THE EXPLORATION OF MIDDLE-YEARS READING INTERVENTION: THE DYNAMICS OF READING PERFORMANCE AND PSYCHOSOCIAL FACTORS WITHIN A FLUENCY-ORIENTED READING PROGRAMME.

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A thesis submitted in fulfilment of the requirement for the degree of Doctor of Philosophy

Faculty of Education and Social Work

University of Sydney

2013
AUTHOR’S DECLARATION

This is to certify that:

i. This thesis comprises only my original work towards the Doctor of Philosophy Degree.

ii. Due acknowledgement has been made in the text to all other material used.

iii. The thesis does not exceed the word length for this degree.

iv. No part of this work has been used for the award of another degree.

v. This thesis meets the University of Sydney’s Human Research Ethics Committee (HREC) requirements for the conduct of research.

Marian Koo

Date: 4th March 2014
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ABSTRACT

The challenges within middle-years education are being increasingly acknowledged and research suggests that psychosocial engagement with learning declines in these years. Numerous studies have also shown declining interest and negative attitudes to reading that have their origins in the middle years. There is an extensive body of knowledge regarding reading, mostly from early years and special education studies, which can be applied to this decline; however there is a lack of applied research examining reading interventions for broad middle years’ cohorts. Furthermore, there are gaps in terms of studies that explore the interplay between reading intervention and psychosocial factors, and studies that target lower-socioeconomic schools where poor reading performance is most evident. This study addresses these gaps by exploring the implementation of a Fluency Orientated Reading and Comprehension Strategy Instruction (FORCSI) intervention program in a quasi-experimental design.

Students (N=216) in Years 4 to 6 in two socio-economically disadvantaged Sydney schools, matched on demographic and school level characteristics, participated in the study. One school received a nine-week FORCSI intervention supplementing teachers’ regular classroom practice and one school maintained their normal classroom literacy practices. Pre- and posttest assessment of reading performance (Neale Analysis of Reading Ability [NARA], the Test of Reading Comprehension [TORCH], reading accuracy and text fluency calculations) and self report of their psychosocial orientations toward reading were conducted. Qualitative process data on the implementation of the intervention were also collected.

Multivariate statistical modelling was used to evaluate the impact of the intervention. Both quantitative and qualitative data explored the dynamics between the psychosocial, cognitive and behavioural processes inherent in a reading programme. The FORCSI intervention had a significant positive impact across the middle-years sample group on comprehension and psychosocial orientation toward reading. The FORCSI effect sizes on comprehension ranged from $d = .35$ to $d = .52$. These effect sizes were larger than those reported in meta-analyses of fluency interventions suggesting further research and replication of the FORCSI study are warranted. Qualitative insights are discussed with reference to the quantitative analyses. Implications for middle-years education practice and policies are discussed.
# TABLE OF CONTENTS

<table>
<thead>
<tr>
<th>Acknowledgement</th>
<th>i</th>
</tr>
</thead>
<tbody>
<tr>
<td>Abstract</td>
<td>iii</td>
</tr>
<tr>
<td>Table of Contents</td>
<td>v</td>
</tr>
<tr>
<td>List of Tables</td>
<td>x</td>
</tr>
<tr>
<td>List of Figures</td>
<td>xii</td>
</tr>
<tr>
<td>List of Appendices</td>
<td>xiv</td>
</tr>
<tr>
<td>List of Abbreviations</td>
<td>xv</td>
</tr>
<tr>
<td><strong>CHAPTER 1: INTRODUCTION</strong></td>
<td>1</td>
</tr>
<tr>
<td>1.1. Background</td>
<td>2</td>
</tr>
<tr>
<td>1.2. Reading in Australia</td>
<td>2</td>
</tr>
<tr>
<td>1.3. Middle-Years of School</td>
<td>3</td>
</tr>
<tr>
<td>1.4. Psychosocial Orientation to Reading</td>
<td>4</td>
</tr>
<tr>
<td>1.5. Purpose and Goals of Study</td>
<td>7</td>
</tr>
<tr>
<td>1.6. Significance of Study</td>
<td>10</td>
</tr>
<tr>
<td>1.7. Thesis Overview</td>
<td>12</td>
</tr>
<tr>
<td><strong>CHAPTER 2: LITERATURE REVIEW</strong></td>
<td>14</td>
</tr>
<tr>
<td>Reading in Australia</td>
<td>14</td>
</tr>
<tr>
<td>2.1. Introduction</td>
<td></td>
</tr>
<tr>
<td>2.2. The Importance of Literacy</td>
<td>15</td>
</tr>
<tr>
<td>2.3. Literacy and Reading</td>
<td>15</td>
</tr>
<tr>
<td>2.4. Decline in Reading Performance</td>
<td>16</td>
</tr>
<tr>
<td>2.5. School Performance and Socioeconomic Status</td>
<td>18</td>
</tr>
<tr>
<td>2.6. Educational Disadvantaged</td>
<td>20</td>
</tr>
<tr>
<td>2.7. Reading and the Middle-Years</td>
<td>22</td>
</tr>
<tr>
<td>2.8. Summary: Reading in Australia</td>
<td>28</td>
</tr>
</tbody>
</table>
| Reading Instruction                          | ...
| 2.9. Introduction                            | 29 |
| 2.10. International Perspectives             | 29 |
| 2.11. Australian Perspective                 | 30 |
| 2.12. Reading Development: Stage Model of Reading Acquisition | 32 |
| 2.13. Reading Development: New South Wales English K-6 Syllabus | 38 |
| 2.14. Summary: Reading Instruction           | 43 |
3.6.1. Rationale ................................................................. 97
3.6.2. Listening Comprehension NARA-L ............................... 99
3.6.3. Reading Accuracy and Text Fluency RA, TF ................... 101
3.6.4. Reading Comprehension TORCH-R ............................. 102
3.7. Quantitative Methodology: Psychosocial Measures .......... 104
  3.7.1. Reading Self Concept ............................................. 104
  3.7.2. Reading Task Values ............................................. 106
  3.7.3. Achievement Emotions ......................................... 107
  3.7.4. Reading Related Choices ...................................... 109
3.8. Procedures .................................................................. 111
3.9. Chapter Summary ........................................................ 112

CHAPTER 4: PSYCHOMETRIC PROPERTIES, GROUP EQUIVALENCE
AND DESCRIPTIVE ANALYSIS ............................................. 113
4.1. Introduction .................................................................. 113
  Psychometric Properties ....................................................
4.2. Reading Measures ........................................................ 113
4.3. Psychosocial Measures .................................................. 114
  Group Equivalence ...........................................................
4.4. Reading Measures ........................................................ 123
4.5. Psychosocial Measures .................................................. 129
  Descriptive Analysis ........................................................
4.6. Reading Performance ..................................................... 135
4.7. Psychosocial Constructs .................................................. 142
4.8. Chapter Summary .......................................................... 152

CHAPTER 5: READING PERFORMANCE ON COMPREHENSION,
ACCURACY AND TEXT FLUENCY .......................................... 154
5.1. Introduction ................................................................... 154
5.2. Review of Descriptive Analysis: Reading Measures .......... 155
5.3. Summary Findings for Research Question 1 ..................... 155
  5.3.1. Quantitative Data Summary ...................................... 155
  5.3.2. Qualitative Data Summary ....................................... 157
5.4. Analytical Procedure and Definition of Statistical Terms ..... 160
5.5. Quantitative Findings: Factors Explaining Reading Performance
  5.5.1. Listening Comprehension ......................................... 163
  5.5.2. Reading Comprehension ......................................... 169
5.5.3. Accuracy 172
5.5.4. Text Fluency 173
5.6 Qualitative Findings: Research Sites and Classroom Practices 175
  5.6.2. Intervention Group 177
  5.6.3. Comparison Group 179
5.7. Chapter Summary 182

CHAPTER 6: YEAR 4-6 READING PERFORMANCE ON
COMPREHENSION, ACCURACY AND TEXT FLUENCY ......................... 184
6.1. Introduction 184
6.2. Summary Findings for Research Question 2 184
  6.2.1. Quantitative Data Summary 184
  6.2.2. Qualitative Data Summary 185
6.3. Quantitative Findings: Factors Explaining Reading Performance at Year Level. 186
  Year 4 6.3.1. Listening Comprehension 186
  6.3.2. Reading Comprehension 189
  6.3.3. Accuracy 190
  6.3.4. Text Fluency 191
  Year 5 6.3.5. Listening Comprehension 192
  6.3.6. Reading Comprehension 193
  6.3.7. Accuracy 194
  6.3.8. Text Fluency 195
  Year 6 6.3.9. Listening Comprehension 196
  6.3.10. Reading Comprehension 197
  6.3.11. Accuracy 198
  6.3.12. Text Fluency 200
6.4. Qualitative Findings 202
  6.4.1. Introduction 202
  6.4.2. Factors Inhibiting or Enhancing FORCSI 203
  6.4.3. Modifications for FORCSI 206
6.5. Chapter Summary 208
CHAPTER 7: RELATIONSHIP BETWEEN PSYCHOSOCIAL CONSTRUCTS AND READING RELATED CHOICES ........................................... 210
7.1. Introduction 210
7.2. Review of Descriptive Analysis: Psychosocial Constructs 210
7.3. Summary Findings for Research Question 3 211
  7.3.1. Quantitative Data Summary 211
  7.3.2. Qualitative Data Summary 212
7.4. Quantitative Findings: Relationship Between Psychosocial Constructs and Reading Related Choices 212
  7.4.1. Assumption Testing 213
  7.4.2. Choice of Text Difficulty 214
  7.4.3. Choice of Core Activities - Reading and Number 216
  7.4.4. Choice of Elective Activities - Drawing and Physical Movement 219
7.5. Qualitative Findings: Reading Related Choices and Engagement 220
  7.5.2. Engagement and Behaviour 220
  7.5.3. Engagement and Cognition 222
  7.5.4. Engagement and Affect 224
  7.5.5. Engagement and Social Context 227
7.6. Chapter Summary 228

CHAPTER 8: DISCUSSION ............................................................................. 230
8.1. Introduction 230
8.2. Factors Explaining Overall Reading Performance 232
  8.2.1. Pretest Covariates 233
  8.2.2. Factors Explaining NARA-L, TORCH-R 233
  8.2.3. Effect Size and Practical Significance 234
8.3. Studies Supporting Findings 234
8.4. Studies with Different Findings 236
8.5. Conceptualisation of Fluency and its Implications 236
8.6. Intervention Attributes Associated with Reading Outcomes 238
  8.6.1. Multiple Components 239
  8.6.2. Practice and Corrective Feedback 240
  8.6.3. Comprehension Focus 243
8.7. Factors Explaining Reading Performance Across Year Levels 244
  8.7.1. FORCSI and NARA-L, TORCH-R 244
  8.7.2. Text Fluency and Reading Performance 247
**LIST OF TABLES**

<table>
<thead>
<tr>
<th>Table</th>
<th>Description</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>3.1</td>
<td>Demographic Attributes and School Level Data for Intervention and Comparison Schools</td>
<td>84</td>
</tr>
<tr>
<td>3.2</td>
<td>Before, During, After Instructional Procedures in FORCSI</td>
<td>89</td>
</tr>
<tr>
<td>3.3</td>
<td>Identification and Recoding of Reading Errors in NARA-L</td>
<td>99</td>
</tr>
<tr>
<td>4.1</td>
<td>Summary of Scale Reliabilities and Factors on Psychosocial Variables</td>
<td>113</td>
</tr>
<tr>
<td>4.2</td>
<td>Factor Loadings for Reading Self Concept</td>
<td>114</td>
</tr>
<tr>
<td>4.3</td>
<td>Factor Loadings for Reading Task Values</td>
<td>115</td>
</tr>
<tr>
<td>4.4</td>
<td>Factor Loadings for Achievement Emotions Items</td>
<td>116</td>
</tr>
<tr>
<td>4.5</td>
<td>Reliability Measures for 15 Emotion Items</td>
<td>117</td>
</tr>
<tr>
<td>4.6</td>
<td>Factor Loadings for Achievement Emotions in SSR</td>
<td>118</td>
</tr>
<tr>
<td>4.7</td>
<td>Factor Loadings for Emotions in Research Reading</td>
<td>119</td>
</tr>
<tr>
<td>4.8</td>
<td>Factor Loadings for Reading for Homework</td>
<td>120</td>
</tr>
<tr>
<td>4.9</td>
<td>Factor Loadings for Core, Elective Activities</td>
<td>121</td>
</tr>
<tr>
<td>4.10</td>
<td>Sample Size, Mean, and SD on Initial Pretest TORCH Test</td>
<td>123</td>
</tr>
<tr>
<td>4.11</td>
<td>Normality and Homogeneity of Variance of Reading Measures</td>
<td>125</td>
</tr>
<tr>
<td>4.12</td>
<td>Summary of Assumption Testing and Group Equivalency</td>
<td>127</td>
</tr>
<tr>
<td>4.13</td>
<td>Normality and Homogeneity of Variance of Psychosocial Measures</td>
<td>130</td>
</tr>
<tr>
<td>4.14</td>
<td>Sample Size, Mean and Standard Deviation for NARA-L and TORCH-R</td>
<td>133</td>
</tr>
<tr>
<td>4.15</td>
<td>Sample Size, Mean and Standard Deviation for Accuracy and Text Fluency</td>
<td>136</td>
</tr>
<tr>
<td>4.16</td>
<td>Correlation between the Dependent and Independent Reading Variables</td>
<td>139</td>
</tr>
<tr>
<td>4.17</td>
<td>Correlation between Predictor and Reading Variables</td>
<td>Appendix F</td>
</tr>
<tr>
<td>4.18</td>
<td>Sample Size, Mean and Standard Deviation for Psychosocial Measures</td>
<td>141</td>
</tr>
<tr>
<td>4.19</td>
<td>Correlation between Pretest Reading, Covariates and Psychosocial Measures</td>
<td>Appendix F</td>
</tr>
<tr>
<td>4.20</td>
<td>Comparison Group-Correlation between Pretest and Posttest</td>
<td>Appendix F</td>
</tr>
<tr>
<td>4.21</td>
<td>Intervention Group-Correlation between Pretest and Posttest</td>
<td>Appendix F</td>
</tr>
<tr>
<td>5.1</td>
<td>Summary of Results for Research Question 1</td>
<td>154</td>
</tr>
</tbody>
</table>
Table 5.2. Regression Coefficients, t-Statistics and Correlation for NARA-L Simultaneous Entry (SE)  
Table 5.3. Variance Contribution for NARA-L Hierarchical Regression (HR)  
Table 5.4. Regression Coefficients, t-Statistics and Correlation for NARA-L (HR).  
Table 5.5. Regression Coefficients, t-Statistics and Correlation for TORCH-R (SE)  
Table 5.6. Variance Contribution for TORCH-R (HR)  
Table 5.7. Regression Coefficients, t-Statistics and Correlation for TORCH-R (HR)  
Table 5.8. Regression Coefficients, t-Statistics and Correlation for Reading Accuracy (SE)  
Table 5.9. Regression Coefficients, t-Statistics and Correlation for Text Fluency (SE)  
Table 5.10. Variance Contribution for Text Fluency (HR)  
Table 5.11. Regression Coefficients, t-Statistics and Correlation for Text Fluency (HR)  
Table 5.12. Summary of the Class-Level Data in the Intervention and Comparison Groups  
Table 6.1. Regression Coefficients, t-Statistics and Correlation for Year 4 NARA-L (SE)  
Table 6.2. Variance Contribution for Year 4 NARA-L Hierarchical Regression (HR)  
Table 6.3. Regression Coefficients, t-Statistics and Correlation for NARA-L (HR)  
Table 6.4. Regression Coefficients, t-Statistics and Correlation for Year 4 TORCH-R (SE)  
Table 6.5. Regression Coefficients, t-Statistics and Correlation for Year 4 Reading Accuracy (SE)  
Table 6.6. Regression Coefficients, t-Statistics and Correlation for Year 4 Text Fluency (SE)  
Table 6.7. Variance Contribution for Year 4 Text Fluency (HR).  
Table 6.8. Regression Coefficients, t-Statistics and Correlation for Year 4 Text Fluency (HR)  
Table 6.9. Regression Coefficients, t-Statistics and Correlation for Year 5 NARA-L (SE)
Table 6.10. Regression Coefficients, $t$-Statistics and Correlation for Year 5 TORCH-R (SE) 190
Table 6.11. Regression Coefficients, $t$-Statistics and Correlation for Year 5 RA (SE) 191
Table 6.12. Regression Coefficients, $t$-Statistics and Correlation for Year 5 Text Fluency (SE) 192
Table 6.13. Regression Coefficients, $t$-Statistics and Correlation for Year 6 NARA-L (SE) 193
Table 6.14. Regression Coefficients, $t$-Statistics and Correlation for Year 6 TORCH-R (SE) 194
Table 6.15. Variance Contribution for Year 6 TORCH-R (HR) 195
Table 6.16. Regression Coefficients, $t$-Statistics and Correlation for Year 6 TORCH-R (HR) 195
Table 6.17. Regression Coefficients, $t$-Statistics and Correlation for Year 6 Reading Accuracy (SE) 196
Table 6.18. Variance Contribution for Year 6 Reading Accuracy (HR) 197
Table 6.19. Regression Coefficients, $t$-Statistics and Correlation for Year 6 Reading Accuracy 197
Table 6.20. Regression Coefficients, $t$-Statistics and Correlation for Year 6 Text Fluency (SE) 198
Table 6.21. Variance Contribution for Year 6 Text Fluency (HR) 198
Table 6.22. Regression Coefficients, $t$-Statistics and Correlation for Year 6 Text Fluency (HR) 199
Table 7.1. Regression Coefficients, $t$-Statistics and Correlation Text Difficulty (SE) 211
Table 7.2. Variance Contribution for Choice of Text Difficulty (HR) 212
Table 7.3. Regression Coefficients, $t$-Statistics and Correlation for Choice of Text Difficulty (HR) 213
Table 7.4. Regression Coefficients, $t$-Statistics and Correlation Core Activities (SE) 214
Table 7.5. Variance Contribution for Choice of Core Activities (HR) 215
Table 7.6. Regression Coefficients, $t$-Statistics and Correlation for Choice of Core Activities (HR) 215
Table 7.7. Regression Coefficients, $t$-Statistics and Correlation for Choice of Elective Activities (SE) 216
## LIST OF FIGURES

<table>
<thead>
<tr>
<th>Figure</th>
<th>Description</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Figure 2.1.</td>
<td>2008-2010 NAPLAN reading results for Year 3, 5, and 7</td>
<td>22</td>
</tr>
<tr>
<td>Figure 2.2.</td>
<td>Conceptual expectancy-value model showing contribution of instructional and student characteristics to achievement related choices</td>
<td>67</td>
</tr>
<tr>
<td>Figure 3.1.</td>
<td>Embedded experimental model design</td>
<td>83</td>
</tr>
<tr>
<td>Figure 4.1.</td>
<td>Error indicating confidence levels and means of pretest reading scores</td>
<td>124</td>
</tr>
<tr>
<td>Figure 4.2.</td>
<td>Error bars indicating confidence levels and pretest means for children’s thoughts, beliefs and choice</td>
<td>128</td>
</tr>
<tr>
<td>Figure 4.3.</td>
<td>Error bars indicating confidence levels and pretest means for children’s achievement emotions</td>
<td>128</td>
</tr>
<tr>
<td>Figure 4.4.</td>
<td>Mean gain scores (%) in NARA-L Listening Comprehension</td>
<td>134</td>
</tr>
<tr>
<td>Figure 4.5.</td>
<td>Mean gain scores (%) in TORCH-R Reading Comprehension</td>
<td>135</td>
</tr>
<tr>
<td>Figure 4.6.</td>
<td>Mean gain scores (%) in Reading Accuracy</td>
<td>137</td>
</tr>
<tr>
<td>Figure 4.7.</td>
<td>Mean gain scores (%) in Text Fluency</td>
<td>138</td>
</tr>
<tr>
<td>Figure 4.8.</td>
<td>The change in means scores (%) in Self Concept, Task, Values</td>
<td>142</td>
</tr>
<tr>
<td>Figure 4.9.</td>
<td>The change in means scores (%) for Pleased, Angry, Worry</td>
<td>143</td>
</tr>
<tr>
<td>Figure 4.10.</td>
<td>The change in means scores (%) for SSR, Research and Homework</td>
<td>144</td>
</tr>
<tr>
<td>Figure 4.11.</td>
<td>The change in means scores (%) for Core, Elective Activities</td>
<td>145</td>
</tr>
<tr>
<td>Figure 4.12.</td>
<td>The mean score for choice of Text Difficulty</td>
<td>146</td>
</tr>
</tbody>
</table>
LIST OF APPENDICES

Appendix A  Reading Folder
Sample of connected text passages and comprehension questions for Year 4, 5, and 6 used daily in FORCSI
Record of Progress Chart

Appendix B  Story Test Booklet
Story A: Grasshopper
Story B: Lizards Love Eggs
Story C: The Swamp Creature
Story D: The Ace of Spades
Story E: The Purple Children

Appendix C  TORCH Answer Sheet
Story A: Grasshopper
Story B: Lizards Love Eggs
Story C: The Swamp Creature
Story D: The Ace of Spades
Story E: The Purple Children

Appendix D  Psychosocial Questionnaire

Appendix E  Information Package
Parent Information Sheet
Parent (or Guardian) Consent Form

Appendix F  Correlation
Table 4.17. Correlation between Predictors-Reading Variables
Table 4.19. Correlation of Pretest, Covariates and Psychosocial Variables
Table 4.20. Comparison Group: Correlation between Pretest and Posttest
Table 4.21. Intervention Group: Correlation between Pretest and Posttest
# LIST OF ABBREVIATIONS

<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>ABS</td>
<td>Australian Bureau of Statistics</td>
</tr>
<tr>
<td>ASK-KIDS</td>
<td>Self Concept Inventory</td>
</tr>
<tr>
<td>$\beta$</td>
<td>Beta Weights</td>
</tr>
<tr>
<td>$Cd$iff</td>
<td>Choice of Text Difficulty</td>
</tr>
<tr>
<td>Cread</td>
<td>Choice of School Activities</td>
</tr>
<tr>
<td>$d$</td>
<td>Effect Size</td>
</tr>
<tr>
<td>DEEWR</td>
<td>Department of Education, Employment and Workplace Relations</td>
</tr>
<tr>
<td>DEST</td>
<td>Department of Science and Training</td>
</tr>
<tr>
<td>Ehwk</td>
<td>Achievement Emotions: Reading for Homework</td>
</tr>
<tr>
<td>Ersch</td>
<td>Achievement Emotions: Reading for a Research Project</td>
</tr>
<tr>
<td>Essr</td>
<td>Achievement Emotions: Sustained Silent Reading</td>
</tr>
<tr>
<td>FORCSI</td>
<td>Fluency Oriented Reading and Comprehension Strategy Instruction</td>
</tr>
<tr>
<td>HR</td>
<td>Hierarchical Regression</td>
</tr>
<tr>
<td>KMO</td>
<td>Kaiser-Meyer-Oklin</td>
</tr>
<tr>
<td>MCEETYA</td>
<td>Ministerial Council for Education, Employment, Training and Youth Affairs</td>
</tr>
<tr>
<td>MLR</td>
<td>Multiple Linear Regression</td>
</tr>
<tr>
<td>NARA-L</td>
<td>Neale Analysis of Reading Ability: Listening Comprehension</td>
</tr>
<tr>
<td>NCLB</td>
<td>No Child Left Behind</td>
</tr>
<tr>
<td>NICHD</td>
<td>National Institute of Child Health and Human Development (NICHD)</td>
</tr>
<tr>
<td>NRP</td>
<td>National Reading Panel</td>
</tr>
<tr>
<td>PSFP</td>
<td>Priority School Funding Programme</td>
</tr>
<tr>
<td>$R^2$</td>
<td>R Squared</td>
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CHAPTER: INTRODUCTION.

1.1. Background.

Rebecca (pseudonym), a nine year old in Year 4, fidgets and fusses trying to avoid the work in front of her. Freckled face and diminutive under the thick mane of untameable hair, she tries to contain herself from throwing another outburst of frustration and anger as she struggles with the most basic words. She is one of six children in the ‘Red Reading Group’ – the lowest of the three reading groups gathered in front of the classroom three times a week for reading with their teacher, Ms Elizabeth (pseudonym). I did not know who was going to have the first meltdown of the morning. Was it going to be Rebecca, another child from the Red Group, or even Ms. Elizabeth? It is not unusual for inclusive classrooms, such as the one like Ms. Elizabeth's, to have children with Attention Deficit Disorder, learning difficulties and behavioural problems. It was understandable why Ms Elizabeth felt challenged that morning. To make matters worse, the children’s disenchantment with reading was palpable. I noticed how they responded to the morning reading session with an attitude of “no time, no interest, no way” (Beers, 1996). Ms Elizabeth’s five and half years of teaching experience was sufficient to teach children how to read but was it enough to stem their growing disengagement from reading, a disconcerting attitude among many students in the middle-years of school (Guthrie & Davis, 2003; Guthrie, Wigfield, & Klauda, 2012; Kamil, Borman, Dole, Kral, Salinger, & Torgesen, 2012; McKenna, Kear, & Ellsworth, 1995; Spinath & Spinath, 2005). I leave the classroom unobserved and head towards the next class two rooms down.

As I ventured into the last four classes participating in the reading intervention, I noticed the mood change with each classroom: from active resistance bordering on mutiny (Rebecca’s class), to restrained reading interest (Year 4 class) to the warm indifference emanating from Year 5 and 6 children. With a few exceptions, the majority of these older children, particularly the boys, were capable readers choosing not to read. Beer (1996) describes these as dominant alliterates, children
who like to read but do not make the effort or spend the time to do so. The problem with being alliterate is succinctly expressed by Mark Twain as he noted “those who don’t read have no advantage over those who can’t”.

These classroom scenarios are not unusual and have changed little in the 30 years I have taught as a classroom teacher and later as a support teacher assisting students with learning difficulties. The only difference is it is more difficult for teachers to cater for today’s diverse classrooms than three decades ago. The description of the intervention classrooms represented a cross-section of the 36% of Australian government school students from the lowest quarter of socioeconomic advantage (Department of Education, Employment and Workplace Relations [DEEWR], 2011). The background information provides a context situating the challenges of implementing a reading intervention focused on examining its impact on children’s reading performance and psychosocial orientation to reading.

1.2. Reading in Australia.

A widening achievement gap between advantaged and disadvantaged students was highlighted by the report from the Program for International Student Assessment (PISA) (Organisation for Economic Cooperation and Development [OECD], 2006) showing there were fewer 15 year olds in 2006 performing at high levels in reading than in the year 2000. The decline in reading level was most noticeable between the highest and lowest socioeconomic levels where gaps were equivalent to almost three full years of school (OECD, 2006). The OECD (2004) recommended the provision of compensatory assistance might assist the least advantaged individuals. Unfortunately, the question of how and in what form this assistance might take was not articulated in the report.

In 2008, the Australian Government released the Melbourne Declaration on Educational Goals for Young Australian (the Melbourne Declaration), a policy directive for Australian schools in the coming decade as developed by Australian Education Ministers in collaboration with government, independent, and Catholic school sectors (Ministerial Council for Education, Employment, Training and Youth Affairs [MCEETYA], 2008). The Melbourne Declaration acknowledged Australian students from low socioeconomic backgrounds were underrepresented among high
achievers and over represented among low achievers. As a result, the Australian governments are now committed to providing targeted support to disadvantaged students as well as focusing on school improvements in low socioeconomic communities with the aim improving student’s educational outcomes. These forms of compensatory assistance while necessary may still be insufficient to close the gap between groups of students.

Since the mid 1980s, general initiatives to improve student literacy and numeracy learning outcomes are conceptualised as first-, second- and third-wave literacy development programmes. The first-wave referred to improving regular classroom instruction of Australian children during their first three years in school. Some examples of first-wave support were the development and effective implementation of whole school literacy programmes, regular assessment to monitor the effectiveness of teaching, and improving teaching standards through the provision of teacher professional programmes. Within these early school years, children identified with learning difficulties were placed in early intervention programmes such as Reading Recovery. These initial intervention strategies come under the second-wave of teaching. The third-wave refers to initiatives supporting the continuation of quality classroom teaching and for students continuing to underachieve and/or experience learning difficulties during the middle-years of schooling (Rohl, 2000; Rowe, Stephanou, & Hoad, 2007). Australia’s concentration of resources has been in the first- and second-wave (Louden, 2000) and there has been minimal follow-up support for students in need of on-going third-wave intervention support in later years specifically in Years 4-9 (Rowe et al., 2007). Not only is there a problem of equity between schools, but it appears the performance gap may be exacerbated when funding and resources are limited for middle-aged primary children in Years 4-6 (DEEWR, 2011).

1.3. Middle-Years of Schooling.

Apart from children with learning difficulties, there is another cohort requiring third-wave support and these are children with late identification and late emerging reading difficulties. Leach, Scarborough and Rescorla (2003) found while some fourth and fifth grade students had been early achievers, they were
experiencing reading difficulties in the middle grades. The authors also found reading tests in earlier grades failed to detect the reading difficulties evident during the middle primary years. Many non-disabled readers appeared to suffer a ‘slump’ (Chall, 1996; Chall, Jacobs, & Baldwin, 1990; Galletly, Knight, Dekkers, & Galletly, 2009; Kieffer, 2010) when confronted with a curriculum of increasing literacy demands where earlier narrative text and its simple vocabulary and comprehension were being replaced with more difficult and conceptually demanding text.

For the older children with existing or late emerging reading needs, the implications are twofold. First, there is a need for research into the acquisition of literacy in later primary years where the literacy demands of schools become increasingly challenging and complex. Third-wave teaching will require the development of well-documented intervention programmes (Louden, 2000) for a wider group of students with literacy difficulties as much of the past research has been focused on students with specific learning difficulties (Chan & Dally, 2000). This study investigated a reading intervention programme with students from mainstream classes in Years 4 to 6 in an attempt to add to the body of reading research. Second, unless funding in the areas of research, training, and development is specifically attached to third-wave initiatives, schools may continue to focus their effort on first- and second-wave teaching and overlook this unassuming area of student need (Louden, 2000).

1.4. Psychosocial Orientation to Reading.

Reading has been described as a response to multimodal representations and as a set of strategies and skills needed to gather, integrate and evaluate information from diverse sources (Kamil, Pearson, Moje, & Afflerbach, 2011). Reading of this nature takes effort requiring motivation that can reinforce the reading process. Reading is also a social activity, situated in a context involving diverse range of individuals and their interactions with their teacher, peers and the instructional setting (Patrick, Anderman, & Ryan, 2011). Promoting reading acquisition therefore requires interventions addressing children’s attitudes, beliefs and motivations as much as interventions that assure cognitive changes in the learner (Guthrie, Wigfield, & Klauda; 2012; Kamil et al., 2008). However this perspective is not frequently
adopted in many reading programmes as a majority of work for students in the middle-years continue to focus on developing cognitive competencies than promoting children’s reading motivation and engagement (Deshler, Palincsar, Biancarosa, & Nair, 2007; Guthrie, Klauda, & Morrison, 2012; Quirk & Schwanenflugel, 2004; Wanzek, Vaughn, Kim, & Cavanaugh, 2006). Although a burgeoning literature examines the psychosocial aspects of early reading, psychosocial factors are surprisingly absent in research on children with reading difficulties in the middle-years.

The terms psychosocial is a construct encapsulating a diverse range of social forces inherent in an instructional context and their interactions with psychological processes (Martikainen, Bartley, & Lahelma, 2002). In this study, the psychological processes including children's self concepts (thoughts), reading task values (beliefs), achievement emotions and reading related choices were examined within the social dimensions of a reading intervention.

Deschler, Palinscar, Biancarosa, and Nair (2007) presented a comprehensive compendium of evidence-based instructional programmes for middle-years students to be used as a resource for classroom teachers and administrators. Of the 48 instructional programmes designed for middle and secondary students, only 29 of these programmes included motivation variables as a goal of the programme. Furthermore, none of the programmes had evaluations of psychosocial aspects in peer-reviewed journal articles.

In this study, the Fluency-Oriented Reading and Comprehension Strategy Instruction programme (FORCSI), a multicomponent intervention, included two sets of instructional procedures. The first set included a method of repeated reading as an instructional approach to develop fluent reading. The second set included comprehension strategy instruction. This programme is evaluated by examining both cognitive and psychosocial aspects.

Repeated reading was originally developed by Samuels (1979) specifically to promote fluency. The method entailed children listening to the teacher model fluent reading before reading aloud to their partner a short connected text repeatedly (three times) until a criterion was attained (number of words correctly read). Corrective
feedback was provided by the teacher. Repeated reading has been associated with robust reading achievement (e.g., Kuhn & Stahl, 2003; National Institute of Child Health and Human Development [NICHD], 2000; Wexler, Vaughn, Edmonds, & Reutebuch, 2008) however, few studies have reported the effects of repeated reading from a psychosocial perspective. Past studies have shown repeated reading effects on increasing student’s confidence (Clark, Morrison, & Wilcox, 2009), enhancing self concept (Schwanenflugel, Kuhn, Morris, Morrow, Meisinger, Woo, Quirk, & Sevcik, 2009) and improving reading-oriented self-esteem (Roundy & Roundy, 2009). While these improvements documented the motivational aspects of repeated reading, little is known about repeated reading and its impact on children’s psychosocial orientation to reading.

In this study, motivational processes include reading self concept, reading task value, achievement emotions and reading-related choices. These processes interact with each other and with other ecological factors inherent in a classroom setting. The study’s psychosocial perspective examined the relationship among the motivational variables within an instructional context and its affect on children’s willingness to participate in reading activities (reading and number or drawing and physical movement) and choice of text difficulty to read ranging from easy (Year 3 text-level) to difficult (Year 10 text-level).

Participation is the key to reading proficiency. Students who read very little do not have the benefits that come with reading widely and frequently. In a recent survey conducted by Guthrie, Singh, and Coddington (2012), the researchers found nearly 60% of interviewed middle school students reported they read information books infrequently. Follow-up interviews with a subset of students found avoidant behaviour towards reading. Nearly half of the middle school students (44%) confessed their active resistance by telling the researchers how they try to avoid reading expository texts for school. For 30% of students interviewed, they responded by stating how they put in as little effort as possible when it came to reading information books. For these students, minimum effort means reading easy books that do not require extra thinking capacities.
Guthrie and colleagues’ study (2012) highlights reading related choices as demonstrated by student’s reading avoidant behaviour. To understand the choices students make and the degree of persistence and effort they will devote on a task, the current study used the expectancy-value theory (Eccles, Adler, Futterman, Goff, Kaczala, Meece, & Midgley, 1983; Wigfield & Eccles, 2000) as a theoretical framework examining children’s psychosocial orientation to reading.

Children’s psychosocial orientation to reading was conceptualised as an indicator of reading engagement. Reading engagement requires effort and persistence (Fredricks, Blumenfeld, & Paris, 2004; Guthrie, Klauda, et al., 2012). Choosing a text with a level of difficulty then completing its related cloze task requires effort, time and persistence in order to activate strategies and apply higher-order thinking skills for processing text deeply. A child’s choice of an easy text to read and complete its comprehension cloze (Year 3 text-level) was viewed as indicating low reading engagement. A child engaged with reading was indicated by his/her choice to read a connected text and complete its cloze that was age-appropriate.

Studies have reported the importance of reading engagement as it is a stronger predictor of reading achievement than socioeconomic status (OECD, 2004; Guthrie, Schafer, & Huang, 2001). In this study, choice of text difficulty serves as proxy for engagement and therefore a predictor of achievement.

1.5. Purpose and Goals.

The study focused on addressing three research questions. These included (a) identifying the factors explaining middle-years children's reading performance in comprehension, reading accuracy and text fluency, (b) identifying the factors affecting reading performance specifically to children in Years 4, 5, and 6 and (c) investigating the relationship between middle-years children's thoughts, beliefs and emotions toward reading and their willingness to participate in reading activities.

The purpose of the study was twofold: first, to investigate the role of fluency instruction in developing the reading skills for children in the middle-years of primary, a sector of student population overlooked by researchers and second, to gain a deeper understanding of children’s psychosocial orientation to reading by
examining the interplay among the ecological (FORCSI), emotional, motivational (self concept and task values) and behavioural (reading-related choices) elements of a reading intervention and its implication on classroom practice and instruction.

The vast majority of studies has focused on either students at the first- or second grade/year level or older struggling readers in middle primary and high school (Chard, Vaughn, & Tyler, 2002; Kuhn & Stahl, 2003; Wanzek, Wexler, Vaughn, & Ciullo, 2010; Wexler, Vaughn, Edmonds, & Reutebuch, 2008). Considerably less is known about fluency intervention in the middle-years of primary school (Years 4-6), reflecting empirical models (e.g., Schwanenflugel, et al., 2006) and theoretical expectations that fluency development is no longer a concern for older able readers (Chall, 1996; Kuhn & Stahl, 2003; Schwanenflugel, Meisinger, Wisenbaker, Strauss, & Morris, 2006).

Many fluency researchers have based their work on Chall’s (1996) stage model approach to reading development, suggesting fluency instruction is most effective for children in the fluency stage of reading development, from the end of first grade to third grade (Kuhn & Stahl, 2003). Beyond or below this level, the results are not as strong (Pikulski, 2006; Valencia, Smith, Reece, Li, Wixson, & Newman, 2010; Wexler, Vaughn, Edmonds, & Reutebuch, 2008). Fluency instruction was also initially designed to remediate students with learning disabilities (Samuels, 1979). Subsequently, a majority of research has since focused on children with reading problems (Kuhn & Stahl, 2003).

Although fluency instruction has improved reading outcomes for high school students (Paige, Rasinski, & Magpuri-Lavell, 2012; Rasinski, Padak, McKeon, Wilfong, Friedauer, & Heim, 2005; Rasinski, et al., 2009), there remains a dearth of studies concerning the middle-years, Years 4-6, a period where children are most vulnerable to a reading ‘slump’ and increasing disengagement from literacy tasks. The study attempted to address this gap in fluency research for older children in diverse classrooms.

The second purpose of the study was to investigate FORCSI’s impact on children’s psychosocial orientation to reading. Mounting disengagement from reading tasks by students during the middle-years (e.g., Guthrie, Klauda, &
Dennison, 2012), late onset reading difficulties arising from increased literacy demands (e.g., Kiefer, 2010) and limited government third-wave initiatives to support middle-years learning and development (DEEWR, 2011) does little to encourage students to develop a disposition towards “wanting to read to learn”.

Understanding children’s psychosocial orientation to reading is important, particularly as a large body of empirical studies has documented the reciprocal relationship between the amount of reading and achievement. Students who frequently engage in reading tend to be higher achievers than students less willing to read frequently (Guthrie, Hoa, Wigfield, Tonks, Humenick, & Littles, 2007; Morgan & Fuchs, 2007). Examining the psychosocial dimensions of FORCSI has implications on classroom literacy practice; it may help ameliorate the powerful undercurrents of student’s reluctance to engage in reading activities and diminishing their future achievement success.

