace</td>
<td>Roy's Largest Root</td>
</tr>
<tr>
<td></td>
<td>Roy's Largest Root</td>
<td></td>
</tr>
<tr>
<td>GENDER * ESBID</td>
<td>.740</td>
<td>.740</td>
</tr>
<tr>
<td></td>
<td>Hotelling's Trace</td>
<td>Roy's Largest Root</td>
</tr>
<tr>
<td></td>
<td>Roy's Largest Root</td>
<td></td>
</tr>
<tr>
<td>SCHOOLID * ESBID</td>
<td>.960</td>
<td>.961</td>
</tr>
<tr>
<td></td>
<td>Hotelling's Trace</td>
<td>Roy's Largest Root</td>
</tr>
<tr>
<td></td>
<td>Roy's Largest Root</td>
<td></td>
</tr>
</tbody>
</table>

a. Computed using alpha = .05
b. Exact statistic
c. The statistic is an upper bound on $F$ that yields a lower bound on the significance level.
d. Design: Intercept+CLU3_1+ABILITY2+NUM2+GRADE+GENDER+SCHOOLID+ESBID+CLU3_1 * ABILITY2+CLU3_1 * NUM2+CLU3_1 * GRADE+CLU3_1 * GENDER+CLU3_1 * SCHOOLID+CLU3_1 * ESBID+ABILITY2 * NUM2+ABILITY2 * GRADE+ABILITY2 * GENDER+ABILITY2 * SCHOOLID+ABILITY2 * ESBID+NUM2 * GRADE+NUM2 * GENDER+NUM2 * SCHOOLID+NUM2 * ESBID+GRADE * GENDER+GRADE * SCHOOLID+GRADE * ESBID+GENDER * SCHOOLID+GENDER * ESBID+SCHOOLID * ESBID

379
<table>
<thead>
<tr>
<th>Source</th>
<th>Dependent Variable</th>
<th>Type III Sum of Squares</th>
<th>df</th>
<th>Mean Square</th>
<th>F</th>
</tr>
</thead>
<tbody>
<tr>
<td>Corrected Model</td>
<td>TGALNUM</td>
<td>151.879&lt;sup&gt;b&lt;/sup&gt;</td>
<td>119</td>
<td>1.276</td>
<td>2.372</td>
</tr>
<tr>
<td></td>
<td>PERFAPNU</td>
<td>136.190&lt;sup&gt;c&lt;/sup&gt;</td>
<td>119</td>
<td>1.144</td>
<td>2.066</td>
</tr>
<tr>
<td></td>
<td>PERAVNUM</td>
<td>175.895&lt;sup&gt;d&lt;/sup&gt;</td>
<td>119</td>
<td>1.478</td>
<td>2.306</td>
</tr>
<tr>
<td>Intercept</td>
<td>TGALNUM</td>
<td>641.196</td>
<td>1</td>
<td>641.196</td>
<td>1191.494</td>
</tr>
<tr>
<td></td>
<td>PERFAPNU</td>
<td>640.290</td>
<td>1</td>
<td>640.290</td>
<td>1155.726</td>
</tr>
<tr>
<td></td>
<td>PERAVNUM</td>
<td>294.572</td>
<td>1</td>
<td>294.572</td>
<td>459.486</td>
</tr>
<tr>
<td>CLU3_1</td>
<td>TGALNUM</td>
<td>4.698</td>
<td>2</td>
<td>2.349</td>
<td>4.365</td>
</tr>
<tr>
<td></td>
<td>PERFAPNU</td>
<td>9.976</td>
<td>2</td>
<td>4.988</td>
<td>9.004</td>
</tr>
<tr>
<td></td>
<td>PERAVNUM</td>
<td>5.997</td>
<td>2</td>
<td>2.998</td>
<td>4.677</td>
</tr>
<tr>
<td>ABILITY2</td>
<td>TGALNUM</td>
<td>1.459</td>
<td>4</td>
<td>0.365</td>
<td>0.678</td>
</tr>
<tr>
<td></td>
<td>PERFAPNU</td>
<td>2.568</td>
<td>4</td>
<td>0.642</td>
<td>1.159</td>
</tr>
<tr>
<td></td>
<td>PERAVNUM</td>
<td>2.652</td>
<td>4</td>
<td>0.663</td>
<td>1.034</td>
</tr>
<tr>
<td>NUM2</td>
<td>TGALNUM</td>
<td>4.994</td>
<td>4</td>
<td>1.248</td>
<td>2.320</td>
</tr>
<tr>
<td></td>
<td>PERFAPNU</td>
<td>8.544</td>
<td>4</td>