The goals of the study were to contribute to the literature on reading fluency for upper primary children in three complementary ways. The first goal was to examine the impact of the reading intervention, FORCSI, on children’s performance in listening comprehension, reading comprehension, reading accuracy and text fluency and the second goal, examining these reading outcomes across year-levels. The third goal was to investigate whether the reading intervention affected children’s thoughts (reading self concepts), beliefs (reading task values), emotions and feelings (positive and negative) impacting their psychosocial orientation to reading (reading engagement). These goals framed the development of research questions for the evaluation of the FORCSI intervention. A mixed-method approach was taken to address these goals as well as gaining a more holistic understanding of the dynamic relationship among these variables.

Two socio-economically disadvantaged schools were matched on demographic and school level characteristics prior to intervention period in this quasi-experimental design. The purpose of having schools equivalent was to reduce threats to internal validity making conclusions that can be interpretable (Cook & Campbell, 1979; Larzelere, Kuhn, & Johnson, 2004; Shadish & Cook, 2009; Stuart, 2007). One school received a reading intervention, FORCSI, supplementing the five teachers’ regular classroom literacy practice. The 30-minute reading session was
conducted three times a week by the researcher in the five classes, Years 4 to 6. The second school had the six teachers continue with their day to day skill-based literacy activities.

Pre and posttest assessment were conducted on 216 participants using the Neale Analysis of Reading Ability (Neale, McKay, & Barnard, 1999) to assess reading accuracy, text fluency and listening comprehension and the Tests of Reading Comprehension (Mossenson, Stephanou, Forster, Masters, McGregor, Anderson, & Hill, 2003) to test for reading comprehension. The participants also had to complete a questionnaire which were self-reports of their psychosocial orientations toward reading. Participants had to score items from 1 (low) to 5 (high) assessing self concept, reading task values, achievement emotions and choice behaviour.

1.6. Significance of the Study.

There are three reasons why this study was significant. First, it will contribute to the body of reading research. Research in fluency instruction has gained prominence with the United States policy directive, No Child Left Behind (NCLB) mandating fluency instruction as an approach to teach children to read (NCLB, 2002). While studies on fluency instruction produced robust reading performance, these studies were confined mainly to younger children between grades 1 and 3 or among older primary and high schooler with learning disabilities. They are very few studies with children in regular mainstream classes in grade 4 to 6. The reason could be some researchers have an implicit assumption fluency instruction is not necessary beyond grade 3 and only for older children with learning disabilities (Kuhn & Stahl, 2003; Schwanenflugel, et al., 2006). This study will fill a gap in fluency research by investigating the efficacy of a fluency-oriented reading programme with comprehension instruction for children in intermediate primary, Years 4 to 6 (equivalent to grades 4 to 6).

The second reason is a great deal of attention and past research in Australia has been concentrated on early intervention and students with identified learning difficulties (Chan & Dally, 2000; Woolley & Hay, 2003). Early intervention programmes such as Reading Recovery attract government funding. The level of funding commitment for children needing literacy support is not as readily available
for children beyond Year 3 (DEEWR, 2011; Worthy, Patterson, Salas, Prater & Tunmer, 2002, MCEETYA, 2008). Woolley and Hay (2003) recommended it was still necessary to maintain high quality literacy teaching in lower primary and the inclusion of early intervention programmes, but schools also needed to increase the number of late intervention programmes beyond Year 3. Herein lies the conundrum: in Australia, there is a lack of well-documented intervention programmes and funding for a wider group of students experiencing difficulties with literacy in upper primary grades (Louden, 2000; MCEETYA, 2008). The findings of this study will help address this short fall in intervention programmes for children in upper primary by documenting an outcome oriented, time efficient, and cost-efficient reading programme designed to be is an integrated component in a teacher’s literacy programme. Given limited staff and resources to attend to the needs of an increasing number of at-risk students (Lamb & Teese, 2005), the significance of this study is particularly relevant for children in low socioeconomic communities. They are often the casualties of poor academic performance from an Australian educational system that acknowledges its need to redress the affects of inequities existing in the school system (MCEETYA, 2008).

A final significance is the study’s investigation into the psychosocial processes arising from the reading intervention. Previous work on fluency interventions have reported students’ improvement in self concept (Pikulski, 2006; Quirk, Schwanenflugel, & Webb, 2009), self-efficacy (Ferrara, 2005) and motivation (Clark, Morrison, & Wilcox, 2009; Ferrara, 2005; Rasinski, Padak, Linek, & Sturtevant, 1994; Roundy & Roundy, 2009). Few have examined the effect fluency instruction has on children’s psychosocial orientation to reading, that is, children’s willingness to participate in reading activities and their choice decisions toward engaging in texts ranging in difficulty from easy to complex. This study will contribute to the body of knowledge as a vast majority of programmes for middle-years students has focused on skills and strategy development but relatively few have attention centred on the motivational aspect of the programme (Deschler, et al., 2007; Guthrie, et al., 2012; Quirk & Schwanenflugel, 2004).

Furthermore, the study extends previous work on fluency instruction by including achievement emotions. In general, cognitive and motivational constructs
have been frequently employed in the study of academic achievement while student’s affective experiences and its impact on learning have been largely unexplored (Goetz, Pekrun, Hall, & Haag, 2006; Hascher, 2010; Pekrun, Elliot, & Maier, 2006). Studies have shown students’ emotions are influenced by the situational characteristics of the learning environment (Goetz, Pekrun, Hall, et al., 2006; Graesser & D’Mello, 2012; Hascher, 2010) and how affective experiences arising from the learning environment can initiate or impede future learning processes (Graesser & D’Mello, 2012; Hascher, 2010; Meyer & Turner, 2002). By examining the interplay of children’s emotions, motivation (self concept and task values), choice behaviour and the learning context (FORCSI), a more nuanced understanding of the psychosocial dimensions of a reading intervention may be gained.

1.7. Thesis Overview.

This thesis is presented in nine chapters. The introductory chapter is followed by a literature review. In Chapter 2, the problem of a widening achievement gap between high and low SES schools in Australia is presented as the catalyst for initiating a search of relevant literature to identifying ways of ameliorating this problem. This investigation resulted in a cost efficient, empirically supported instructional reading approach involving improving children’s reading fluency. Research has demonstrated the efficacy of fluency instruction in improving children’s comprehension and word recognition skills (e.g., Kuhn & Stahl, 2003; NICHD, 2000; Samuels & Farstrup, 2006). Although there are many methods of improving reading fluency, this study used only a repeated reading method and included an instructional component of teaching children comprehension strategies. Studies have noted repeated reading’s ability to improve reading attitudes (Rasinski, et al., 1994; Stahl & Heubach, 2005) but evidence was only anecdotal. In this study, measures were included to identify the psychosocial processes latent in repeated readings interventions and are reported in Chapter 3. In this methodological chapter, there is a description of the instruments, the research design and method of statistical analysis. The results are presented in three chapters beginning with Chapter 4 presenting the descriptive analysis of the data. Chapter 5 presents the results of children’s reading performance across the whole sample population and Chapter 6 presents investigation of children’s performance on a year level basis. Chapter 7
presents the results on the psychosocial aspects of the investigation. Qualitative data is integrated throughout Chapters 5, 6 and 7 and occupied a secondary role of supporting the quantitative analysis (Cresswell & Clark, 2007). Chapter 8 includes the study’s limitations with suggestions for future research and implications for policy and practice. Finally, Chapter 9 presents salient areas of the investigation to conclude the thesis.
CHAPTER: LITERATURE REVIEW.

Reading in Australia.

2.1. Introduction.

Chapter 2 is presented in four sections. In Part 1: Reading in Australia, this section provided the background information situating the study’s focus on children from low socioeconomic background in the middle-years of school, Years 4, 5, and 6. Part 2: Reading Instruction, investigated how children learn to read by examining a theoretical stage model of reading acquisition (Chall, 1996). When the stage model was compared to how children are taught to read as mandated by the NSW K-6 syllabus, there were differences. The most obvious was the significance of fluency in children’s reading development in the stage model and its insignificance in the English K-6 syllabus. The role of fluency in the reading process was examined in Part 3: Focus on Fluency. In this section, the fluency literature was reviewed, evaluating fluency’s effectiveness in the reading achievement of children and the inherent gap in studies focusing on students in the middle-years. In the final section, Part 4: Psychosocial Aspects, the FORCSI intervention was examined for its impact on children’s thoughts (self concept), beliefs (task values), and emotions and whether these motivational constructs within an instructional setting, can impact on children’s reading related choice behaviour. The expectancy-value model was used to examine this question and is explained in this section.

In this first part, Reading in Australia, the importance of literacy and how it is defined in the Australian context is presented. Australia’s literacy performance in international assessments survey has highlighted inequities within the education system as well as a drop in world standing in literacy performance over the past 10 years. These issues are discussed in relation to Australian government policy and current funding levels for middle-years children with low SES.
2.2. The Importance of Literacy.

The demands on an individual’s literacy are increasing and are inextricably and indisputably linked to the psychosocial well-being, economic success, and the social advancement of the nation (Department of Science and Training [DEST], 2005). For the proficient and literate individual educational attainment, employment opportunities, and financial stability are available. However, for the less literate, the results are less stellar. Results from international literacy surveys (e.g., Progress in International Reading Literacy Study [PIRLS]; Progress for International Student Assessment [PISA], International Adult Literacy Survey [IALS]) point out students with the lowest literacy scores are at risk in adulthood facing increased chances of unemployment, reduced prospects of having a well-paid job, and a limited likelihood of engaging in future learning (OECD, 2000; Australian Bureau of Statistics: [ABS], 2008). In Australia, individuals with the highest level of literacy have a median weekly income of $890 compared to $289 for those assessed at the lowest level (ABS, 2008). Individuals completing 12 years or less of schooling (up to Year 11) had an unemployment rate two to three times higher than individuals with a Bachelor degree or higher (ABS, 2006).

If the level of literacy proficiency is a precursor to one’s economic and psychosocial well-being, it makes sense an investment in literacy would be a profitable undertaking as it will pay substantial social and economic dividends to the individual and society (Centre for Educational Research and Innovation [CERI], 2000; Cox & Guthrie, 2001; National Center on Education and Economy, 2008; OECD, 2010b). This investment in literacy begins with schools providing quality literacy instruction that does not stop once a child knows the basics of how to read and write. Literacy instruction must be provided from primary and through high school to enable today’s students to have the skills they will need to negotiate the increasingly complex work-life environment of the future (Mikulecky, 2000).

2.3. Literacy and Reading.

The demands of the twenty-first century require complex and multiple literacies. It is no longer sufficient for literacy teaching to focus on learning the alphabetical principles for reading and writing purposes. Rather, as a result of
globalisation and technological innovation, literacy pedagogy must encompass a broader range of multimodal representations, particularly as the reliance on digital technology is fast becoming more predominant than print media. In addition, the multiliterate classrooms must be responsible for developing students’ capacity to gather, process, integrate and evaluate diverse forms of information enabling them to communicate and effectively participate in a global society with its ever changing economic and occupational realities (DEEWR, 2011).

In New South Wales (NSW) schools, the English K-6 Syllabus (NSW Board of Studies, 2007) has promoted multiliteracy by mandating literacy teaching as developing children’s critical literacy skills. These skills entail the higher-order thinking skills of questioning, challenging, and evaluating text when reading, listening and viewing any written, spoken, or visual communication involving language (NSW Board of Studies, 2007). Literacy goes beyond acquiring and practicing orthographic knowledge to gain literal understanding. Becoming literate is about learning how to read and write with understanding through evaluative and reflective considerations. For NSW students this requires them to gather information, to interpret the text and to reflect on and evaluate what they have read even as early as Kindergarten (New South Wales Board of Studies, 2007). In this study, the focus is on one key element of literacy, reading. Reading is one facet within the broader context of literacy.

For approximately eight million Australians (53%) between 15 to 74 years of age, being literate under these terms does not pose a barrier to occupational success and further education and training. However, the 7 million (46%) with poor literacy skills will have difficulty accessing printed materials presented in everyday life and work (ABS, 2006). The current study was situated in a marginalised community of learners where reading may prove to be a stumbling block to future success at school and later as an effective participant in tomorrow’s global society.

2.4. Decline in Reading.

Australia was one of five OECD countries where reading levels have declined since 2000 (OECD, 2006) and this decline continues to be evident in more recent, international literacy assessments (Thomson, Hillman, Wernert, Schmid, Buckley, &
Munene, 2012). In general, 15 year-old Australian students compared well to international students on PISA, a standardised assessment administered every three years in over 70 participating countries. However, there were fewer 15 year olds now performing at high levels in reading in 2009 than in the year 2000. On the 2009 PISA survey, the mean score for Australian students was 515 points reflecting a statistically significant decline from 528 points in the 2000 PISA (Australia Council for Educational Research [ACER], 2009).

The decline in reading levels was most noticeable between the highest and lowest socioeconomic levels where gaps were equivalent to almost three full years of school (OECD, 2006). OECD (2011) reported socioeconomic differences were the strongest single factor associated with performance on PISA, explaining approximately 14% of all variations in students’ reading scores. When socioeconomic status (SES) was indexed by parental education and occupation, the achievement gap was more compelling. In Australia, an average of 13% of Year 3 children failed to reach national literacy benchmarks when parents had an education equivalent to Year 11 or below and were unemployed (low SES). In comparison, only 1% of Year 3 children fell below the national minimum standard when parents had a university degree and were employed as qualified professionals or positions in senior management (high SES). This trend continues with each successive year. By the time children were in Year 5, on average 16.8% (low SES) and 2.4% (high SES) were below national minimum literacy standard (MCEETYA, 2008).

In 2011, 6000 Australian children participated for the first time in the Progress in International Reading Literacy Study (PIRLS), a comparative study on the reading achievement of Year 4 students across 59 participating countries. Four international benchmarks, Advanced, High, Intermediate and Low, were used to compare students across and within countries. Students who achieved Advanced international benchmark, were able to interpret story events and character actions. They were capable of providing reasons, identify feelings and character traits with full text-based evidence. They were also able to distinguish, interpret, integrate and evaluate information when reading informational texts. At the Low international benchmark, students were able to retrieve a stated detail in a narrative text, or locate and reproduce two or three pieces of information from within the text.
The PIRLS 2011 results showed Australia having a substantial ‘tail’ of underperformance. Almost one-quarter (24%) of Australian Year 4 students failed to achieve Intermediate benchmark, with 17% of students achieving Low benchmark. In the Netherlands, all students attained at least the Low international benchmark compared to the 7% of Australian students currently not failing to achieve this very basic level of literacy (Thomson, et al., 2012).

A substantial proportion of developed countries outperformed Australia in PIRLS. In comparison to the higher achieving countries, Hong Kong, the Russian Federation and Singapore, the proportion of Australian students at the Advanced and High international benchmark was modest. Only ten per cent of Australian students achieved the Advanced international benchmark, with 32 per cent at the High international benchmark. The minimum standard for PIRLS was set at the reading performance at the Intermediate international benchmark. Only 34% of Australian Year 4 student achieved this level (Thomson, et al., 2012).

A high quality, world class schooling system has enabled Australia to be ranked among the top ten countries in some assessments of international literacy surveys (OECD, 2010a). However, recent assessment of Year 4 students’ reading performance on PIRLS 2011 showed Australia as the lowest performing among English speaking nations and ranked 34th in the world (Thomson, et al., 2012). Furthermore there is evidence that Australia’s attainment is inequitably distributed. If Australia is to remain as an example of world’s best education system then it must ensure the socioeconomic disadvantage ceases to be a significant determinant to educational outcomes.

2.5. School Performance and Socioeconomic Status.

In Australia, promoting equity and excellence was one of two goals set for Australian schools to achieve in the coming decade (MCEETYA, 2008). Studies have reported the relationship between socioeconomic background of the student and their academic performance (OECD, 2006; 2011). In a report reviewing equity programmes for NSW government schools (Lamb & Teese, 2005), Year 3 students in high SES primary schools had an average literacy score of 53 compared to 47.5 on schools with a large number of low SES students. In addition, only one in ten schools
was able to achieve above the national average in low SES schools compared with nine out of ten from high SES schools. A similar trend appeared in Year 5 students with a widening of the literacy achievement gap of 5.1 points between high and low SES schools.

The Melbourne Declaration (MCEETYA, 2008) was developed by a consortium of Australian education ministers, government officials, and independent and Catholic school sectors. The Melbourne Declaration acknowledged, “Australian students from low socioeconomic backgrounds were under represented among high achievers and over represented among low achievers” (p. 5). Australian governments in collaboration with all school sectors were committed to ensuring the socioeconomic disadvantage would not to play a significant role in determining educational outcomes.

Since the Melbourne Declaration in 2008, children from low socioeconomic backgrounds are still underachieving on nationwide literacy and numeracy tests. The National Assessment Program–Literacy and Numeracy (NAPLAN) is administered annually for students in Years 3, 5, 7 and 9 in reading, writing, use of language convention (i.e., spelling, grammar and punctuation) and numeracy. A government report on school funding indicated SES was still exerting a negative influence on student performance (DEEWR, 2011). The report found low student achievement on NAPLAN from 2008 to 2010 was associated with low SES and low levels of parental education. This low performance was consistent across all the year levels tested. Low SES also had an effect at the senior school level. Students were unlikely to attain a Year 12 or equivalent qualification if they were from lower socioeconomic communities. In 2009, students from low and medium socioeconomic backgrounds had Year 12 attainment rates of 56 percent and 62 percent respectively, compared to 75 percent for students from high socioeconomic backgrounds.

Studies have shown individuals with low socioeconomic background tend to underperform in national and international literacy tests, have low retention rates and are less likely to enter further or higher education and are more likely to enter into low-paid jobs. It is the responsibility of the nation’s education system to ensure
social disadvantage does not preclude individuals from becoming effective participants in society.

2.6. Educational Disadvantaged.

Since the mid 1980s, a three-tier system has been implemented to assist students’ literacy and numeracy learning outcomes through one of the following literacy development initiatives, first-wave, second-wave or third-wave intervention (Louden, 2000; Rowe, et al., 2007). The first-wave refers to improving the regular classroom instruction of Australian children during their first three years of school (Kindergarten, Year 1 and Year 2). Some examples of first-wave support are the development and effective implementation of whole school literacy programmes, regular assessments to monitor the effectiveness of teaching and improving teaching standards through the provision of teacher professional development courses.

Within these early years, if children are struggling with reading or are identified with learning difficulties, a second-wave of intervention provides schools with the resources and funding to set up preventative literacy programmes such as Reading Recovery (Clay, 1993) and MULTILIT (Making Up for Lost Time in Literacy, Wheldall, 2002). While first-wave is generally focused on whole-class support, second-wave intervention targets a specific cohort of children with learning issues, withdrawing them from class on a one-to-one basis or as a small group for remediation.

Research has shown the significance placed on early prevention and reading intervention initiatives to support individuals with reading difficulties (e.g., NICHD, 2000; Snow et al., 1998) and this is demonstrated by Australia’s concentration of resources in the first- and second-wave of literacy teaching in Australia (DEEWR, 2011; Department of Education, Science and Training [DEST], 2003; Louden, 2000). However for some children, powerful early intervention is not enough as long term follow-up studies reveal ‘booster sessions’ (Snow et al., 1998, p 248) are necessary. Some have observed early gains made in Reading Recovery sessions do not transfer to classroom reading lessons and whatever gains were made eventually disappeared with time (Chan & Dally, 2000; Chapman & Tunmer, 1995, 2011).
There is a need for third-wave support, as many children with initial reading difficulties do not outgrow their literacy difficulties (Francis, Shaywitz, Stuebing, Shaywitz, & Fletcher, 1996; Juel, 1988; Smart, Prior, Sanson, & Oberklaid, 2001). The third-wave of literacy development consists of initiatives supporting the continuation of quality classroom teaching programmes assisting children that have not outgrown their learning difficulties along with non-disabled readers in the middle and upper grades (Years 4 to 6) (Louden, 2000; Rohl, 2000; Rowe et al., 2007).

In addition to the wave interventions and in response to the needs of students in low socioeconomic communities, the NSW government established the Priority School Funding Programme (PSFP) (NSW Department of Education and Training, 2009). Extra financial support is given to disadvantaged schools enabling them to initiate and implement practices that encourage improvement such as providing professional learning for teachers and community members and resource material development. PSFP schools were encouraged to meet regional objectives including improvements in student literacy, numeracy, and participation outcomes.

The PSFP funding model was abandoned in 2012 and replaced with a Resource Allocation Model (RAM) in NSW. However, nationally funding systems are in transition as the Commonwealth and State government currently negotiate new funding models in response to the Gonski Report (DEEWR, 2011). As yet it is unclear how the proposed Gonski model addresses third-wave intervention.

In planning and implementing any instructional programme in low SES schools, it is important to consider whether the programme is cost effective in terms of value for money in delivering robust educational outcomes and is sustainable in the midst of high teacher turnover. In many disadvantaged schools, high staff turnover has worked against the capacity of the funding to reduce social differences in performance across schools. Approximately one in ten disadvantaged primary schools had 61 percent or more of the staff members as new teachers in 2004 (Lamb & Teese, 2005). High staff turnover means funding used to help promote staff development and build skill capacity of teachers do not stay with the school. The gains from new and innovative programmes designed for disadvantaged students
either lose momentum or are lost with the continual ebb and flow of teachers (Lamb & Teese, 2005).

Another consideration is the minimal follow-up support for students in need of on-going third-wave intervention (Rowe et. al., 2007). The provision of third wave compensatory assistance while necessary may also be insufficient to meet the needs of children during the middle-years of school, namely in Year 4 to Year 6 (DEEWR, 2011). The insufficiency lies with the fact 69% of government schools are in relatively disadvantaged areas of NSW (Lamb & Teese, 2005) and with most of the funds and resources diverted to the first- and second-wave literacy interventions (DEST, 2003; Louden, 2000; Woolley & Hay, 2003), this leaves little for third-wave support, particularly funding directed into the acquisition of literacy in upper primary years (Years 4 to 6). Prior research has concentrated on students with specific learning difficulties leaving a paucity of findings from Australian evidence-based research on well documented third-wave intervention strategies for a wider group of students during the upper primary years (Chan & Dally, 2000; DEST, 2003; Louden, 2000; Rowe et. al., 2007).

2.7. Reading and the Middle-Years.

The 2008 Melbourne Declaration had as its second goal the commitment to develop confident, creative, and informed successful learners (MCEETYA, 2008). To achieve this goal, several educational areas were committed to action including improving the academic achievement of children in the middle-years of school. In NSW, the middle-years span across primary and secondary school beginning in Year 5 (age 10) and ending in Year 9 (age 14). In this study, the middle-years focused specifically on upper primary children in Years 4 to 6.

A wealth of evidence has shown alarming trends within these middle-years of schooling including children experiencing a slump in reading (Chall & Jacobs, 2003; Galletly, Knight, Dekkers, & Galletly, 2009; Kieffer, 2010; Leach, Scarborough, & Rescorla, 2003) and reading disengagement peaking (Guthrie & Davis, 2003; Guthrie, Klauda, et al., 2012; Kamil, et al., 2008). Most U.S. students can read by third grade using the basic procedural word-reading skills. However by fourth grade, approximately two-third of students were unable to read for meaning, lacking in
proficiency in evaluating texts and linking narratives to real-life experiences (Reardon, Valentino, & Shores, 2012). Almost one-quarter of Australian Year 4 students failed to achieve the minimum international benchmark in PIRLS 2011 (Thomson, et al., 2012). These are some of the evidence suggesting why middle-years require attention, particularly if the Declaration’s goal of developing Australian youths into successful learners is to be accomplished.

Although the Declaration has committed to enhancing middle-years development by ensuring schools provide programmes supporting students’ developmental and learning needs (MCEETYA, 2008), inspection of the NAPLAN results suggests there are groups within the middle-years requiring specific targeting. From 2008 to 2010, children in Year 5 were not performing as well as Year 3 and Year 7 on the NAPLAN reading test. In Figure 2.1, Year 5 children had the highest percentage of children with reading scores below the national minimum standard over three consecutive years of national assessments. There are a number of factors explaining this learning slump and two specific ones include: a) the phenomenon known as the “fourth grade slump” (Chall, 1996; Chall et al., 1990) and b) the lack of specific educational focus and intervention activities pertaining to this cohort of the student population due to funding constraints (DEST, 2003; Louden, 2000; Rowe et al., 2007).

![Figure 2.1 2008-2010 NAPLAN reading results for Years 3, 5, and 7](image-url)
2.7.1. Fourth Grade Slump.

The Year 5 reading results may be symptomatic of a learning deceleration begun in Year 4. Known as the ‘fourth grade slump,’ this phenomenon was coined by Chall, Jacobs and Baldwin (1990) while studying 30 children from low income families in grades 2, 4 and 6. They found around fourth grade, children were exhibiting a general decline in reading progress and were experiencing difficulties with word meanings, word recognition, and spelling compared with the normative population. These researchers attributed the reading slump to the curriculum shifting from learning to read to reading to learn. The shift in curriculum meant children were encountering instructional materials and concepts beyond their everyday experiences. In this transitional phase, children were challenged with reading materials requiring higher cognitive and linguistic abilities. New concepts and vocabulary was being increasingly introduced through expository texts replacing the-simpler narrative texts dominating the reading material of earlier years when children were learning to read.

Although the reading slump was observed among low SES fourth graders, these difficulties may arise from increasing literacy demands and could easily carry forward into subsequent years. It is understandable how low SES children experience a down turn in reading progress beginning around Year 4 which then can continue into later years. Many of these children come from literacy impoverished environments (Neuman & Celano, 2001) and stumble when challenged with curriculum different from one they were accustomed in the early primary. As children enter upper primary (Years 4 to 6), they are confronted with a curriculum more text-laden and containing words that are phonologically and morphologically complicated. Children here have to make sense of concepts and vocabulary beyond their normal daily experience (Chall & Jacobs, 2003). Children are expected to read in order to learn new information, applying higher-order thinking skills in order to compare and contrast information and to interpret and integrate ideas (Reardon et al., 2012).

For many children, developing these higher-order reading skills not only takes longer than the procedural word-reading skills taught in early primary, but data from national and international literacy assessments indicated a large proportion will
not achieve a high level of proficiency in these skills. Reardon et al., (2012) found roughly only one third of U.S. fourth-graders were proficient in making inferences and interpreting and evaluating multiple texts on the National Assessment of Educational Progress (NAEP) reading assessments administered in 2011. This low level of literacy skills is not a U.S. phenomenon. Australia had a substantial ‘tail’ of underperformance in PIRLS 2011 as 24% of Year 4 students failed to achieve the Intermediate benchmark. Only 17% achieved the Low benchmark and seven per cent failed to achieve this basic literacy level (Thomson, et al., 2012). Adding to the surmounting reading challenges, there are for some children, reading difficulties that were not present earlier but are now late in emerging as the purpose of reading changes from learning to read to reading to learn (Galletly et al., 2009; Kieffer, 2010; Leach et al., 2003).

Leach et al., (2003) studied 161 fourth and fifth graders some with reading disabilities (RD) and others achieving normally. The 66 children with RD had either poor reading comprehension or word-level deficits (as in poor word accuracy and speed) or a combination of both and their RD was categorised as having been identified by the school as early (prior to fourth grade) or late (during fourth or fifth grade). The researchers found 31 children had late emerging RD. Prevention efforts although commendable, are not sufficient to safeguard against late-emerging RD as many of these children went undetected by the schools at least for the first year or two after their emergence. The problem schools face is being able to identify the type of skill deficit the child has. Leach and her colleagues found for late-identified children, 35% had word-level processing deficits along with adequate comprehension skills, 32% had poor comprehension skills but with good word-level skill and for another 32 percent of children the demonstrated both types of difficulties. Distinguishing which students require what type of instruction depends on whether assessment tests can identify those with comprehension problems only, from those difficulties only in word-level processing, and those exhibiting across the board weaknesses in reading.

The issue with children with late onset reading comprehension and/or word level difficulties can be appreciated when understood from the perspective of a meaning-emphasis curriculum. Fourth grade children are leaving a curriculum
focused on learning to read and entering into another where the expectation is to read in order to learn (Chall & Jacobs, 2003). It is assumed by the end of third grade (or Year 3), children will have been grounded in the alphabetic principle, have become familiar with the systematic correspondences between letters and phonemes, and have the capability to apply this knowledge to become proficient at word recognition. During the middle school years, generally there is less instruction on how to read and more on learning how to assess meaning from a myriad of text types (Leach et al., 2003). The problem occurs as children’s reading falters when they are faced with a curriculum making heavier demands not just for deeper understanding of text but also for handling lower-level processes more complex than in the earlier grades. In general, the rudimentary phoneme-grapheme correspondences have been learned in the years from Kindergarten to Year 3. Beyond these years, it is expected for children to have mastered these bottom-up processing skills enabling them to decode and recognise words of increasing orthographic complexity. For some middle-years children, coping with increasing literacy demands exposes their late-onset and late-identified reading difficulties (Leach, et al., 2003).

This profile of late emerging RD involving both top-down and bottom up difficulties has been observed in older children in other studies (Galletly, et al., 2009; Kieffer, 2010). Keiffer (2010) used longitudinal data based on the reading proficiency from the Early Childhood Longitudinal Study reading tests to investigate the emergence of reading difficulties during three developmental periods: before or in Grade 3, in Grades 4-5 and in Grades 6-8 among English language learners and English speakers from diverse socioeconomic backgrounds. Using discrete time survival analysis, results highlighted the extent SES played in late-emerging difficulties. Students with lower SES were substantially at higher risk for developing reading difficulties during each developmental period compared with students with higher SES.

Children learning to read successfully in the earlier years and going on to experience difficulties after third grade (or Year 3) were identified in another study investigating late-emerging reading accuracy difficulties among Australian readers in Years 1 to 8. Galletly et al., (2010) assessed reading accuracy levels of 1205 students at multiple schools and year levels using the Test of Word Reading Efficiency
(TOWRE) (Torgeson, Wagner, & Rashotte, 1999). Preliminary findings indicated reading accuracy achievement, measured as standard scores (SS), early readers (Years 1 to 3) were significantly higher than those of older readers (Years 5 to 8). Although the mean achievement at all year-levels were within average range, the proportion children with low standard scores (i.e., SS< 90) increased steadily across Years 1 to 8 suggesting the likelihood of late-emerging reading accuracy difficulties were present. In addition, more boys than girls were low achievers (i.e., SS< 90) and the proportion of boys increased across the upper-school years.

2.7.2. Middle-Years Focus.

In recent years policy makers both in Australia and abroad have directed considerable resources toward improving the literacy skills of the youngest school children. This continuing emphasis on funding supporting reading acquisition and early intervention programme is in the face of a middle-years literacy crisis requiring the same level of attention their younger siblings have been receiving. In America, it is estimated that 69% of fourth graders cannot read at proficient levels (NCES, 2005). If Australia is to avert the declining ranked performance over the last decade on international literacy benchmarks (e.g., PISA), then greater efforts are needed to channel funding into middle-years schooling, particularly in the area of developing intervention programmes targeting this cohort of student population. Although there are intervention programmes and materials in schools, there is limited research evidence as to their effectiveness (DEST, 2003; van Kraayenoord, 2010). Effective intervention for children in the middle-years requires the development of well documented intervention programmes as well as funding attached to improving professional development (DEST, 2003; Louden, 2000). Even with the limited availability of third-wave programmes, there has been persistent call for teachers to use evidence based practices in the teaching of literacy (e.g., Rowe, 2007). Without continued effort and funding support for professional development, teachers will continue to overlook validated pedagogical practices. Too many of the reported professional development have appeared to have been one-off sessions, too short to lead to long-term change or significant skill development (Louden et al., 2000).
2.8. Summary: Reading in Australia.

Traditionally there has been the policy concentration at State and Commonwealth levels of focussing on providing resources and funding initiatives for children in the early years of school. Research has demonstrated the significance of directing effort and attention toward young children in the prevention of reading difficulties (e.g., NICHD, 2000; Snow et al., 1998). However, there is a sector of the student population also facing literacy challenges just as disconcerting as those in faced by their younger counterparts; children in the middle-years of school from low socioeconomic families. Achievement in NAPLAN from 2008 to 2010 demonstrated how socio-economic status was a key factor in shaping the educational outcomes of Australian students. Across Years 3, 5, 7, and 9, lower student performance was strongly and consistently associated with lower levels of parental education (DEEWR, 2011). Funding and resources were stretched in responding to the literacy needs of approximately one-fifth of Australian school children struggling with the effects of socio-economic marginality (DEEWR, 2011). The development and learning characteristics of the middle-years sector, requires renewed efforts to reduce the socioeconomic disadvantage as a significant determinant of educational outcomes. The 2008 Melbourne Declaration has stated there is a need to enhance middle year schooling and to promote equity and excellence particularly for those from low socioeconomic backgrounds (MCEETYA, 2008). It is within this context the current study was situated. Because there exists a paucity of findings from Australian evidence based research on well-documented third-wave intervention programmes for children in Years 4, 5, and 6 (Chan & Dally, 2000; DEST, 2003; Louden, 2000; Rowe et al., 2007), the study’s challenge was to find a suitable evidence-based reading intervention to deliver robust cost effective educational outcomes for children in the middle-years, Years 4 to 6.
Reading Instruction.

2.9. Introduction.

In this second section, Reading Instruction, an overview of reading instruction from an international and national perspective is presented. Fluency instruction has been widely documented as an effective evidence-based practice, is a key reading component in U.S. schools (Pressley, et al., 2006), and has been acknowledged as a necessary skill advancing the literacy development of Australian children (DEST, 2005). Because of the high regard for fluency as an important reading component, fluency’s importance was examined using Chall’s (1996) stage model of reading development. Chall’s stage model was then compared with how reading is developed in New South Wales schools by examining the NSW English K-6 syllabus (NSW Board of Studies, 2007).

Comparison of Chall’s stage model (1996) with the English K-6 syllabus revealed similarities and differences on fluency’s significance in children’s reading development and these are discussed in the latter part of this section. The section concludes by asking whether fluency instruction can assist children’s reading achievement in the middle-years, ameliorating learning barriers associated with social disadvantage.

2.10. International Perspectives.

Learning to read is a complex task for children and it requires a high degree of professional skill in the teaching of it (Center, 2005). There are two basic processes in reading: learning to decipher print and understanding what the print means. Scientific research has indicated for these processes to be successful, a set of sub-skills must be integrated including: letter-symbol recognition, phonemic awareness, phonological knowledge, whole-word recognition, fluency and the ability to access meaning from written text (Cassidy, Valadez, & Garrett, 2010; NICHD,2000; Snow et al., 1998). There is a considerable body of knowledge on reading supporting the need for the effective integration of these subskills. Much of this evidence has been synthesized in the United States of America (U.S) Report of the National Reading Panel: Teaching Children to Read (NICHD, 2000) and in
In 1999, convened by the U.S. Congress, the National Reading Panel (NRP) was given the task of identifying the most important research-based factors associated with high achievement in the teaching and learning to read in the elementary grades. The NRP was comprised of fourteen U.S. reading specialists and they focused their efforts on published peer-reviewed journals with research using either experimental or quasi-experimental design so cause-and-effect could be examined. The NRP began with broadening its understanding of the reading issues through a systematic analysis of the findings of the National Research Council (NRC) Committee on *Preventing Reading Difficulties in Young Children* (Snow, Burns, & Griffin, 1998).

The NRP identified the following topics for further examination: *alphabetic* (including phonemic awareness and phonics instruction), *fluency* and *comprehension*. These three areas were considered central to learning to read by the NRC Committee. The NRP expanded the review process by including literature on reading instruction in *teacher education* and *computer technology*. The NRP chose these five topics as they reflected the central issues pertaining to instruction in reading. Some educators however, have criticised the NRP for being too narrow in its conceptual approach to reading instruction and for ignoring many elements of balanced instruction that enjoyed empirical support (Cummins, 2008; Pressley, Graham, & Harris, 2006).

### 2.11. Australian Perspective.

In 2004, the Australian government announced a National Inquiry into the Teaching of Literacy (NITL) with the task of investigating the teaching of reading in Australian schools. One of five objectives set by the Committee of Inquiry was to identify research evidence on literacy teaching and policies to inform classroom teaching practice and support teacher professional learning in Australian schools. The Committee of Inquiry’s report, *Teaching Reading*, included two recommendations of “the highest priority and are made as a basis for all other recommendations in this report” (DEST, 2005, p. 38).
The first recommendation was for teachers to be equipped with evidence-based teaching strategies demonstrated to be effective in advancing the literacy development of all children. The second recommendation was for teachers to provide systematic and explicit phonics instruction ensuring children can master the alphabetic code-breaking skills necessary for reading proficiency. In addition, teachers were to provide “an integrated approach to reading that supports the development of oral language, vocabulary, grammar, reading fluency, comprehension and the literacies of new technologies” (DEST, 2005, p. 38).

An inspection of the New South Wales English K-6 Syllabus (New South Wales Board of Studies, 2007) supports the Committee’s recommendations of mandated reading outcomes by developing the necessary reading skills for children in New South Wales (NSW) schools. However, one area where the reading outcomes have been less explicit and forthright is the development of children’s reading fluency. Fluency is generally described as reading text quickly and accurately with appropriate expressiveness or prosody (Hudson, Pullen, Lane, & Torgesen, 2009). Developing reading fluency is through a variety of guided oral repeated reading practices of which repeated reading is the most widely researched approach to fluency instruction (Kuhn & Schwanenflugel, 2006). Repeated reading, used as a method to improve fluency in this current intervention, involves practicing a given passage repeatedly. A more detailed description of fluency is presented in the next section, Focus on Fluency.

Research has found fluent reading skills aid comprehension (Chard, Pikulski & McDonald, 2006; Chard, Vaughn & Tyler 2002; Paige, Rasinski, & Magpuri-Lavell, 2012; Rasinski, Rikli, & Johnston, 2009; Therrien, 2004; Valencia, Smith, Reece, Li, Wixson, & Newman, 2010) and is a predictor of reading success (Fuchs, Fuchs, Hosp, & Jenkins, 2001; NICHD, 2000). Unfortunately, the NSW English K-6 syllabus does not appear to have taken advantage of these benefits. Many of the syllabuses’ suggested teacher activities imply reading fluency is more about improving children’s speech elocution and reading speed than comprehension.

Until recently, fluency has neither been actively enlisted nor fully realised in classroom instruction, particularly with older students (Paige, et al., 2012; Rasinski,
2006). Considered a neglected goal of reading (Allington, 1983), fluency instruction has gained prominence since the Report of the National Reading Panel (NICHD, 2000) established fluency instruction as a key component in any reading programme. The NRP’s findings had an impact on teaching as it informed the No Child Left Behind (NCLB) legislation requiring all students, regardless of ability level, to meet annual standards of achievements so every child would be competent readers by 2014 (NCLB, 2002). NCLB legislation has had significant impact on skill instruction at the kindergarten through to grade 3 levels, emphasising phonemic awareness, phonics, fluency, vocabulary development, and comprehension strategies (Pressley, et al., 2006). In Australia, the push for fluency was not observed as it was in the U.S.

If fluency instruction is an integral part of a classroom’s reading programme in the U.S, a closer examination of the NSW English K-6 is warranted to see how reading fluency is developed. To assist with this examination, Chall’s (1996) stage model of reading development will be used firstly to delineate the milestones in children’s reading acquisition and secondly, as a comparison against the English K-6 syllabus, looking for similarities and differences that might explain why some NSW school children incur a slump in reading during the middle-years of school.