<td>2.136</td>
<td>3.856</td>
</tr>
<tr>
<td></td>
<td>PERAVNUM</td>
<td>3.402</td>
<td>4</td>
<td>0.851</td>
<td>1.327</td>
</tr>
<tr>
<td>GRADE</td>
<td>TGALNUM</td>
<td>2.673</td>
<td>1</td>
<td>2.673</td>
<td>4.966</td>
</tr>
<tr>
<td></td>
<td>PERFAPNU</td>
<td>3.167</td>
<td>1</td>
<td>3.167</td>
<td>5.716</td>
</tr>
<tr>
<td></td>
<td>PERAVNUM</td>
<td>1.715</td>
<td>1</td>
<td>1.715</td>
<td>2.676</td>
</tr>
<tr>
<td>GENDER</td>
<td>TGALNUM</td>
<td>0.471</td>
<td>1</td>
<td>0.471</td>
<td>0.876</td>
</tr>
<tr>
<td></td>
<td>PERFAPNU</td>
<td>0.237</td>
<td>1</td>
<td>0.237</td>
<td>0.428</td>
</tr>
<tr>
<td></td>
<td>PERAVNUM</td>
<td>0.487</td>
<td>1</td>
<td>0.487</td>
<td>0.759</td>
</tr>
<tr>
<td>SCHOOLID</td>
<td>TGALNUM</td>
<td>1.332</td>
<td>3</td>
<td>0.444</td>
<td>0.825</td>
</tr>
<tr>
<td></td>
<td>PERFAPNU</td>
<td>1.867</td>
<td>3</td>
<td>0.622</td>
<td>1.124</td>
</tr>
<tr>
<td></td>
<td>PERAVNUM</td>
<td>1.543</td>
<td>3</td>
<td>0.514</td>
<td>0.802</td>
</tr>
<tr>
<td>ESBID</td>
<td>TGALNUM</td>
<td>3.005</td>
<td>1</td>
<td>3.005</td>
<td>5.585</td>
</tr>
<tr>
<td></td>
<td>PERFAPNU</td>
<td>0.721</td>
<td>1</td>
<td>0.721</td>
<td>1.301</td>
</tr>
<tr>
<td></td>
<td>PERAVNUM</td>
<td>2.833</td>
<td>1</td>
<td>2.833</td>
<td>4.419</td>
</tr>
<tr>
<td>CLU3_1 * ABILITY2</td>
<td>TGALNUM</td>
<td>6.514</td>
<td>8</td>
<td>0.814</td>
<td>1.513</td>
</tr>
<tr>
<td></td>
<td>PERFAPNU</td>
<td>7.916</td>
<td>8</td>
<td>0.990</td>
<td>1.786</td>
</tr>
<tr>
<td></td>
<td>PERAVNUM</td>
<td>6.029</td>
<td>8</td>
<td>0.754</td>
<td>1.176</td>
</tr>
<tr>
<td>CLU3_1 * NUM2</td>
<td>TGALNUM</td>
<td>4.906</td>
<td>8</td>
<td>0.613</td>
<td>1.139</td>
</tr>
<tr>
<td></td>
<td>PERFAPNU</td>
<td>2.291</td>
<td>8</td>
<td>0.286</td>
<td>0.517</td>
</tr>
<tr>
<td></td>
<td>PERAVNUM</td>
<td>11.751</td>
<td>8</td>
<td>1.469</td>
<td>2.291</td>
</tr>
<tr>
<td>CLU3_1 * GRADE</td>
<td>TGALNUM</td>
<td>1.916</td>
<td>2</td>
<td>0.958</td>
<td>1.780</td>
</tr>
<tr>
<td></td>
<td>PERFAPNU</td>
<td>1.452</td>
<td>2</td>
<td>0.726</td>
<td>1.310</td>
</tr>
<tr>
<td></td>
<td>PERAVNUM</td>
<td>0.244</td>
<td>2</td>
<td>0.122</td>
<td>0.190</td>
</tr>
<tr>
<td>CLU3_1 * GENDER</td>
<td>TGALNUM</td>
<td>0.336</td>
<td>2</td>
<td>0.168</td>
<td>0.312</td>
</tr>
<tr>
<td></td>
<td>PERFAPNU</td>
<td>2.280</td>
<td>2</td>
<td>1.140</td>
<td>2.058</td>
</tr>
<tr>
<td></td>
<td>PERAVNUM</td>
<td>0.856</td>
<td>2</td>
<td>0.428</td>
<td>0.668</td>
</tr>
<tr>
<td>CLU3_1 * SCHOOLID</td>
<td>TGALNUM</td>
<td>1.540</td>
<td>6</td>
<td>0.257</td>
<td>0.477</td>
</tr>
<tr>
<td></td>
<td>PERFAPNU</td>
<td>4.053</td>
<td>6</td>
<td>0.675</td>
<td>1.219</td>
</tr>
<tr>
<td></td>
<td>PERAVNUM</td>
<td>4.714</td>
<td>6</td>
<td>0.786</td>
<td>1.226</td>
</tr>
<tr>
<td>CLU3_1 * ESBID</td>
<td>TGALNUM</td>
<td>0.481</td>
<td>2</td>
<td>0.241</td>
<td>0.447</td>
</tr>
<tr>
<td></td>
<td>PERFAPNU</td>
<td>1.691</td>
<td>2</td>
<td>0.845</td>
<td>1.526</td>
</tr>
<tr>
<td></td>
<td>PERAVNUM</td>
<td>0.574</td>
<td>2</td>
<td>0.287</td>
<td>0.448</td>
</tr>
<tr>
<td>ABILITY2 * NUM2</td>
<td>TGALNUM</td>
<td>5.413</td>
<td>16</td>
<td>0.338</td>
<td>0.629</td>
</tr>
<tr>
<td></td>
<td>PERFAPNU</td>
<td>8.830</td>
<td>16</td>
<td>0.552</td>
<td>0.996</td>
</tr>
<tr>
<td></td>
<td>PERAVNUM</td>
<td>12.448</td>
<td>16</td>
<td>0.778</td>
<td>1.214</td>
</tr>
<tr>
<td>ABILITY2 * GRADE</td>
<td>TGALNUM</td>
<td>4.070</td>
<td>4</td>
<td>1.018</td>
<td>1.891</td>
</tr>
<tr>
<td></td>
<td>PERFAPNU</td>
<td>1.009</td>
<td>4</td>
<td>0.252</td>
<td>0.455</td>
</tr>
<tr>
<td></td>
<td>PERAVNUM</td>
<td>0.610</td>
<td>4</td>
<td>0.152</td>
<td>0.238</td>
</tr>
<tr>
<td>ABILITY2 * GENDER</td>
<td>TGALNUM</td>
<td>3.672</td>
<td>4</td>
<td>0.918</td>
<td>1.706</td>
</tr>
<tr>
<td></td>
<td>PERFAPNU</td>
<td>2.649</td>
<td>4</td>
<td>0.662</td>
<td>1.195</td>
</tr>
<tr>
<td></td>
<td>PERAVNUM</td>
<td>1.321</td>
<td>4</td>
<td>0.330</td>
<td>0.515</td>
</tr>
<tr>
<td>Source</td>
<td>Dependent Variable</td>
<td>Type III Sum of Squares</td>
<td>df</td>
<td>Mean Square</td>
<td>F</td>
</tr>
<tr>
<td>-----------------</td>
<td>--------------------</td>
<td>-------------------------</td>
<td>----</td>
<td>-------------</td>
<td>----</td>
</tr>
<tr>
<td>ABILITY2 * SCHOOLID</td>
<td>TGOALNUM</td>
<td>7.649</td>
<td>12</td>
<td>.637</td>
<td>1.185</td>
</tr>
<tr>
<td></td>
<td>PERFAPNU</td>
<td>4.440</td>
<td>12</td>
<td>.370</td>
<td>.668</td>
</tr>
<tr>
<td></td>
<td>PERAVNUM</td>
<td>6.427</td>
<td>12</td>
<td>.536</td>
<td>.835</td>
</tr>
<tr>
<td>ABILITY2 * ESBIID</td>
<td>TGOALNUM</td>
<td>3.534</td>
<td>4</td>
<td>.884</td>
<td>1.642</td>
</tr>
<tr>
<td></td>
<td>PERFAPNU</td>
<td>2.306</td>
<td>4</td>
<td>.576</td>
<td>1.041</td>
</tr>
<tr>
<td></td>
<td>PERAVNUM</td>
<td>5.423</td>
<td>4</td>
<td>1.356</td>
<td>2.115</td>
</tr>
<tr>
<td>NUM2 * GRADE</td>
<td>TGOALNUM</td>
<td>2.336</td>
<td>4</td>
<td>.584</td>
<td>1.085</td>
</tr>
<tr>
<td></td>
<td>PERFAPNU</td>
<td>1.699</td>
<td>4</td>
<td>.425</td>
<td>.767</td>
</tr>
<tr>
<td></td>
<td>PERAVNUM</td>
<td>.406</td>
<td>4</td>
<td>.102</td>
<td>.159</td>
</tr>
<tr>
<td>NUM2 * GENDER</td>
<td>TGOALNUM</td>
<td>1.252</td>
<td>4</td>
<td>.313</td>
<td>.581</td>
</tr>
<tr>
<td></td>
<td>PERFAPNU</td>
<td>4.156</td>
<td>4</td>