2.12. Reading Development: Stage Model of Reading Acquisition.

There are many theories on the acquisition and development of reading skills (e.g., Ehri, 2005; Gough & Tunmer, 1986). One theory of particular relevance is Chall’s stages of reading development (1996). Chall’s stage model acknowledges the important role of fluency in the acquisition and advancement of reading skills by describing when fluency should be taught, how it should be taught, and why it should be taught. A review of the stage model brings coherence to fluency and its potential impact on children’s reading acquisition and development. The stage model also offers a framework for instruction designed to promote and improve fluency.

Chall (1996) proposed a stage model primarily communicating how reading develops and changes through six distinguishable stages, from birth to college and beyond. These stages mark the course of reading development that remains consistent and fundamental throughout one’s life. For example, an illiterate adult
would undergo each of the stages in the same hierarchical progression as a beginner reader or as a fluent ten year old reader. Regardless of the age, individuals will progress through each stage in succession. This cognitivist’s perspective may appear to be a limitation as the stage model does not consider reading acquisition as an interactive process shaped according to the sociocultural environment in which the learning occurs (Davidson, 2010).

Chall (1996) posits that although learning to read follows a course of development in an invariant sequential order, the stage model does recognise however, the significance of sociocultural factors. The pattern of age and grade specification may vary as progress through the six reading stages can be at different rates depending on the interaction between "individual (biological, motivational, cognitive and so on) and environmental (home, school, community) factors" (p. 82). Chall (1996) contends that the stage model does consider the reciprocal interaction of the individual, environment and behaviour by identifying, for example, the reading challenges associated with social disadvantage. The stage model addresses the learning and developmental needs of children from low socioeconomic families by providing a framework that informs teachers of when, what, and how to use instructional methods to improve the reading competencies of these children.

The six reading stages are the pre-reading phase of Stage 0, learning to read phase of Stages 1 and 2, reading in order to learn phase of Stages 3 and 4, and finally Stage 5 where individuals become mature readers capable of constructing and reconstructing knowledge from their own reading (Chall, 1996). These stages are finite structures, qualitatively different from each other with each stage presupposing skills acquired in the previous stage. A basic tenet of Chall’s stage model states relevant skills must be taught within each of the six stages if reading acquisition is to be achieved and reading failure averted.

In NSW schools, classes are organised according to year levels. Children begin school in Kindergarten (ages 5-6) progressing onto Year 1 (ages 6-7) then Year 2 (ages 7-8) until they leave primary school in Year 6 (ages 11-12) to begin high school in Year 7 (ages 12-13). In subsequent discussions, ‘year’ and ‘grade’ will be used interchangeably as both terms refer to children of similar age category.
2.12.1. Stage 0. Pre-reading: Birth to Age 6.

Preschoolers with repeated opportunities to practice expressive oral language (talking) and receptive oral language (understanding oral language) are better able to handle school-based literacy instruction when they begin formal education than children lacking emergent literacy experiences. Children’s oral and receptive facilities are more fundamental to their first encounters with classroom literacy making a whole-language approach to reading instruction supportive to the developmental needs of children (Chall, 1996; Pressley, 2006). Chall (1996) found children taught using whole-language instruction were either better than or as good as those using a phonics approach when they first began school (Stage 0). However, as the children transitioned from Stage 0 to Stage 1, children with successful reading performance were in classes with phonics instruction.


Young children at Stage 0 and at the beginning of Stage 1 behave in a similar way - they are both more preoccupied with the meaning of the text than its printed form. Children are engaged in a type of pseudo-reading where an ‘inside-out’ process occurs, when the understanding of the text takes precedence over what has been actually written (Chall, 1996).

Reading educators have observed this developmental phenomenon and encourage classrooms to facilitate this ‘inside-out’ process by replacing basal readers with real-life, authentic reading materials (Pressley, 2006) and to have lessons focus on developing vocabulary and background knowledge through content-rich expressive and receptive oral language activities (Guthrie, Wigfield, & Klauda, 2012; Hirsch Jr., 2006; Pressley, 2006; Willingham, 2006). A whole-language approach is strongly recommended as facilitating reading acquisition for students beginning Stage 1.

Noticeable changes occur as the child progress further into Stage 1. Word-error substitutions reflect the child’s reading maturity. In the initial phase of Stage 1, first graders often make word-substitutions errors based on semantic and syntactical acceptability. As reading matures, word-substitution errors make ways into a second
phase where there is a greater concern to read with accuracy than bringing one’s own interpretation of the text. Children literally read word-by-word and are ‘glued to the print’ (Chall, 1996, p. 18). Allington (2009) considers this developmental milestone as a fundamental process to becoming a mature reader.

According to the stage model, optimal learning environments for children entering Stage 1 (beginning grade 1) would be focused initially on developing language skills under a whole-language approach. As children become ‘glued to print’ and are more conscious of reading the words properly, the introduction of a skills-oriented phonics programme becomes more relevant during the later part of Stage 1 (end of grade 1 and throughout grade 2). Skill instruction during this later phase include phonemic awareness instruction, letter-sound correspondences, and whole-word approaches to reading and decoding through explicit teaching of the alphabet (Pressley, 2006). By the time children finish Stage 1 (end of grade 2), they should be able to read given text using a variety of skills and strategies taken from both whole-language and skill-based reading instructions (Chall, 1996).


The initial phase of Stage 2 is about consolidating and confirming what has been taught in Stage 1, such as consolidating phonological information, linguistic comprehension skills, and sight vocabulary. Confirming these skills is through reading materials with concepts and language familiar to children’s everyday experiences. Stage 2 is not oriented towards learning new information but to allowing children to practice their decoding knowledge to gain fluency and speed (Chall, 1996).

Chall (1996) felt fluency was important during this stage as it will be needed in Stage 3, reading to learn. Children begin to ‘unglue from print’ as they leave word-by-word reading to prosodic fluent reading, particularly if the children are immersed with materials with familiar concepts, language structure, and vocabulary allowing attention to be concentrated on the printed word.
Fluency has been acknowledged as an essential component to reading development (Allington, 2009; Cassidy, et al., 2010; Chall, 1996; Kuhn & Stahl, 2003; NICHD, 2000; Pinnell, Pikulski, Wixson, Campbell, Gough, & Beatty, 1995; Rasinski, Blachowicz, & Lems, 2012) as it enables children to direct attention on other multiple aspects of print beyond phonological processing, such as assisting with the ability to recognise words accurately and automatically (LaBerge & Samuels, 1974). This is particularly important in the latter phases of Stage 2 between grades 2 and 3, when children are presented with reading materials with vocabulary, language and content beyond what they are familiar with. There is a shift away from the controlled vocabulary and content matter of earlier stages. Children must be able to draw upon semantic and syntax cues as well as relying on previous background knowledge to access meaning from text. The role fluency plays during this phase is pivotal as it allows children to recognise words accurately and automatically allowing them to focus on comprehending what they are reading rather than on the actual words they are reading. In fact, fluency and comprehension share a unique reciprocal relationship such that fluency is considered to be the link between decoding and comprehension (Chard et al., 2006).

Chall’s stage model implies a sequential developmental progression in which decoding lends itself to word recognition which then carries onto fluency. Recent studies have indicated that fluency occurs when reading processes are operating concurrently and not necessarily in a sequential manner. Cartwright (2002, 2007) found both children and adult’s reading and comprehension performance were associated with their ability to simultaneously process phonological and semantic features of printed words over and above the contributions of general cognitive ability and verbal ability. Furthermore, fluent reading occur when one can successfully and flexibly co-ordinate the phonological and semantic processing of information. A graphophonological-semantic inflexibility may be producing poor-reading fluency rather than a deficiency in the operation of phonological and semantic processing of information (Cartwright, 2007).
2.12.4. Stage 3. Reading to Learn. 3A Grades 4-6, Ages 9-11; 3B Grades 7-8, Ages 12-14.

Stage 3 is qualitatively different from the previous stages. Learning to read is a preoccupation in Stage 1 and Stage 2 and now the focus shifts to reading to learn and acquiring new information. Children are more concerned with relating print to ideas than to speech as had been in earlier stages. The skills and knowledge procured in the earlier stages are now used as tools to access new knowledge, information and experiences.

There are two phases in Stage 3: Phase A or grades 4-6 (ages 9-11) and Phase B grades 7-8 and/or 9 (ages 12-14). A brief description of Phase B and the remaining Stage 4 and Stage 5 will be given as these stages are beyond the scope of this study.

In Phase A, children begin to develop a sense reading is more than satisfying their egocentric needs and reading may serve the bigger purpose of expanding their outlook and knowledge of the world. Children in grades 4 to 6 are introduced to increasingly complex texts, demanding them to accommodate more abstract words and unfamiliar concepts than previous narrative texts. Sentences begin to be more challenging with linguistic and syntax features becoming more difficult. In Stage 1, the focus was on mastering printed material while in Stage 2 it was gaining mastery through fluent reading. In Stage 3 the goal becomes mastering of ideas. For some children this shift in task focus has meant additional reading demands may put those at-risk of incurring late-onset reading problems (Leach et al., 2003). For others, it simply exacerbates their already poorly developed reading skills from the previous stages.

Reading instruction should be take into consideration the transitional difficulties from Stage 2 to Stage 3 experienced by some children on entering grade 4. To assist reading in Phase A, Chall (1996) suggests lessons build on children’s knowledge base through exposure to a wide variety of visual and audio materials. Another recommendation is that texts have only one point of view and be used as introduction to content areas. By doing this, fewer demands are placed on readers to have prior knowledge of concepts and vocabulary.
In Phase B, children in grades 7 to 8 are expected to read with discernment. They will have developed the ability to analyse and present opinions in the light of differing viewpoints and are considered to have reached a level of reading maturity. The remaining Stage 4 and Stage 5 are concerned with developing these skills to a greater level of sophistication.


The central emphasis in Stage 4 is the ability to hold multiple levels of facts coupled with a variety of differing perspectives. The success within Stage 4 is predicated by the amount of knowledge acquired earlier. A major obstacle to further reading growth is an inability to bring knowledge and experience to their reading as reading materials with multiple viewpoints and or concepts are beyond the reader’s present experience.


Stage 5 is about the reader’s ability to construct their own ‘truth’ though the analysis, synthesis, and evaluation of information gathered from a variety of sources. This stage involves the ability to construct knowledge at a high level of abstraction.


The stage model is a conceptualisation of how children learn to read from a developmental perspective. By understanding this stage-by-stage reading process, reading instruction can be planned and delivered accordingly. The New South Wales English K-6 syllabus is compared to the stage model and how the syllabus develops reading fluency, a major recommendation on the Committee’s report on Teaching Reading (DEST, 2005).

For children in Kindergarten to Year 3, the English K-6 syllabus follows the basic tenets of the stage model. For example, in Chall’s model, children’s mastery of word identification skills is paramount during Kindergarten to Year 3 (Stages 0, 1 and 2) and teaching strategies are provided to develop word recognition. Children taught under the English K-6 syllabus, learn how to read by using the names and sounds of the alphabet taught in Kindergarten (Stage 0). Word recognition continues
to be developed as children in Years 1 and 2 (*Stage 1*) increasing their knowledge of letter-sound correspondences and blending skills. By the time they finish Year 3 (*Stage 2*), children are able to use a large number of skills and strategies to recognise and decode an increasing number of regular and irregular words automatically (NSW Board of Studies, 2007).

In the early primary years from Kindergarten to Year 3 (*Stages 0 to 2*), the main preoccupation was teaching children the alphabetic principle. As children enter Year 4 (*Stage 3*), the curriculum shifts from the previous focus of teaching children how to read to the new focus of teaching reading to learn new material or content (Chall, 1996). This shift in curriculum is also reflected in the English K-6 syllabus where reading is treated not as an end in and of itself but as a means of gaining knowledge and with this knowledge, the ability to appraise and reflect on opinions, ideas and events (NSW Board of Studies, 2007). How well children transition from Year 3 to Year 4 as they exit *Stage 2* into *Stage 3*, will determine if reading flourishes or becomes a struggle in later years for some children. This is because a basic tenet of the stage model stating relevant skills must be taught within each of the six stages if reading acquisition is to be achieved and reading failure averted (Chall, 1996).

According to Chall (1996), readers need to be developed in three areas in order to progress to *Stage 3*: sufficient knowledge in word meanings, word recognition and decoding, and fluency. Chall noted fourth grade, below-average readers were behind in these three areas and experienced earlier and more intensive reading deceleration. Chall conjectured despite above-average readers falling below national norms on word meanings, their strong performance in other reading skills was due to their robust reading skills in word recognition and fluency. The question needs to be asked whether or not the English K-6 syllabus has sufficiently developed fluency to allow for a smooth exit from *Stage 2* (Year 3) into *Stage 3* (Year 4) and avert the documented phenomena of the fourth grade reading slump (Chall, 1996; Chall & Jacobs, 2003; Chall, Jacobs, & Baldwin, 1990; Galletly, et al., 2009; Kieffer, 2010; Leach, et al., 2003).
Although the English K-6 syllabus followed the stage model closely in the first three years of school, one noticeable divergence from the stage model was how fluency was taught. For Chall (1996), the development of fluency in Years 2 to 3 (Stage 2) is a vital reading component in reading acquisition. If children lack reading fluency (Stage 2) because they are still ‘glued to the print’ reading word-by-word (Stage 1), these children will not benefit from activities requiring them to use reading to learn new ideas in the later years of school (Stage 3 onwards).

In order for children to meet the challenge of increasing literacy demands in subsequent years, the stage model suggests children in Years 2 to 3 (Stage 2) be given more time to practice, consolidate, and confirm previously learned skills. Children need to be immersed in reading materials with simple concepts, language structure, and vocabulary. Providing them with a learning environment where consolidation and application of previously learned skill is encouraged, reading fluency is developed, and the skills are polished “for the difficulty to come – the acquisition of new ideas in Stage 3” (Chall, 1996, p. 20).

While the stage model maintains the crucial role of fluency in reading acquisition in Years 2 to 3 (Stage 2), during the same period, the main focus of the English K-6 syllabus’s is on developing children’s critical thought processes to integrate reading and writing (NSW Board of Studies, 2007). As early as Years 1 and 2 (Stage 1) and until they leave primary school in Year 6 (Stage 3), the English K-6 syllabus follows the current educational trend of calling for increased skill acquisition requiring a shift from accessing information at the literal level of reading to accessing information using higher-order level. These higher order skills require children to interpret and integrate information. In recent years, many of the international assessments of literacy (e.g., PISA and PIRLS) have broadened their assessment of student literacy to include reading processes necessary to solve problems.

Reading instruction for children in NSW schools is about teaching and learning how to construct meaning by drawing knowledge from texts, information, and personal experiences through the use of gathering, questioning, and evaluating information (NSW Board of Studies, 2007). The four resources model (Freebody &
Luke, 1990; Luke & Freebody, 1999) is used in all of the state English syllabi across Australia’s education system (van Kraayenoord, 2010). The four resources model would argue that reading skills do not develop as a consequence of age or ability but rather, all four roles (code breaker, meaning maker, text user and text analyst) should be develop simultaneously. Thus, students in a NSW Kindergarten class, should be able to engage in text and understand the cultural and social functions of text (text user) at the same time have the ability to critically analyse what they are reading (text analyst) when they are still learning the alphabetic principle (code breaker).

At the core of the English K-6 syllabus is the theoretical perspective conceptualising language as a resource for making meaning (Freebody & Luke, 1990; Luke & Freebody, 1999; NSW Board of Studies, 2007). From this perspective, the English K-6 syllabus sees children's reading process largely guided by their developing need to make meaning through the gathering, questioning and evaluating of information. A high priority is given to the development of these language skills in NSW classrooms (NSW Board of Studies, 2007). However, developing these language skills does not necessarily depend on one's age or ability, but should be developed concomitantly (van Kraayenoord, 2010). This is contrasted with Chall's model which emphasises the hierarchical nature of the reading process where children must master lower order skills before higher order skills. It is necessary to understand a child's developmental stage in order to determine what, when and how reading should be taught.

The disparity between the two theoretical perspectives is highlighted by the way reading fluency is developed. In the stage model, children’s fluency is developed in Years 2 to 3 in classrooms focused on using texts with content familiar to the children’s lived experiences and with sentence structure and language patterns familiar to their everyday life. Because the content of what is read is familiar, children focus their attention on the printed word, confirming what is already known. Now is not the time to introduce new information but to practice the decoding knowledge with the goal of gaining reading fluency and speed.

In the stage model, fluency enables children to direct their attention on other aspects of print beyond phonological processing. Reading fluently can assist with the
ability to recognise words accurately and automatically, allowing children to focus on the meaning of text rather than the identification of the word. In fact, not only is fluency acknowledged as an essential component in reading acquisition (Allington, 2009; Cassidy, et al, 2010; Chall, 1996; Kuhn & Stahl, 2003; NICHD, 2000) but it is also considered to be the link between decoding and comprehension (Chard et al., 2006).

Under the stage model, children in Years 2 to 3 (Stage 2), are not introduced to new information as reading instruction is based on consolidating previously learned skills and developing reading fluency using simple and predictable texts. In the English K-6 syllabus, the opportunity to develop fluency is limited as Year 2 children are exposed to wider range of texts on less familiar topics continuing on to texts with increasingly challenging topics in Year 3 (NSW Board of Studies, 2007).

As word recognition, phonemic abilities, and fluency are emphasised in the early years (Stages 0, 1 and 2), NSW school children are expected to be taught to attend multiple aspects of print. Children must learn how to process the orthographic, phonological and semantic information while at the same time, interpreting and evaluating text from a writer’s viewpoint (NSW Board of Studies, 2007). According to the stage model, the use of higher-level cognitive skills is developmentally appropriate for children in Years 4 to 6 (Stage 3) and not earlier. In younger readers, word recognition and phonetic abilities are critical for reading success more than cognitive skills and construction of meaning. It is only in Year 4 (Stage 3) a shift occurs and cognition and word meaning becomes a stronger correlate of reading (Chall, 1996).

As early as Year 2 (Stage 2), NSW school children develop critical literacy by engaging in activities requiring them to interpret, justify and make connections between their own experiences and information from the text (NSW Board of Studies, 2007). By the time children leave Year 3 (Stage 2), they have begun to develop the skills of analysis and evaluation. The English K-6 syllabus’s preoccupation with developing children’s critical literacy may be why some skills (e.g., gathering, questioning, analysis, and evaluation) are heavily advanced while developments in other skills are restrained (e.g., fluency) and for Chall (1996), when
The National Inquiry into Teaching of Literacy (DEST, 2005) found many Australian teachers were using instructional approaches without a clear understanding of why, how, what, and when to use them. Reading fluency as a teaching strategy is not so much neglected as misunderstood by NSW teachers. Teachers may use an instructional strategy as a suggested teaching tool before they have a clear understanding of when and how and under what condition it should be used (Lipson & Lang, 1991). In the English K-6 syllabus, oral fluent reading may be construed as a strategy developing oral self-expression. Having children “read text orally using appropriate stress, pausing and intonation” (NSW Board of Studies, p. 76) may be used more in poetic readings or scripted drama to practice oral expression than using oral reading as a prime strategy to develop comprehension through reading fluently with prosody (Kuhn, Schwanenflugel, Meisinger, Levy, Rasinski, 2010).

Teachers may not have the knowledge and teaching skills to meet the developmental and learning needs of children from a diverse range of backgrounds (DEST, 2005), particularly children from disadvantaged families who often do not have rich phonological knowledge, phonemic awareness and literacy experiences upon which to base new learning compared to children from high socioeconomic families (Rowe, 2006). Teachers may not have been aware of developing fluency as an approach to improving reading comprehension as well as a response to the social and cultural contexts with which disadvantaged children can be assisted with their reading development (Chall & Jacobs, 2003). As a result, teachers may inadvertently view fluency as an discrete, decontextualised skill and misappropriating it to a lesser function of developing oral expression, forsaking fluency as a means of improving reading comprehension (Chard, Pikulski, & McDonald, 2012; Kuhn, et al., 2010)

2.14. Summary: Reading Instruction.

Reading fluency was identified as a key component in children’s acquisition of reading in Report of the National Reading Panel (NICHD, 2000) and was recommended as an area for development in the report, Teaching Reading (DEST,
However, the English K-6 syllabus (NSW Board of Studies, 2007) addressed fluency instruction in a cursory manner and this contrasts with the high regard for fluency presented in Chall’s (1996) stages of reading development. In the stage model, fluency was a key reading component and must be developed if success in the later stages of reading is to be achieved and reading difficulties averted. Reading fluency developed in Years 2 to 3 (Stage 2) enables readers to recognise words accurately printed word. This is important when they move into Year 4 (Stage 3), as children are confronted with reading for information in increasingly complex linguistically and conceptually texts requiring strong reading skills in word recognition and fluency.

Fluency has been credited as a key reading component and described as a “hallmark of skilled reading” (Logan, 1997, p. 165). If fluency is an indicator of reading competence (Fuchs et al., 2001), what happens to children’s reading progress when reading fluency instruction is not delivered as intended, particularly when viewed as a decontextualised and discrete skill than a developmental component of reading instruction responsive to the cultural and social influences impacting disadvantaged children? To what extent does the lack of fluency in the earlier years have a bearing on low SES children being under-represented among high achievers on national wide literacy and numeracy tests (DEEWR, 2011; MCEETYA, 2008)? Can fluency instruction in the middle-years (Stage 3) be of significance, particularly as fluency development is at its optimal in Years 2-3 (Stage 2)? A review of the literature on fluency may provide some insights to these pervasive questions. This is conducted in the following section, Focus on Fluency.

Focus on Fluency.

2.15. Introduction.

In this section, the definition of reading fluency is given with a description of repeated reading presented. Fluency’s role in the reading process is then discussed, focusing on the automaticity of reading sub-skills and its link with comprehension and its implications on children from low socioeconomic background and the English K-6 syllabus. A review of fluency studies concludes this section examining the
significance of fluency instruction on reading outcomes for children in Years 4 through 6 highlighting the gap in fluency research.

2.16. Defining Reading Fluency.

Oral reading fluency is generally regarded as reading accurately at a quick pace with relative ease (automatically) and with expressiveness (prosody). This simple definition belies the complex and multifaceted nature of the construct. It is not enough to identify readers as being fluent or non-fluent. The nature of fluency has been beset by a lack of consensus among researchers on definitional, theoretical, empirical, and instructional issues (Hudson, et al., 2009; Kame'enui & Simmons, 2001; Lipson & Lang, 1991; Rasinski, 2006; Samuels & Farstrup, 2006; Wolf & Katzir-Cohen, 2001).

An alternate way of looking at whether a reader is fluent or dysfluent is by asking the question, “What can this student read fluently?” (Lipson & Lang, 1991, p. 225). Skilled readers may demonstrate fluent oral reading in a large range of conditions but this does not automatically mean they will be able to read quickly, accurately, and with comparable ease all types of texts. Barr et al., (1990) concurred by noting, “It is possible for children to demonstrate fluent reading with familiar stories they have read many times, but unless this same fluency is demonstrated with unfamiliar selections, we cannot conclude that they are fluent readers” (p. 65).

Reading fluency is a developmental process and has many predisposing factors impacting the ability to read fluently in one instance but not in another (Samuels, 2006; Topping, 2006). More exposure to print and reading practice will be of greater benefit to fluency development than in conditions that do not provide these opportunities. Practice begets fluency (Nathan & Stanovich, 1991; Schwanenflugel & Ruston, 2008; Stanovich, 1986) but only under the conditions where practice is successfully monitored and reading instruction consistently guides the student towards successful comprehension (Labbo & Teale, 1990). When students have continued instruction, practice in the classroom, and independent reading is guided and supported both in the classroom and at home, fluency skills can be developed and strengthened to the point where students become fluent at reading more challenging and complex texts (Samuels & Farstrup, 2006). In short, fluency is not a
benchmarkable competence (Topping, 2006) but is a process that with consistent practice, will continue to grow given effective and supportive classroom instruction.

Fluency is not a static entity. It is adaptive and influenced by situational factors such as the readability level of the text (text difficulty) and the text topic (content area) (Hudson et al., 2009; Lipson & Lang, 1991; Samuels, 2006; Topping, 2006). A fifth grader may be able to read fluently a book with a third grade readability level but falters when given a grade appropriate text. Similarly, a child interested in the solar system is more likely to read fluently in similar or in other related topics because of his/her familiarity with the topic’s concepts, syntax structure, and vocabulary. However, when asked to read an unfamiliar topic, his or her reading fluency may be very different. A reader cannot be described as either fluent or non-fluent; rather, it is about a reader fluent in a given text (Hudson et al., 2009; Samuels, 2006).

With the understanding fluency should not be viewed as a dichotomous variable of the fluent versus non-fluent (Kame’enui & Simmons, 2001; Samuel & Farstrup, 2006), fluency needs to be viewed as a developmental process proceeding along a continuum with many situational and maturational factors effecting its development (Nathan & Stanovich 1991; NICHD, 2000; Topping, 2006). Reading fluency is so broad and general in meaning, “little insight and understanding are gained beyond the mere use of the term” (Kame’enui & Simmons, 2001, p 204).

One of the reasons for the complexity of reading fluency is the lack of a unified definition in the research literature because the nature of fluency is so unclear (Geva & Farnia, 2011; Kame'enui & Simmons, 2001; Kuhn, Schwanenflugel, Meisinger, Levy, & Rasinski, 2010; Lipson & Lang, 1991; Nathan & Stanovich, 1991; Pinnell, et al., 1995; Rasinski, 2006a; Samuels & Farstrup, 2006; Valencia, Smith, Reece, Li, Wixson, & Newman, 2010; Wolf & Katzir-Cohen, 2001). Additionally, fluent reading in schools has undergone an evolutionary process where skills once thought to be important in oral reading have now been supplanted. Schools in the nineteenth century had oral reading as the goal of classroom instruction with the emphasis placed on elocutionary elements such as reading with correct pronunciation and expressiveness. By the beginning of the twentieth century,
this emphasis on oral production was challenged by literacy scholars advocating reading with comprehension should be the end goal of reading instruction (see Allington, 2009; Rasinski, 2006; Samuels & Farstrup, 2006).

Contemporary fluency research has comprehension embedded in definitions of fluency but often it is either implied or not stated explicitly. Most variations in the definition of fluency have centred on reading text with ease, rapidity, accuracy and expressiveness. The definition in *The Report of the National Reading Panel* typifies this as, “the ability to read text quickly and with proper expression” (NICHD, 2000 p 3-5). Hudson, Lane and Pullen (2005) defined fluent reading as being able to accurately read connected text with appropriate expressiveness and at a conversational rate. In these definitions, fluency is about the development of sub-processes such as automatic word recognition and reading with appropriate phrasing allowing the reader to move beyond preoccupation with decoding so more attention can be focused on gaining meaning from the text. Definitions like these have comprehension as an implied benefit with the primary focus on the complex orchestration of the multiple sub-processes.

In contrast, there are definitions where comprehension is explicitly associated with fluent oral reading. Samuels (2006) defined fluency as the, “ability to decode and comprehend at the same time” (p 39). In fact, Samuels continued by stating oral reading with accuracy, rapidity, and expression, “are simply indicators of fluency” (p 39). Hiebert (2006) defined fluent reading as the reader’s ability to focus on the meaning of the text because word recognition is sufficiently automatic and accurate. Pikulski and Chard (2005) viewed fluency as the bridge between decoding and reading comprehension. Definitions like these explicitly relate the centrality of fluency to constructing text.

In this study, fluency is inextricably linked to comprehension. Fluency was defined in this study as the mechanism where text is comprehended through reading with appropriate expression (prosody), decoding speed (text fluency) and accuracy. Pikulski and Chard (2005) succinctly encapsulated the conceptualisation of fluency along similar lines with their definition as the, “efficient, effective word-recognition
skills that permit a reader to construct the meaning of text. Fluency is manifested in accurate, rapid, oral expressive reading…” (p. 510).

The primary focus of this study was fluency’s links with aspects of comprehension, such as the macrocomprehension and microcomprehension processes that occur during activities when reading comprehension was assessed by a paper/pencil cloze task (microcomprehension processes) and in an oral/listening format (macrocomprehension processes). Other components of fluency were measured in their subsidiary role as indicators of fluency (Samuels, 2006). These included word accuracy (number of words read correctly) and rate of reading or text fluency (number of correct word read /time taken x 60). Prosody was not measured. Prosody was modelled by the researcher/ teacher during the reading sessions and its significance made salient with guided and explicit instruction on the appropriate use of phrasing, pausing and intonation. Children practiced reading with fluency and expression through choral reading of the text passages.

2.16.1. Repeated Reading.

There are many approaches to fluency instruction of which the best-know and most widely researched is repeated readings (Kuhn & Schwanenflugel, 2006). In this study, paired repeated reading was the instructional approach improving fluency. This method basically requires paired students to work together in developing each other’s fluency. A fuller description is given in the Methodology chapter.

Conceptualised by Dahl (1974) and Samuels (1979), repeated readings was based on the information processing model where fluent readers were students decoding text automatically, leaving cognitive resources free for comprehension. There are basic instructional components common among repeated reading methods such as reading a passage at an appropriate instructional level aloud several times until a performance criterion is reached. This criterion can be reading until a fixed number of words correct per minute are reached (wcpm) or reading a passage within a predetermined time period (usually one-minute). When the criterion is reached, a new passage is given to the reader. The reader is usually given feedback on the word recognition errors and the results graphed.
Samuels (1979) originally used repeated reading specifically to promote fluency on beginning readers with learning disabilities. Since then, Samuel’s method of repeated reading has become the basis for later approaches to fluency instruction and has been delivered to children individually (e.g., repeated reading, Samuels, 1979; neurological impress method, Heckelman, 1986), in small groups (e.g., reading-while-listening, Chomsky, 1978; FOORI, Kuhn, 2005) or as a whole class instruction (e.g., oral recitation lesson, Hoffman, 1987; Reutzel & Hollingsworth, 1993; FORI, Stahl & Heubach, 2005). Essentially all these programmes develop fluency through varying degrees of feedback with support that can be either assisted (with adults or peers) or unassisted (independent practice of text). There was not one instructional technique superior over others as all approaches improving reading fluency were positively linked with reading gains (Kuhn & Stahl, 2003; NRP, 2000; Therrien, 2004).

2.17. Fluency and its Role in the Reading Process.

Fluency, as an indicator of reading competence (Fuchs, Fuchs, Hosp, & Jenkins, 2001) is highly recommended as an instructional component in any reading programme because of its reciprocal relationship with comprehension (Chard, Pikulski, & McDonagh, 2012; Kuhn & Stahl, 2003; Kuhn, et al., 2010; NICHD, 2000; Pikulski & Chard, 2005; Schwanenflugel, Meisinger, Wisenbaker, Kuhn, Strauss & Morris, 2006; Therrien, 2004; Valencia, et al., 2010). Comprehension’s relationship to fluency is explained in terms of automaticity theory (LaBerge & Samuels, 1974; Logan, 1997; Samuels & Flor, 1997; Schneider, Dumais, & Shiffrin, 1984; Skinner, Pappas, & Davis, 2005; Thurlow & van den Broek, 1997).

2.17.1. Automaticity and Comprehension.

Reading is a complex process involving many sub-skills. Some of these skills include the ability to recognise printed words, construct the meaning of sentences, connect the information in the sentences to the stored knowledge in the memory, and make inferences. In order to read successfully, readers must be able to orchestrate these sub-skills concomitantly with one another. This ability to multi-task the various sub-skills with a minimum of attention and conscious effort is conducted through the automatic information processing mechanism known as automaticity. Automaticity is
the ability to perform complex tasks with speed, minimal effort and with a lack of conscious awareness enabling individuals to perform multiple tasks simultaneously (LaBerge & Samuels, 1974; Logan, 1997; Samuels & Flor, 1997; Stanovich, 1980; Thurlow & van den Broek, 1997).

A multiplicity of processes are involved in reading but primarily, readers are required to perform two interdependent tasks; they must recognise words through decoding while concurrently constructing meaning. Decoding and word identification are some examples of processes or sub-skills automaticised readily. Others skills are more resistant. These include higher-order thinking skills such as comprehension, writing, and metacognition (Samuel & Flor, 1997). According to LaBerge and Samuel’s (1974) information processing model, in order to carry out this dual task, the sub-skills of decoding and word recognition must first become automaticised if constructing meaning is to proceed simultaneously and with a minimum of effort. This model postulated decoding, word recognition, and comprehension cannot be performed concurrently if attention is focused disproportionately on word processing skills. The brain has limited short term memory capacity and attentional resources to perform tasks simultaneously. However, with extended practice, word processing skills can become automatic freeing cognitive resources for the construction of meaning.

A fluent reader is able to apply maximum concentration on deriving meaning as automatic decoding and word identification processes minimally drains the limits of memory and other resources. In contrast, a dysfluent reader’s ability to decode accurately is slow and deliberate (non-automatic) and may have impaired comprehension because available cognitive resources are consumed by slow letter-by-letter (unit-by-unit) decoding, leaving very little attentional energy for the processing of meaning. Chall (1996) maintained the importance of providing opportunity to practice consolidating and confirming previously taught skills in the alphabetic principle so there is automaticity in decoding and word recognition by grades 2 to 3 (Stage 2). Children need extended practice to develop fluency in reading since the speed (automaticity) with which decoding and word recognition takes place enables readers to focus on comprehending what they are reading rather than on the actual words they are reading. Failure to develop reading fluency in the
early years will have an impact on children’s comprehension in later years (Chall, 1996; Pinnell, et al., 1995).

The relationship between fluency and comprehension is complex with its own unresolved issues. For example, is fluency an outgrowth or a contributor to comprehension? There is empirical support for both position (Biggs, Homan, Dedrick, Minick, & Rasinski, 2008). Some researchers have argued the correlation between fluency and comprehension is more salient for younger children than older children. There is also a developmental aspect to be considered. The link is more significant with younger readers where attention is more focused on word recognition. The fluency and comprehension link becomes less relevant for older students. For older children, attention shifts from word recognition assisted by fluent reading to applying more mental capacity in order to gain meaning (Fuchs et al., 2001; Pikulski, 2006; Valencia, Smith, Reece, Li, Wixson, & Newman, 2010).

2.17.2. Automaticity and Low Socioeconomic Status.

Automaticity is developed after a high level of accuracy has been reached through extended practice (Samuels & Flor, 1997). When children in Stage 1 and 2 for example, learn the decoding and word identification skills, continued guided repetition is needed to move these skills beyond accuracy to becoming automatic. If they have only reached accuracy level, their skills and knowledge are retained for a short period. Children reaching a level of automaticity have their skills and knowledge integrated in long-term memory (Samuels & Flor, 1997). For some children from low socio-economic backgrounds, the automaticity of decoding or word recognition cannot be attained. Poor attendance and high mobility coupled with high teacher turnover in schools in disadvantaged areas (Lamb & Teese, 2005) may result in recently acquired foundational skills learned only to accuracy level. Going beyond accuracy to automaticity would require the child to have to re-learn and practice the previously covered material until automaticity level is reached and all before their next move to another school or the next new class teacher.
2.17.3. Fluency and the New South Wales English K-6 Syllabus.

Automaticity is vital for reading because important sub-skills must be performed with unconscious ease and efficiency, placing fewer demands on limited memory and cognitive resources while allowing comprehension to perform effectively at the same time. Extended practice and repetition are needed before skills become automaticised. Chall (1996) suggested during Stage 2 that no new information should be given as time should be spent on consolidating previously learned skills and knowledge.

This was in sharp contrast to the English K-6 Syllabus where little emphasis is placed on the need for fluency through practice and repetition. For example, in order to develop word recognition and reading fluency, second and third grader texts should have subject matter within children’s experiences and contain familiar sentence structure and language patterns (Chall, 1996). In the English K-6 Syllabus, children are not limited to predictable texts. Beginning as early as Year 2, children are exposed to a wide range of texts and on less familiar topics (NSW Board of Studies, 2007). Reading instruction in NSW schools requires children from an early age to be able to process a multiplicity of tasks concurrently, namely the orthographic, phonological and semantic information while interpreting and evaluating the text from a non-egocentric viewpoint or from the author’s perspective (NSW Board of Studies, 2007). This process of learning to read makes automaticity of skills very difficult and subsequently impacts the development of children’s reading fluency.

The National Reading Panel (NICHD, 2000) had an impact on teaching as it informed the Reading First provision of the No Child Left Behind legislation in the United States (NCLB, 2001). This legislation had a far reaching impact as it stimulated more skill instruction at the kindergarten through grade 3 levels, emphasising phonemic awareness, phonics, fluency, vocabulary development, comprehension strategies in American schools (Pressley, Graham, & Harris, 2006). In Australia, the push for fluency was not pursued as it was in the United States. Consequently, fluency has not been promoted as a key reading component as found by an independent government inquiry into the current practices in literacy.
acquisition of Australian school children, recommending fluency development be included in teacher's reading programmes (DEST, 2005). Another reason why fluency instruction may have been neglected in NSW classrooms is that "too many teachers do not have a clear understanding of why, who, what and when to use particular strategies" (DEST, 2005, p.14). In many classrooms, reading fluently has become the instruction in how to read fast than as a means of developing comprehension skills (Rasinski, Blachowicz, & Lems, 2012). What are the ramifications on reading performance for children in Years 4-6 from low socio-economic areas, particularly given Chall’s (1996) warning of potential reading failure when development of earlier skills, such as reading fluency, has been deficient? In the following section, a review of the fluency literature may bring clarity on the significance of fluency instruction for children in the middle years.

2.18. Empirical Research on Fluency Instruction.

Fluency was one of the six targeted area of investigation by the National Reading Panel (NRP) (NICHD, 2000). Fourteen reading specialists conducted a review of research based literature starting from 1990 onwards on the effectiveness of fluency as an instructional component necessary for the teaching and acquisition of reading skills in classrooms. The NRP focused their efforts on guided oral repeated reading practices as an instructional approach facilitating fluency development in reading. Oral repeated reading practices included any approach involving students reading connected text repeatedly with guidance and feedback provided. Some of the practices the NRP reviewed were repeated reading, neurological impress, paired reading, shared and assisted reading (students reading text with a fluent oral model).

The effectiveness of oral repeated reading practices was examined by conducting a meta-analysis on fourteen of the 92 studies meeting the NRP’s methodological criteria. The results indicated the viability of repeated reading practices as an instructional approach to improving reading outcomes with a weighted effect size average of 0.41. Additional support for oral repeated reading was the mean effect size of 0.55 on reading accuracy, 0.44 on reading fluency and 0.35 for reading comprehension. Guided oral repeated reading approaches were also
noted to have improved reading outcomes for non-impaired readers through at least to grade 4 and students with reading difficulties through high school.

Although the NRP advocated for a balanced approach to reading instruction, its meta-analysis was conceptually restrictive, neglecting many elements of balanced instruction that had enjoyed empirical support. For example, the importance of literacy engagement was ignored (Cummins, 2008). There is mounting evidence supporting literacy engagement as strongly related to the development of reading comprehension (Guthrie, 2004) and reading achievement (Cummins, 2011; Guthrie, 2004; Guthrie & Davis, 2003; Guthrie, Wigfield & Klauda, 2012; Guthrie, Wigfield & You, 2012; Pressley, 2006) The NRP has also been criticised for being methodologically narrow as interpretation of results were constrained by using only studies experimental or quasi-experimental in design (Pressley, et al., 2006).

The NRP’s focus was simple and straightforward, making dissemination of information readily implemented for school wide use and available for teacher’s classroom practice. Kuhn and Stahl’s (2003) synthesis of fluency literature was approached from a theoretical and developmental perspective with the purpose of building knowledge of fluency’s role in the reading process in contrast to the pragmatism of the NRP’s approach aimed at making theory easily translatable into practice.