<td>1.039</td>
<td>1.878</td>
</tr>
<tr>
<td></td>
<td>PERAVNUM</td>
<td>1.955</td>
<td>4</td>
<td>.489</td>
<td>.763</td>
</tr>
<tr>
<td>NUM2 * SCHOOLID</td>
<td>TGOALNUM</td>
<td>6.227</td>
<td>12</td>
<td>.519</td>
<td>.964</td>
</tr>
<tr>
<td></td>
<td>PERFAPNU</td>
<td>8.251</td>
<td>12</td>
<td>.688</td>
<td>1.241</td>
</tr>
<tr>
<td></td>
<td>PERAVNUM</td>
<td>9.188</td>
<td>12</td>
<td>.766</td>
<td>1.194</td>
</tr>
<tr>
<td>NUM2 * ESBIID</td>
<td>TGOALNUM</td>
<td>2.397</td>
<td>4</td>
<td>.599</td>
<td>1.114</td>
</tr>
<tr>
<td></td>
<td>PERFAPNU</td>
<td>4.426</td>
<td>4</td>
<td>1.106</td>
<td>1.997</td>
</tr>
<tr>
<td></td>
<td>PERAVNUM</td>
<td>6.056</td>
<td>4</td>
<td>1.514</td>
<td>2.362</td>
</tr>
<tr>
<td>GRADE * GENDER</td>
<td>TGOALNUM</td>
<td>2.590</td>
<td>1</td>
<td>2.590</td>
<td>4.813</td>
</tr>
<tr>
<td></td>
<td>PERFAPNU</td>
<td>3.329E-02</td>
<td>1</td>
<td>3.329E-02</td>
<td>.060</td>
</tr>
<tr>
<td></td>
<td>PERAVNUM</td>
<td>2.601E-02</td>
<td>1</td>
<td>2.601E-02</td>
<td>.041</td>
</tr>
<tr>
<td>GRADE * SCHOOLID</td>
<td>TGOALNUM</td>
<td>.592</td>
<td>3</td>
<td>.197</td>
<td>.367</td>
</tr>
<tr>
<td></td>
<td>PERFAPNU</td>
<td>.610</td>
<td>3</td>
<td>.203</td>
<td>.367</td>
</tr>
<tr>
<td></td>
<td>PERAVNUM</td>
<td>3.274</td>
<td>3</td>
<td>1.091</td>
<td>1.702</td>
</tr>
<tr>
<td>GRADE * ESBIID</td>
<td>TGOALNUM</td>
<td>.325</td>
<td>1</td>
<td>.325</td>
<td>.604</td>
</tr>
<tr>
<td></td>
<td>PERFAPNU</td>
<td>9.998E-02</td>
<td>1</td>
<td>9.998E-02</td>
<td>.180</td>
</tr>
<tr>
<td></td>
<td>PERAVNUM</td>
<td>1.432E-02</td>
<td>1</td>
<td>1.432E-02</td>
<td>.022</td>
</tr>
<tr>
<td>GENDER * SCHOOLID</td>
<td>TGOALNUM</td>
<td>.111</td>
<td>2</td>
<td>5.547E-02</td>
<td>.103</td>
</tr>
<tr>
<td></td>
<td>PERFAPNU</td>
<td>.186</td>
<td>2</td>
<td>9.311E-02</td>
<td>.168</td>
</tr>
<tr>
<td></td>
<td>PERAVNUM</td>
<td>.983</td>
<td>2</td>
<td>.491</td>
<td>.786</td>
</tr>
<tr>
<td>GENDER * ESBIID</td>
<td>TGOALNUM</td>
<td>9.329E-05</td>
<td>1</td>
<td>9.329E-05</td>
<td>.000</td>
</tr>
<tr>
<td></td>
<td>PERFAPNU</td>
<td>.433</td>
<td>1</td>
<td>.433</td>
<td>.782</td>
</tr>
<tr>
<td></td>
<td>PERAVNUM</td>
<td>.539</td>
<td>1</td>
<td>.539</td>
<td>.841</td>
</tr>
<tr>
<td>SCHOOLID * ESBIID</td>
<td>TGOALNUM</td>
<td>.715</td>
<td>3</td>
<td>.238</td>
<td>.443</td>
</tr>
<tr>
<td></td>
<td>PERFAPNU</td>
<td>.625</td>
<td>3</td>
<td>.208</td>
<td>.376</td>
</tr>
<tr>
<td></td>
<td>PERAVNUM</td>
<td>.567</td>
<td>3</td>
<td>.189</td>
<td>.295</td>
</tr>
<tr>
<td>Error</td>
<td>TGOALNUM</td>
<td>329.344</td>
<td>612</td>
<td>.538</td>
<td></td>
</tr>
<tr>
<td></td>
<td>PERFAPNU</td>
<td>339.058</td>
<td>612</td>
<td>.554</td>
<td></td>
</tr>
<tr>
<td></td>
<td>PERAVNUM</td>
<td>392.347</td>
<td>612</td>
<td>.641</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>TGOALNUM</td>
<td>9507.120</td>
<td>732</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>PERFAPNU</td>
<td>10350.833</td>
<td>732</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>PERAVNUM</td>
<td>4810.361</td>
<td>732</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Corrected Total</td>
<td>TGOALNUM</td>
<td>481.224</td>
<td>731</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>PERFAPNU</td>
<td>475.248</td>
<td>731</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>PERAVNUM</td>
<td>568.242</td>
<td>731</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Source</td>
<td>Dependent Variable</td>
<td>Sig.</td>
<td>Partial Eta Squared</td>
<td>Noncent. Parameter</td>
<td>Observed Power</td>
</tr>
<tr>
<td>--------</td>
<td>-------------------</td>
<td>------</td>
<td>---------------------</td>
<td>-------------------</td>
<td>----------------</td>
</tr>
<tr>
<td>Corrected Model</td>
<td>TGOALNUM</td>
<td>.000</td>
<td>.316</td>
<td>282.227</td>
<td>1.000</td>
</tr>
<tr>
<td></td>
<td>PERFAPNU</td>
<td>.000</td>
<td>.287</td>
<td>245.824</td>
<td>1.000</td>
</tr>
<tr>
<td></td>
<td>PERAVNUM</td>
<td>.000</td>
<td>.310</td>
<td>274.368</td>
<td>1.000</td>
</tr>
<tr>
<td>Intercept</td>
<td>TGOALNUM</td>
<td>.000</td>
<td>.661</td>
<td>1191.494</td>
<td>1.000</td>
</tr>
<tr>
<td></td>
<td>PERFAPNU</td>
<td>.000</td>
<td>.654</td>
<td>1156.726</td>
<td>1.000</td>
</tr>
<tr>
<td></td>
<td>PERAVNUM</td>
<td>.000</td>
<td>.429</td>
<td>459.486</td>
<td>1.000</td>
</tr>
<tr>
<td>CLU3_1</td>
<td>TGOALNUM</td>
<td>.013</td>
<td>.014</td>
<td>8.731</td>
<td>.755</td>
</tr>
<tr>
<td></td>
<td>PERFAPNU</td>
<td>.000</td>
<td>.029</td>
<td>18.007</td>
<td>.974</td>
</tr>
<tr>
<td></td>
<td>PERAVNUM</td>
<td>.010</td>
<td>.015</td>
<td>9.354</td>
<td>.785</td>
</tr>
<tr>
<td>ABILITY2</td>
<td>TGOALNUM</td>
<td>.697</td>
<td>.004</td>
<td>2.712</td>
<td>.221</td>
</tr>
<tr>
<td></td>
<td>PERFAPNU</td>
<td>.328</td>
<td>.008</td>
<td>4.636</td>
<td>.366</td>
</tr>
<tr>
<td></td>
<td>PERAVNUM</td>
<td>.389</td>
<td>.007</td>
<td>4.137</td>
<td>.328</td>
</tr>
<tr>
<td>NUM2</td>
<td>TGOALNUM</td>
<td>.056</td>
<td>.015</td>
<td>9.280</td>
<td>.675</td>
</tr>
<tr>
<td></td>
<td>PERFAPNU</td>
<td>.004</td>
<td>.025</td>
<td>15.423</td>
<td>.898</td>
</tr>
<tr>
<td></td>
<td>PERAVNUM</td>
<td>.259</td>
<td>.009</td>
<td>5.307</td>
<td>.418</td>
</tr>
<tr>
<td>GRADE</td>
<td>TGOALNUM</td>
<td>.025</td>
<td>.008</td>
<td>4.966</td>
<td>.605</td>