Kuhn and Stahl (2003) found only the “broadest conclusions” could be drawn from the NRP’s findings (p. 6). They found there was a mixture of different types of oral reading practices among the corpus of studies under NRP’s evaluation. In one study, guidance was provided before reading and in another practice, the child only read a text once. The studies in NRP’s meta-analysis were so wide ranging any conclusions could be misleading. Subsequently, Kuhn and Stahl (2003) limited their analysis to a few different approaches to fluency, such as unassisted repeated reading (independent repeatedly reading of text passage), assisted reading (model of fluent reading provided), and approaches used in whole-class settings (techniques such as echo reading, paired partner reading, choral reading used in integrated lesson plan). There were 71 studies under review consisting of students with reading disabilities or
from a clinical population. Students included were from elementary school to high
school.

Kuhn and Stahl used vote-counting procedures and qualitatively synthesised
each study. Meta-analysis of the data was deliberately avoided. The researchers
argued variables impacted and constrained the ability of meta-analysis to be
interpreted definitively. Kuhn and Stahl found repetitive approaches (e.g., assisted
reading, repeated reading, or approaches integrating repeated readings into a
classroom design) did not have a clear advantage over non-repetitive ones. There was
no significant difference in effects between reading a small number of texts
repeatedly and the nonrepetitive reading of a larger set of texts. Although all
approaches under review were effective, Kuhn and Stahl did not identify why they
were effective. The NRP also came to the same conclusion, finding all approaches
improving fluency produced robust reading outcomes and no one approach could be
singled out as being more effective than the others (NICHD, 2000).

Practice and support were found to be essential instructional components to
the development of fluent reading and can be provided either through repetition or
the use of an individual to model behaviours, or the use of a taped narration. Offering
greater opportunities to practice reading through rereading of text, assisted reading
strategies (e.g., individual or taped-recorded modelled reading) or unassisted reading
strategies (e.g., independent practice of text) may have improved children’s fluency
relative to traditional instruction. However, it can be conjectured it was not so much
the repetition as it was the amount of time spent on reading connected texts that
fluency improvements can be attributed (Kuhn & Stahl, 2003). Kuhn and Stahl’s
evaluative report on fluency took on a theoretical and developmental perspective
compared to Therrien (2004).

Therrien (2004) narrowed his focus on repeated readings. Therrien conducted
a meta-analysis examining the effects of repeated readings on reading fluency and
comprehension as well as identifying key instructional components responsible for
the improved reading outcomes. Repeated readings of connected text are the most
frequently studied fluency method of improving reading fluency (Kuhn &
Schwanenflugel, 2006).
The 33 studies included in Therrien’s meta-analysis were published journals from 1977 to 2001. Studies included experiments with school-aged participants from ages 5 to 18 years. The results found repeated readings were effective for improving fluency and comprehension for nondisabled students and students with learning disabilities. Therrien did bring clarity on an issue raised by the Kuhn and Stahl study (2003): whether improvements resulted from specific instructional component(s) or simply from children being given extended opportunities to practice reading. Therrien’s meta-analysis found there were specific instructional components leading to successful results in fluency and comprehension gains. The set of components could be different depending on the goal of the intervention. If the aim was to improve a student’s fluency and comprehension skill through repetitive reading of the same passage (non-transfer measure), then students should be provided with a cue to focus on speed and comprehension and the passage should be read aloud three or four times. The meta-analysis demonstrated when the passage was read three times ($ES = .85$) or four times ($ES = .95$), mean fluency effect size ($ES$) was more than 30% larger than when the passage was read twice ($ES = .57$). However, these instructional elements were different if the goal of repeated readings was for children to improve in fluency and comprehension on new and different passages after previously rereading other reading material (transfer measure). Three instructional components were necessary for this happen and included reading aloud to an adult (as opposed to a peer), the provision of corrective feedback on word errors, and passages read until a performance criterion was reached.

According to results found in Therrien’s (2004) study, regardless of the goal of the intervention, all methods of repeated readings should include children reading passages aloud to an adult. When the programmes were run by adults (mean fluency $ES = 1.37$, mean comprehension $ES = .71$), the effect size was three times larger than those obtained by programmes implemented by peers (mean fluency $ES = .36$, mean comprehension $ES = .22$). When corrective feedback was provided by an adult on word errors, a large mean fluency effect size was obtained (1.37). When children read to a performance criterion (reading until a fixed number of correct words per minute was reached or reading a passage within a specified time limit), the effect size
(1.70) was four times larger than programmes with children reading a fixed number of readings (.38).

In Kuhn and Stahl’s review (2003), an essential instructional component was the provision of good modelling of fluent reading to children. This was not supported in Therrien’s meta-analysis as results were inconclusive. The studies under Therrien’s review were limited and any modelling effects may have been overshadowed by stronger components such as adult-run programmes being more effective than peer-run programmes. In another synthesis of fluency intervention, it was the actual rereading of the text and not the prosodic modelling accounting for the most improvement in assisted and unassisted repeated (Meyer & Felton, 1999).

Although modelling of fluent reading was deemed to be a nonessential component in Therrien’s study, one must consider the effect modelling has apart from its association with fluency instruction. Modelling can offer readers the necessary support assisting them to transition easily beyond the point where they are able to work independently and should be looked upon with the same amount of value and importance as other instructional components (Kuhn & Stahl, 2003).

Wexler et al., (2008) used extensive coding procedures to synthesise a corpus of studies from journals published between 1980 and 2005 relevant to fluency intervention for struggling secondary students. The 19 studies focused on comprehension and fluency outcomes for students with reading difficulties in grades 6 through 12. The findings revealed fluency outcomes similar to previous evaluative reports of effective intervention (e.g., Chard et al., 2002; Kuhn & Stahl, 2003; NICHD, 2000). For example, Wexler et al’s study concurred with Kuhn and Stahl’s assertion that supporting strategies were necessary for the development of fluency.

Wexler et al., (2008) reported the significance of incorporating supportive strategies such as providing students the opportunity to preview the text with a model of good reading (adult model reader or use of audio taped readings) as well as providing corrective feedback. Larger gains were found for students with these supportive components than students on programmes without support of this nature. Although the provision of these support mechanisms had a positive effect on reading rate, these improvements were not found to necessarily generalise to word reading
accuracy or comprehension. In contrast, reported improvements in comprehension when a model read the text initially was reported in Chard et al., (2002) synthesis of 24 fluency interventions for elementary students with reading disabilities. Chard and his colleagues found repeated reading interventions with a model (using teacher, tape or computer model, and cross-age tutoring as modelled readers) were more effective than repeated readings without a model for building children’s reading fluency and comprehension.

Wexler et al., (2008) reported there may be no differential effects between reading texts repetitively and non-repetitively (text read continuously), a finding consistent with Kuhn and Stahl’s (2003) study. Meyer and Felton (1999) found results to the contrary. Meyer and Felton found treatment effects from repetitive repeated reading programmes different from non-repetitive ones. These differences were related to the students’ level of reading skill prior to the intervention. For readers with average skills, all types of repeated reading techniques produced improvements in reading speed and accuracy. Beginning readers reading accurately but slowly and disabled fifth grade readers had improved reading performance under prosodic modelling within a repeated readings intervention.

The role of text difficulty in reading fluency was another issue discussed in these evaluative studies of fluency intervention. Wexler et al., (2008) reported repeated readings might increase secondary students’ oral reading fluency on passages above students’ instructional level but would have little effect on students’ comprehension. Chard et al., (2002) however, found when learning disabled elementary readers were given instructional level reading materials, reading accuracy improved. In fact other studies have highly recommended the use of instructional levelled-text as an essential component in any fluency programme for poor readers (Chard et al., 2002; Meyer & Felton, 1999). Kuhn and Stahl (2003) suggested further research was needed to assess the effects of the relative difficulty of text on learning. Their vote-counting procedure ended with mixed results supporting both the use of instructional-level text and text at the frustration level.

Fluency growth was linked with growth in comprehension for readers in the elementary grades (Chard et al., 2002; Kuhn & Stahl, 2003; Therrien, 2004) but this
relationship was not apparent for struggling readers in high school. Wexler’s study (2008) had few fluency interventions resulting in the improvement of comprehension skills. The study reported reading rate, while it may be improved by fluency instruction, instruction of this nature may not be sufficient for developing proficient reading comprehension skills. Synthesis of the extant research found as students got older and text became more difficult, the correlation between oral reading fluency and comprehension appeared to decrease. Edmonds et al., (2009) had similar findings regarding the fluency-comprehension relationship.

Edmonds et al., (2009) synthesised intervention studies with older struggling students in grades 6 through 12. Struggling readers were defined in the same way as in the Wexler study: students who were low achievers or who had reading difficulties such as dyslexia or who had reading, learning or language disabilities. Unlike Wexler’s study, which had concentrated on elements that influenced performance in repeated reading on fluency and comprehension (e.g., text difficulty, with and without a model, number of repetitions), Edmonds et al., (2009) examined interventions focused on decoding, fluency, vocabulary and comprehension. Of the 29 studies that were synthesised, 13 studies met the methodological criteria for meta-analysis. The results relating to the studies of fluency indicated that increased reading rate and accuracy did not automatically lead to improved comprehension. Their data trend reflects what other studies have found, that is, there appears to be a developmental relationship between oral reading and comprehension with the correlation decreasing steadily with age and text difficulty.

Although the findings from Edmond’s study do not suggest forgoing fluency instruction with struggling secondary readers, the results from the synthesis do encourage instruction targeting comprehension skills. The findings suggests that for older struggling readers, explicit comprehension strategy instruction may be of benefit, particularly in developing students’ ability to self-question and reflect during and after reading as well as improving monitoring their understanding and processing text meaning.

Wanzek et al., (2010) synthesised 20 years of research examining the effects of reading interventions for students with reading difficulties and disabilities in
fourth and fifth grade. Out of the 24 studies, only two were on fluency instruction with results mixed on fluency and comprehension outcomes. Other findings included the moderate to large effect size associated with multicomponent reading interventions. Older students may benefit when the intervention have more than one element of reading, particularly if comprehension was included as a component. The researchers found when interventions focused on teaching certain comprehension practices, moderate to high reading outcomes resulted. These practices included allowing the opportunity for students to preview the text and connect with their knowledge, providing practice in the use of self-questioning during reading and for student to summarise what they are learning.

Taking into account these studies synthesising fluency instruction, reading outcomes differ depending on whether students were non disabled readers (NICHD, 2000; Therrien, 2004), or if they are struggling readers in the elementary grades (Chard et al., 2002; Kuhn and Stahl, 2003) or in classes beyond grade 3 (Edmonds et al., 2009; Wanzek et al., 2010; Wexler et al., 2008). Findings from these empirical fluency studies indicated the complexity involved in assessing reading performance gains from fluency instruction. The majority of intervention studies on the effectiveness of fluency instruction have been conducted for readers mainly at the elementary level (Chard et al., 2002; Kuhn & Stahl, 2003; Meyer & Felton, 1999; NICHD, 2000; Therrien, 2004) or on older students struggling with reading (Edmonds et al., 2009; NICHD, 2000; Therrien, 2004; Wanzek et al., 2010; Wexler et al., 2008). Considerably less is known about the impact of fluency instruction in classrooms of diverse reading abilities in the middle-years of school, Years 4 to 6, in low socioeconomic communities.

The present study examined the effects of a reading intervention designed as a supplementary multicomponent programme for classrooms of diverse abilities focusing on low SES students in Year 4 to 6. The findings are expected to contribute to the theory and practice regarding the implementation of a fluency-oriented reading programme in a cohort of students overlooked in the fluency literature. The study will investigate the effectiveness of the programmatic intervention (FORCSI) by identifying the factors explaining children’s comprehension and word processing skills.
2.19. Summary: Focus on Fluency.

How fluency is defined will determine what measures are used to identify aspects of the multidimensional nature of fluency and its affect on reading outcomes (Kuhn, Schwanenflugel, Meisinger, Levy, & Rasinski, 2010; Samuels & Farstrup, 2006). Fluency was conceptualised in this study as being inextricably linked to comprehension and defined as the mechanism where text is comprehended through reading with appropriate expression (prosody), decoding speed (text fluency) and accuracy. As a result, more interest was given on fluency’s link with comprehension than fluency’s indicators, accuracy (automatic word recognition) and text fluency (reading rate).

Greater interest in the fluency-comprehension connection began with a prevailing problem - the reading slump - the documented phenomenon appearing at the beginning of grade 4 and most notably in children from low socioeconomic families (Chall & Jacobs, 2003; Chall, et al., 1990; Galletly, et al., 2009; Kieffer, 2010; Leach, et al., 2003). Can improved fluency assist with children’s comprehension based on the theory of automatic information processing (LaBerge & Samuels, 1974)? In other words, can the repeated reading method used in FORCSI, enable readers to decode text smoothly and effortlessly (i.e., automatically) permitting readers to expend less cognitive resources on word-processing skills leaving more attentional resources on the construction of meaning?

A review of the fluency literature revealed that while improved fluency was associated with growth in comprehension for readers in early primary (Chard et al., 2002; Kuhn & Stahl, 2002; Therrien, 2004), this relationship was not found among readers in upper primary and beyond (Edmonds et al., 2009; Wexler et al., 2008). Furthermore, considerably less is known about the influence of fluency instruction on children’s reading performance in the middle-years of school. Most of the studies have focused on populations on elementary readers or older struggling readers with learning disabilities. This study was an attempt to address the gap in research, practice, and knowledge on fluency interventions for low SES children in Years 4 to 6 in inclusive classrooms.
2.20. Introduction.

Many studies have shown fluency as a key instructional component in reading instruction for younger children and for older readers with learning difficulties, yet there is a dearth of studies examining this construct for children in upper primary, specifically from low socioeconomic communities. Also missing from the fluency literature is information regarding fluency’s influence on student’s attitudes, motivation, and behaviour towards reading. In this section, the expectancy-value theory was used as a theoretical framework investigating the relationship between children’s thoughts, beliefs and emotions and their reading-related choices. This is discussed in detail. To conclude this section, the research questions are presented.

2.21. An Approach to Fluency Instruction: Repeated Reading.

Oral repeated readings entail reading text with guidance and feedback with the desired outcome of improved fluency. Examples of guided oral repeated reading practices include repeated reading, neurological impress, paired reading, shared reading and assisted reading.

Repeated reading was selected as the preferred instructional procedure in this research study for three reasons. First, repeated reading is effective in developing word recognition, fluency and comprehension (Chard et al., 2002; Kuhn & Stahl, 2003; NICHD, 2000). Second, in repeated reading, the teacher provides guided instruction and modelling of fluent reading. This instructional procedure can play a major role in enhancing learner’s motivational, attitudinal and cognitive process more than other procedures that simply model fluent reading alone such as using audio tapes (e.g., Hollingsworth, 1970, 1978) or peers (e.g., Heckelman, 1969) to improve reading fluency (Coleman & Bornholt, 2003; Lutz, Guthrie, & Davis, 2006; Quirk & Schwanenflugel, 2004; Quirk, et al., 2009). The third reason involved repeated reading requires minimum set-up costs and is easily integrated into a teacher’s current reading programme. It is also suitable for readers in diverse ability classrooms (NICHD; 2000; Rasinski, et al., 1994).
In this study, the reading intervention FORCSI was an adaptation of the Fluency Development Lesson (FDL), developed by Rasinski, Padak, Linek and Sturtevant (1994). Unlike most other whole class approaches or stand-alone programmes requiring a heavy commitment of class time (e.g., FOOR: Kuhn, 2005; Wide FORI: Kuhn, Schwanenflugel, Morris, Morrow, Woo, Meisinger, Sevcik, Bradley & Stahl, 2006; FORI: Stahl & Heubach, 2005), the FDL’s format suited the current study’s interest in an instructional approach to fluency that is easily integrated into a teacher’s regular literacy programme with minimum cost and time expended in teacher training. The study was mindful of the concentration of government funding on early intervention programmes while justifiable, limits funding for third-wave interventions assisting students in upper grades and beyond (i.e., from Years 4 onwards). Currently there is a lack of well-documented late intervention programmes for Australian students (Chan & Dally, 2000; DEST, 2003; Louden, 2000; Rowe et al., 2007). Investigating a supplemental reading intervention is one way this study can meet the limited number of intervention programmes for older students in a practical and cost-efficient manner.

The FDL study (Rasinski et al., 1994) was implemented in two second-grade classrooms in a 10-15 minute lesson including rereading a brief passage. The daily lessons would follow a set instructional procedure beginning with the teacher reading the text followed by a brief discussion relating to text content. The class would then chorally read the short passage along with the teacher several times. Students would pair up and practice the text three times with their partner. Each of the partners would take turns providing positive feedback. Lastly, students would perform the text for the class or another audience. The FDL was implemented daily for six months. Although there was a noticeable improvement in reading performance for the FDL group, it was not statistically significantly over the two control groups using a traditional basal reading programme during the assigned time.

Research studies has found there were recurring programme attributes making interventions successful and these include: (a) the provision of ample opportunities for practice and receiving corrective feedback, (b) interventions addressing multiple components than those addressing only one and (c) interventions with a focus on improving comprehension (Kamil, et al., 2008; Lipson
In the present investigation, the FORCSI intervention included all these attributes. There were also two attributes not included in the FDL programmes including the provision of corrective feedback and explicit instruction of comprehension strategies. The FORCSI intervention, a multicomponent fluency-oriented reading and comprehension strategy instruction programme, was developed to improve children’s comprehension skills by increasing automaticity of word processing skills as well and the use of comprehension strategies. Further details of FORCSI are presented in Chapter 3, Methodology.

Research has found motivation is a key component in the development of children’s reading skills (Snow et al., 1998) and without motivation orthographic knowledge, reading comprehension, and the use of comprehension strategies will not develop optimally (Cox & Guthrie, 2001; Guthrie, et al., 2007; Verhoeven & Snow, 2001). Studies have indicated the role of motivation in predicting children’s reading amount and breadth (Wigfield & Guthrie, 1997) as well as promoting academic reading performance (Edmonds, et al., 2009). However, very few motivational principles have been incorporated in reading programmes (Quirk & Schwanenflugel, 2004). In some cases, reading interventions can even have a negative effect on students’ attitudes towards reading, academics, and school (Wanzek, Vaughn, Kim, & Cavanaugh, 2006).

Getting children to want to read is of critical importance because the amount of time spent reading predicts reading achievement and knowledge of the world (Cox & Guthrie, 2001; Guthrie, Wigfield, Metsala, & Cox, 1999; Wigfield & Guthrie, 1997). Some readers may not choose to engage in literacy activities when there is no incentive or purpose (Daniels & Arapostathis, 2005; Ivey & Broaddus, 2001; Pikulski & Chard, 2005), or when there is an overwhelming number of leisure activities available. This can result in deferring learning or reading tasks in preference to the attractive alternatives (Fries, Dietz, & Schmid, 2008). In addition, getting children to read for learning and recreation is becoming increasingly difficult as evidence has shown a trend of mounting disengagement from literacy activities as negative attitudes, declining interest, and competence beliefs becomes more entrenched with each increasing grade level (Chapman & Tunmer, 1995; Chapman,
Two key elements need to be considered when delivering any reading programme: first the need to develop children’s reading skills and second their will to learn (Quirk & Schwanenflugel, 2004; Snow, et al., 1998). Teaching fundamental reading skills is essential if reading proficiency is to be achieved and providing opportunities to practice these skills necessary for developing and sustaining reading growth (Chall, 1996; NICHD, 2000; Snow et al., 1998; Stanovich, 1986). How willing children are in participating in reading activities depends on whether they are motivated or not. Motivated readers are endowed with the will necessary for ameliorating self perceptions that develop in response to poor attitudes or difficulties in reading (Baker & Wigfield, 1999; Chapman & Tunmer, 2003; Snow et al., 1998). Reading frequently and widely is often associated with motivated behaviour (Wigfield & Guthrie, 1997). When initial reading comprehension was controlled, students’ motivation predicted their level of reading comprehension (Guthrie, et al., 2006).

Guided oral repeated reading has been documented as significantly improving the skill component of reading, namely reading fluency, word accuracy, and comprehension among children up to at least grade 4 for able readers and higher grades for students with reading difficulties (Chard et al., 2002; Kuhn & Stahl, 2003; NICHD, 2000). The will component however, has received less attention in fluency literature and any reported improved reading attitudes and motivated behaviour have been anecdotal. For example, kindergarten and fifth graders were able to enjoy their reading experience and discontinue poor reading habits as a result of their repeated reading sessions (Labbo & Teale, 1990). In another study lasting ten months, five and eight year olds had their reading fluency improved by a method of reading-while-listening to audio-taped books. Initially some children professed an intense dislike for reading but afterwards, not only were the children reading independently but they were also actively engaged in the tasks (Chomsky, 1978). Both studies recorded these observations anecdotally.
Other fluency interventions have documented changes in children’s motivation and attitudes through self-reports and semi-structured interviews. Rasinski et al., (1994) interviewed the two experimental teachers finding children’s reading attitudes had improved over the six-month intervention period. Additionally, the principal had noticed FDL students were more willing and had a greater desire to read than pre-intervention. In a study conducted by Roundy and Roundy (2009), 110 grade 7 students of diverse academic abilities, socioeconomic statuses, and ethnic backgrounds were involved in a five-week reading intervention examining the effects of repeated readings on student fluency. Teacher observation logs and surveys measuring students’ attitudes and reactions to reading indicated student had increased reading-oriented self-esteem and confidence as a result of the intervention.

Other fluency studies showed increases in motivation and confidence for fourth-grade students over an eight-week period using a reader’s theatre as the method of fluency practice (Clark, et al., 2009). Middle school struggling readers displayed engagement and motivation while using a singing software programme incorporating authentic repeated reading experiences (Biggs, et al., 2008) and better self-concept for second-graders than children in the control group when using a wide reading fluency (Schwanenflugel, et al., 2009). While these studies have documented incorporating authentic repeated reading experiences (Biggs, et al., 2008) and better self-concept for second-graders than children in the control group when using a wide reading fluency (Schwanenflugel, et al., 2009). While these studies have documented improved motivation and attitude to reading, there has been limited research from a psychosocial perspective.

2.22. Psychosocial Orientation to Reading.

The Oxford English Dictionary defines psychosocial as “the influence of social factors on an individual’s mind or behaviour and to the interrelation of behavioural and social factors”. Psychosocial is a broad construct encapsulating both social and psychological processes and their interaction. Because the

psychosocial perspective includes the social forces inherent in a learning environment, it offers a wider lens exploring the dynamics of a reading programme than if under a motivational lens, constraining the investigation within parameters defining motivation within the contexts of children’s beliefs, values and goals for particular activities (Martikainen, Bartley, & Lahelma, 2002).

To gain a more nuanced understanding of the processes within the current reading intervention, children’s thoughts, beliefs, and emotions were investigated as to how they were impacted by the reading programme within the dynamics of a classroom setting. In addition, do individual’s thoughts, beliefs and emotions affect children’s achievement-related choices toward reading tasks? Reading educators have recognised the contributory role of schools (Kos, 1991; McFadden & Munns, 2002; Pikulski & Chard, 2005; Stanovich, 1980) and the instructional context (Chapman & Tunmer, 2003; Gambrell, 1996, 2011; Guthrie & Cox, 2001; Guthrie, Klauda, et al., 2012; Guthrie, Wigfield, & You, 2012) in determining whether the learning experience is enhanced or diminished. The corollary is one of not only investigating the cognitive benefits from the reading intervention but also the social-psychological outcomes. Although the influence of psychosocial factors on children reading is well recognised, these processes have not been explored in reading interventions studies targeting students in the middle-years and is worthy of investigations, particularly as recent randomised experiments have found if interventions can target students’ subjective experiences in school, large gains in student achievement can be found months and even years later (Yeager & Walton, 2011).

Within the classroom, students can make either can’t do or won’t do choices (Skinner, et al., 2005). Can’t do choices occur when students are unable to complete the assigned reading tasks due to lack of prerequisite skills. Won’t do choices are from individuals competent and efficacious but unwilling to engage in reading if they have no incentive or reason for doing so (Beers, 1996; Skinner, et al., 2005). In the past, there has been a concentration on providing reading programmes focusing on developing reading skills, catering for the needs of can’t do students. Very few interventions have been designed to include children’s thoughts, feelings and beliefs
as a means of facilitating academic achievement for won’t do children (Quirk & Schwanenflugel, 2004).

Participation is the key to reading proficiency. Students reading very little do not have the benefits that come with reading a lot. Not only does the amount of reading correlate to reading achievement but it also contribute to reading growth (Anderson, Wilson, & Fielding, 1988; Cox & Guthrie, 2001; Taylor, Frye, & Maruyama, 1990). How children are motivated to choose reading as a preferred activity above competing alternatives and the degree they persist in the activity can be explained by the expectancy-value model of achievement performance and choice (Eccles, Adler, Futterman, Goff, Kaczala, Meece, & Midgley, 1983; Wigfield & Eccles, 2000).


Expectancy-value theory is one of many positing a variety of constructs to explain how factors influence choice, persistence, and performance. Theorists adopting this perspective believed individuals’ choice, persistence, and performance can be explained by their thoughts about how well they do in the activity and how they value the activity (Eccles, et al., 1983; Wigfield, 1994; Wigfield & Eccles, 2000). Thoughts of how well they will perform include self evaluation such as self concept of one’s ability, perception of task demands, and short-term goals. How individuals value the activity is determined whether or not they find the activity interesting and useful. Guided by this framework, FORSCI and its relationship among three constructs were examined for its influence on children’s achievement-related choices as illustrated in Figure 2.2. The constructs included children’s (a) reading-related thoughts (reading self concept), (b) valuing reading (reading task value) and (c) positive and negative emotions.
Figure 2.2. Conceptual model based on the Expectancy-Value model showing contribution of instructional and student self appraisals to achievement-related choices.

Past studies have indicated students’ ability perception and task values predicting a range of educational choices relating to the continuation of taking more math (Meece, Wigfield, & Eccles, 1990), choice of reading over other activities, and choice among reading tasks and stories (Bornholt, 2004; Coleman & Bornholt, 2003), intention for further study (Bornholt, 2001; Bornholt, Gientzotis, & Cooney, 2004), participation in physical activities (Bornholt & Piccolo, 2005), and high school literacy choices (Durik, Vida, & Eccles, 2006). In this study, reading related choices (dependent variable) was measured two ways; (a) how participants rated their willingness to participate in Core (reading and number tasks) and Elective (drawing and physical movement) activities and (b) participant’s choice of text to read connected text and complete its cloze activity. Children were given a selection of connected texts ranging in difficulty from very easy to difficult.

In Figure 2.2, the conceptual framework shows how FORCSI was expected to influence children’s thoughts (reading self concepts), beliefs (reading task values)
and achievement emotions resulting in a range of reading related choices. Researchers utilising the expectancy-value model have focused on different aspects of students’ thoughts and beliefs contributing to achievement behaviour. Very few studies have moved beyond these constructs. This study moves beyond earlier work on expectancy-value and achievement choices by including psychosocial elements such as the instructional context (FORCSI) and children’s emotions. By taking the two psychosocial entities (FORCSI and emotions) into account, this study furthers our understanding of how children’s thoughts, beliefs and emotions interact with socio-ecological factors (e.g., student-teacher relationship, task/material and instructional procedures) influencing children’s reading related choices. The study also extends the work on fluency interventions since affect has not been included previously and neither have the dynamic processes within fluency instruction been examined in a theoretical context using expectancy value as its framework. In the following sections, the conceptual framework is outlined in detail.

2.23.1. Reading Related Choices and Reading Engagement.

Able readers are apt to ask, “Do I want to read and why?” The choice to read above other activities can depend on the social influences acting upon the reader. Many researchers and theorists agree learning is an inherently social activity (Vygotsky, 1978). Learning in classrooms is not in isolation but occurs within the relationships between teachers, peers, and ecological factors (Chapman, et al., 2000; Pianta, Hamre, & Allen, 2012; Skinner & Belmont, 1993; Worthy, Patterson, Salas, Prater, & Turner, 2002). School and classroom settings can either have a positive or negative effect on educational and psychosocial outcomes (Kos, 1991; Martin, 2008; McFadden & Munns, 2002; Munns, 2007; Yeager & Walton, 2011). The dynamic and complex nature of classrooms includes instructional practices influencing children in many different ways (Chapman & Tunmer, 1995; Guthrie, Wigfield, Barbosa, Perencevich, & Taboada, 2004; Wigfield, Cambria, & Eccles, 2012). With this psychosocial perspective, FORCSI was examined with the question of whether the reading programme made a difference in the way children were willing to participate in reading activities and make achievement-related choices assisting reading development.
In this current study, participants were asked to rate their degree of willingness to engage in two types of school activities: *Core* activities including reading and number tasks and *Elective* activities of drawing and physical movement (i.e., sports, dancing, games etc). How children rated their willingness to participate in *Core* and *Elective* activities provided only a partial indication of how committed they were to the task. The decision to engage in reading may only last until a better alternative arises. Skinner, Pappas, and Davis (2005) described this as a continuous choice. For instance, Skinner and colleagues explain how a continuous choice may begin with a child's decision to read. However, when a more appealing activity appears, the initial choice to read is forgotten as children are often unaware of their choice making decisions (Skinner et al., 2005). How students rate their willingness to participate in *Core* and *Elective* activities is therefore a measure of a student’s short-term, non-committal unconscious reading related choice.

A more *discrete choice* is when students make a conscious and deliberate decision to engage in a reading task. Participants in this current study were asked to select one text from a range of short stories varying in difficulty from easy (Year 3 level text) to very difficult (Year 10 level text). Rather than rating which text to read reflecting a continuous choice, participants would have to make a discrete choice as their intentions would have to be actualised when completing the accompanying cloze task. Participants had to decide whether to expend less effort by choosing to read text below their year level (i.e., Year 3 level text) or else expend more effort by choosing to read age appropriate or higher level texts (i.e., Year 4-10 level texts). In many respects, discrete choices reflected a child’s reading engagement.

Reading engagement requires effort and persistence (Fredricks, et al., 2004; Guthrie, et al., 2004). Those choose to read age-appropriate texts over easier ones demonstrated a specific kind of effort. The effort required to complete a routine task is not considered engaged behaviour as the effort may have been directed at the procedural aspect of the task rather than processing the activity at a deeper level. Simply choosing a text and then reading it may indicate a willingness to be highly task-attentive. Choosing text with a level of difficulty then completing its related cloze requires effort to activate strategies to process the text deeply and then apply higher order thinking processes to complete the cloze task. It is this level of
dedication while committing effort, time, and persistence to a reading task characterising reading engagement (Guthrie, Wigfield, & Klauda, 2012).

In the conceptual model, FORCSI, children’s thoughts, beliefs, and emotions were examined for their impact on children’s reading engagement as operationalised by their discrete choice of text difficulty and to a lesser extent, their continuous choice when rating their willingness to participate in Core and Elective activities.

2.23.2. The Importance of Reading Engagement.

Reading engagement is strongly related to reading achievement. PISA data from large scale international surveys of 15 year-old students showed reading engagement was a stronger predictor of reading achievement than socioeconomic status (OECD, 2004). Recent PISA data has supported these earlier findings (2010b). When reading engagement was assessed through measures of reading enjoyment, time devoted to reading, and the use of various learning strategies, analysis of PISA data indicated reading engagement was significantly related to reading performance and approximately one-third of the association between reading performance and students’ socioeconomic background was mediated by reading engagement (OECD, 2010b).

Guthrie, Schafer, and Huang (2001) analysed fourth grade students on the National Assessment of Educational Progress (NAEP) in 1998. Based on this large sample, the analysis found engaged reading significantly predicted reading achievement on the NAEP. Engaged reading is more important than students’ family background to the extent students with high reading engagement. Those with lower parental education and income had higher reading achievement than students with lower reading engagement and the same background characteristics.

In the past, increased funding has been channelled into improving better school facilities, creating smaller class sizes, improving the experience or education level of teachers, and establishing minimum standards of achievement set by the policy makers. However, these have not generated significant achievement improvements (Becker & Luthar, 2002; The National Institute of Child Health and Human Development Early Child Care Research Network, NICHD ECCRN, 2005).
Potential improvements in scholastic standards may be better afforded when efforts are aimed at promoting “academic engagement and resilient adaptation” (Becker & Luthar, 2002, p 206) rather than the attainment of minimum reading standards. Furthermore, instructional practices do not produce achievement directly, but rather student engagement mediates this relationship (Guthrie & Wigfield, 2000).

The importance of reading engagement as an educational outcome is highlighted against the evidence suggesting declining motivation to read school-related texts and increasing negative reading attitudes as children progress from lower to upper primary school (Chapman & Tunmer, 1995; Chapman, et al., 2000; Kamil, et al., 2008; McKenna, et al., 1995; Wigfield, et al., 1997). Reading engagement can serve as proxy for achievement, particularly since existing educational disadvantage has found a large proportion of Australian children from low socioeconomic backgrounds representing the low achievers in nationwide literacy and numeracy tests (DEEWR, 2011).

2.23.3. Children’s Thoughts: Reading Self Concept.

Proponents of expectancy-value model argue that individuals’ choices, persistence, and performance can be explained by their thoughts about how well they perform on activities and how they value the activities. The thoughts children have about their ability is related to how they perceive their current competence at a given activity and can be measured in a variety of ways depending on the theoretical perspective taken (Wigfield & Eccles, 2000). For instance, children’s ability perceptions have tended to be domain specific in expectancy-value studies. In self efficacy studies, children’s ability perceptions are task specific. In the expectancy value model, children’s thoughts about their domain related-ability are judgement based, asking them to rate their individual abilities (how good are you?) against other individuals and across subject areas. In studies of self concept, researchers measure ability beliefs without these comparative questions focusing instead on asking how good the individual thinks he/she is and how well or poorly he/she can do different activities. Measures of self efficacy ask individuals’ thoughts on how confident they are in completing specific tasks rather than comparing their efficacy with others (Wigfield & Eccles, 2000).
As a result of the wide range of ability beliefs measures, Wigfield and Eccles (2000) have suggested careful consideration be given to identifying the aspects of perceived ability being investigated (e.g., reading, writing, mathematics) and with what specific measures that align themselves to the corresponding theoretical perspectives (e.g., theoretical perspectives in self concept, expectancy-value, self efficacy). In this study, the ASK-KIDS self concept inventory (Bornholt, 2001) was used as it specifically measured children’s reading self concept as a reflection of their participatory intentions towards reading activities. The ASK-KIDS inventory was also used because previous investigations found behavioural intentions to participate in reading activities were responsive to planned intervention (Bornholt, 2004).

Coleman & Bornholt (2003) conducted one-to-one intervention sessions with 18, Year 5 children identified as having low reading self concept and struggling with reading. The intervention consisted of children receiving verbal feedback regarding their pretest reading performance and visual representation as indicated by a large arrow pointing to a position on a five-point rating scale. The visual feedback was fictitious as the targeted rating was in fact a prototypical position calculated separately for each child based on his or her initial self concept measure. The study used the ASK-KIDS self concept inventory (Bornholt, 2001). The results indicated children’s self concepts were responsive to intervention as improvements from pretest to posttest were shown. Further, children with enhanced self concept fed forward to an improvement of their choice of reading activities over and above performance. Further description of this self concept measure is presented in Chapter 3, Methodology.

2.23.4. Children’s Beliefs: Reading Task Values.

According to the expectancy value model, children’s subjective task values are assumed to influence directly their achievement related choices. Task values are themselves are assumed to be influenced by self concepts, thoughts, and individuals’ affective memories (Eccles, et al., 1983; Wigfield & Eccles, 2000). This is replicated in the conceptual model (Figure 2.2).

In the conceptual model, children’s reading task values (beliefs/values) included three aspects of valuing reading as identified in the expectancy-value
framework (Eccles, et al., 1983; Wigfield & Eccles, 2000). Intrinsic value refers to the internal enjoyment derived from doing a task. Children are more likely to engage in reading activities if they find the task more intrinsically satisfying than tasks less intrinsically valuable. Children will engage in other tasks for values apart from enjoyment and interest. Children will also engage in tasks high in attainment and utility value. Attainment value refers to the importance of doing well on a task. For some children, reading competently is an important value because it brings them closer to the person they want to be. Utility value or usefulness is when children see the practical significance of a task as achieving short or long term goals. For example, children will view reading as useful if they aspire to be a lawyer.

Prior research on achievement task values has examined each component separately in relationship to adolescents’ intentions for senior courses (Bornholt, 2001), motivation in science (DeBacker & Nelson, 1999), developmental patterns and socialisation (Wigfield, et al., 1997), expectancies for success and perception of task difficulties (Eccles & Wigfield, 1995), and changes during the transition to high school (Eccles, Wigfield, Flanagan, Miller, Reuman & Yee, 1989). However, some studies have combined the task values as a unitary construct. In this study, and consistent with previous research (Durik, et al., 2006; Jacobs, Lanza, Osgood, Eccles, & Wigfield, 2002; Updegraff, Eccles, Barber, & O’Brien, 1996), intrinsic, attainment and utility values were summarised into a composite construct and referred as reading task value. Children responded to a five-point Likert type scale indicating how little (1= low) or how high (5 = high) they found reading to be interesting, enjoyable, usefulness and important.

Studies have shown children’s value of reading decreasing over time (Eccles, Wigfield, Flanagan, Miller, Reuman & Yee, 1989; Wigfield et al., 1997) with younger children in first grade reporting greater valuing of math, reading, sports, and music than older children in fourth grade (Eccles, Wigfield, Harold & Blumenfeld, 1993). Subjective task values along with self concept have been empirically linked to achievement-related choices (Eccles, et al., 1989; Wigfield, 1994; Wigfield & Eccles, 2000).
2.23.5. Children’s Achievement Emotions.

The expectancy-value model has affective memories directly influencing subjective task values and values themselves influencing achievement-related choices (Eccles, et al., 1983; Wigfield & Eccles, 2000). In contrast, the conceptual model has affective experiences in a bidirectional relationship with children’s thoughts, beliefs, and reading related choices. Consistent with recent findings indicating emotions are inseparable from the learning process and linked to instructional practices and activities (Graesser & D’Mello, 2012; Lutz, Guthrie, & Davis, 2006; Meyer & Turner, 2002; Pekrun, 2009; Vollmeyer & Rheinberg, 2005), the conceptual model reflects these findings. The conceptual model has adapted the expectancy-value model by modifying it to include children’s positive and negative emotions impacting their thoughts, beliefs and reading related choices. Children’s achievement emotions were measured on a five-point Likert type response scale indicating their emotions sustained during various reading activities (i.e., sustained silent reading, reading for research purposes and reading a chapter for homework). Achievement emotions were also measured by children indicating one or many of the 15 emotions (e.g., pleased, angry, worried) they sustained during various school related activities in reading, number, drawing and physical movement.