</tr>
<tr>
<td></td>
<td>PERFAPNU</td>
<td>.017</td>
<td>.009</td>
<td>5.716</td>
<td>.665</td>
</tr>
<tr>
<td></td>
<td>PERAVNUM</td>
<td>.102</td>
<td>.004</td>
<td>2.676</td>
<td>.372</td>
</tr>
<tr>
<td>GENDER</td>
<td>TGOALNUM</td>
<td>.350</td>
<td>.001</td>
<td>.876</td>
<td>.154</td>
</tr>
<tr>
<td></td>
<td>PERFAPNU</td>
<td>.513</td>
<td>.001</td>
<td>.428</td>
<td>.100</td>
</tr>
<tr>
<td></td>
<td>PERAVNUM</td>
<td>.384</td>
<td>.001</td>
<td>.759</td>
<td>.140</td>
</tr>
<tr>
<td>SCHOOLID</td>
<td>TGOALNUM</td>
<td>.480</td>
<td>.004</td>
<td>2.475</td>
<td>.230</td>
</tr>
<tr>
<td></td>
<td>PERFAPNU</td>
<td>.339</td>
<td>.005</td>
<td>3.371</td>
<td>.304</td>
</tr>
<tr>
<td></td>
<td>PERAVNUM</td>
<td>.493</td>
<td>.004</td>
<td>2.406</td>
<td>.224</td>
</tr>
<tr>
<td>ESBID</td>
<td>TGOALNUM</td>
<td>.018</td>
<td>.009</td>
<td>5.585</td>
<td>.655</td>
</tr>
<tr>
<td></td>
<td>PERFAPNU</td>
<td>.254</td>
<td>.002</td>
<td>1.301</td>
<td>.207</td>
</tr>
<tr>
<td></td>
<td>PERAVNUM</td>
<td>.036</td>
<td>.007</td>
<td>4.419</td>
<td>.555</td>
</tr>
<tr>
<td>CLU3_1 * ABILITY2</td>
<td>TGOALNUM</td>
<td>.149</td>
<td>.019</td>
<td>12.105</td>
<td>.683</td>
</tr>
<tr>
<td></td>
<td>PERFAPNU</td>
<td>.077</td>
<td>.023</td>
<td>14.289</td>
<td>.769</td>
</tr>
<tr>
<td></td>
<td>PERAVNUM</td>
<td>.311</td>
<td>.015</td>
<td>9.404</td>
<td>.549</td>
</tr>
<tr>
<td>CLU3_1 * NUM2</td>
<td>TGOALNUM</td>
<td>.335</td>
<td>.015</td>
<td>9.116</td>
<td>.534</td>
</tr>
<tr>
<td></td>
<td>PERFAPNU</td>
<td>.644</td>
<td>.007</td>
<td>4.136</td>
<td>.242</td>
</tr>
<tr>
<td></td>
<td>PERAVNUM</td>
<td>.020</td>
<td>.029</td>
<td>18.330</td>
<td>.881</td>
</tr>
<tr>
<td>CLU3_1 * GRADE</td>
<td>TGOALNUM</td>
<td>.169</td>
<td>.006</td>
<td>3.561</td>
<td>.373</td>
</tr>
<tr>
<td></td>
<td>PERFAPNU</td>
<td>.270</td>
<td>.004</td>
<td>2.621</td>
<td>.284</td>
</tr>
<tr>
<td></td>
<td>PERAVNUM</td>
<td>.231</td>
<td>.001</td>
<td>1.930</td>
<td>.180</td>
</tr>
<tr>
<td>CLU3_1 * GENDER</td>
<td>TGOALNUM</td>
<td>.732</td>
<td>.001</td>
<td>6.25</td>
<td>.100</td>
</tr>
<tr>
<td></td>
<td>PERFAPNU</td>
<td>.129</td>
<td>.007</td>
<td>4.116</td>
<td>.424</td>
</tr>
<tr>
<td></td>
<td>PERAVNUM</td>
<td>.513</td>
<td>.002</td>
<td>1.336</td>
<td>.163</td>
</tr>
<tr>
<td>CLU3_1 * SCHOOLID</td>
<td>TGOALNUM</td>
<td>.826</td>
<td>.005</td>
<td>2.862</td>
<td>.195</td>
</tr>
<tr>
<td></td>
<td>PERFAPNU</td>
<td>.294</td>
<td>.012</td>
<td>7.315</td>
<td>.483</td>
</tr>
<tr>
<td></td>
<td>PERAVNUM</td>
<td>.291</td>
<td>.012</td>
<td>7.354</td>
<td>.486</td>
</tr>
<tr>
<td>CLU3_1 * ESBID</td>
<td>TGOALNUM</td>
<td>.640</td>
<td>.001</td>
<td>.895</td>
<td>.123</td>
</tr>
<tr>
<td></td>
<td>PERFAPNU</td>
<td>.218</td>
<td>.005</td>
<td>3.052</td>
<td>.325</td>
</tr>
<tr>
<td></td>
<td>PERAVNUM</td>
<td>.639</td>
<td>.001</td>
<td>.896</td>
<td>.123</td>
</tr>
<tr>
<td>ABILITY2 * NUM2</td>
<td>TGOALNUM</td>
<td>.862</td>
<td>.016</td>
<td>10.059</td>
<td>.439</td>
</tr>
<tr>
<td></td>
<td>PERFAPNU</td>
<td>.459</td>
<td>.025</td>
<td>15.938</td>
<td>.685</td>
</tr>
<tr>
<td></td>
<td>PERAVNUM</td>
<td>.252</td>
<td>.031</td>
<td>19.417</td>
<td>.739</td>
</tr>
<tr>
<td>ABILITY2 * GRADE</td>
<td>TGOALNUM</td>
<td>.110</td>
<td>.012</td>
<td>7.563</td>
<td>.573</td>
</tr>
<tr>
<td></td>
<td>PERFAPNU</td>
<td>.769</td>
<td>.003</td>
<td>1.821</td>
<td>.158</td>
</tr>
<tr>
<td></td>
<td>PERAVNUM</td>
<td>.917</td>
<td>.002</td>
<td>9.51</td>
<td>.102</td>
</tr>
<tr>
<td>ABILITY2 * GENDER</td>
<td>TGOALNUM</td>
<td>.147</td>
<td>.011</td>
<td>6.823</td>
<td>.524</td>
</tr>
<tr>
<td></td>
<td>PERFAPNU</td>
<td>.312</td>
<td>.008</td>
<td>4.781</td>
<td>.377</td>
</tr>
<tr>
<td></td>
<td>PERAVNUM</td>
<td>.725</td>
<td>.003</td>
<td>2.061</td>
<td>.175</td>
</tr>
<tr>
<td>Source</td>
<td>Dependent Variable</td>
<td>Sig.</td>
<td>Partial Eta Squared</td>
<td>Noncent. Parameter</td>
<td>Observed Power</td>
</tr>
<tr>
<td>-----------------</td>
<td>--------------------</td>
<td>------</td>
<td>---------------------</td>
<td>--------------------</td>
<td>----------------</td>
</tr>
<tr>
<td>ABILITY2 * SCHOOLID</td>
<td>TGOALNUM</td>
<td>.290</td>
<td>.023</td>
<td>14.214</td>
<td>.685</td>
</tr>
<tr>
<td></td>
<td>PERFAPNU</td>
<td>.783</td>
<td>.013</td>
<td>8.013</td>
<td>.395</td>
</tr>
<tr>
<td></td>
<td>PERAVNUM</td>
<td>.614</td>
<td>.016</td>
<td>10.026</td>
<td>.498</td>
</tr>
<tr>
<td>ABILITY2 * ESBIID</td>
<td>TGOALNUM</td>
<td>.162</td>
<td>.011</td>
<td>6.568</td>
<td>.507</td>
</tr>
<tr>
<td></td>
<td>PERFAPNU</td>
<td>.385</td>
<td>.007</td>
<td>4.162</td>
<td>.330</td>
</tr>
<tr>
<td></td>
<td>PERAVNUM</td>
<td>.078</td>
<td>.014</td>
<td>8.459</td>
<td>.629</td>
</tr>
<tr>
<td>NUM2 * GRADE</td>
<td>TGOALNUM</td>
<td>.363</td>
<td>.007</td>
<td>4.341</td>
<td>.344</td>
</tr>
<tr>
<td></td>
<td>PERFAPNU</td>
<td>.547</td>
<td>.005</td>
<td>3.067</td>
<td>.247</td>
</tr>
<tr>
<td></td>
<td>PERAVNUM</td>
<td>.959</td>
<td>.001</td>
<td>.634</td>
<td>.083</td>
</tr>
<tr>
<td>NUM2 * GENDER</td>
<td>TGOALNUM</td>
<td>.676</td>
<td>.004</td>
<td>2.326</td>
<td>.193</td>
</tr>
<tr>
<td></td>
<td>PERFAPNU</td>
<td>.113</td>
<td>.012</td>
<td>7.502</td>
<td>.569</td>
</tr>
<tr>
<td></td>
<td>PERAVNUM</td>
<td>.550</td>
<td>.005</td>
<td>3.050</td>
<td>.246</td>