Affect has been largely overlooked in social cognitive theories of motivation (Goetz, Pekrun, & Hall, 2006; Pekrun, Goetz, Titz, & Perry, 2002). Theoretical and methodological assumptions have perpetuated the identification of affect as a separate construct rather than perceiving it as an integral aspect of motivational behaviour and important mediators of motivated actions capable of facilitating or hindering learning (Ainley, Corrigan, & Richardson, 2005; Efklides & Petkaki, 2005; Meyer & Turner, 2002; Pekrun, et al., 2002). Previous studies have limited the range of affect to either positive or negative but address no more than one or two emotions (Meyer & Turner, 2002; Pekrun, et al., 2002). Today, affective states are emotions assumed to influence student’s cognitive processes and academic performance. These achievement related emotions range from the positive emotions of enjoyment, hope, pride, delight, surprise, and flow (engagement) to the negative emotions of anger, anxiety, shame, hopelessness, frustration, confusion and boredom (Graesser & D’Mello, 2012; Pekrun, et al., 2002). The emotional state of an individual can
influence how she or he interprets the situation (Goetz, Pekrun, Hall, et al., 2006; Meyer & Turner, 2002; Pekrun, et al., 2006). Positive emotions, such as feeling proud and pleased, are linked to appraising a situation as beneficial to the individual. Negative emotions, such as fear and worry, are linked to appraisals that a situation is harmful to the individual. Examinations of the types of feelings and emotions instigated by FORCSI may lead to a better understanding of how affective experiences and reading instruction can support or undermine each other.

Feelings and achievement emotions are frequently used interchangeably and are quite distinct from each other. Efklides (2005) highlighted two main differences between these constructs. First, the resultant actions of feelings are not as urgent compared to those activated by emotions. Second, feelings are related to the monitoring of cognitive processing and its execution of decisions. Feelings are very subtle and subsequently difficult to identify. Emotions are executions of actions leading to engagement or disengagement with the learning process and are readily identifiable as they can be easily traced back to the stimuli. In this study, feelings and emotions were used as indicators of reading engagement. Feelings were assumed to trigger continuous choices as decisions do not prove or justify willingness to participate in reading activities. Decisions may not be activated into actions or actions may be short-lived and terminated shortly after commencement. Children may rate their willingness to engage in reading and number activities highly but pursue the activity for short duration or until another attractive alternative arises. Emotions were assumed to trigger discrete choices and subsequent actions are demonstrations of behavioural intent such as the purposeful, effortful, and persistent behaviour of an individual engaged in reading. It is assumed emotions are responsible for a child’s willingness to engage in reading deeply by spending time and effort with an age-appropriate reading material just as emotions are responsible for a child’s propensity to expend minimum effort by choosing to read easier texts.

Feelings and emotions infiltrate every aspect of the classroom environment from students’ beliefs, values, and learning goals (Goetz, Pekrun, & Hall, 2006; Jarvenoja & Jarvela, 2005; Pekrun, et al., 2006; Pekrun, et al., 2002) to teachers’ instructional practices (Goetz, et al., 2006; Meyer & Turner, 2002). According to the control value theory of achievement emotions (Pekrun, 2006; Pekrun, et al., 2002),
the instructional environment plays a crucial role in shaping control-related and value-related appraisals. Students’ emotional experiences have their origin in these appraisals. If a student has a strong reading self concept and perceives a high probability of mastering the task and completing it successfully (high control appraisal), positive emotions will most likely be experienced. Similarly, if a student finds the task important and intrinsically interesting (high value appraisal), this too shapes emotions to be more positive. Pekrun et al. (2002) examined students’ emotions in terms of their appraisal processes. The results showed enjoyment from learning statistics emerged when both high appraisal in control and subjective values were indicated and little enjoyment when either control or value, or both were low. Anxiety from the statistics course occurred when students recorded patterns of low control combined with high value.

Goetz et al., (2006) using correlation analysis and structural equation modelling found a strong relationship between students’ emotional experiences and the antecedents of these emotions. The instructional behaviours of teachers were linked to the achievement emotions of 200 students in Latin classes from grades 7 to 10 with control and value related cognitions mediating this relationship.

There is a need to examine how instructional practices impact on children’s learning and reading engagement. When children respond positively to a teacher’s instructional discourse, this can influence the effectiveness of instruction and classroom interaction. Reciprocity between the learner and teacher exists (Goetz, et al., 2006; Meyer & Turner, 2002) and augments the inclusion of emotions and feelings in designing reading interventions to develop children’s skill and psychosocial orientation to reading.

In summary, achievement emotions and feelings were included for three reasons: (a) affective experiences are present throughout the learning process and needs to be taken into consideration whenever performance is under investigation (Efklides, 2005; Goetz, et al., 2006; Hascher, 2010; Lutz, et al., 2006; Meyer & Turner, 2002), (b) emotions and feelings are strongly correlated to student’s self-regulated learning, interest, and performance and can either enhance or inhibit the learning experience by influencing motivational and related volitional processes.
(Ainley, Corrigan, & Richardson, 2005; Goetz, et al., 2006; Meyer & Turner, 2002; Pekrun, 2009; Pekrun, et al., 2002), and (c) there is a lack of research on fluency instruction examining children’s achievement emotions and its impact on the reading performance and reading engagement.


Reports of a widening achievement gap between schools of high and low socioeconomic status in Australia (MCEETYA, 2008; OECD, 2006), limited evidenced-based well documented third-wave programmes to handle the literacy demands of later primary years, the developmental challenges of children in the middle-years of school (Chan & Dally, 2000; DEST, 2003; Lamb & Teese, 2005; Louden, 2000; Rowe et al., 2007), older children experiencing a learning slump, and an increasing disengagement towards reading (Chall, 1996; Chall et al., 1990; Galletly et al., 2009; Kamil, et al., 2008; Kiefer, 2010; Leach et al., 2003) are some of the reasons behind the investigation of a low-cost reading programme capable of high educational returns for children with low socioeconomic background.

Numerous studies have confirmed the efficacy of fluency instruction for improving children’s comprehension and componential reading skills (Kuhn & Stahl, 2003; NICHD, 2000; Samuels & Farstrup, 2006); however, studies were limited and with mixed results for older children in grade 3 and beyond (Edmonds, et al., 2009; Kuhn & Stahl, 2003; Meyer & Felton, 1999; Wanzek, et al., 2010; Wexler, et al., 2008). This study was an attempt to address these limitations by examining a multicomponent fluency intervention for its affect on children’s reading performance and psychosocial orientation to reading. The reading programme had two instructional components. The first was to improve children reading skills through the method of repeated readings using the instructional procedures from FDL (Rasinski et al, 1994) and second, to improve children’s comprehension through instruction in the use of comprehension strategies.

The aims of the study were threefold. The first aim was to examine the relationship among reading skills and FORCSI on children’s reading performance. The second aim examined this relationship at each year-level and the third aim investigated whether the reading intervention affected children’s thoughts (reading
self concepts), beliefs (reading task values), emotions and feelings (positive and negative) impacting their psychosocial orientation to reading (reading engagement). A mixed-method approach was taken to address these aims as well as gaining a more holistic understanding of the dynamic relationship among these variables.

The general aims of the study focused on the following research questions:
1.  
   i) What factors explained middle-years children’s reading performance in comprehension$^2$ (NARA-L and TORCH-R), accuracy$^3$ (RA) and text fluency$^4$ (TF) over a nine-week period?

   ii) To what extent did the nine-week FORCSI$^5$ intervention explain the above reading measures?

2.  
   i) What factors explained middle-years children’s reading performance in comprehension, accuracy and text fluency in Year 4?

   ii) What factors explained middle-years children’s reading performance in comprehension, accuracy and text fluency in Year 5?

   iii) What factors explained middle-years children’s reading performance in comprehension, accuracy and text fluency in Year 6?

   iv) To what extent did the FORCSI intervention explain the reading outcomes in each of these year groups?

3.  
   i) What are the relationships between middle-years children’s self concept (thoughts), reading task values (beliefs), achievement emotions and their reading

2 NARA-L. Listening comprehension using Neale Analysis of Reading Ability test. TORCH-R. Reading comprehension using Tests of Reading Comprehension.

3 Reading Accuracy (RA) - measured by the number of words correctly read correctly.

4 Text Fluency (TF) - measured by calculating the number of words read correctly divided by the time taken to read the connected text then multiplied by 60.

5 FORCSI - Fluency - Oriented Reading and Comprehension Strategy Instruction
psychosocial reading outcomes (willingness to participate in reading and choice of text difficulty) over a nine-week period?

ii) To what extent did the nine-week FORCSI intervention explain these psychosocial reading outcomes?
3.

CHAPTER: METHODOLOGY.

3.1. Introduction.

Chapter 3 presents a description of participants and instruments used in the Fluency-Oriented Reading and Comprehension Strategy Instruction (FORCSI) programme for children in Years 4 to 6. The chapter begins with a description of the study’s quasi-experimental design followed by how a mixed-method approach, adopting aspects of design-based research, can serve to illuminate and support quantitative findings. An outline of the FORCSI intervention is presented thereafter.

Two standardised reading tests were used to address the pragmatic question of FORCSI’s effectiveness as a supplementary reading programme for children in socioeconomically disadvantaged schools. The Neale Analysis of Reading Ability (Neale, et al., 1999) was used to measure children’s reading accuracy, text fluency and listening comprehension and The Torch Test of Reading Comprehension (Mossenson, Stephanou, Forster, McGregor, & Anderson, & Hill, 2003) was used to measure children’s reading comprehension. These assessments are introduced and critically assessed.

Further, to capture the complex phenomena of students’ motivated behaviour in a social-cognitive context, the following psychosocial measures were used; Reading Self Concept, Reading Task Values, Achievement Emotions and Participatory or Choice Behaviour. Qualitative data was integrated with quantitative data in a mixed method approach to offer a more comprehensive understanding of the dynamics processes enacted in an intervention. Finally, a procedural outline of the study is presented.

3.2. Research Design.

In this study, a quasi-experimental research design was used as random assignment was not possible given logistical and resource constraints. It is widely acknowledged making causal conclusions from nonrandomized studies is
problematic, particularly when some quasi-experimental studies fail to rule out a number of plausible alternative explanations limiting the certainty of any causal inferences concerning the effectiveness of the treatment programme (Cook & Campbell, 1979; Corrin & Cook, 1998; Larzelere, et al., 2004; Shadish & Cook, 2009; Stuart, 2007). However, recent empirical evidence has shown non-randomised studies can approximate results like those of experiments (Cook, Shadish, & Wong, 2008; Cook & Steiner, 2009; Glazerman, Levy, & Meyers, 2003; Larzelere, et al., 2004; Shadish & Cook, 2009) and are nearly as good as warranting causal assertions (Cook & Steiner, 2009).

Results from non-randomised studies approximating experimental-like results can be achieved through careful planning and the use of structural design elements such as regression discontinuity and interrupted time series designs. Both designs have built in design controls; the former targets the selection process explicitly while the latter controls for both pre-existing differences and trends pre-intervention (Shadish & Cook, 2009). Both are strong alternatives to random experiments because their structural integrity reduces the impact of threats to internal validity and subsequent causal inferences can be strengthened (Cook, 2002; Cook & Campbell, 1979; Larzelere, et al., 2004).

The next option for supporting interpretable causal inferences is the use of non-equivalent control group designs (Cook, 2002; Cook & Campbell, 1979; Larzelere, et al., 2004; Shadish, Cook, & Campbell, 2002). Furthermore, this study includes additional exploratory mixed methods and also draws upon some methodological principles from design-based research.

3.2.1. Non-equivalent Control Group Design with Pretest and Posttest.

In non-equivalent control group design, pre-treatment measures and post-treatment measures are used to determine whether any post-treatment difference was due to the treatment, pre-existing differences, or some combination of these. The pre and post- measures were conducted on two groups; the intervention group where the treatment was conducted and the comparison or control group with no treatment. The inclusion of a control or comparison group was important as it ensured a plausible rendering of causal inferences (Cook & Campbell, 1979). Another reason for its
inclusion is that in fluency research there has been a paucity of studies with control or comparison groups (Kuhn & Stahl, 2003). The National Reading Panel (NICHD, 2000) used meta-analysis to examine the effectiveness of oral repeated reading and found of the 92 studies meeting methodological criteria only 14 had control groups.

### 3.2.2. Design Elements.

To create the best possible approximation to the missing ‘truth’ that random assignment can provide, the importance of design over statistical controls is key to systematically ruling out other plausible alternative interpretations of the data (Cook, 2002; Cook & Campbell, 1979; Larzelere, et al., 2004; Shadish & Cook, 2009; Stuart, 2007). In non-equivalent comparison-group design when random assignment is not possible, the design element creating the best approximation is matching the intervention and comparison groups prior to treatment. Intervention and comparison groups were matched on characteristics pertinent to the study as well as on pretest measures of the outcome variable under investigation (Larzelere, et al., 2004; Shadish & Cook, 2009; Stuart, 2007).

In this study, design elements were addressed by including schools with similar demographics and school-level characteristics such as ethnicity, socioeconomic status and language background. Due to logistic and financial constraints, it was not possible to conduct tests to ensure groups were similar on pretest measures prior to the experimental period. Statistical procedures can be used to determine if the groups were equivalent on pretest measures. In Chapter 4, study pretest measures were statistically analysed for group equivalency to determine the extent to which inferences were plausible or should be treated with caution.

### 3.2.3. Mixed Method Design.

The purpose of this concurrent mixed methods study was to better understand the efficacy of a reading programme by converging both quantitative and qualitative data. In this study, the quantitative data and its analysis will provide a general understanding of the impact of the intervention on children's reading performance. The qualitative data and its analysis will illuminate how the intervention worked, for
whom it worked and why (Bradley & Reinking, 2011b; Hoadley, 2004; Pigot & Barr, 2000).

**Figure 3.1.** Embedded experimental model design.

A mixed method approach was adopted using an embedded experimental model design (Cresswell & Clark, 2007). This model primarily uses the quantitative methodology with the qualitative dataset being subservient in this methodology (Cresswell & Clark, 2007). As seen in Figure 3.1, quantitative data is first collected (pretest measures) followed by a nested qualitative phase where process data is recorded to examine the processes of the intervention. Finally a last set of quantitative data (posttest measures) is collected once the intervention has been completed.

**3.3. Participants.**

There were a total of 236 participants from two Australian government primary schools in Year 3 (6.4%), Year 4 (30.9%), Year 5 (27.5%) and Year 6 (35.2%). In total, 55.1% of participants were female and 44.9% male. The mean age of participants was 10.5 years ($SD = 1.08$).
With the permission from principals, consent forms authorising voluntary participation were issued to both schools. Of the 236 participants, 125 students from the five classes in the intervention school volunteered to be in the reading intervention programme. By the end of the study’s 24 weeks, 120 participants remained; five students had left to attend another school. There were 174 students in the six classes at the comparison school; however, only 111 students volunteered to participate in the study. This number remained intact through to the end of the study.

Schools were selected because they shared many similar features. The schools were in the same urban areas west of Sydney and were recipients of the Priority School Funding Programme (PSFP). PSFP is a state government initiative aimed at providing additional funding and assistance to school communities with a high concentration of students from low socio-economic status (SES) backgrounds (NSW Department of Education and Training, 2009). The schools had comparable enrolments of students with a primary language other than English (LBOTE). The majority spoke English (97.3%) while Chinese (1.3%), Arabic (.8%) and Samoan (.8%) were the languages primarily spoken at home. Finally, both schools organized their classes in a similar structure with both schools having a similar number of composite classes (e.g. Year 3/4, Year 5/6) and intact grade classes (e.g. Year 4, Year 5, and Year 6). A summary of the schools’ shared characteristics is provided in Table 3.1.

The intervention school had an enrolment of 283 children and was located northwest Sydney in an area with a significant number of single-parent families living in subsidised government housing. This government school included a preschool and Special Education classes supporting children with moderate intellectual disabilities (children with an IQ below 70) and autistic children. The intervention school had five inclusive classes participating in the supplementary reading programme, including Year 3/4 ($n = 23$), Year 4 ($n = 28$), Year 5 ($n = 26$), Year 5/6 ($n = 23$) and Year 6 ($n = 24$).
The intervention school had an enrolment of 283 children and was located northwest Sydney in an area with a significant number of single-parent families living in subsidised government housing. This government school included a preschool and Special Education classes supporting children with moderate intellectual disabilities (children with an IQ below 70) and autistic children. The intervention school had five inclusive classes participating in the supplementary reading programme, including Year 3/4 \( (n = 23) \), Year 4 \( (n = 28) \), Year 5 \( (n = 26) \), Year 5/6 \( (n = 23) \) and Year 6 \( (n = 24) \).

The comparison school was situated in an area developed by the State Housing Commission for a growing suburb where the main employment has been from a nearby industrial estate. There were 363 students enrolled at the comparison school from Kindergarten to Year 6. The school does not have designated classes for students identified with special education needs. The six participating inclusive classes were structured similarly to the Intervention school, and included Year 3/4 \( (n = 10) \), Year 4 \( (n = 17) \), Year 4/5 \( (n = 19) \), Year 5 \( (n = 16) \), Year 5/6 \( (n = 28) \) and Year 6 \( (n = 20) \).

The data from the 15 participants in Year 3 from both groups was not included in the final analysis. The focus of the study was on the middle years of school, Years 4 to 6 where fluency instruction appears to be a neglected area of

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<td>31.5</td>
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<tr>
<td>Year 6</td>
<td>44</td>
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<tr>
<td>Total</td>
<td>125</td>
<td>100</td>
<td>111</td>
<td>100</td>
<td>236</td>
</tr>
</tbody>
</table>
reading instruction (Allington, 1983) or was assumed to play an insignificant role in children’s reading development (see Kuhn & Stahl, 2003).

3.4. Fluency-Oriented Reading and Comprehension Strategy Instruction (FORCSI) Programme.

The reading intervention programme consisted of two instructional components: fluency-oriented reading instruction and comprehension strategy instruction. The Fluency Development Lesson (FDL) (Rasinski, et al., 1994) from which FORCSI was adapted has its central focus on promoting growth in reading fluency. Very little attention has been given to the importance of understanding the text or providing instruction in developing comprehension skills. In this study, instruction in reading fluency was promoted as a means of developing children’s comprehension skills. Children were given systematic and explicit instructions in the use of four comprehension strategies; summarizing (finding the main idea), locating the details of the story, drawing inferences and using contextual cues to assess word meaning.

The thirty minute lesson began with the researcher modelling fluent reading and the class following their own copy of the text. This was followed by a short discussion of the material with particular attention drawn to the way the text was to be read with fluency, expression, phasing, and intonation. The class was led into several choral readings of the text by the researcher. The class then broke into pairs where one child reads a short passage for one minute while the second child listens and records the reader’s miscues. The roles are then reversed. This was repeated until each student has read the text three times to his or her partner. Each child has only one-minute to read the text with the researcher signalling when to stop.

Five multiple choice questions appeared at the end of the text targeting each of the four comprehension strategies. The researcher demonstrated how and when to apply the strategies through modelling and by the use of a teacher think-aloud. Each reading session concluded with each child recording their daily reading performance (number of words read, number of miscues and number of correctly answered comprehension questions) on their individual Record of Progress sheet.
3.4.1. Organisation and Instructional Procedure.

The reading programme was conducted across three phases; introduction of FORCSI in the Orientation Phase, children practicing the skills in the Guided Practice Phase, and children working independently in the Intervention Phase.

Phase 1: Orientation

Children were given a folder which contained a booklet of reading passages, comprehension questions, and a Record of Progress sheet (see Appendix A). Children were instructed they would read short texts with the purpose of improving reading fluency and expression. The researcher demonstrated fluent and expressive reading with the class following the text with their own copy. The class was led in several choral readings of the text, with the emphasis on correct text phrasing and intonation rather than on reading fast. A constant reminder throughout this orientation phase was that reading fluently and with comprehension are hallmarks of a good reader. Reading fast was strongly discouraged particularly if it resulted in poor comprehension performance.

Five comprehension questions were given at the end of each reading passage. These questions were designed to develop the comprehension strategies of summarizing, finding the main idea, answering both literal and inferential questions and deducing the meaning of words from contextual cues. The questions were multiple choice responses. Both the reading passages and comprehension were taken from the SRA Multiple Skills Reading Series (Boning, 1998).

During the Orientation Phase most of the time was devoted to the systematic and explicit instruction of developing these comprehension strategies. For example, Question 1 always required the selection of an appropriate title for the story. Teacher think-aloud was used to demonstrate how selecting the best title was about identifying the main ideas from the details of the story. Questions 2 and 3 were always literal questions where children were taught the strategy of locating information by quickly scanning over the text. Another strategy was for children to read the questions at the very beginning thus making reading the text more purposeful and directed. Question 4 required drawing out an inference and required
children to identify the answers hidden between the lines. Question 5 involved the strategy of using contextual cues to find the meaning of a word. By the end of the first week, children are aware of what was meant by fluent and expressive reading and how to answer the comprehension questions in a strategic manner.

**Phase 2: Guided Practice**  

During the **Guided Practice Phase** the children were given the opportunity to practice reading fluently with a partner. In addition, children were informed fluent reading required a certain number of words to be read within a minute. To be a fluent reader, a Year 3 child must be able to read 100 words in a minute, in Year 4, 110 words per minute and in Year 6, 140 words per minute (Neal, 1990). Children were encouraged to set their respective year level fluency criterion as a personal goal along with improving word accuracy and completing all the comprehension questions correctly.

During the partner reading session, the instructional procedures were aligned to the Fluency Development Lessons (Rasinski et. al., 1994) and were as follows:

1. The researcher activated children’s prior knowledge prior to the reading of the text.

2. Fluent reading was demonstrated with meaning text phrasing and appropriate text phrasing modelled by the researcher as text was followed by the class on their own copy.

3. The researcher led the class in several choral readings of text.

4. Each student paired with another student. One was to be the designated *reader* and the second the *listener*. The *listener*’s role was to help out when reading difficulties arose. Reading began when the researcher announces GO, and STOP to end the reading, 1-minute later.

5. The *reader* read the text while the *listener* followed along with a copy, crossing out the reading mistakes made by the *reader*. On the command STOP, the *reader* cease reading and the *listener* circled the last word read. The roles are reversed.
6. Step 5 was repeated until each student had read the text three times.

When the partners had finished reading, comprehension questions were completed as a teacher-guided activity. Children recorded the day’s reading performance by noting the following information on the Record of Progress sheet: the number of total words read correctly, the number of words inaccurately read, and the number of correctly answered comprehension questions. These were recorded separately for each of the three readings.

**Phase 3: Intervention  Weeks 3 – 9**

By this stage, most of the children were accustomed to the reading procedure and worked with a minimum of supervision allowing the researcher to wander around the classroom offering assistance, correction, or prompting to stay on task where necessary. The 30-minute session was presented as three distinct but integrated parts: a) *before reading*, b) *during reading* and c) *after reading* (Pressley & Afflerbach, 1995). An outline of the instructional procedure is presented in Table 3.2.

Table 3.2. *Before, During and After Instructional Procedures in FORCSI.*

| BEFORE READING  
(10 minutes) | DURING READING  
(10 minutes) | AFTER READING  
(10 minutes) |
|-----------------|-----------------|-----------------|
| - Introduce text by activating child’s prior knowledge.  
- Discuss new words introduced in the passage ie meaning, pronunciation, spelling etc.  
Record new vocabulary on chart.  
- Predict what the passage may be about.  
- Teacher reads passage. Model fluent, expressive reading (prosody). | - Child is partnered with another reader.  
- One child is the ‘reader’ the other, the ‘recorder’.  
- The ‘reader’ has 1 minute to read text. The ‘recorder’ marks out the errors and the last word read before the 1-minute is up. The ‘recorder’ goes over the mistakes with the ‘reader’. The roles are swapped. Repeat procedure three times.  
- Each child records errors and reading time on individual record chart. | - Children to complete 5 comprehension questions which develop the skills of summarising, finding the main idea, answering literal and inferential questions and writer’s purpose.  
- Discuss answers and comprehension strategies of skimming to locate answers, using contextual cues to find meaning of unfamiliar words, self-monitoring.  
- Record comprehension score on record sheet. |
In the beginning of each reading session, before reading the day’s connected text, the first ten minutes were devoted to discussing and learning key words, unfamiliar vocabulary, and any new concepts appearing in the session. The researcher modelled fluent and expressive reading and class mimicked the researcher with a few choral readings. During reading was the next ten minutes where paired students read to each other. After reading was the final ten minutes where answering of comprehension questions was done independently. Documenting the day’s reading performance on the Record of Progress concluded the reading session.

3.5. Qualitative Methodology.

3.5.1. Rationale.

Intervention studies are difficult to design, execute, replicate, and have been under scrutiny particularly with regard to methodological concerns and if left unattended, can limit the significance and interpretability of the intervention study (Chard, et al., 2009; Lyon & Moats, 1997). Unfortunately some studies lacking in methodological rigor have already influenced both theory and practice (Lysynchuk, Pressley, d'Ailly, Smith, & Cake, 1989). For example, in a recent study reviewing the efficacy of repeated reading approaches for improving reading fluency for students with or at risk for learning disabilities, the results indicated the majority of repeated reading studies under examination failed to meet rigorous quality indicators and classification as an evidence-based practice should be applied tentatively (Chard, et al., 2009). In this current study, attempts were made to include quality indicators such as the use of multiple measures, reporting effect sizes, finding samples which were comparable across conditions and the inclusion of detailed description of implementation procedures.

Apart from these methodological considerations, another problem associated with intervention research is the failure of educational research to influence practice. In many U.S classrooms, evidence-based instruction is not fully utilised despite government policies encouraging their use (Pressley, et al., 2006). This lack of implementation points to an often lamented gap between research and practice (Bradley & Reinking, 2011b; Pigot & Barr, 2000).
Translating theory into practice is never easy and made even harder when educational researchers are challenged to provide scientifically sound and generalisable knowledge on one hand and useable knowledge in a practical sense on the other (Reigeluth & Frick, 1999). Bradley and Reinking (2011b) described this challenge as researchers seeing the significance of research in terms of implications for understanding long term repercussions and policy making versus teachers wanting research results to inform classroom practice and to achieve valued pedagogical goals. With this challenge in mind, the present study used a variety of measures, both quantitative and qualitative, not only to determine the effectiveness of the intervention in relation to measurable academic achievement for theory building (quantitative) but to also illuminate how it works in classroom practice (qualitative).

Inspired by design-based research, a focus on the qualitative processes of the intervention was implemented to guide data collection and its analyses complementing the quantitative findings to provide a richer and deeper understanding of how a reading intervention works, for whom it works and why. Further, as design-based research is inherently concerned with how an intervention “works” in a given context (Bradley & Reinking, 2011b; Hoadley, 2004; Pigot & Barr, 2000), the findings can contribute to theory, practice and policy (Pigot & Barr, 2000; Reinking & Bradley, 2004). It can be argued that the main purpose of design-based research is to generate research that is more relevant to practice. Knowing if the intervention worked is not enough. How the intervention worked, under what conditions, is it economically feasible and practical for teachers, is it engaging for students, will teachers use it after the intervention has finished are all important questions. This information can provide a more holistic understanding not only of practice but also of how theory might be improved and become more useable for teachers and policy makers alike (Bradley & Reinking, 2011b; Hoadley, 2004; Pigot & Barr, 2000).

Qualitative process data was collected in the form of field notes to document the day-to-day experiences of the students and teachers throughout the implementation of the intervention. This data was reported as a supplement to the quantitative analyses. This data cannot be used to draw causal inferences; it is used to provide important contextual information which can inform interpretation of the
quantitative analyses. It is also hoped that the depth and details of these accounts will assist in research and practice and replicate the FORCSI intervention in the future.

3.5.2. Design-based research.

Design-based research is a broad term referring to a series of methodological approaches recognising and exploring the dynamic forces among diverse variables inherent in naturalistic settings. Under this broad term are the following related approaches such as formative experiments (Newman, 1990), formative evaluation (Flagg, 1990), and situated evaluation (Bruce & Rubin, 1993). Currently there is uncertainty about how each approach is clearly distinguishable from each the other (Bradley & Reinking, 2011a; Reinking & Watkins, 2000). The aim of any of these investigative approaches is to produce new theories, artefacts and practices that account for and potentially impact learning and teaching (Bradley & Reinking, 2011b; Hoadley, 2004; Reinking & Bradley, 2004; Sandoval & Bell, 2004). The challenge of any programmatic intervention adopting this investigative approach is to document with methodological rigor, the complexity and messiness of the phenomena in a way that will be valuable to others (Barab & Squires, 2004).

A methodological issue associated with design-based research is making an intervention “work” at the expense of empirical control which argues against changing the planned “treatment” (Sandoval & Bell, 2004). At the heart of design-based research is reaching a well-specified pedagogical goal with the use of iterative cycles of data collection and identifying any salient factors impacting on the intervention’s effectiveness. Factors can either inhibit or capitalise intervention effects will necessitate modifications to the programme (Reinking & Bradley, 2004; Bradley & Reinking, 2011b). This raises questions of alternative explanations for results and possible confounding factors. Cook and Campbell (1979) detailed these threats in experimental and quasi-experimental studies.

Although the presented study did not involve experimental iteration it does draw on some of the design-based research features in other ways and design-based research theory guided some of the study’s methodology. Design-based research can develop different kinds of knowledge (Pressley et al, 2006; Sandoval and Bell, 2004; Reinking & Watkins, 2000; Barab & Squires, 2004) because of design-based
researchers’ reluctance to manipulate the context. Because of this reluctance, replicating others’ findings is problematic (Hoadley, 2004). Therefore different kinds of information are generated when the goal of design-based research is to expose and problematise the completed design and resultant implementation in such a way it provides insights into the local dynamics (Barab & Squires, 2004). Design-based research allows for a richer description of the context, guiding emerging theory, assessing important outcomes, and addressing implementation issues impacting participation and learning, and reducing the risk of missing other perspectives accompanying programmatic innovation (Barab & Squires, 2004; Pigot & Barr, 2000).

In sum, designed-based research is fundamentally concerned with exploring the myriad of interacting factors and events that influence and intervention's effectiveness and its unanticipated consequences. It involves investigating systematically and with disciplined inquiry, real problems in authentic classrooms with the aim of developing useable solutions to support teachers if they are to implement instructional practices benefiting children. Therefore, the pedagogical goal becomes the central reference point for collecting and analysing data (Bradley & Reinking, 2011a). The way process data is collected and analysed is shaped by the goal of answering the question of what works and what does not as well as how these findings can refine theoretical understandings of instruction and learning. The study presented here similarly adopts a specific focus on process and reports on the reading intervention research in an exploratory way that can inform future practice.

3.5.3. Data Analysis Strategy.

This study’s methodological framework was primarily influenced by work of Reinking and Watkins (2000). The researchers’ investigation was on an intervention focused on increasing fourth and fifth grader’s independent reading by changing the instructional environment. The study provided an approach to design-based method and a way to plan and report the results. The framework was comprised of a series of questions and answers to shape how the study was conceptualised, planned, data collected and findings analysed. In this study, five questions formed the framework, two of which helped direct this study and are presented below:
1. **What is the pedagogical goal of the intervention?** The pedagogical goal was to improve children’s componential reading and comprehension skills through a fluency-oriented reading programme with a comprehension strategy instruction component. Another goal was to account for any intervention effects on children’s psychosocial orientation to reading.

2. **What instructional intervention can achieve the identified pedagogical goal?**

The instructional intervention was taken from Fluency Development Lesson (FDL: Rasinski, et al., 1994) using short reading passages children read and reread within a one-minute time period (see p. 85 & 88). In this study, attention was focused on the instructional components producing robust reading outcomes in repeated reading interventions. The intervention consisted of corrective feedback on word errors and passages being read aloud at least three times (Therrien, 2004). Other instructional components to achieve pedagogical goals were reading aloud to a partner chosen by the reader, frequent of modelling of fluent reading, explicit and systematic instruction, children cued to focus on reading with prosody and with understanding rather than on reading fast. Finally, the intervention was presented as a training/enhancement programme developing reading skills based on effort than a programme remediating reading skills.

These two questions were the central reference points for collecting and analysing data for the remaining three questions. Design-based research is more preoccupied with investigating how to achieve the pedagogical goals than attaining fidelity. This is because researchers approach the investigation with the assumption changes will inevitable. Sources of qualitative data were from the observational field notes, researcher’s journal, reflection diary, student’s work, and classroom teachers’ comments. The 3 remaining questions in design-based research were as follows:

1. **What are the factors inhibiting or enhancing the intervention while achieving the pedagogical goal?**

2. **Was the intervention and its implementation modified to achieve the pedagogical goal?**

3. **Did the intervention produce any positive or negative effects relating to the pedagogical goal?**
3.6. Quantitative Methodology: Reading Performance Measures.

Quantitative measures of the study design were used to identify the patterns of progress in the students’ reading abilities. Analysis focused on comparing the relative shifts in the intervention and comparison groups and on exploring the relationships between the different reading and psychosocial measures. The approach for examining reading performance is outlined here and followed by the approach for psychosocial measures.

3.6.1. Rationale.

Analysis of variance (ANOVA) and multiple linear regression (MLR) are two of many statistical procedures used to analyse the data. In many instances, ANOVA and MLR carry out a similar function; they both account for the variance in the level of one variable on the basis of the level of one or more other variables (Keith, 2006). The ANOVA family of statistical procedures seeks to essentially identify whether or not there are differences in a dependent variable based on the independent variable. Regression studies seek to identify whether a single predictor variable predicts or explains the dependent variable as in simple linear regression or whether or not a set or multiple independent or predictor variables predict or explains a single dependent variable as in multiple linear regression (Field, 2009). The use of naturally occurring scores is more in accord with the exploratory nature of the study (Keith, 2006). The primary interest in this study was to use MLR in identifying the independent variables that were the best predictors of the dependent variables rather than using ANOVA, which would have focused on determining whether or not there were differences in the dependent variables.

There are several different methods for entering variables in a regression equation including enter, stepwise, forward and backward method. An enter method was used since no a priori hypotheses had been made to determine the entry of variables. In addition to using simple multiple regression, hierarchical multiple regression analysis was conducted to examine the effects of certain predictor variables independent of the influence of others. Hierarchical regression enables the examination of the contribution of variables (e.g., FORCSI) above and beyond other predictor (or independent) variables.
This study used two well established tests of comprehension the *Neale Analysis of Reading Ability – 3rd Edition* (NARA) (Neale et. al., 1999) and the *Tests of Reading Comprehension – 2nd Edition* (TORCH) (Mossenson et. al., 2003). These are standardized tests frequently used in research as reading assessments however they measure different aspects of comprehension.

These two tests are used firstly to provide a measure of the effectiveness of an intervention programme and assess whether the instructional procedure can be generalized to overall reading ability. Standardised tests such as the NARA and TORCH can be used to measure overall reading ability. Many fluency-based studies lack generalisability because they use researcher-designed tests with specific instructional passages and any intervention effects such as fluency training are limited to the set passages (Dymock, 1998). Other fluency studies have used baseline designs useful in evaluating the effectiveness of the approaches of children in small heterogeneous populations (children with learning or reading disabilities); however, the results from these studies cannot be readily generalised to an average population (Kuhn & Stahl, 2003).

The second reason for the inclusion of two comprehension tests was not all tests were the same nor do they measure the same constructs. There is an implicit assumption reading tests measure the same cognitive process. Research has found this was not the case (Bowyer-Crane & Snowling, 2005; Cain & Oakhill, 2006; Cutting & Scarborough, 2006; Francis, Fletcher, Catts, & Tomblin, 2005; Keenan, Betjemann, & Olson, 2008; Kuhn & Stahl, 2003; Nation & Snowling, 1997). Some assessments of reading comprehension may be more heavily dependent on word reading skills than others. Keenan, Betjemann and Olson (2008) found some comprehension tests, such as the Peabody Individual Achieveme (PIAT; Dunn & Markwardt, 1970) and Woodcock - Johnson Passage Comprehension (WJPC; Woodcock, McGrew, & Mather, 2001), were more dependent on individual differences in decoding skills while others, the Gray Oral Reading Test (GORT; Wiederholt & Bryant, 1992) and Qualitative Reading Inventory (QRI; Leslie & Caldwell, 2001), had oral comprehension and not decoding accounting for most of the variance in regression analyses.
The underpinning of comprehension involves a range of language and cognitive skills and answers to research questions might differ according to the specific test used to assess comprehension (Keenan, et al., 2008). The NARA and the TORCH were used primarily to assess the differential dependence on oral comprehension and decoding respectfully. NARA is a measure of oral reading ability with open-ended questions asked by the examiner once each passage has been read aloud by the child. NARA was intended to measure macrocomprehension processes by tapping into the ability to use prior knowledge or real-world knowledge to generate inferences in reading (Bowyer-Cane & Snowling, 2005; Kuhn & Stahl, 2003) and is more dependent on listening comprehension than on word reading ability (Cain & Oakhill, 2006; Keenan, et al., 2008; Nation & Snowling, 1997). In contrast, the TORCH is a measure of silent reading ability. Children demonstrate understanding of the passage by providing the missing word or phrase when given the text with words omitted. This sentence completion method is referred to as a cloze test and is used to measure the microcomprehension processes involved with children’s ability to decode words (Cain & Oakhill, 2006; Francis, et al., 2005; Keenan, et al., 2008; Nation & Snowling, 1997) and their knowledge of the syntactic relationship in sentences (Kuhn & Stahl, 2003).

In summary, the two standardised reading tests measured different aspects of the comprehension process; the NARA is a measure of children’s listening comprehension and relies on children’s prior knowledge to access meaning (macrocomprehension processes) compared to the TORCH, measuring a child’s ability to gain text meaning through decoding (microcomprehension processes). The NARA and the TORCH included literal and inferential questions children must answer. The ability to answer literal and inferential questions has been shown to be a key discriminator between skilled and less skilled comprehender (Cain, Oakhill, & Bryant, 2004).

3.6.2. Listening Comprehension: Neale Analysis of Reading Ability NARA-L

The Neale Analysis of Reading Ability – 3rd Edition (NARA) (Neale et. el., 1999) is a 20-minute individually administered test of oral reading ability for children aged six to thirteen years. The NARA measures three facets of reading...
performance: accuracy, comprehension, and text fluency (reading rate). The *NARA* is commonly used as an assessment of reading ability in the United Kingdom (Cain & Oakhill, 2006; Spooner, Baddeley, & Gathercole, 2004) and as a diagnostic tool by Australian reading specialists to assess the oral reading ability of students with a range of learning disabilities (McInerney, 2000) The *NARA* has also been adopted in a wide range of research studies (Douglas, Grimley, McLinden, & Watson, 2004; Kelso, Fletcher, & Lee, 2007; Moni & Jobling, 2001; Nation & Snowling, 1997; Nunes, Bryant, & Barros, 2012; Yuill & Oakhill, 1991). In the past, *NARA* has also been studied for its effectiveness as a measure of reading comprehension and accuracy (Bowyer-Crane & Snowling, 2005; Cain & Oakhill, 2006; Nation & Snowling, 1997; Spooner, et al., 2004). In this study, *NARA-L* denoted the scale measuring children’s listening comprehension.

*NARA* consists of a *Reader, Individual Record* forms, and *Manual*. The *Reader* is a booklet containing six graded passages with two parallel forms, Form 1 and Form 2. Form 1 was used for the pretest and Form 2 was used as the posttest. The parallel passages in Forms 1 and 2 contained both narrative and expository texts at six levels of increasingly difficult vocabulary and grammar. The child reads each passage contained in the *Reader* out loud to a test administrator. The time taken (text fluency measure) and any reading errors (reading accuracy measure) made during reading are recorded on the child’s *Individual Record* form. The student’s comprehension score is the number of comprehension questions answered correctly and this too is recorded on the form. Comprehension questions are orally presented following each of the passages.

The *Manual* contains the information on the administration, scoring, and the conversion of test scores into standardised scores. Information on the administration of *NARA* includes details such as which practice passage (X or Y) to begin with, step-by-step scripted instruction for the test administrator to read when the child begins to read the test passages, and when and how to prompt the child during reading so comprehension is not affected. Handouts outlining these instructional protocols were given to each test administrator throughout testing ensuring consistency and reliability.
3.6.3. Reading Accuracy and Text Fluency: Neale Analysis of Reading Ability.

The NARA measured children’s reading accuracy and text fluency (or reading rate). To measure reading accuracy, the Individual Record form was used to record the reading errors under six groups of miscues: mispronunciations, substitutions, refusals, additions, omissions and reversals. The descriptions and the examples of the reading miscues are presented in Table 3.3. The separate errors are summed to give a cumulative reading accuracy score. Along with the accuracy score, the Individual Record form records the reading rate or text fluency. This is calculated by the total number of words read divided by the total time taken multiplied by 60. Conversion tables in the Manual were used to convert the raw scores of accuracy, text fluency and comprehension into standardised scores allowing the child’s reading scores to be assessed against national profile levels and reading ages.

Table 3.3. The Identification and Recording of Reading Errors in NARA.

<table>
<thead>
<tr>
<th>Errors</th>
<th>Features</th>
<th>Example</th>
<th>Recording Errors</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mispronunciations</td>
<td>Words pronounced incorrectly</td>
<td>‘Holly’ instead of ‘holy’</td>
<td>Transcribe child’s phonetically</td>
</tr>
<tr>
<td></td>
<td>Dialects and accents are NOT errors</td>
<td>‘Sam’ instead of ‘same’</td>
<td>mispronunciations</td>
</tr>
<tr>
<td></td>
<td></td>
<td>‘Anythink’ instead of ‘anything’</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>‘Bruve’r instead of ‘brother’</td>
<td></td>
</tr>
<tr>
<td>Substitutions</td>
<td>Real words are used instead of the correct word in the passage</td>
<td>‘I live here’ not ‘I live her’</td>
<td>The correct word is given but the error is recorded</td>
</tr>
<tr>
<td>Refusals</td>
<td>Child pauses for 4 to 6 than 6 seconds without attempting to decode the word</td>
<td></td>
<td>Supply the word but record the failure to read the word as a refusal</td>
</tr>
<tr>
<td>Additions</td>
<td>Words or parts of words inserted in the text</td>
<td>‘Mother went shopping’ not ‘Mother went to shopping’</td>
<td>When more than 1 word is added within a phrase, record it as 1 error only. Correct the error but record its occurrence.</td>
</tr>
<tr>
<td>Omissions</td>
<td>Words that are omitted from the text.</td>
<td></td>
<td>1 point for each word omitted. Give the correct word</td>
</tr>
<tr>
<td>Reversals</td>
<td>‘no’ for ‘on’</td>
<td>‘dad’ for ‘bad’</td>
<td>Record as error</td>
</tr>
</tbody>
</table>
3.6.4. Reading Comprehension: Test of Reading Comprehension TORCH-R.

The *Tests of Reading Comprehension – 2nd Edition (TORCH)* (Mossenson et al., 2003) is a set of twelve class-administered reading tests for students in Years (grades) 3 to 10. Each reading test is an excerpt from a longer passage but can stand alone as a piece of fiction or non-fiction literature and vary in difficulty and in length from 200 to 900 words. The *TORCH* is untimed and provides both diagnostic information and norm-referenced data for classroom use. The *TORCH* is packaged as a set containing the *Test Booklet* (12 passages), *TORCH Answer Sheets* (12 cloze worksheets), and the *Teacher Manual*. For the purpose of this study, a *Student Test Booklet* was made consisting of five of the twelve passages with the level of text difficulties ranging from Year 3 to Year 10. *TORCH-R* denoted the scale measuring children’s reading comprehension.

The *Story Test Booklet* included expository and narrative texts and was compiled in order of difficulty beginning with *Story A*, the easiest with 200 words. The stories become more difficult with each successive passage until *Story E* the most complex with 900 words. The *Student Test Booklet* with the passage titles and level of reading difficulty is provided below (see Appendix B).

<table>
<thead>
<tr>
<th>Story</th>
<th>Name</th>
<th>Reading Difficulty by Year (grade) Level</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>Grasshopper</td>
<td>3 (expository)</td>
</tr>
<tr>
<td>B</td>
<td>Lizards Love Eggs</td>
<td>3 – 4 (narrative)</td>
</tr>
<tr>
<td>C</td>
<td>The Swamp Creature</td>
<td>5 – 6 (narrative)</td>
</tr>
<tr>
<td>D</td>
<td>The Red Ace of Spade</td>
<td>7 – 10 (expository)</td>
</tr>
<tr>
<td>E</td>
<td>The Purple Children</td>
<td>9 – 10 (narrative)</td>
</tr>
</tbody>
</table>

The passages were deliberately selected to address the range of ability levels of participants in Years 4 to 6. The passages (Story A, B, C and D), were easy to identify as becoming more difficult as each new story had the print size becoming smaller and the length of the passage longer. It was important for the participants to recognise the increasing reading demands placed successively on the five passages in order for children’s intention and choice of reading material be examined. From the researcher-prepared instructions, participants were informed of the following:
“Story A is the easiest because of the bigger letters and fewer printed words. Each story then gets a little bit harder – the letters get smaller and there are more words. Story E is the hardest story to read. Choose a story you like to read and then answer questions on it”. The scripted instruction was to ensure all participants understood the stories increased in complexity and was repeated in all classes. Participant’s choice of one of the five passages was the basis for the scale measuring choice of Text Difficulty (Cdiff).

Studies have shown children tend to choose books at or slightly below their instructional level (Carver & Leibert, 1995; Stahl & Heubach, 2005). To further ensure choice of reading material was volitional, participants were given explicit instructions that changing texts at any stage of the reading task was permissible. It was important for this point to be made salient as the current investigation was based on children choosing a reading task of their own volition when given easy and challenging reading tests to select from. Participants were instructed to read only one of the five stories in the Student Test Booklet and then complete a retelling of the story on the TORCH Answer Sheet (see Appendix C). The retelling is in a cloze procedure format where participants are required to fill in the gaps in the sentences by providing one or more of their own words on the Answer Sheet. By filling in the blanks, participants were able to demonstrate their own understanding of the story both at the literal and inferential level.

Instructions on the scoring the TORCH are found in the Manual. Score keys are provided and suggested appropriate responses for each gap in the cloze test, as well as responses deemed to be unacceptable. The numbers of correct responses were tallied to give a raw TORCH score. The raw scores were then converted into TORCH scaled scores (or TORCH units) from the conversion tables provided in the Manual.

The TORCH was developed through a calibration and equation process using the Rasch measurement method (Mossenson, Hill, & Masters, 1987). This enables direct comparison of ability estimates of children within the same class or grade using taken different test passages. Child A with ten correct answers on Grasshopper (Story A) has a scaled score of 29.5 TORCH units. This score can be validly compared with a classmate such as Child B completing Lizards Love Eggs (Story B)
and correctly answering ten questions but has a scaled score of 32.8 TORCH units and has performed better at reading comprehension than Child A. TORCH was used to assess reading comprehension performance before and after the intervention period regardless of the story chosen at both time points.

The TORCH was developed in Australia and standardised with over 6,000 students in years (grades) 3 – 10. Reliability of the TORCH was reported in terms of Kuder – Richardson (KR-20) reliability coefficients showing evidence of internal consistency for the test items ranging between .90 and .93 for the various passages. Full details of the technical considerations are provided in the Manual.

3.7. Quantitative Methodology: Psychosocial Measures.

The following scales were used to measure children’s psychological processes and included: Reading Self Concept, Reading Task Values, Achievement Emotions in General and Specific Reading tasks and participatory behaviour as in Choice of School Activities and Choice of Text Difficulty.

3.7.1. Reading Self Concept (Rself).

The ASK-KIDS Inventory for Children (Bornholt, 2005) was selected for the study to measure children’s self concept of themselves as a reader. The ASK-KIDS was selected for the study because it specifically measures reading self concept. Other scales, the Academic Self Description Questionnaire I and II (Marsh, 1990), the Perception of Ability Scale for Children (Boersma & Chapman, 1992) and the Self Scale (Burnett, 1994), measure self concept using a subscale consisting of a few items and as a component of the broader and more general construct of self concept.

The Reader Self Perception Scale (RSPC) (Henk & Melnick, 1995), the Reading Self Concept Scale (RSCS) (Chapman & Tunmer, 1999) along with ASK-KIDS (Bornholt, 2005) specifically measure reading self-concept. Both the RSPC and RSCS also contain items measuring children’s attitudes and feelings about reading in general. Empirical evidence has linked positive self concept, reading attitudes, and motivation to better reading performance (Chapman & Tunmer, 1995, 2002, 2003; Chapman et al., 2000; Cox & Guthrie, 2001; Eccles, et al., 1998;
McKenna et al., 1995). However, not all reading achievement is positively correlated to children’s motivational and attitudinal profiles (Baker & Wigfield, 1999; Pumfrey, 1997). Some children may complete reading tasks satisfactorily but demonstrate poor attitudes about reading (Oldfather, 2002). Similarly, children high in motivation may not always achieve high reading scores (Baker & Wigfield, 1999). While it is useful to have items measuring the attitudes and feelings in the RSPC (Henk & Melnick, 1995) and RSCS (Chapman & Tunmer, 1999) scales, caution must be taken when interpreting the self-concept scores and its links to academic performance.

The ASK-KIDS reading self-concept scale moves beyond just a few items measuring attitudes and feelings about their reading. The reading self-concept scales measures self concept as an interpretation of children’s behavioural intentions and motivation to participate in activities (Bornholt, 2005). Behavioural intentions to participate in reading activities are responsive to variations in reading experience, such as in a planned intervention (Bornholt, 2004; Coleman & Bornholt, 2003). By using ASK-KIDS, the study will be able to measure children’s self-concept as a reflection of their participatory intentions and behaviour about reading activities. Other measures concentrate on self-concept as aspect of performance (e.g., Marsh, 1990) or perceptions of difficulties and reading attitudes (e.g., Chapman & Tunmer, 1999; Henk & Melnick, 1995). For example, if a child scored a moderate to high self-concept on reading, ASK-KIDS would interpret the results in two ways. First, the child exhibits positive experiences of reading (over and above actual performance) and second the child shows an increasing willingness to participate in reading (Bornholt, 2005). By interpreting the results this way, it is possible to understand the dynamic and multifaceted psychosocial processes within a reading intervention programme better.

The ASK-KIDS reading self-concept subscale ($R_{self}$) consists of five items and asks children to examine their own self-knowledge with items related to current performance (How good are you at reading activities?), natural talent (How naturally talented are you at reading activities?), effort (How much effort do you try at reading activities?), task difficulty (How hard are reading activities?), and future performance (Next year when you are in Year...at school, how good will you be at reading activities?) (See Appendix D). Children responded to these items by using a
five-point Likert type response scale of *a bit good* (1), *a bit more* (2), to *very, very good* (5). The numerical scores for the five items were summed and a mean calculated providing a score for the scale labelled Reading Self Concept. One item (*How hard are reading activities?*) was reverse coded.

### 3.7.2. Reading Task Values (*Rval*).

The Reading Task Values (*Rval*) scale contained four items adapted from previous studies (Eccles & Wigfield, 1995; Wigfield & Eccles, 2000; Wigfield, et al., 1997) and was used to measure the following three components of the expectancy-value model: the intrinsic value or interest gained from doing an activity (*How much do you enjoy reading, How much do you like reading?*), the utility value or usefulness of the task in reaching future goals (*How useful are reading activities?*); and attainment value or importance of doing well on a task (*How important are reading activities?*) (See Appendix D).

In previous research, task values were differentiated into intrinsic, utility and attainment values and explored separately in relationship to high school literacy choices (Durik, et al., 2006), motivation in science (DeBacker & Michael Nelson, 1999), developmental patterns and socialisation (Wigfield et al., 1997), expectancies for success and perception of task difficulties (Eccles & Wigfield, 1995), changes during the transition to high school (Eccles, et al., 1989) and adolescents’ intention for senior courses (Bornholt, 2001). Prior research studies have used the task value scales designed with seven-items by Eccles & Wigfield (1995) or six-items by Wigfield and Eccles (2000). In this current study, the *Rval* scale was adapted from these previous studies and used four items addressing the intrinsic, utility and attainment values as a single composite construct than using the values individually. Prior research has combined intrinsic, utility and attainment values into a composite construct and referred it as reading task value (Jacobs et al., 2002; Updegraff et al., 1996). This study was interested in measuring children’s reading task values as a multidimensional facet of reading motivation and how this composite task value was affected by the reading intervention and subsequently on school achievement and reading motivation.
The *Rval* scale utilized a five-point Likert type response scale of low indicating reading was only valued *a little bit* (1) to high indicating that they valued reading *a lot* (5). The responses to each of the four items were totalled then averaged to create a single score labelled Reading Task Value and the mean was used in further analysis, examining its relationship to *FORCSI* and children’s achievement related choices.

**3.7.3. Achievement Emotions.**

Achievement emotion is a construct of children’s psychosocial orientation towards reading that may show its impact on performance after the reading intervention. Two instruments were used, one measuring children’s emotions elicited during general reading - the Achievement Emotion and General Reading (*Eread*) and the second, measuring children’s emotions during reading specific reading activities, Achievement Emotion and Specific Reading Tasks scales for Sustained Silent Reading (*Essr*), reading for Research (*Ersch*) and Homework (*Ehwk*).

**3.7.3.1. Achievement Emotions and General Reading (*Eread*).**

The Achievement Emotion and General Reading (*Eread*) scale included a positive and negative range of emotions for children to indicate their emotions or feelings about various school-related activities in reading, drawing, numbers, and physical movement. These emotions were presented as 15 words (or descriptors) and were taken from previous studies on affective responses (Bornholt, 2002; Bornholt & Piccolo, 2005; Levins, Bornholt, & Lennon, 2005).

Study participants were asked *How do you feel when doing reading activities?* Students responded by circling as many of the 15 descriptors that best fit their emotions about the activity. The descriptors were read aloud by the researcher and included positive emotions such as being comfortable, pleased, proud and alright and the negative emotions such as being embarrassed, guilty, worried, sick, yuk, shame, disgust, nervous, bad tempered, concerned and furious (Appendix D). The procedure was repeated for drawing, number, and physical movement; however, only the reading scale was used in the study for analysis as a factor contributing to the psychosocial dimensions of the reading programme.
3.7.3.2. Achievement Emotions and Specific Reading (Essr, Ersch, Ehwk).

The Achievement Emotions and Specific Reading is a 15-item scale using a situation-response questionnaire format to measure emotions in specific reading contexts. The scale was adapted by the researcher from studies assessing affective responses in contextualised situations such as in test-taking conditions (Pekrun, et al., 2002), children with learning needs (Levins, et al., 2005), and circumstances relating to discrimination against an indigenous colleagues (Bornholt, 2002).

Twelve individual descriptors were grouped to form five related but discrete composite emotions as follows: good (pleased, proud, alright), worried (nervous, concerned), guilty (shame, embarrassed), angry (bad, temper, furious), and yuk (sick, disgust). In previous studies where similar scales have been used (Bornholt, 2002; Bornholt & Piccolo, 2005; Levins, et al., 2005), confirmatory factor analysis confirmed individual affects can be clustered into composite emotions (Bornholt, 2002) yielding acceptable levels of internally consistency with affective responses (Bornholt & Piccolo, 2005; Levins et al., 2005).

The scale included descriptions of reading tasks using three scenarios, (a) sustained silent reading, (b) gathering information to complete a research assignment, and (c) reading a book as homework. These scenarios represent specific reading events in Australian classrooms (Cairney, Lowe, & Sproats, 1994). The researcher asked, How do you feel when completing...

a) Sustained silent reading. Lunchtime is over and you are back in class. It is sustained silent reading for the next ten minutes.

b) Reading to complete a research assignment. You have to get information from the Internet and from the library to complete a project.

c) Reading as homework: Your class is reading a chapter book with the teacher. Your homework is to read some pages of the book each night.

Children were asked to rate their responses using a five-point Likert type response scale of feeling a little bit (1) to feeling very, very (5) to the following emotions of good, worried, guilty, angry and yuk (See Appendix D).
Reliability analysis and analysis of the item to total correlations of the composite emotion items indicated it was necessary to reverse code four of the items (worry, guilty, angry, and yuk) as follows: a little bit was coded as a 5 and feeling very, very was coded as a 1. Scores were calculated by summing across the five items to create a score for each of the three reading tasks (silent reading, research reading and homework reading).

3.7.4. Participatory Behaviour or Reading-Related Choices.

Participatory or reading-related choice behaviour refers to the behavioural intentions and actions to participate in reading activities and is measured using two scales: a) Choice of Text Difficulty (Cdiff) and b) Choice of School Activities (Cread). In this study, participatory or reading-related choice behaviour was operationalised as an indicator of reading engagement. Findings will extend earlier investigations reporting on anecdotal data on improved motivation in studies using repeated reading (Chomsky, 1978; Rasinski, et al., 1994; Samuels, 1979; Stahl & Heubach, 2005).

When students were given the opportunity to select reading material, they often choose a book matching their instructional reading level or below their current reading level (Carver & Leibert, 1995a; Stahl & Heubach, 2005). Children are more likely to adopt the principle of least effort (Skinner, Pappas, & Davis, 2005) and make selections requiring minimal expenditure of cognitive resources. When children assess how much effort and time is required for a task, their selection behaviour is made consciously and with deliberation. Skinner et al. (2005) described this as a discrete form of choice behaviour. Tapping into this discrete choice behaviour the choice of Text Difficulty (Cdiff) scale was used.

3.7.4.1. Choice of Text Difficulty (Cdiff).

Choice of Text Difficulty (Cdiff) measures an aspect of participatory conscious and strategic behaviour where behavioural intentions and actions are purposeful. The scale item seeks to investigate what reading choices students make when asked what they would read. The discrete choice making behaviour was
operationalised as an indicator of the degree of responsiveness or readiness to engage in reading requiring effort, concentration, and time.

The assessment asks children to choose one story from among the five stories on the Tests of Reading Comprehension (TORCH) (Mossenson et. al., 2003). The TORCH is a standardised reading comprehension test. The students were instructed to choose one story to read and complete the accompanying cloze activity. Children were told Story A (Year 3 reading level) was the easiest and each story became progressively more difficult with Story E (Year 9, 10 reading level) being the most difficult of the five passages. Children were also instructed they could change their choice of story at any time during the testing session. Children marked their choice of text by circling A, B, C, D or E on their questionnaire booklet (see Appendix D).

Previous studies have used the five TORCH stories to assess children’s choice behaviour for choice of reading material (Bornholt, 1999; Bornholt, 2004; Coleman & Bornholt, 2003). When children are asked to choose reading material from appropriately age appropriate levelled test (narrative or expository), their choice of text was reflective of their motivation to read. Children choosing to read harder material (stories C, D, E) are making a deliberate choice to read more complicated material and are considered more motivated than children choosing to read easier passages (story A or B).

Each of the stories was given a rating reflecting the level of text difficulty. Story A was a Year 3 level text and given a rating of 3.0, Story B a rating of 3.5 (Year 3-4 text level), Story C a rating of 5.5 (Year 5-6), Story D’s rating was 8.5 (Year 7-10) and Story E was 9.5 (Year 9-10) (Mossenson et. al., 2003). Text Difficulty was scored by using these ratings.

3.7.4.2. Choice of School Activities (Cread).

Other choice behaviours may not be made as consciously. Choices can be more ‘continuous’ in nature rather than ‘discrete’ because they are often made unconsciously, not premeditated, and the behaviour may appear transitory or fleeting (Skinner et. al., 2005). When reading is a choice, the strength of the choice may vary if another alternative is also offered.
The Choice of School Activities scale (Cread), was adapted from previous research assessing intentions (see Bornholt, 1999; Bornholt, 2004; Bornholt & Piccolo, 2005; Coleman & Bornholt, 2003). The Cread scale measures a child’s willingness to participate in the school-related activities of: reading, numbers (mathematics), drawing, and movement (sports). Children were asked How much do you choose to do these activities - reading, number, drawing and physical movement? The responses were measured with a five-point Likert type response with low (1), would choose the activity a bit (2) to would choose the activity a lot (5) indicating how likely they were willing to read, work with numbers (mathematics), draw, or engage in physical movement (see Appendix D). The school-related activities of number, drawing, and movement were used to help contextualise children’s thoughts about their intentions to participate in reading tasks as opposed to other academic activities (number) and non-academic activities (drawing and physical movement). Scores were children’s response to the five-point Likert.


3.8.1. Administration of Pretests, Posttests and Placement Test.

An information package was distributed to both schools prior to beginning the programme. The package contained a letter addressed to parents detailing the purpose of the study, an outline of the reading programme, and an assurance of participant’s anonymity. A separate consent form was also included requiring the signatures of either parent and of the consenting student. This information package was approved by the University Human Research Ethics Committee and by the New South Wales Department of Education and Training and is presented in Appendix E.

The administration of the questionnaires and the TORCH were conducted in each of the classrooms with the questionnaire taking 30 minutes to complete and the TORCH up to 60 minutes. The class teacher remained in the classroom as children completed the TORCH test. The individually administered Neale Analysis test was conducted in a room designated for this purpose by both schools. The SRA Multiple Skills Placement Test was given to the intervention classes prior to the commencement of the reading programme. The 20 minute placement test was administered by the class teacher with each child reading a series of short passages.
The children then answered multiple choices questions related to each of the short passages on the provided *Pupil Placement Test Worksheet*. These completed worksheets were given to the researcher for marking. The results from this test provided information regarding the level of text difficulty needed to organise the reading material for the *FORCSI* sessions.

3.8.2. **Training Research Assistant and Testing Integrity.**

A room was allocated for the training of three assistants at the comparison school; two undergraduates completing their honours degree in school counselling and a doctoral student. The two-hour training session was delivered by the experimenter and organised in the same week as the commencement of data collection. Each of the test instruments was reviewed; however, since three members were to conduct the reading test a majority of the session time was devoted to ensuring the instructional procedure of *NARA* was properly followed as outlined in the manual. For instance, focus was on correctly identifying and recording of the following errors; mispronunciation, substitution, refusal, additions, omissions, and reversals, when to read the scripted instructions, ending the testing when a limit of errors had been reached and the use of prompts to assist with reading. A handout summarizing these key procedural matters was given to each team member to be used during the administration of *NARA* to ensure procedural integrity as well as sound reliability in measuring student’s reading comprehension, word accuracy, and rate of reading.

3.9. **Chapter Summary.**

In this chapter, the methodology of this study was described. The chapter included the nature of the research design and why schools similar in demographic profile and school level characteristics were selected to reduce threats to internal validity since randomisation was not a viable option. A description of the reading programme was provided with information on its implementation across the nine week intervention period as well as how *FORCSI* was delivered the classroom. Lastly, reading performance measures and psychosocial measures were explained followed by a description of the procedure involved in conducting the pretests and posttests.
4.

CHAPTER: PSCHOMETRIC PROPERTIES, GROUP EQUIVALENCE AND DESCRIPTIVE ANALYSIS.

4.1. Introduction.

This chapter is divided into three parts. The first part examines the psychometric properties of the study measures. The second part investigates whether the groups were equivalent. If the groups are equivalent on the outcome variables then this allow results to be “generally interpretable” (Cook & Campbell, 1979, p.103) as threats to internal validity are minimised. Group equivalency was analysed descriptively using error bars and inferentially with analysis of variance (ANOVA) on reading and psychosocial variables. The third part is on the descriptive analysis of the data and includes information regarding the sample mean, standard deviation and the changes made from pretest to posttest for each of the study measures. Correlation analyses were conducted to examine the relation between pretest and posttest psychosocial variables highlighting the psychosocial processes unique to the intervention group. Chapter 4 concludes with comments focusing on the salient issues that arose from the analyses.

Psychometric Properties.

4.2. Psychometric Properties: Reading Measures.

The Neale Analysis of Reading Ability (Neale et al., 1999) and The Test of Reading Comprehension (Mossenson et al., 2003) has been used extensively by Australian reading specialists as a diagnostic tool to assess reading ability of students. Both tests have been undergone test revision and development since their original inception and their psychometric properties are outlined in detail and provided in their respective manuals.

The measure of reading self-concept, reading task values, achievement emotions for specific reading tasks, and participatory or choice behaviour had been used in prior research; however, the scaled instruments had not been subjected to factor and reliability analysis to establish their psychometric properties. Principal components factor analysis using varimax and promax rotations was used to identify whether the five scales had useful and meaningful subscales and whether or not any identified subscales were unique or part of a larger total scale.

Factor analysis essentially uses the variance as defined by the intercorrelations among a set of variables or items and allocates it to a smaller number of underlying hypothetical variables or constructs. The underlying hypothetical and unobservable variables are called factors or in the case of this set of analyses, subscales. Factors or subscales are identified by their factor loadings and range in value from \(-1.00\) to \(+1.00\). Variables have loadings on all factors but only have high loadings on one factor. Rotation is the process where a factor is made more interpretable without altering the underlying mathematical structures. A varimax rotation is an orthogonal rotation resulting in the factors being uncorrelated with each other. An oblique or promax rotation results in factors correlated with each other. The interfactor correlations can assist in determining whether or not the subscales are unique independent subscales or factors. Low to very low interfactor correlations are indicative of the subscales being unique and make a total score unnecessary. Factor analysis lends itself to establishing the validity of the scale or subscales when it is not possible to use construct, criterion, or concurrent validity.

Reliability can be calculated a number of different ways, split half, test-retest, parallel forms, and assessing the internal consistency or reliability of a set of items. The Cronbach alpha is a measure of the internal consistency and reliability of a single instrument administered to a group of people on one occasion to estimate the reliability. The expectation is the alphas will be approximately consistent across administrations with different groups of people. A Cronbach alpha was used to assess the internal consistency and reliability of each of the scales identified through the factor analysis process. Factor analysis and reliability analysis is an iterative process seeking to find the highest reliability with the meaningful and useful subscales. If the
item to total correlation is negative, reverse coding will be attempted to determine whether or not this would improve reliability. Test-retest reliability was also used to assess the consistency between the pretest and posttest reliability. The length of time between the pre and posttest contributes to the consistency. The closer in time the pre and posttest are, the correlation coefficient is typically higher and the longer the time between the pre and posttest, the correlation coefficient is typically lower. The Hopkins correlation coefficient (2009) was used to assist in the interpretation of the correlation coefficients and can be found below.

<table>
<thead>
<tr>
<th>Correlation Coefficient</th>
<th>Descriptor</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.0 – 0.1</td>
<td>Trivial, very small insubstantial tiny, practically zero</td>
</tr>
<tr>
<td>0.1 – 0.3</td>
<td>Small, low, minor</td>
</tr>
<tr>
<td>0.3 - 0.5</td>
<td>Moderate, medium</td>
</tr>
<tr>
<td>0.5 - 0.7</td>
<td>Large, high, major</td>
</tr>
<tr>
<td>0.7 - 0.9</td>
<td>Very large, very high, huge</td>
</tr>
<tr>
<td>0.9 - 1.0</td>
<td>Near, practically, or almost perfect, distinct, infinite.</td>
</tr>
</tbody>
</table>

A summary of the psychometric properties containing the scaled item’s Cronbach alpha coefficient, test-retest reliability and factor is presented in Table 4.1.

<table>
<thead>
<tr>
<th>Scale</th>
<th>α</th>
<th>r</th>
<th>Factors</th>
</tr>
</thead>
<tbody>
<tr>
<td>Thoughts / Beliefs</td>
<td></td>
<td>Pre</td>
<td>Post</td>
</tr>
<tr>
<td>Self Concept</td>
<td>.81</td>
<td>.82</td>
<td>.63</td>
</tr>
<tr>
<td>Task Values</td>
<td>.74</td>
<td>.79</td>
<td>.51</td>
</tr>
<tr>
<td>Emotions</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>General Reading</td>
<td>.59</td>
<td>.59</td>
<td>.36</td>
</tr>
<tr>
<td></td>
<td>.66</td>
<td>.62</td>
<td>.10</td>
</tr>
<tr>
<td></td>
<td>.59</td>
<td>.62</td>
<td>.49</td>
</tr>
<tr>
<td></td>
<td>.57</td>
<td>.41</td>
<td>.42</td>
</tr>
<tr>
<td>Specific Reading</td>
<td>.77</td>
<td>.80</td>
<td>.51</td>
</tr>
<tr>
<td></td>
<td>.77</td>
<td>.84</td>
<td>.46</td>
</tr>
<tr>
<td></td>
<td>.83</td>
<td>.85</td>
<td>.55</td>
</tr>
<tr>
<td>Behaviour</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Choice of School Activities</td>
<td>.58</td>
<td>.52</td>
<td>.49</td>
</tr>
<tr>
<td></td>
<td>.39</td>
<td>.15</td>
<td>.62</td>
</tr>
</tbody>
</table>

Table 4.1. Summary of Scale Reliabilities and Factors on Psychosocial Variables
Following this, the analysis (factor and reliability) will be presented separately for each of the set of scaled items representing children’s thoughts (self concept and task values), emotions (in general and specific reading activities) and actions (choice behaviour).

4.3.1. Reading Self Concept.

The Reading Self-Concept scale (Rself) consists of five items and measured self concept as an interpretation of children’s behavioural intention and motivation to participate in reading activities (Bornholt, 2005). Students responded to the five items by marking a Likert type response scale ranging from A Bit (1) to A Lot (5). Prior to factor analysis the Kaiser-Meyer-Olkin (KMO) was assessed to ensure sampling adequacy. The KMO was in an acceptable range (.772) indicating factor analysis procedures should yield distinct, useful, and meaningful factors or subscales.

Table 4.2. Factor Loadings for Reading Self Concept

<table>
<thead>
<tr>
<th>Item</th>
<th>Component Loading</th>
</tr>
</thead>
<tbody>
<tr>
<td>How talented are you?</td>
<td>.951</td>
</tr>
<tr>
<td>How good are you?</td>
<td>.798</td>
</tr>
<tr>
<td>How much do you try?</td>
<td>.771</td>
</tr>
<tr>
<td>How hard are reading activities?</td>
<td>.721</td>
</tr>
<tr>
<td>How good will you be next year?</td>
<td>.613</td>
</tr>
</tbody>
</table>

The analysis indicated the five items were measuring a unitary construct as all of the items loaded on one factor as shown in Table 4.2. Since principal components analysis indicated the items loaded on only one factor, rotation was not possible. The unitary factor suggests the five items together form an underlying dimension measuring a reading self concept construct and the items accounted for 59.2% of the variance. Reliability was also tested for the five items using a Cronbach alpha coefficient of internal consistency. Findings indicated the reading self concept pretest scale had a high level of internal consistency and reliability ($\alpha = .81$). The posttest Cronbach alpha was $\alpha = .82$. Reliability was also tested using test-retest reliability. Test-retest reliability was also conducted by correlating the mean scores
on the pretest to the mean scores on the posttest. The analysis \((r = .63)\) indicated fairly high level of consistency between the reading self concept pre and posttests.

4.3.2. Reading Task Values.

*Reading Task Value* scale \((R_{val})\) measured the value reading has for individuals and consists of four items measuring three areas of value; the intrinsic value or interest gained from reading, the usefulness of the reading task in attaining future goals, and the value or importance of doing well on the task. Students responded to the four items by marking a Likert type response scale ranging from *A Bit* \((1)\) to *A Lot* \((5)\). Prior to conducting the factor analysis the KMO statistic \((.618)\) was checked to ensure the data was appropriate for factor analysis. Results of the factor analysis indicated the scale was a unitary factor with no viable, useful, or meaningful subscales. Table 4.3 presents the factor loadings for the *Reading Task Values* and as can be seen, each item loaded well on one and only one factor and accounted for 56.1% of the variance.

Table 4.3 Factor Loadings for Task Values.

<table>
<thead>
<tr>
<th>Item</th>
<th>Component Loading</th>
</tr>
</thead>
<tbody>
<tr>
<td>How much do you enjoy reading?</td>
<td>.878</td>
</tr>
<tr>
<td>How much do you like reading?</td>
<td>.850</td>
</tr>
<tr>
<td>How useful are reading activities?</td>
<td>.613</td>
</tr>
<tr>
<td>How important are reading activities?</td>
<td>.612</td>
</tr>
</tbody>
</table>

Reliability was also tested for the four items on the *Reading Task Values* scale using a Cronbach alpha coefficient of internal consistency. Findings indicated the *Reading Task Value* pretest scale had a high level of internal consistency and reliability \((\alpha = .74)\). The posttest Cronbach alpha was \(\alpha = .79\). Reliability was also tested using test-retest reliability. Test-retest reliability was also conducted by correlating the mean scores on the pretest to the mean scores on the posttest. The analysis \((r = .51)\) indicated moderate level of consistency between the *Reading Task Values* pre and posttests.
4.3.3. Achievement Emotions: General Reading.

The *Achievement Emotion and General Reading* scale (*Eread*) measured children’s yes-no responses to a range of fifteen positive and negative emotions possibly experienced during any general reading activity. The students’ responses were scored as 1 = Yes and 0 = No. The KMO statistics (.706) indicated the data was appropriate for factor analysis. Inspection of the scree plot indicated the 15 items were not a unitary scale. Based on the scree plot and factor loadings, four factors emerged with eigenvalues greater than 1 when rotated using varimax rotation. The four factors accounted for 51.7% of the variance. The four factors were named, *Guilt, Anger, Pleased,* and *Worry.* The factor loadings for the 15 items and four subscales can be found in Table 4.4. As can be seen in the Table the items load satisfactorily on each of the four subscales. Guertin and Bailey (1979) noted items loading at .30 or higher were acceptable and not candidates for deletion. The promax rotation indicated there was little to no relationship between the factors (*r* = .253 to *r* = -.196) and it was not appropriate to use a total scale score in further analysis.

<table>
<thead>
<tr>
<th>Item</th>
<th>Guilty</th>
<th>Angry</th>
<th>Good</th>
<th>Worry</th>
</tr>
</thead>
<tbody>
<tr>
<td>Guilty</td>
<td>.715</td>
<td>.053</td>
<td>.088</td>
<td>-.114</td>
</tr>
<tr>
<td>Shame</td>
<td>.678</td>
<td>-.004</td>
<td>-.221</td>
<td>.052</td>
</tr>
<tr>
<td>Embarrass</td>
<td>.642</td>
<td>-.035</td>
<td>-.153</td>
<td>.292</td>
</tr>
<tr>
<td>Sick</td>
<td>.489</td>
<td>.323</td>
<td>-.009</td>
<td>.104</td>
</tr>
<tr>
<td>Bad -temper</td>
<td>-.114</td>
<td>.782</td>
<td>-.197</td>
<td>.028</td>
</tr>
<tr>
<td>Furious</td>
<td>.269</td>
<td>.751</td>
<td>-.002</td>
<td>-.049</td>
</tr>
<tr>
<td>Yuk</td>
<td>.361</td>
<td>.631</td>
<td>-.052</td>
<td>.096</td>
</tr>
<tr>
<td>Disgust</td>
<td>-.094</td>
<td>.551</td>
<td>-.120</td>
<td>.001</td>
</tr>
<tr>
<td>Pleased</td>
<td>.092</td>
<td>-.87</td>
<td>.805</td>
<td>-.004</td>
</tr>
<tr>
<td>Comfortable</td>
<td>-.180</td>
<td>-.023</td>
<td>.731</td>
<td>-.049</td>
</tr>
<tr>
<td>Proud</td>
<td>-.181</td>
<td>-.165</td>
<td>.685</td>
<td>-.203</td>
</tr>
<tr>
<td>Alright</td>
<td>-.194</td>
<td>-.102</td>
<td>.316</td>
<td>.099</td>
</tr>
<tr>
<td>Nervous</td>
<td>.118</td>
<td>.079</td>
<td>-.071</td>
<td>.739</td>
</tr>
<tr>
<td>Concern</td>
<td>-.127</td>
<td>-.014</td>
<td>.064</td>
<td>.736</td>
</tr>
<tr>
<td>Worried</td>
<td>.406</td>
<td>-.006</td>
<td>-.177</td>
<td>.635</td>
</tr>
</tbody>
</table>
The Guilty subscale (Egui) consisted of four items including the emotions of guilty, shame, embarrass, and sick. The pretest Cronbach alpha was \( \alpha = .591 \) and the post test Cronbach alpha was \( \alpha = .590 \) indicating a moderate level of internal consistency and reliability. The Angry subscale (Eang) consisted of four items, bad temper, furious, ‘yuk’, and disgust with a pretest Cronbach alpha of \( \alpha = .659 \) and a posttest Cronbach alpha of \( \alpha = .617 \) again demonstrating a moderate level of internal consistency and reliability. The Pleased subscale (Epls) consisted of four items including pleased, comfortable, alright, and proud. The pretest Cronbach alpha was \( \alpha = .593 \) and the post test Cronbach alpha was \( \alpha = .615 \). The Worry subscale (Ewor) contained three items, nervous, concern and worried. It had a calculated Cronbach alpha of \( \alpha = .568 \) and a posttest Cronbach alpha of \( \alpha = .405 \) indicating a moderate level of internal consistency and reliability. Test-retest reliability was also conducted between the pre and posttest and can be found in Table 4.5 with a summary of the reliability statistics for the 15 emotion items.

Table 4.5. Reliability Measures for Achievement Emotion Items.

<table>
<thead>
<tr>
<th>Subscale</th>
<th>No of Items</th>
<th>Pretest Alpha</th>
<th>Posttest Alpha</th>
<th>Test-Retest r</th>
</tr>
</thead>
<tbody>
<tr>
<td>Guilty</td>
<td>4</td>
<td>.591</td>
<td>.590</td>
<td>.36</td>
</tr>
<tr>
<td>Angry</td>
<td>4</td>
<td>.659</td>
<td>.617</td>
<td>.10</td>
</tr>
<tr>
<td>Pleased</td>
<td>4</td>
<td>.593</td>
<td>.615</td>
<td>.49</td>
</tr>
<tr>
<td>Worry</td>
<td>3</td>
<td>.568</td>
<td>.405</td>
<td>.42</td>
</tr>
</tbody>
</table>

4.3.4. Achievement Emotions: Sustained Silent Reading.

Student emotions were also measured using a five item scale for Sustained Silent Reading, SSR (Essr). The items asked students to indicate on a five point Likert type scale of A Little (1) to Very very good (5) if they were feeling good, worried, guilty, angry, or ‘yuk’. To assist the students assessing perceptions of their feelings for SSR, additional descriptive words were put in parenthesis such as: Feeling good (pleased, proud, alright), Feeling worried (nervous, concerned), Feeling guilty (shame, embarrassed), and Feeling angry (bad tempered, furious) and Feeling
‘yuk’ (sick, disgust). It was of interest to determine whether or not the five items functioned as a single unitary scale or did the five items contain subscales. A principal components factor analysis was conducted to assess the SSR emotions scale.

The KMO statistic (.787) indicated the five items were suitable for factor analysis. The results indicated the five items formed a unitary scale with the five items loading on one and only one factor or scale. The factor loadings can be found in Table 4.6. The five items scale accounted for 53.7% of the variance and a pretest calculated Cronbach alpha of $\alpha = .77$ and a posttest Cronbach alpha of $\alpha = .80$ indicating an acceptable level of internal consistency and reliability. The test-retest reliability correlation was $r = .51$.