</tr>
<tr>
<td>NUM2 * SCHOOLID</td>
<td>TGOALNUM</td>
<td>.482</td>
<td>.019</td>
<td>11.571</td>
<td>.572</td>
</tr>
<tr>
<td></td>
<td>PERFAPNU</td>
<td>.251</td>
<td>.024</td>
<td>14.894</td>
<td>.711</td>
</tr>
<tr>
<td></td>
<td>PERAVNUM</td>
<td>.283</td>
<td>.023</td>
<td>14.332</td>
<td>.690</td>
</tr>
<tr>
<td>NUM2 * ESBIID</td>
<td>TGOALNUM</td>
<td>.349</td>
<td>.007</td>
<td>4.454</td>
<td>.352</td>
</tr>
<tr>
<td></td>
<td>PERFAPNU</td>
<td>.093</td>
<td>.013</td>
<td>7.989</td>
<td>.600</td>
</tr>
<tr>
<td></td>
<td>PERAVNUM</td>
<td>.052</td>
<td>.015</td>
<td>9.447</td>
<td>.684</td>
</tr>
<tr>
<td>GRADE * GENDER</td>
<td>TGOALNUM</td>
<td>.029</td>
<td>.008</td>
<td>4.813</td>
<td>.591</td>
</tr>
<tr>
<td></td>
<td>PERFAPNU</td>
<td>.806</td>
<td>.000</td>
<td>.060</td>
<td>.057</td>
</tr>
<tr>
<td></td>
<td>PERAVNUM</td>
<td>.840</td>
<td>.000</td>
<td>.041</td>
<td>.055</td>
</tr>
<tr>
<td>GRADE * SCHOOLID</td>
<td>TGOALNUM</td>
<td>.777</td>
<td>.002</td>
<td>1.100</td>
<td>.122</td>
</tr>
<tr>
<td></td>
<td>PERFAPNU</td>
<td>.777</td>
<td>.002</td>
<td>1.100</td>
<td>.122</td>
</tr>
<tr>
<td></td>
<td>PERAVNUM</td>
<td>.165</td>
<td>.008</td>
<td>5.106</td>
<td>.446</td>
</tr>
<tr>
<td>GRADE * ESBIID</td>
<td>TGOALNUM</td>
<td>.437</td>
<td>.001</td>
<td>.604</td>
<td>.121</td>
</tr>
<tr>
<td></td>
<td>PERFAPNU</td>
<td>.671</td>
<td>.000</td>
<td>.180</td>
<td>.071</td>
</tr>
<tr>
<td></td>
<td>PERAVNUM</td>
<td>.881</td>
<td>.000</td>
<td>.022</td>
<td>.053</td>
</tr>
<tr>
<td>GENDER * SCHOOLID</td>
<td>TGOALNUM</td>
<td>.902</td>
<td>.000</td>
<td>.206</td>
<td>.066</td>
</tr>
<tr>
<td></td>
<td>PERFAPNU</td>
<td>.845</td>
<td>.001</td>
<td>.336</td>
<td>.076</td>
</tr>
<tr>
<td></td>
<td>PERAVNUM</td>
<td>.465</td>
<td>.002</td>
<td>1.533</td>
<td>.181</td>
</tr>
<tr>
<td>GENDER * ESBIID</td>
<td>TGOALNUM</td>
<td>.989</td>
<td>.000</td>
<td>.000</td>
<td>.050</td>
</tr>
<tr>
<td></td>
<td>PERFAPNU</td>
<td>.377</td>
<td>.001</td>
<td>.782</td>
<td>.143</td>
</tr>
<tr>
<td></td>
<td>PERAVNUM</td>
<td>.359</td>
<td>.001</td>
<td>.841</td>
<td>.150</td>
</tr>
<tr>
<td>SCHOOLID * ESBIID</td>
<td>TGOALNUM</td>
<td>.722</td>
<td>.002</td>
<td>1.329</td>
<td>.139</td>
</tr>
<tr>
<td></td>
<td>PERFAPNU</td>
<td>.770</td>
<td>.002</td>
<td>1.128</td>
<td>.124</td>
</tr>
<tr>
<td></td>
<td>PERAVNUM</td>
<td>.829</td>
<td>.001</td>
<td>.884</td>
<td>.107</td>
</tr>
</tbody>
</table>

a. Computed using alpha = .05
b. R Squared = .316 (Adjusted R Squared = .183)
c. R Squared = .287 (Adjusted R Squared = .148)
d. R Squared = .310 (Adjusted R Squared = .175)

General Linear Model - NUMERACY GOAL ORIENTATIONS