Table 4.6. Factor Loadings for SSR.

<table>
<thead>
<tr>
<th>Item</th>
<th>Factor Loading</th>
</tr>
</thead>
<tbody>
<tr>
<td>How angry do you feel during SSR?</td>
<td>.849</td>
</tr>
<tr>
<td>How yuk do you feel during SSR?</td>
<td>.795</td>
</tr>
<tr>
<td>How worried do you feel during SSR?</td>
<td>.787</td>
</tr>
<tr>
<td>How guilty do you feel during SSR?</td>
<td>.767</td>
</tr>
<tr>
<td>How good do you feel during SSR?</td>
<td>.351</td>
</tr>
</tbody>
</table>

4.3.5. Achievement Emotions: Research Reading.

Student emotions were also measured using a five item scale for reading for a Research project (Ersch). The items asked students to indicate on a five point Likert type scale of A little (1) to Very very good (5) if they were feeling good, worried, guilty, angry, or ‘yuk’. To assist the students assessing perceptions of their feelings for reading for research purposes, additional descriptive words were put in parenthesis such as: Feeling good (pleased, proud, alright), Feeling worried (nervous, concerned), Feeling guilty (shame, embarrassed), and Feeling angry (bad tempered, furious) and Feeling yuk (sick, disgust). It was of interest to determine whether or not the five items functioned as a single unitary scale or did the five items contain
subscales. A principal components factor analysis was conducted to assess the *Ersch* emotions scale.

The KMO statistic (.823) indicated the five items were suitable for factor analysis. The results indicated the five items formed a unitary scale with the five items loading on one and only one factor or scale. The factor loadings can be found in Table 4.7. The five items scale accounted for 60.2% of the variance and a pretest calculated Cronbach alpha of $\alpha = .77$ and a posttest Cronbach alpha of $\alpha = .84$ indicating an acceptable level of internal consistency and reliability. The test-retest reliability correlation was $r = .46$.

<table>
<thead>
<tr>
<th>Item</th>
<th>Factor Loading</th>
</tr>
</thead>
<tbody>
<tr>
<td>How angry do you feel about reading for a project?</td>
<td>.903</td>
</tr>
<tr>
<td>How yuk do you feel?</td>
<td>.890</td>
</tr>
<tr>
<td>How worried do you feel?</td>
<td>.845</td>
</tr>
<tr>
<td>How guilty do you feel?</td>
<td>.806</td>
</tr>
<tr>
<td>How good do you feel?</td>
<td>.187</td>
</tr>
</tbody>
</table>

### 4.3.6. Achievement Emotions: Homework Reading.

Student emotions were also measured using a five item scale for reading as *Homework (Ehwk)*. The items asked students to indicate on a five point Likert type scale of *A little* (1) to *Very very good* (5) if they were feeling good, worried, guilty, angry, or yuk when given a chapter to read for homework. To assist the students assessing perceptions of their feelings toward reading as homework, additional descriptive words were put in parenthesis such as: Feeling good (pleased, proud, alright), Feeling worried (nervous, concerned), Feeling guilty (shame, embarrassed), and Feeling angry (bad tempered, furious) and Feeling yuk (sick, disgust). It was of interest to determine whether or not the five items functioned as a single unitary scale or did the five items contain subscales. A principal components factor analysis was conducted to assess the reading homework emotions scale.
The KMO statistic (.802) indicated the five items were suitable for factor analysis. The results indicated the five items formed a unitary scale with the five items loading on one and only one factor or scale. The factor loadings can be found in Table 4.8. The five items scale accounted for 64.3% of the variance and a pretest calculated Cronbach alpha of $\alpha = .83$ and a posttest Cronbach alpha of $\alpha = .85$ indicating an acceptable level of internal consistency and reliability. The test-retest reliability correlation was $r = .55$.

Table 4.8. Factor Loadings for Homework Reading.

<table>
<thead>
<tr>
<th>Item</th>
<th>Factor Loading</th>
</tr>
</thead>
<tbody>
<tr>
<td>How yuk do you feel about reading a chapter for homework?</td>
<td>.883</td>
</tr>
<tr>
<td>How worried do you feel about reading a chapter for homework?</td>
<td>.854</td>
</tr>
<tr>
<td>How angry do you feel about reading a chapter for homework?</td>
<td>.852</td>
</tr>
<tr>
<td>How guilty do you feel about reading a chapter for homework?</td>
<td>.848</td>
</tr>
<tr>
<td>How good do you feel about reading a chapter for homework?</td>
<td>.513</td>
</tr>
</tbody>
</table>

4.3.7. Reading-Related Choice Behaviour.

Participatory or Choice behaviour was measured by four items measuring students’ willingness to participate in reading, number (or mathematics), drawing and physical movement (such as sport and dance). The students used a five point Likert type response scale of Would not choose (1) to Would always choose (5). The KMO statistic (.540) indicated the data was appropriate for factor analysis. Inspection of the scree plot indicated the four items were measuring two different choice groups or subscales. A varimax rotation allows for the maximum loading of a number of variables onto factors such that it makes for more interpretable clusters of factors (Fields, 2009). The varimax rotation identified two subscales of two items each and accounted for 67.258% of the variance. The subscales were named Core activities ($C_{core}$) to include reading and number and Elective activities ($C_{elect}$) to include drawing and physical movement. Table 4.9 presents the factor loading for the items and subscales. The calculated Cronbach alpha measure of internal consistency
Table 4.9. Factor Loadings for Core or Elective Activities.

<table>
<thead>
<tr>
<th>Item</th>
<th>Academic</th>
<th>Non Academic</th>
</tr>
</thead>
<tbody>
<tr>
<td>How much do you choose to do reading?</td>
<td>.849</td>
<td>.006</td>
</tr>
<tr>
<td>How much do you choose to do number?</td>
<td>.818</td>
<td>.127</td>
</tr>
<tr>
<td>How much do you choose drawing?</td>
<td>-.033</td>
<td>.824</td>
</tr>
<tr>
<td>How much do you choose physical movement?</td>
<td>.163</td>
<td>.760</td>
</tr>
</tbody>
</table>

and reliability for the Core subscale pretest was $\alpha = .58$ and the Cronbach alpha for the posttest was $\alpha = .52$ indicating a moderate level of internal consistency and reliability. The calculated Cronbach alpha measure of internal consistency and reliability for the Elective subscale pretest was $\alpha = .39$ and the Cronbach alpha for the posttest was $\alpha = .15$ indicating a low level of internal consistency and reliability. The test-retest reliability coefficient for Core activities was $r = .49$ and for Elective activities was $r = .62$.

**Group Equivalence.**

**4.4. Group Equivalence: Reading Measures.**

In this study, random allocation was not feasible and therefore the study’s ability to draw casual inferences depends on how well it can systematically rule out plausible alternative interpretations by addressing threats to internal validity. Minimising the threats was established by designing a research plan that included selecting schools that had similar local and demographic features as well as focal aspects, such as school level characteristics and reading ability. Implementation of the fore mentioned design control can reduce threats and can create the best
approximation(s) to the missing counterfactual that randomisation would have afforded (Cook, 2002).

As detailed in the Methodology Chapter (see Chapter 3), two schools were selected based on their shared similarities, for example, low socioeconomic backgrounds, class organisation, and proportion of students with English as their second language. However, students’ reading ability was not assessed prior to intervention. The aim of the following sections is to use statistical procedures to determine if the groups were equivalent, descriptively and inferentially on the four reading measures and psychosocial scales.

4.4.1. Descriptive Analysis: Reading Performance.

In Table 4.10, the results from the TORCH reading comprehension test shows that both groups were below the mean scores of the norming sample collected by the TORCH researchers (Mossenson et al., 2003). The TORCH sample was drawn from all education sectors around Australia and with over 7,500 students from Year 3 to Year 10. With the exception of Year 5 intervention participants, both groups had pretest TORCH mean scores below the national year level, indicating the influential nature of low socioeconomic status (SES) on reading achievement. The results indicate that the current study targeting socially and economically disadvantaged schools was appropriately situated.
Table 4.10. Sample Size, Mean, and Standard Deviation on Initial Pretest TORCH Test from Participants and a Nationally Representative Sample Normed on Australian Primary and Secondary Schools.

<table>
<thead>
<tr>
<th>Year</th>
<th>COMPARISON</th>
<th>INTERVENTION</th>
<th>NORMATIVE</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>n</td>
<td>M</td>
<td>SD</td>
</tr>
<tr>
<td>Year 4</td>
<td>36</td>
<td>33.7</td>
<td>13.67</td>
</tr>
<tr>
<td>Year 5</td>
<td>35</td>
<td>38.48</td>
<td>12.86</td>
</tr>
<tr>
<td>Year 6</td>
<td>39</td>
<td>44.96</td>
<td>11.63</td>
</tr>
</tbody>
</table>

Figure 4.1 shows the error bars for the four reading measures. It includes the means of the reading scores and its 95 percent confidence level. Error bars can graphically show if groups are significantly different from each other by examining whether the confidence intervals of two means overlap. When there is considerable overlapping of intervals, both groups contain similar values with 95 percent confidence that the value of the mean is contained within the specified interval. When this occurs, it shows that the groups are not significantly different from each other. Inspection of the error bars in Figure 4.1 shows a high degree of overlapping of intervals across the reading measures. This suggests that the groups have similar values and that the means that could plausibly come from the same population. It appears from this preliminary screening, that groups are equivalent on TORCH Reading Comprehension (TORCH-R), NARA Listening Comprehension (NARA-L), Reading Accuracy (RA) and Text Fluency (TF).
**Figure 4.1.** Error bars indicating confidence levels and means of pretest reading scores.

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**4.4.2. Inferential Analysis.**

The pretest measures of *NARA-L, TORCH-R, RA and TF* were first screened for skewness and anomalies. ANOVA was conducted if assumptions of normality and homogeneity of variance were tenable. Group equivalency was indicated when results produced p-values that were greater than *p*=.013. This was the adjusted significance level when the Bonferroni correction was applied to control for the bias effect of repeated testing.

**4.4.2.1. Assumption Testing.**

Table 4.11 is a summary of the preliminary screening examining the data for anomalies, normality and homogeneity of variance prior to conducting ANOVA. Skewness values can provide some indication as to whether the distribution is normal or non-normal. Based on a number of Monte Carlo studies, researchers (e.g., Byrne, 1998; Curran, West, & Finch, 1996) suggest that scores of skewness are considered non-normal if they reach 2.0 to 3.0. When the scores were assessed for skewness, the
highest score was .39, indicating normality was within acceptable range for comparison and intervention groups.

Table 4.11. *Normality and Homogeneity of Variance of Reading Measures.*

<table>
<thead>
<tr>
<th></th>
<th>Anomalies</th>
<th>Normality Skewness</th>
<th>Homogeneity of Variance</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Outliers</td>
<td></td>
<td></td>
</tr>
<tr>
<td>NARA-L</td>
<td>No</td>
<td>.13</td>
<td>-.39</td>
</tr>
<tr>
<td>TORCH-R</td>
<td>anomalies</td>
<td>.19</td>
<td>-.15</td>
</tr>
<tr>
<td>Accuracy</td>
<td>or outliers</td>
<td>.13</td>
<td>-.39</td>
</tr>
<tr>
<td>Text Fluency</td>
<td>in groups</td>
<td>.31</td>
<td>.22</td>
</tr>
</tbody>
</table>

There were no anomalies (e.g., extreme cases or outliers) that might suggest threats of instrumentation. However, boxplots for *Reading Accuracy* indicate a ceiling effect caused by participants achieving accuracy scores beyond the scope of the measurement scale and could present threats to instrumentation. Finally, the Levine’s test was used to examine if the assumption homogeneity of variance was tenable, that is, if the test showed that the variances were not significant (i.e. *p* > .05). The findings indicated that all reading performance scores were appropriate for ANOVA analysis as the assumptions of normality and homogeneity of variance were not violated.

### 4.4.3. Listening Comprehension (NARA-L).

Children were asked to read short passages aloud to the examiner. After each passage, questions were asked and children responded by giving verbal answers. The number of correctly answered questions constituted *NARA-L*’s raw listening comprehension score. The raw scores were converted into a standardised score and this represented the child’s listening comprehension age (in months).

The results showed that there was equality of groups on the measure for *NARA-L*, *F* (1, 219) = 5.85, *p* = .02 when the Bonferroni correction adjusted the significance level of .013. The mean score of the intervention group (*M* = 115.68, *SD* = 23.23) was not statistically significant from the mean score of the comparison group (*M* = 108.45, *SD* = 21.13).
4.4.4. Reading Comprehension (TORCH-R).

Children were given five grade-levelled stories. They were instructed to choose only one to read silently and then complete the cloze type test by filling in the gaps in the sentences with one or more of their own words. The number of correct responses was tallied to give a raw TORCH score. The raw TORCH scores were then converted into TORCH scale scores or ‘TORCH units’.

Results of the ANOVA indicated that there was equality of groups on the measure for TORCH-R, $F (1, 219) = .002, p = .97$. The mean TORCH-R pretest scores for the intervention group ($M = 39.21$, $SD = 13.39$) was not statistically significant from the mean score of the comparison group ($M = 39.28$, $SD = 13.44$).

4.4.5. Reading Accuracy (RA).

Children read short passages aloud and any miscues (e.g., mispronunciations, omitted words, and errors) were recorded by the examiner. The reading accuracy raw scores were calculated as the maximum possible score$^6$ minus the number of errors made. The raw scores were converted into standardised scores and this represented the child’s reading accuracy age (in months).

Results of the ANOVA indicated that there was equality of groups on the measure for RA, $F (1, 219) = 1.12, p = .29$. The mean reading accuracy pretest scores of the intervention group ($M = 130.45$, $SD = 27.39$) was not statistically significant from the mean score of the comparison group ($M = 126.55$, $SD = 27.59$).

4.4.6. Text Fluency (TF).

Text fluency measures children’s ability to recognise words accurately and quickly as they read short passages aloud to the examiner. The raw score was calculated by the number of correctly read words divided by the time taken to read the passage and then multiplied by 60. The raw score was converted into a standardised score and this represented the child’s text fluency age (in months).

$^6$ Maximum score for good readers is 20, and 16 for poor readers
Results of the ANOVA showed that there was equality of groups on the measure for $TF, F (1, 219) = 3.01, p = .08$. The mean reading rate pretest scores of the intervention group ($M = 121.67, SD = 21.16$) was not statistically significant from the mean scores of the comparison group ($M = 116.57, SD = 22.48$).

4.4.7. Summary: Group Equivalence of Reading Measures.

A summary of the results of ANOVA including data screening for skewness, normality and variance is shown in Table 4.12. Descriptive analysis using error bars and inferential analysis using ANOVA indicated that groups were equivalent as there were no significant group mean differences on any of the four reading measures.

Table 4.12. Summary of Assumption Testing and Group Equivalency

<table>
<thead>
<tr>
<th>Pretest measure</th>
<th>Skewness</th>
<th>Normality</th>
<th>Assumptions of Normality and Variance</th>
<th>ANOVA $p &lt; .013^*$</th>
<th>Equivalency of Groups</th>
</tr>
</thead>
<tbody>
<tr>
<td>NARA-L</td>
<td>_</td>
<td>√</td>
<td>tenable</td>
<td>$p = .02$</td>
<td>√</td>
</tr>
<tr>
<td>TORCH-R</td>
<td>_</td>
<td>√</td>
<td>tenable</td>
<td>$p = .97$</td>
<td>√</td>
</tr>
<tr>
<td>Accuracy</td>
<td>_</td>
<td>√</td>
<td>tenable</td>
<td>$p = .29$</td>
<td>√</td>
</tr>
<tr>
<td>Text Fluency</td>
<td>_</td>
<td>√</td>
<td>tenable</td>
<td>$p = .08$</td>
<td>√</td>
</tr>
</tbody>
</table>

*adjusted Bonferroni correction

4.5. Group Equivalence: Psychosocial Measures.

The scales measuring children’s thoughts and beliefs, achievement emotions and participatory (or choice) behaviour were examined descriptively using error bars then inferentially using ANOVA to find whether the groups were equivalent on pretest measures. If groups are equivalent, this reduces the number of extraneous factors that could make interpreting conclusion difficult.
4.5.1. Descriptive Analysis: Psychosocial Constructs.

Figure 4.2 shows the error bars for the scales measuring children’s thoughts and choice behaviour and Figure 4.3 for children’s achievement emotion in reading activities. The error bars indicate that the groups were equivalent. The considerable overlapping of intervals is indicative of no significant differences between groups (Field, 2009).

Figure 4.2. Error bars indicating confidence levels and pretest means for children’s thoughts and choice behaviour.

Figure 4.3. Error bars indicating confidence levels and pretest means for children’s achievement emotions.
4.5.2. Inferential Analysis.

The pretest measures of SELF, VAL (thoughts/beliefs), Epl, Egui, Eang, Ewor, Eread, Essr, Ersch, Ehwk (achievement emotions) and Ccore, Celect, Cdiff (choice behaviour) were first screened for skewness and anomalies. ANOVA was conducted if assumptions of normality and homogeneity of variance were tenable. Group equivalency was indicated when results produced p-values that were greater than \( p = .004 \). This was the adjusted significance level when the Bonferroni correction was used to adjust for the number of tests.

4.5.2.1. Assumption Testing.

A summary of the preliminary screening of data for anomalies, outliers, normality and homogeneity of variance is presented in Table 4.13. There were no anomalies (e.g., extreme cases or outliers) that might suggest threats of instrumentation. Non-normality was indicated for Guilty, Angry, and Elective scales as skewness scores were above 2.0. Variances were significant (i.e., \( p < .05 \)) for Guilty, Angry, SSR, Research and Homework making the assumption of variance untenable for these scales. Despite the lack of normality and untenable assumptions, analysis using ANOVA will be conducted. Previous studies has shown that ANOVA is considered a robust procedure against violations of assumptions as accurate \( p \) values can still be attained despite an untenable normality assumption or when the assumption of homogeneity of variance is violated (Field, 2009; Glass & Hopkins, 2008; Tabachnick & Fidell, 2007). Further, because this study has groups of similar size, violations also have negligible effects (Mertler & Vannetta, 2001).

4.5.3. Reading Self Concept (Rself).

The results showed that there was equality of groups for Rself, \( F (1, 29) = .32, p = .57 \). The mean score of the intervention group (\( M = 3.77, SD = .91 \)) was not statistically significant from the mean score of the comparison group (\( M = 3.84, SD = .89 \)).
### Table 4.13 Normality and Homogeneity of Variance of Psychosocial Measures

<table>
<thead>
<tr>
<th></th>
<th>Anomalies</th>
<th>Outliers</th>
<th>Normality</th>
<th>Skewness</th>
<th>Homogeneity of Variance</th>
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</thead>
<tbody>
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<td></td>
</tr>
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<td><strong>Thoughts</strong></td>
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<td>- .76</td>
<td>- .41</td>
<td>.47</td>
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</tr>
<tr>
<td></td>
<td>Task Values</td>
<td>-1.83</td>
<td>-1.25</td>
<td>.08</td>
<td></td>
</tr>
<tr>
<td><strong>Emotions</strong></td>
<td>Pleased</td>
<td>.16</td>
<td>-.09</td>
<td>.08</td>
<td></td>
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<td></td>
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<td></td>
</tr>
<tr>
<td></td>
<td>Angry</td>
<td>3.48</td>
<td>7.07</td>
<td>.02</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Worry</td>
<td>1.68</td>
<td>1.33</td>
<td>.22</td>
<td></td>
</tr>
<tr>
<td></td>
<td>SSR</td>
<td>-1.10</td>
<td>-1.69</td>
<td>.03</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Research</td>
<td>-1.57</td>
<td>-1.43</td>
<td>.01</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Homework</td>
<td>-1.27</td>
<td>-1.90</td>
<td>.03</td>
<td></td>
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<tr>
<td><strong>Choices</strong></td>
<td>Core</td>
<td>-.59</td>
<td>-.88</td>
<td>.05</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Electives</td>
<td>-2.23</td>
<td>-1.61</td>
<td>.48</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Text difficulty</td>
<td>.81</td>
<td>.91</td>
<td>.28</td>
<td></td>
</tr>
</tbody>
</table>

4.5.4. *Reading Task Values (Rval)*.

Results of ANOVA indicated that there was group equivalence for *Rval*, $F(1, 29) = 5.62$, $p = .02$ when the Bonferroni correction adjusted the significance level of .004. The mean pretest scores for the intervention group ($M = 4.18, SD = .82$) was not statistically significant from the mean score of the comparison group ($M = 4.43, SD = .70$).

4.5.5. *Pleased (Epls)*.

ANOVA analysis indicated that there was equality of groups for *Epls*, $F(1, 29) = 1.84$, $p = .18$. The mean score for the intervention group ($M = 2.24, SD = 1.38$) was not statistically significant from the mean score of the comparison group ($M = 2.0 SD = 1.29$).
4.5.6. Guilty (Egui).

Results indicated that there was group equivalence for Egui, $F(1, 29) = 1.27$, $p = .26$. The means score for the intervention group ($M = .14$, $SD = .44$) was not statistically significant from the mean score of the comparison group ($M = .22$, $SD = .64$).

4.5.7. Angry (Eang).

ANOVA results indicated that there was group equivalence for Eang, $F(1, 29) = 1.61$, $p = .21$. The means score for the intervention group ($M = .08$, $SD = .45$) was not statistically significant from the mean score of the comparison group ($M = .16$, $SD = .52$).

4.5.8. Worry (Ewor).

The results indicated that there was group equivalence for Ewor, $F(1, 29) = .02$, $p = .90$. The means score for the intervention group ($M = .48$, $SD = .74$) was not statistically significant from the mean score of the comparison group ($M = .49$, $SD = .89$).

4.5.9. Sustained Silent Reading (Essr).

The results indicated that there was group equivalence for Essr, $F(1, 29) = 4.22$, $p = .04$. The means score for the intervention group ($M = 4.44$, $SD = .72$) was not statistically significant from the mean score of the comparison group ($M = 4.22$, $SD = .84$).

4.5.10. Research Reading (Ersch).

The ANOVA results indicated that there was group equivalence for Ersch, $F(1, 29) = 1.34$, $p = .25$. The means score for the intervention group ($M = 4.41$, $SD = .63$) was not statistically significant from the mean score of the comparison group ($M = 4.29$, $SD = .89$).

4.5.11. Homework Reading (Ehwk).

The results indicated that there was equality of groups for Ehwk, $F(1, 29) = 3.68$, $p = .06$. The means score for the intervention group ($M = 4.41$, $SD = .81$) was
not statistically significant from the mean score of the comparison group ($M = 4.19, SD = .95$).

### 4.5.12. Core Activities – Reading and Number (Ccore).

The results indicated that there was equality of groups for $Ccore$, $F (1, 29) = 1.58, p = .21$. The means score for the intervention group ($M = 3.83, SD = .97$) was not statistically significant from the mean score of the comparison group ($M = 3.66, SD = 1.09$).


The results indicated that there was group equivalency for $Celect$, $F (1, 29) = 1.59, p = .21$. The means score for the intervention group ($M = 4.50, SD = .67$) was not statistically significant from the mean score of the comparison group ($M = 4.61, SD = .67$).


The results indicated that there was group equivalency for $Cdiff$, $F (1, 29) = .35, p = .55$. The means score for the intervention group ($M = 4.97, SD = 2.54$) was not statistically significant from the mean score of the comparison group ($M = 5.18, SD = 2.69$).

### 4.5.15. Summary: Group Equivalence of Psychosocial Measures.

A summary of data screening for skewness, normality and variance was presented in Table 4.13 (p. 130) indicating ANOVA analysis was permissible. A series of ANOVA procedures found the groups equivalent on the psychosocial measures. There were no significant group mean differences on the scales measuring children’s thoughts, emotions and choice behaviour. Although some of the scale measures showed non-normality and violation of test assumptions, ANOVA has been identified as robust against these violations (Field, 2009; Glass & Hopkins, 2008; Tabachnick & Fidel, 2007).
Descriptive Analysis.

4.6. Descriptive Analysis: Reading Performance.

Descriptive statistics using SPSS is presented for the four reading measures, NARA-L, TORCH-R, RA and TF. Analysis of the data included mean, standard deviation and graphs to show the change in reading performance from pretest to post test.

Table 4.14 Sample Size, Mean and Standard Deviation for NARA-L and TORCH-R.

<table>
<thead>
<tr>
<th>Comparison</th>
<th>Intervention</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>n</td>
</tr>
<tr>
<td>Y4 NARA Listening Comprehension</td>
<td></td>
</tr>
<tr>
<td>Listening Comprehension – pre</td>
<td>36</td>
</tr>
<tr>
<td>Listening Comprehension - post</td>
<td>35</td>
</tr>
<tr>
<td>Y5 NARA-L</td>
<td></td>
</tr>
<tr>
<td>Listening Comprehension – pre</td>
<td>35</td>
</tr>
<tr>
<td>Listening Comprehension - post</td>
<td>34</td>
</tr>
<tr>
<td>Y6 NARA-L</td>
<td></td>
</tr>
<tr>
<td>Listening Comprehension – pre</td>
<td>39</td>
</tr>
<tr>
<td>Listening Comprehension - post</td>
<td>39</td>
</tr>
<tr>
<td>Y4 TORCH Read Comprehension</td>
<td></td>
</tr>
<tr>
<td>Reading Comprehension - pre</td>
<td>36</td>
</tr>
<tr>
<td>Reading Comprehension – post</td>
<td>35</td>
</tr>
<tr>
<td>Y5 TORCH-R</td>
<td></td>
</tr>
<tr>
<td>Reading Comprehension - pre</td>
<td>35</td>
</tr>
<tr>
<td>Reading Comprehension – post</td>
<td>35</td>
</tr>
<tr>
<td>Y6 TORCH-R</td>
<td></td>
</tr>
<tr>
<td>Reading Comprehension - pre</td>
<td>39</td>
</tr>
<tr>
<td>Reading Comprehension – post</td>
<td>39</td>
</tr>
</tbody>
</table>
4.6.1. Listening and Reading Comprehension (NARA-L, TORCH-R).

Table 4.14 shows the sample size, mean and standard deviation for NARA-L and TORCH-R. Students from both groups improved performance in listening and reading comprehension over the 24 weeks, from pretest to posttest.

Another way of looking at reading performance is by the difference between the initial and final reading scores as a percentage over the initial pretest scores. Figure 4.4 and Figure 4.5, can assist with identifying the group and the year level that had the greatest gain from pretest to posttest. Inspection of Figure 4.4 showed that the intervention group made substantial gains in NARA-L in comparison to their counterparts. Improvements in listening comprehension was particularly noticeable in Year 4 (14.1%) and Year 5 (12.9%) for the intervention group compared to the comparison students in Year 4 (5.1%) and Year 5 (9.6%).

![Figure 4.4 Mean gain scores (%) in NARA-L Listening Comprehension.](image)

Despite the nine-week reading intervention, Year 6 intervention students’ listening comprehension (5.5%) did not improve as much as Year 6 comparison students (7.7%). The data suggest that while FORCSI may have assisted with Year 4 and 5 intervention student’s listening comprehension, its impact on Year 6 intervention students was nominal. This limited affect on the intervention Year 6’s performance in listening comprehension performance was not repeated on TORCH-R reading comprehension.
In Figure 4.5, FORCSI may have contributed towards the substantial change in reading comprehension for Year 6 intervention students (22.5%) particularly when Year 6 comparison group made gains that were marginal (0.8%). The reading programme may have been instrumental in the mean score improvement of Year 4 students (10.2%), a stark contrast to the gains made by their peers in the comparison group (1.9%).

![TORCH-R Reading Comprehension](image)

*Figure 4.5 Mean gain scores (%) in TORCH-R Reading Comprehension.*

While FORCSI may have helped listening comprehension for Year 5 intervention children, its impact was not replicated for reading comprehension; Year 5 intervention group had improved in reading comprehension (6.6%) but not as well as their counterparts (7.7%).

### 4.6.2. Reading Accuracy and Text Fluency (RA, TF).

The sample size, mean and standard deviation for Reading Accuracy (RA) and Text Fluency (TF) is shown in Table 4.15. Children in both groups and across year levels made changes from pretest to posttest. Identifying the changes made by each group and by year level is shown in Figure 4.6 and Figure 4.7.
Table 4.15. *Sample Size, Mean and Standard Deviations for Accuracy and Text Fluency.*

<table>
<thead>
<tr>
<th></th>
<th>Comparison</th>
<th>Intervention</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td><em>n</em></td>
<td>Mean</td>
</tr>
<tr>
<td><strong>Year 4 Reading Accuracy</strong></td>
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</tr>
<tr>
<td>Accuracy –pre</td>
<td>36</td>
<td>117.14</td>
</tr>
<tr>
<td>Accuracy - post</td>
<td>35</td>
<td>119.80</td>
</tr>
<tr>
<td><strong>Year 5</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Accuracy - pre</td>
<td>35</td>
<td>122.91</td>
</tr>
<tr>
<td>Accuracy - post</td>
<td>34</td>
<td>127.76</td>
</tr>
<tr>
<td><strong>Year 6</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Accuracy – pre</td>
<td>39</td>
<td>138.85</td>
</tr>
<tr>
<td>Accuracy – post</td>
<td>39</td>
<td>141.05</td>
</tr>
<tr>
<td><strong>Year 4 Text Fluency</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Text Fluency- pre</td>
<td>36</td>
<td>108.25</td>
</tr>
<tr>
<td>Text Fluency - post</td>
<td>35</td>
<td>108.89</td>
</tr>
<tr>
<td><strong>Year 5</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Text Fluency- pre</td>
<td>35</td>
<td>114.31</td>
</tr>
<tr>
<td>Text Fluency - post</td>
<td>34</td>
<td>118.65</td>
</tr>
<tr>
<td><strong>Year 6</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Text Fluency- pre</td>
<td>39</td>
<td>127.69</td>
</tr>
<tr>
<td>Text Fluency - post</td>
<td>39</td>
<td>131.33</td>
</tr>
</tbody>
</table>
In Figure 4.6, the intervention group had Year 4 children with the highest gains in mean reading accurately scores (7.8%) and Year 6 with the lowest (1.2%). A similar trend is shown in the comparison group with the highest mean gains in Year 5 (3.9%) and the lowest in Year 6 (1.6%). The trend suggests that the ability to read accurately is subject to children’s developmental process; growth in reading accuracy is more pervasive in earlier years than later years in primary school.

![Reading Accuracy Graph](image)

*Figure 4.6. Mean gain scores (%) in Reading Accuracy.*

In Figure 4.7, *FORCSI* did not affect children’s ability to read with speed and accuracy. Overall, comparison children showed better improvement gains in mean text fluency scores, particularly in Year 6 (2.9%) compared to intervention students in Year 6 (0.6%). Inspection of Figure 4.7 suggests that overall, children in Year 5 are very susceptible to growth in text fluency.
4.6.3. Correlation.

Table 4.16 shows the correlations of all the study measures with the four reading skills, NARA-L, TORCH-R, RA and TF. Group membership is correlated significantly with post NARA-L ($r = .25, p < .001$) and post TORCH-R ($r = .17, p < .01$). Age correlated significantly with all four outcome variables, ranging from $r = .28, p < .001$ (RA) to $r = .43, p < .001$ (TORCH-R) suggesting that reading skills may be better explained by maturational processes than by the intervention programme. Similarly, Year 6 correlated significantly with all outcome variables unlike Gender, which had no significant correlations.
In Chapters 5, 6, and 7 the findings from the multivariate analyses were presented answering the research questions regarding the impact of FORSCI on children’s reading performance and psychosocial orientation. Preliminary screening for multicollinearity is needed if multiple regression analysis is to be conducted reliably. Table 4.17 (See Appendix F) displays the correlation between independent (or predictor) variables. Multicollinearity occurs when two or more predictors are correlated providing redundant information regarding the response. High multicollinearity increases standard error of estimates of the $\beta$ values making analysis using multiple linear regression (MLR) untenable (Keith, 2006). The correlation matrix (Table 4.17 in Appendix F) showed multicollinearity was not a threat as correlations among predictors were not substantial (i.e., $R > .9$).
4.6.4. Summary: Descriptive Analysis of Reading Performance.

The descriptive analyses showed that children in both groups improved in the four reading skills from pretest to posttest. However, FORCSI may have contributed to the reading improvement of students in the intervention group beyond the improvements made in the comparison group. For example, in the intervention group, Year 4 students had improved in listening comprehension (14%) and reading comprehension (10.2%) and this was approximately three times (5%) and five times (1.9%) that of their Year 4 comparison peers respectively. Year 6 intervention students (22.5%) improvement in reading comprehension was 28 times better than the same-age students in the comparison group (0.8%). Correlation results shows similar findings as NARA-L and TORCH-R were significantly correlated with intervention group. Gender did not correlate with any of the reading measures.

While these statistics suggests FORCSI’s potential role in improving children’s listening and reading comprehension, the reading programme had limited impact on children’s ability to read accurately and with fluency. The overall improvements made on reading accuracy were similar in both groups and across year levels but dissimilar on text fluency. Comparison students showed better gains in text fluency than intervention children.

4.7. Descriptive Analysis: Psychosocial Constructs.

In this section two sets of descriptive analyses were completed: (a) descriptive analyses included describing the scale means and standard deviations of participants’ psychosocial orientation using graphs to demonstrate change from pretest to posttest and (b) correlation analyses describing the association between reading performance and psychosocial factors and their correlations at pretest and another to examine how these psychosocial processes were correlated from pretest to posttest.

Table 4.18 presents the means and standard deviations for the 12 scales measuring the participant’s thoughts about their Reading Self Concept (Rself) and Reading Task Values (Rval), their emotions when engaged in General Reading (Eread) and in Specific Reading Tasks (Sustained Silent Reading Essr, Research
and participatory behaviour measured using two scales (a) choice to participate in reading and number activities or \textit{Core} activities (\textit{Ccore}) or in drawing and physical movement activities or \textit{Elective} activities (\textit{Celect}) and (b) choice of \textit{Text Difficulty} (\textit{Cdiff}). Both groups on pretest and posttest scores had relatively high means on the scales measuring participant’s thoughts, emotion and participatory behaviour. Closer inspection using bar graphs will present a clearer picture of the changes occurring from pre to posttest.

Table 4.18. \textit{Sample Size, Means and Standard Deviations for the Psychosocial Measures.}

<table>
<thead>
<tr>
<th></th>
<th>\textbf{Comparison (N=110)}</th>
<th>\textbf{Intervention (N=111)}</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>Pretest</td>
<td>Posttest</td>
</tr>
<tr>
<td></td>
<td>Mean (SD)</td>
<td>Mean (SD)</td>
</tr>
<tr>
<td>Thoughts</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Self Concept</td>
<td>3.84 (.89)</td>
<td>3.92 (.99)</td>
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<tr>
<td>Beliefs</td>
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<td></td>
</tr>
<tr>
<td>Task Values</td>
<td>4.43 (.71)</td>
<td>4.33 (.83)</td>
</tr>
<tr>
<td>Emotions</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pleased</td>
<td>2.01 (.29)</td>
<td>2.30 (1.36)</td>
</tr>
<tr>
<td>General Guilty</td>
<td>.23 (.64)</td>
<td>.17 (.45)</td>
</tr>
<tr>
<td>Reading Angry</td>
<td>.16 (.52)</td>
<td>.16 (.52)</td>
</tr>
<tr>
<td>Reading Worry</td>
<td>.49 (.89)</td>
<td>.31 (.62)</td>
</tr>
<tr>
<td>Emotions SSR</td>
<td>4.22 (.84)</td>
<td>4.41 (.75)</td>
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<tr>
<td>Specific Research</td>
<td>4.29 (.89)</td>
<td>4.40 (.81)</td>
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<td>Reading Homewk</td>
<td>4.19 (.95)</td>
<td>4.28 (.92)</td>
</tr>
<tr>
<td>Choices</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Core</td>
<td>3.66 (1.09)</td>
<td>3.88 (1.03)</td>
</tr>
<tr>
<td>Elective</td>
<td>4.61 (.67)</td>
<td>4.61 (.67)</td>
</tr>
<tr>
<td>Text</td>
<td>5.18 (2.69)</td>
<td>4.33 (2.09)</td>
</tr>
</tbody>
</table>
4.7.1. Thoughts: Reading Self Concept and Reading Task Values (Rself, Rval).

Figure 4.8 highlights the changes in children’s self evaluations of their reading ability and the importance and value of reading in their lives. The mean reflects a five-point scale with changes in scores calculated as the difference between posttest and pretest and converted as a percentage. Intervention participants made favourable improvements in Self Concept (8.5 %) and Task Values (7.9%) compared to the marginal improvements made by the comparison group in Self Concept (2.1%) and no improvements in Task Values (- 2.3%).

![Figure 4.8](image.png)

*Figure 4.8. The change of mean scores (%) in Self Concept and Task Values.*

4.7.2. Achievement Emotions: General and Specific Reading Activities (Eread, Essr, Ersch, and Ehwk).

It would appear that some emotions are relatively consistent and “logical” while others, depending on the situational context, are relatively unpredictable and changeable. The dual nature of emotions is shown in Figure 4.9. The Figure depicts the how some emotions (Guilty and Angry) are unpredictable while others (Pleased and Worry) are “logical” because its manifestation is understandable. The graph shows how children feel when engaged in general reading or reading to include
wide-ranging tasks that may not be necessarily school-related (e.g., reading a TV guide, comics, magazine etc). Children were asked to place a mark next to any of the 15 affect words representing how they felt when reading at home, at school, recreationally or casually. Factor analysis reduced the 15 emotions words into four factors, Pleased, Guilty, Angry, and Worry. The change as a percentage was the difference in the summed scores for each of the emotions from pre to posttesting.

![Figure 4.9. The change in means scores (%) for Pleased, Guilty, Angry and Worried.](image)

The achievement emotion, Pleased, can be perceived to be relatively stable across groups. Percentage change for the participants in the comparison (14.4%) and intervention group (10.3%) remained lower indicating these children associated pleasure on a consistent basis when reading. It is encouraging to see change in children feeling less worried in the comparison (36.7%) and intervention (35.4%) groups.

Contrasting to the more consistent qualities of Pleased and Worried were the more changeable aspects of Guilty and Angry. Comparison group participants were more susceptible to the emotions of guilt compared to the intervention group. Although Guilty feelings improved over time for comparison (26.1%) and
intervention (7.1%) groups, questions can be raised as to why comparison children were almost four times more guilt prone when reading than their counterparts. The large difference in improvements between groups suggests that guilty emotions can fluctuate from one context to another. Angry displays similar tendencies as Guilty, more changeable and unpredictable.

For many intervention children, Angry improved dramatically (75 percent) compared to children in the comparison group (0 percent) where anger was not a major concern. What role did FORCSI play in reducing this anger among intervention children as emotions are powerful influencers on students’ engagement and learning (Linnebrink -Gacia & Pekrun, 2011).

In Figure 4.10, participants’ emotions during specific reading tasks are shown with a mean score reflecting a five-point scale ranging from 1 (least desired emotion) to 5 (most desired emotion). The three specific reading tasks practiced in most classrooms are: Sustained Silent Reading, reading undertaken for Research projects and reading a chapter for Homework.

![Image of Figure 4.10](image_url)

*Figure 4.10. The change (%) in mean scores for SSR, Research and Homework.*

The graph shows the variability of emotion for different groups of children and for different reading purposes. Participants responded to this scale by indicating
how much positive or negative emotion they felt under each of the three reading conditions. The positive emotions ranged from good, pleased, and alright. Negative motions included guilt, anger, and worry. The intervention group improved most in reading for *Homework* (5.7%) yet this activity had the least gain for the comparison group (2.1%). It would appear that emotions emanating from some reading tasks are quite stable over time, as gains were minimal as in *Homework* and *Research* (2.6%) for comparison children and *Research* (2.1%) for intervention children.

4.7.3. Participatory Behaviour: Core and Elective Activities and Choice of Text Difficulties (*C*core, *C*elec, and *C*diff).

Participatory behaviour was measured by children’s willingness to participate in *Core* and *Elective* activities (Figure 4.11) and their choice of *Text Difficulty* (Figure 4.12). Children were asked to indicate on a five-point scale the degree to which they would like to participate in *Core* (reading and numbers) and *Elective* (drawing and physical movement) activities. Figure 4.11 shows the change in mean scores from pretest to posttest. Intervention students were not willing to participate in *Core* activities (-7.9 percent) or *Elective* activities (-1.8 percent). Comparison students were more willing to engage in reading and number tasks (6 percent).

![Figure 4.11. The change (%) in mean scores for Core and Elective activities.](image-url)

<table>
<thead>
<tr>
<th>Core &amp; Elective Activities</th>
<th>Mean Gain %</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Core</strong></td>
<td>6.01</td>
</tr>
<tr>
<td><strong>Elective</strong></td>
<td>0.00</td>
</tr>
<tr>
<td><strong>Comparison</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Intervention</strong></td>
<td></td>
</tr>
</tbody>
</table>

-7.94 | -1.78
In accessing children’s choice of Text Difficulty, participants were asked to pick one of five texts to read and complete the corresponding cloze type comprehension activity. The level of text difficulty ranged from the very easy Story A (rating 3.0) to age-appropriate Story B (rating 3.5) and C (rating 5.5) to the very difficult Story D (rating 8.5) and E (9.5). The ratings represent the relationship between year level and text difficulty. A rating of 3.0 means that the text was suitable for Year 3, a rating 3.5 was texts suitable for Years 3 to 4, rating 5.5 was texts levelled at Years 5 to 6, a rating 8.5 and 9.5 were texts suitable for Years 8 to 10 (Mossenson et.al., 2003). The mean score was calculated by averaging the summed ratings. Figure 4.12 shows the mean score improvement made in the level of text difficulty children chose to read. At pretest, the comparison group had a higher mean score (5.18) than the intervention group (4.97) indicating that the comparison group chose to read more C, D and E stories than the intervention. At posttest, the intervention group had the higher mean (5.47) than the comparison group (4.33) indicating intervention readers continued to choose more age-appropriate texts (Stories C, D, and E) while comparison readers selected easier texts (Story A and B) to read and complete the comprehension.

Figure 4.12. The mean score for choice of Text Difficulty.
4.7.4. Correlation Analysis.

Correlation analyses was used to describe the linear association between reading achievement and study measures at pretest (see Appendix F: Table 4.19) as well as to investigate the processes within FORSCI and how the psychosocial factors correlated with each other to support or constrain thoughts, emotions and behaviour over time (Appendix F: Table 4.20 and Table 4.21).

Table 4.19 (Appendix F) displays the correlations of all the pretest study measures used including the outcome variables (TORCH-R, NARA-L, Accuracy, and Text Fluency), the covariates (Group, Gender and Age) and the 12 scales measuring participant’s thoughts, emotions, and behaviour. The Hopkins correlation coefficient (2009) was used as a guide to indicate the strength of association (see p. 113 for interpretation of the correlation coefficients).

Assessment of the bivariate correlations indicated data was also suitable for multiple regression as the majority of predictors has a moderate correlation with the outcome variables and inter-correlation were well below .80 indicating multicollinearity did not pose a threat to the validity of multiple regression analysis (Field, 2009).

Inspection of the relationships across reading achievement and the predictors, all four reading skills were linked to Age. The correlation with Age ranged from small (TORCH-R, \( r = .28, p < .01 \)) to moderate (NARA-L, \( r = .32, p < .01 \), Accuracy, \( r = .32, p < .01 \), Text Fluency \( r = .40, p < .01 \)). Reading performance was also moderately but significantly related Self Concept (TORCH-R, \( r = .28, p < .01 \), RA, \( r = .33, p < .001 \), TF, \( r = .25, p < .01 \)). With the exception of TORCH-R (\( r = .15, p < .05 \)) none of the other three reading skills were significantly linked to Gender. Similarly, correlations with Group, children’s emotions and choice behaviour were either weak or not significant as can be seen in Table 4.16 (Appendix F).

Although Self Concept and Task Values were highly correlated with each other (\( r = .52, p < .01 \)), the variables correlated differently. Where Self Concept was moderately correlated to Text Difficulty (\( r = .33, p < .01 \)), Task Values had no significant correlation. Self Concept was weakly correlated to children’s emotions yet
**Task Values** had moderate correlations to the following emotions: **Pleased** \( (r = .43, p < .001) \), **SSR** \( (r = .36, p < .001) \), **Homework** \( (r = .31, p < .001) \) and **Research** \( (r = .30, p < .001) \). Children choice of reading and number activities was the only variable that **Self Concept** \( (Core, r = .46, p < .01) \) and **Task Values** \( (Core, r = .57, p < .01) \) shared a large correlation.

The purpose of the next set of descriptive analyses was to explore the dynamic processes within **FORCSI**. To do this, pretest and posttest variables were correlated separately for each group. Interest was directed on how children’s reading achievement, thoughts, emotions and participatory behaviour were linked with each other to support or constrain final outcome variables and how these links were unique to each group.

In Tables 4.20 and 4.21 (Appendix F), pretest scores on **TORCH-R, NARA-L, Accuracy** and **Text Fluency** were highly correlated with their respective posttest scores for both groups. However, pretest reading scores were also found to be correlated to different variables for each group. In the intervention group, reading performance was highly related to choice behaviour, **Text Difficulty** \( (TORCH-R, r = .46, p < .01, NARA-L, r = .45, p < .01, RA, r = .47, p < .01, TF, r = .47, p < .01) \) and for the comparison it was related to emotions associated with reading in **SSR, Research** and **Homework**. Intervention children who performed well on the initial reading tests were more willing to read age-appropriate texts or higher at posttest as indicated by the high correlation compared to the weak correlation shown in the comparison group. Comparison children who performed well on the reading pretests were more likely to have experienced the desired emotions arising from reading in activities related to **SSR, Research and Homework** as the correlation was moderate.

Willingness to participate in **Core** and **Elective** activities was also measure of participatory or choice behaviour. Intervention children had higher correlations than comparison between **Core** activities (pretest) and thought variables (posttest). Children who were more willing to participate in the **Core** activities of reading and number \( (1= \text{low}, 5 = \text{high}) \) were associated with greater self-report on **Self Concept** \( (r = .53, p < .01) \) and **Task Values** \( (r = .48, p < .01) \). Correlations between **Elective**
activities (drawing and physical movement) and other measures were with very weak or not significant for both groups.

Finally, children’s emotions were correlated to different variables. For intervention children, emotions arising from SSR, Research and Homework (pretest) were related to their final self perception of the reading ability and the value they placed on reading. For comparison children, SSR, Research and Homework (pretest) were moderately correlated to the four reading skills.

4.7.5. Summary: Descriptive Analysis of Psychosocial Constructs.

A salient trend emerging from these analyses were the differences between the groups on the psychosocial measures. Regarding children’s thoughts and beliefs, intervention children’s reading self concept had improved four times that of the comparison group suggesting FORSCI’s contributory role, particularly as pretest means were similar for the intervention (\(M = 3.7\)) and comparison (\(M = 3.87\)) groups. Children’s reading task values was another area suggesting FORCSI’s impact. At pretest, both groups held similar reading values as means were comparable. However, over time, these values changed. Intervention children’s value towards reading as interesting and important improved by almost eight percent since pretesting while comparison children valued reading with less importance and interest. At posttest their mean score fell close to two percent.

There were differences between the groups on achievement emotions. The data suggests that comparison children are more prone to emotions of guilt and for intervention children, emotions of anger when reading in general. This conclusion was based on the marked change in Guilty feelings (26%) and Angry feelings (75%) for comparison and intervention groups respectively.

A rather interesting yet perplexing occurrence was the intervention group’s choice behaviour. The higher mean score at posttest (\(M = 5.47\)) suggests that children chose more age-appropriate books than at pretest (\(M = 4.97\)). In contrast, the comparison group chose easier books as the mean score dropped from pretest (\(M = 5.18\)) to posttest (\(M = 4.33\)). One would expect that if children chose texts that were either age-appropriate or higher they would also be willing to participate in reading
and number activities, the Core activities. Similarly, if children chose less demanding texts to read one would anticipate they would be less willing to participate in Core activities. This was not the case. Intervention children were not willing to participate in Core activities as the mean score dropped by almost eight percent from pretesting. Comparison children were more willing to engage in Core activities as there was a six percent improvement in mean score. Correlation analysis supported this pattern of behaviour.

The processes within the reading programme indicated initial reading performance supported subsequent willingness to choose appropriate text difficulty (high correlation) yet constrained children’s willingness to choose reading and number activities over time (low correlation). Positive and desired affects resulting from reading during SSR, Research and Homework supported increased reading self-concept and reading values over time. These correlations ranged from high (reading performance and text difficulty) to moderate (emotions during specific reading tasks and thoughts). These correlations were unique to the intervention group and suggest FORCSI’s impact on children’s subsequent psychosocial orientation to reading.

4.8. Chapter Summary.

In Part 1 of this chapter, the psychometric properties showed internal consistency and reliability for the scales measuring reading performance and psychosocial orientation. Factor analysis found unitary factors for Reading Self Concept, Reading Task Values, SSR, Research and Homework. General Reading had four factors, Guilty, Angry, Pleased and Worry. Choice of school activities had two factors, Core activities (reading and number) and Elective activities (drawing and physical movement).

In Part 2, the aim was to see whether the groups were matched on the four reading measures. The ANOVA results indicated that the groups were equivalent on reading and psychosocial scales. By matching groups on pretest measures, a number of plausible alternative inferences can be minimised thus rendering conclusions more interpretable (Cook & Campbell, 1979; Cook, et al., 2008; Glazerman, et al., 2003; Shadish & Cook, 2009). Nevertheless, analysis of the data will take into
consideration other issues pertaining to non-random allocation in group assignment (see Cook & Campbell, 1979).

In Part 3, the descriptive analysis involved reporting the changes made in mean scores from pretest to posttest. Both groups showed improvements in the four reading skills however, there were areas where improvements were substantial. For example, Year 4 intervention group made gains in TORCH-R that were more than five times the gains made by Year 4 comparison students. In the intervention group, Year 6 students had improved in TORCH-R by a mean score that was 28 times greater than Year 6 comparison students. From the analysis, intervention students from Years 4 to 6 had overall better percentage gains in listening and reading comprehension scores than comparison students suggesting FORSCI’s potential role in the development of children’s comprehension. While the descriptive analysis suggests FORSCI’s potential benefits, the analysis also revealed that it does little to improve reading accuracy and text fluency. For most parts, comparison students from Years 4 to 6 had improvements in reading accuracy and text fluency that exceeded the improvements made by intervention students.

Descriptive analysis of the psychosocial measures were conducted and showed differences, particularly the improvements in self concept, task value and choice of text difficulty of children in the intervention group relative to the comparison group. Correlation analysis showed associations between variables were different for each group suggesting the dynamic nature of FORSCI on children’s psychosocial orientations towards reading, particularly on children’s choice behaviour. For example, TORCH-R, NARA-L, RA and TF were highly correlated to children’s choice of text difficulty for the intervention group but not for the comparison. Also there was a higher correlation between the willingness to participate on Core activities and the thought variables (Rself and Rval) than the comparison group.

Further analysis is needed to clarify an emerging pattern that suggests FORSCI’s promising beginnings as a reading program facilitating children’s reading skill and reading will.
5.

RESULTS: READING PERFORMANCE ON COMPREHENSION, ACCURACY AND TEXT FLUENCY

5.1. Introduction.

A primary purpose of this study was to explore the impact of fluency instruction in the middle years of school where reading fluency has been viewed as playing a minor role in children’s ongoing reading development (Kuhn & Stahl, 2003; Paige, Rasinski, & Magpuri-Lavell, 2012; Rasinski et al., 2009). In this chapter, the first research question is addressed: What are the factors explaining children’s performance in comprehension (listening and reading), accuracy and text fluency? To what extent did the FORCSI intervention explain the reading outcomes?

Evidence has shown that there is no one best method of teaching literacy (NICHD, 2000). This intervention study is less concerned with adding another alternative to the plethora of quality evidence-based reading programmes and more concerned with addressing the fundamental questions of which children need what and when and with what type of instruction and under what learning conditions. These types of questions have often been overlooked in studies (NICHD, 2000), particularly in fluency studies where efforts have been directed on defining and measuring fluency (Samuels, 2006). In response to this, Chapter 6 and 7 addresses these issues. In Chapter 6, the second research question investigates which children need what and when by examining children’s reading performance on a year-by-year basis, exploring the year group with which FORCSI had the greatest impact. In Chapter 7, the third research question is addressed which includes the quantitative data detailing aspects of FORCSI’s influence on children’s psychosocial orientation to reading. Qualitative data in a supportive role to the quantitative data is presented in Chapters 5, 6, and 7.

Chapter 5 begins with a review of the salient aspects of the descriptive data presented previously in Chapter 4. This is followed by summaries of the quantitative and qualitative findings. A procedural template outlining the steps in the analytical
process is presented next. Statistical terms are defined followed by the quantitative and qualitative results. Final concluding comments are presented to complete Chapter 5.

5.2. Review of the Descriptive Analysis: Reading Measures.

Inspection of the mean scores demonstrated children in both groups (intervention/comparison) improved over the course of this study. The descriptive analysis demonstrated children in Year 4 intervention group had improved three times that of their Year 4 comparison peers in listening comprehension from pretest to posttest. In reading comprehension, Year 4 intervention student gains were five times greater than their same-aged counterparts.

There was a substantial 23% improvement for Year 6 intervention children in reading comprehension compared to the only one percent improvement in mean scores for children in the Year 6 comparison group. The preliminary findings suggested FORCSI did have an impact on children’s comprehension skills. However, further analysis was needed to determine whether these improvements were statistically significant.

The descriptive analysis indicated FORCSI did not affect reading accuracy or text fluency. Comparison children had larger improvement gains than intervention students. Inferential statistics may provide additional information as to what variables can explain the variance in these dependent variables. How data is to be analysed, the inclusion of particular variables, and how results are to be interpreted largely rests on what the researcher is investigating and the study’s purpose (Keith, 2006; Wright, 2006). This study sought more to explore rather than confirm or establish cause and effect relationships. The study was more about finding what works in FORCSI than it was about confirming that it works.

5.3. Summary Findings for Research Question 1.

5.3.1. Quantitative Data Summary.

The first research question was on finding the factors (or variables) that explained the children’s reading performance and the role FORCSI played in
improving reading outcomes. The pretest scores of the dependent variables were the main contributors of variance as shown in Table 5.1. Inspection of $R^2_{chg}$ column shows the pretests contributing a proportion of variance that ranged from a high 87% (Reading Accuracy) to a low 36.2% (TORCH-R) controlling for the other predictors.

Another variable explaining variance in reading performance was Reading Accuracy. Understandably this variable explained most of the variance where reading was required, as in Reading Accuracy (87%), Text Fluency (23%) and TORCH-R (10.3%) and the least in NARA-L (3.9%) where reading was not the focus as much as listening. The fact that such a large proportion of variance in Reading Accuracy was accounted for by its pretest and was a significant predictor in other reading skills, serves as a reminder that the responsibility of developing this lower-level word

<table>
<thead>
<tr>
<th>Dependent Variable</th>
<th>$R^2$ %</th>
<th>Predictor Variables</th>
<th>$R^2_{chg}$ %</th>
<th>$\beta$ value</th>
<th>Effect Size</th>
<th>Size</th>
</tr>
</thead>
<tbody>
<tr>
<td>NARA-L Listening Comprehension</td>
<td>66.2</td>
<td>NARA-L Accuracy</td>
<td>57.9</td>
<td>.55***</td>
<td>Moderate effect size, $d = .52$</td>
<td></td>
</tr>
<tr>
<td>TORCH-R Reading Comprehension</td>
<td>52.5</td>
<td>TORCH-R Accuracy</td>
<td>36.2</td>
<td>.39***</td>
<td>Small effect size, $d = .35$</td>
<td></td>
</tr>
<tr>
<td>RA Accuracy</td>
<td>86.7</td>
<td>Accuracy</td>
<td>87.0</td>
<td>.84***</td>
<td></td>
<td></td>
</tr>
<tr>
<td>TF Text Fluency</td>
<td>78.7</td>
<td>Fluency</td>
<td>56.0</td>
<td>.59***</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*p < .05, ** p < .01, *** p < .001
processing skill does not remain in the hands of teachers in Kindergarten to Year 3. Developing automaticity in word recognition enabling children to read words accurately and promptly requires attention throughout upper primary years if reading growth is to be ensured.

There were different predictors explaining the children listening and reading comprehension skills. Gender (2%) and TORCH-R (1%) accounted for almost 3% of the variance in NARA-L (listening comprehension) compared to Age which accounted 4% of the variance in TORCH-R (reading comprehension). The results suggest that there is a gender bias associated with listening comprehension with boys performing better than girls. Age appeared to be a factor explaining differences in children’s reading comprehension with older children performing better than younger children. In the next section, gender and age differences will be examined more closely when analysis was conducted on each year level.

The first research question also inquired whether or not FORCSI’s had a role in improving children’s reading skills. FORCSI (1.6%) did impact children’s listening (1.6%) and reading comprehension (2.1%) scores. The effect size, indicated the standardised mean difference between the groups, was moderate for NARA-L (d = .52) and small for TORCH-R (d = .35). Of particular interest especially to policy makers was whether the mean difference was of practical significance (i.e., d > .41) (Ferguson, 2009). NARA-L achieved this practical significance (d = .52) and to a lesser extent, TORCH-R (d = .35).

FORCSI’s impact can also be reported by noting how well Group (intervention) was correlated with the outcome variable. This correlation is an index of effect size (Ferguson, 2009; Keith, 2006). Both NARA-L (β = 14) and TORCH-R (β = .13) had a moderate effect size indicating there was an average amount of shared variance between Group and the outcome, controlling for the other variables (Ferguson, 2009).

5.3.2. Qualitative Data Summary.

Description of teachers’ classroom literacy practices indicated differences between groups were of an instructional nature. A skill-based approach was adopted
by the comparison teachers (six teachers) compared to the whole-language used by the intervention teachers (five teachers). Similarities between the groups were around organisational features, such as the frequency and time spent on literacy activities.

Year 4 teachers in the comparison group relied heavily on the use of reading groups where instructions were specifically planned and organised to develop reading skills that addressed children’s specific reading problems. Reading instruction was more homogeneous and standardised across the three Year 4 comparison classes as teachers collaborated on a regular and consistent basis compared to the two Year 4 intervention classes. Comparison children in Years 5 and 6 were on individualised reading programmes using basal readers and working from reading activities taken from commercial reading kits designed to develop vocabulary knowledge and comprehension skills. Whereas comparison teachers had reading instruction that was explicitly skills based, intervention teachers adopted a whole-language approach to reading instruction. Reading skills were taught within the context of the class novel. Only one intervention teacher used reading groups as a means of addressing the diverse range of ability levels. The remaining interventions teachers used various strategies to cater for individual differences.

Speculations as to why the groups differed on the approach to teaching reading may come from the fact that three of the six comparison teachers had been teaching that ranged from 10 to 20 years. In addition to the depth of experience, these ‘older’ teachers occupied executive positions which included the supervision of the other ‘younger’ three teachers. The ‘younger’ teachers had been teaching for a short time, ranging from one to four years. The approach to reading instruction taken by the comparison teachers may have been the result of the pragmatism and depth of knowledge and experience of the ‘older’ teachers shaping the literacy landscape under which the ‘younger’ teachers were being trained and mentored.

In the intervention group, of the five teachers, only one held an executive position and had been teaching for nine years. Whether her bias towards whole-language influenced the teachers she was supervising could not be ascertained as easily as it was for the Year 4 teachers in comparison group. Nevertheless, a whole-language approach was widely embraced by all intervention teachers who were
generally more experienced than the three ‘younger’ comparison teachers. The teaching experience for the five intervention teachers ranged from one to ten years making them more experienced than the ‘younger’ comparison teachers. Being more experienced may have afforded intervention teachers greater liberty and confidence to teach than the novice comparison teachers who, because of their inexperience, were more willing to follow the prevailing instructional approach as set by the ‘older’ teachers (Journal entry: Friday 8th September).

The similarities shared by both groups included the way the classes were organised. Each school had composite classes (Year 3/4 and Year 5/6) and both groups would devote a minimum of two hours a day, three to four times a week on reading, spelling, comprehension and writing. Both groups had additional reading instruction integrated in other content areas throughout the day such that the amount of time spent in reading over the week was generally very similar for both groups. Both groups had children engaged in sustained silent reading (SSR) and teacher read-aloud of class novels and its ensuing discussion was the commonly used strategy to develop children’s understanding of the grammatical aspects and salient features of the text.

The FORSCI sessions were very different to what the intervention classes were accustomed to. The reading intervention had many of the characteristics of direct instruction, namely it had explicit directions and performance expectations, systematic prompting (prosody and use of correct comprehension strategy), structured practice, monitoring of achievement (progress chart) and reinforcement and corrective feedback during partner reading. Of the five teachers, only one teacher freely commented how FORSCI worked well for her class of eight and nine year olds. The structured nature and routine practice served to settle the class as they found it easier to focus and concentrate compared to literacy lessons that were integrated in other content areas.
5.4. Analytical Procedure and Definition of Statistical Terms.

A series of steps were used to answer Research Question 1 (Chapter 5) and 2 (Chapter 6) and are presented below along with statistical terms defined.

1. Previous diagnostics had been conducted when group equivalency was investigated (see Chapter 4). This involved the preliminary screening of data for missing data and outliers. There was no missing data and boxplots showed an absence of outliers. Graphical depiction of distribution and measures of skewness indicated normality.

2. Assumption testing involved testing for multivariate normality, linear relationship, homoscedasticity, autocorrelation, and multicollinearity

3. Consideration was given to the number of tests being performed simultaneously and its effect on the overall Type 1 error rate. The Bonferroni adjustment was used to control for this repeated testing effect by dividing the nominal significance level ($\alpha = .05$) by the number of tests ($k = 8$) being performed. The adjusted level of significance was $p = .006$ ($\alpha / k = .05/8$) for Research Question 1. Research Question 2 required four tests and was added to the previous eight tests making the adjusted level of significance as $p = .004$ ($\alpha / k = .05/12$).

4. Descriptive statistics included the means, sample size and standard deviation, bivariate correlation with screening for multicollinearity reported in Chapter 4.

5. Inferential statistics. Multiple Linear Regression (MLR) used (a) the enter method (or simultaneous method) to identify the variables explaining the variance of the dependent variables of posttest reading performance ($post\ NARA-L$, $post\ TORCH-R$, $post\ RA$ and $post\ RR$) using the student covariates, $Age$, $Gender$, $Group$, and the pretest reading scores as the predictor variables, (b) $\beta$ values were used to interpret the significance of predictor variables and (c) hierarchical multiple regression was used to examine each of the predictor’s contribution to the outcome variance above and beyond other variables. For Research Question 2, the steps were repeated for each of the three year levels, Year 4, Year 5 and Year 6. The following were used to
answer the first and second questions: $R$ squared ($R^2$), adjusted $R$ squared change ($R^2_{adj}$), ANOVA to test the model, beta weights ($\beta$), $t$ test, $p$ value and effect size.

$R$ Square ($R^2$) or the coefficient of multiple determination, is a measure of the proportion of the total variance in the dependent variable explained by the predictive power of all the explanatory variables. However, $R^2$ tends to overestimate the success of the model when applied to the real world, so an Adjusted $R$ Square ($R^2_{adj}$) value is calculated and takes into account the number of variables in the model and the number of participants the model is based on. Both $R^2$ and $R^2_{adj}$ indicate how well the model fits with the data (Field, 2009).

Adjusted $R$ Square Change ($R^2_{chg}$) was used to indicate the contribution of a predictor to the variance of the outcome variable above and beyond other independent variables (Field, 2009). These unique contributions of significant predictors were identified using hierarchical regression.

$\beta$ weights or the standardised beta values were measured in standard deviation units and allowed for direct comparison with other predictors making it easier to identify the ‘relative importance’ of a predictor in the model. $\beta$ values measure the number of standard deviations the dependent variable will change as a result of one standard deviation change in the predictor (Field, 2009).

Effect size quantifies the actual size of the intervention treatment, and effect sizes are reported. However, there are many different effect sizes (e.g., Cohen’s $d$, Glass’s $\Delta$ and Hedges’s $g$) and just as many ways of calculating them (Ferguson, 2009; Field, 2009; Turner III & Bernard, 2006). Although effect size can indicate practical significance, they are not inherently meaningful. There are many factors determining the importance and meaning of an effect, such as prior effect sizes in the related literature (Sun, Pan, & Wang, 2010). Because previous research on the influences on school learning has used Cohen’s $d$, this measure of effect size was used in assessing comparability with other studies.

The effect size was calculated as the difference between the mean posttest score of the participants in the intervention condition ($M_1$) minus the mean posttest
score of the participants in the comparison condition (M₂) divided by the pooled standard deviation (s_pooled) and is represented by the following formula: \( d = \frac{M_1 - M_2}{s_{pooled}} \) (Cohen, 1988). The guideline for interpreting effect size was as follows: \( d = 0.20 \) is small, \( d = 0.50 \) is medium and \( d = 0.80 \) is a large effect (Cohen, 1988).

Effect size also has important implication when evaluating the practical significance of the study or whether or not the difference was large enough to be of value in a practical sense. In social science research, a recommended minimum effect size of \( d = 0.41 \) represents a difference with practical significance (Ferguson, 2009). The practical significance value of 0.41 shows FORCSI’s efficacy as a cost-effective value added intervention.

Effect size is also an index of the correlation between a predictor variable and the outcome (Ferguson, 2009; Vacha-Haase & Thompson, 2004). Where Cohen’s \( d \) was used to measure the magnitude of the difference between the two groups, the standard regression coefficient \( \beta \) will be used to determine the effect size of an independent variable (e.g., Group) by noting the magnitude of the shared variance between it and the outcome measure (Ferguson, 2009; Keith, 2006). Using \( \beta \) values as an index of effect size can eliminate extraneous variance from a relationship artificially increasing non-additive effect size estimates and can be more accurate than other commonly used strength of association measures, such as bivariate \( r \) (Ferguson, 2009).

Determining effect size can provide information as to the predictor variable’s practical significance based on the degree of shared variance. The guideline for interpreting effect size is as follows: \( \beta \) values below .05 are considered to have an effect size too negligible to be a significant contributor to learning; \( \beta \) values above .05 are considered small but meaningful, above .10 are moderate and above .25 are large effects (Keith, 2006).
5.5. Quantitative Findings: Factors Affecting Reading Performance.

Research Question 1: What factors explained children’s reading performance in listening and reading comprehension, reading accuracy and text fluency? To what extent did FORCSI explain children’s reading performance?

The following student profile covariates, Age, Gender, and Group in addition to the pretest reading measures, NARA-L (listening comprehension), TORCH-R (reading comprehension), RA (reading accuracy), and TF (text fluency) were the seven predictors used to explain children’s reading performance during a nine-week reading intervention period.

Two analyses were conducted on each of the four dependent variables, posttest NARA-L, TORCH-R, RA and TF. The first analysis, labelled Variables Explaining Variance, entered seven predictors into a simultaneous multiple regression. Non significant variables were removed and only the significant predictors reported.

The second analysis included hierarchical regression. The significant predictors from the first analysis were entered manually into the regression in order to find how much each predictor variable can account for the variance in the dependent variable above and beyond the other independent variables. This section is labelled Variance Contribution. The results are reported for each dependent variable in the following format:

Assumption Testing: Results from testing for multivariate normality, linearity, homoscedasticity, autocorrelation and multicollinearity

Variables Explaining Variance: Model summary from the multiple regression is presented. The effect size ($d$) is reported indicating group difference.
Significance of Variable: Regression coefficients indicating the degree to which the predictor affects the dependent variables is presented. The effect size ($\beta$) is reported indicating the amount of shared variance between the predictor and dependent variable.

Variance Contribution: Model summary from hierarchical regression indicating the unique variance of predictors.

Summary: Brief report on the variables (or factors) explaining children’s reading performance.

5.5.1. Factors Explaining Listening Comprehension (NARA-L).

5.5.1.1. Assumption Testing.

Preliminary analysis evaluated the feasibility of conducting MLR by testing five key assumptions of MLR: multivariate normality, linear relationship, homoscedasticity, auto-correlation, and multicollinearity. An examination of the normal probability plot and the histogram for post NARA-L indicated a normal distribution. The scatterplot of residuals against predicted values showed it was consistent with the assumption of linearity and homoscedasticity. The Durbin-Watson tests the null hypothesis that the residuals are not linearly auto-correlated. The test statistic, $d$, can vary between 0 and 4 with the values around 2 indicating no auto-correlation (Fields, 2009). Analysis indicated no auto-correlation ($d = 1.92$).

The correlation matrix, the variance inflation factor (VIF) and the tolerance statistics were used to test for multicollinearity. The correlation matrix (see Chapter 4) indicated multicollinearity was unlikely to be a problem for any of the predictors. Multicollinearity is likely to be present when the VIF value is greater than 10 and when the tolerance statistic is below .2 (Fields, 2009). There was no evidence of multicollinearity as the VIF values ranged between 1.046 and 1.896. Tolerance ranged between .565 and .943, well within limits.
Screening of data for multivariate outliers must be undertaken as extreme cases have a considerable effect on the regression solution (Coakes & Steed, 1999; Field, 2009; Kinnear & Gray, 2009). The Mahalanobis distance indicated there were no outliers since none of the values were greater than or equal to the critical chi-value of 13.8. The results of preliminary examination of the data indicated MLR could be reliably undertaken. The Bonferroni correction, \( p = .006 \), was used in the following analyses to control for the bias of repeated testing effects.

5.5.1.2. Variables Explaining Variance in NARA-L (MLR Simultaneous Entry, SE).

Seven predictor variables, Age, Gender, Group, and the pretest scores on NARA-L, TORCH-R, RA and TF were regressed on post NARA-L. A simultaneous method was used since there was no a priori hypothesis to determine the entry of the predictor variables. The seven predictors variables accounted for 66.3% of the variance in the listening comprehension posttest score, \( R^2 = .663 \), \( R^2_{adj} = .652 \), \( F (7, 204) = 57.364, p < .001 \). Table 5.2 is a summary of the regression coefficients, \( t \) statistics, bivariate and partial correlations for post NARA-L. Inspection of the \( \beta \) weights shows the relative importance of the predictors in the model, with pre NARA-L (\( \beta = .546, p < .001 \)) as the strongest predictor followed by Reading Accuracy (\( \beta = .201, p < .001 \)), TORCH-R (\( \beta = .187, p < .001 \)), Group (\( \beta = .144, p < .01 \)), and Gender (\( \beta = -.122, p < .01 \)). The effect size was calculated to measure the

<table>
<thead>
<tr>
<th>Model</th>
<th>( B )</th>
<th>( \beta )</th>
<th>( t )</th>
<th>( p )</th>
<th>Bivariate</th>
<th>Partial</th>
</tr>
</thead>
<tbody>
<tr>
<td>NARA-L</td>
<td>.524</td>
<td>.546</td>
<td>10.548</td>
<td>&lt;.001</td>
<td>.761</td>
<td>.594</td>
</tr>
<tr>
<td>Accuracy</td>
<td>.158</td>
<td>.201</td>
<td>3.601</td>
<td>&lt;.001</td>
<td>.576</td>
<td>.244</td>
</tr>
<tr>
<td>TORCH-R</td>
<td>.302</td>
<td>.187</td>
<td>3.611</td>
<td>&lt;.001</td>
<td>.498</td>
<td>.245</td>
</tr>
<tr>
<td>Group</td>
<td>6.214</td>
<td>.144</td>
<td>3.434</td>
<td>.001</td>
<td>.253</td>
<td>.234</td>
</tr>
<tr>
<td>Gender</td>
<td>5.296</td>
<td>-.122</td>
<td>-2.934</td>
<td>.004</td>
<td>-.101</td>
<td>-.201</td>
</tr>
</tbody>
</table>
overall difference between intervention and comparison group on children’s listening comprehension performance. The effect size was moderate \((d = 0.52)\) indicating the extent to which FORCSI can make a practical and important difference in children’s listening comprehension skills.

5.5.1.3. Significance of Variables.

The significance of the variables is indicated by their standardised \(\beta\) weights and their effect size. The \(\beta\) values tell us to what degree each predictor variable affects NARA-L scores when other significant independent variables are held constant. The predictor’s \(\beta\) values are an index of the correlation between the predictor and dependent variable and are a measure of effect size (Ferguson, 2009; Keith, 2006; Vacha-Haase & Thompson, 2004).

1) Gender \((\beta = -.122)\). The standard deviation of NARA-L scores is 21.68 months. Being a dichotomous variable (boys = 0, girls = 1), the negative \(\beta\) value indicates a shift towards better NARA-L scores if the child is a boy. If the child is a boy, NARA-L scores are expected to increase by 2.60 standard deviations \((.12 \times 21.68)\) compared to girls. This value indicates boys are predicted to perform better on NARA-L than girls. The effect size was moderate.

2) Group \((\beta = .144)\). The \(\beta\) value for Group represents the change in one standard deviation in NARA-L scores when there is a shift from the comparison group (coded 0) to the intervention group (coded 1). Because the \(\beta\) value was positive, this indicated as a student moves from the comparison into the intervention group, there was an increase of .14 standard deviations in the listening comprehension score, a score given as a reading age in months. The standard deviation for NARA-L is 21.68 months meaning if a student is in the intervention group, he/she can expect to gain a listening comprehension age of 3.04 months \((.14 \times 21.68)\) more than a child in the comparison group. The effect size was moderate indicating the strength of FORCSI’s correlation with NARA-L.

3) TORCH-R \((\beta = .187)\). This value indicated for each additional increase in standard deviation in TORCH-R scores \((SD = 13.41 \text{ “torch units”})\), NARA-L
scores also increased by .19 standard deviations. With each additional increase in TORCH-R standard deviations, NARA-L scores are expected to increase by 4.12 (.187 x 21.68). The effect size was moderate.

4) **Reading Accuracy** (β = .201). This value indicated as the scores for Reading Accuracy increased by one standard deviation (SD = 27.65 months), NARA-L scores increase by .20 standard deviations. If the scores on Reading Accuracy increased by 27.65, the expected increase in NARA-L scores will be 4.34 (.201 x 21.68). The effect size was moderate.

5) **NARA-L** (β = .546). This indicated if the score for pretest NARA-L rises by one standard deviation (SD = 22.59), it is expected the final score for NARA-L will increase by 11.92 (.546 x 21.68). The effect size was large.

5.5.1.4. Variance Contribution (Hierarchical Regression, HR).

The first analysis using simultaneous entry multiple regression, identified Gender, Group, TORCH-R, RA and NARA-L as having a significant effect on final NARA-L scores. These predictors were used in a second analysis involving a series of hierarchical regressions. This second analysis (variance contribution), examined the unique contribution of each predictor in explaining the variance of post NARA-L scores.

The predictors were entered in order of their β values with the NARA-L (β = .55) entered as the first step of the hierarchical regression model as it had the largest β coefficient. This was followed by entering the predictor with the next largest β value, Reading Accuracy (β = .20) and continued until the last predictor, Gender (β = -.12), is entered into the model (Keith, 2006).

A 5 step hierarchical model (Table 5.3) accounted for 66.2% of the variance in the final NARA-L scores for all students, intervention and comparison, $R^2 = .662$, $R^2_{adj} = .653$, $F$ (5, 206) = 80.520, $p < .001$. Children’s variance in listening comprehension skills can be best explained by five predictors: pre NARA-L (57.9% of variance explained), Reading Accuracy (3.9%) and to a lesser degree, Gender (1.5%) and pre TORCH-R (1.3%). Group (i.e., FORCSI) explained 1.6% of the variance in children’s listening comprehension scores. Table 5.4 presents a summary
of the steps generated by the hierarchical regression. The effect size was moderate, indicating the practical and significant impact of FORCSI.

Table 5.3. Variance Contribution for NARA-L- Hierarchical Regression (HR).

<table>
<thead>
<tr>
<th>Step</th>
<th>R</th>
<th>R²</th>
<th>R² adj</th>
<th>R² chg</th>
<th>F chg</th>
<th>df</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>.761 a</td>
<td>.579</td>
<td>.577</td>
<td>.579</td>
<td>288.693</td>
<td>1,210</td>
<td>&lt;.001</td>
</tr>
<tr>
<td>2</td>
<td>.786 b</td>
<td>.618</td>
<td>.614</td>
<td>.039</td>
<td>21.145</td>
<td>1,209</td>
<td>&lt;.001</td>
</tr>
<tr>
<td>3</td>
<td>.794 c</td>
<td>.631</td>
<td>.626</td>
<td>.013</td>
<td>7.522</td>
<td>1,208</td>
<td>.006</td>
</tr>
<tr>
<td>4</td>
<td>.804 d</td>
<td>.647</td>
<td>.640</td>
<td>.016</td>
<td>9.415</td>
<td>1,207</td>
<td>.002</td>
</tr>
<tr>
<td>5</td>
<td>.813 e</td>
<td>.662</td>
<td>.653</td>
<td>.015</td>
<td>8.842</td>
<td>1,206</td>
<td>.003</td>
</tr>
</tbody>
</table>


Table 5.4. Regression Coefficients, t-Statistics and Correlation for NARA-L (HR).

<table>
<thead>
<tr>
<th>Model</th>
<th>B</th>
<th>β</th>
<th>t</th>
<th>p</th>
<th>Bivariate</th>
<th>Partial</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.NARA-L</td>
<td>.730</td>
<td>.761</td>
<td>16.991</td>
<td>&lt;.001</td>
<td>.761</td>
<td>.761</td>
</tr>
<tr>
<td>2.NARA-L Accuracy</td>
<td>.609</td>
<td>.635</td>
<td>12.491</td>
<td>&lt;.001</td>
<td>.761</td>
<td>.654</td>
</tr>
<tr>
<td>3.NARA-L Accuracy TORCH-R Group Gender</td>
<td>.575</td>
<td>.599</td>
<td>11.577</td>
<td>&lt;.001</td>
<td>.761</td>
<td>.626</td>
</tr>
<tr>
<td>4.NARA-L Accuracy TORCH-R Group</td>
<td>.584</td>
<td>.571</td>
<td>11.076</td>
<td>&lt;.001</td>
<td>.761</td>
<td>.610</td>
</tr>
<tr>
<td>5.NARA-L Accuracy TORCH-R Group Gender</td>
<td>.530</td>
<td>.553</td>
<td>10.846</td>
<td>&lt;.001</td>
<td>.761</td>
<td>.603</td>
</tr>
</tbody>
</table>
5.5.1.5. Summary: Listening Comprehension (NARA-L).

Children’s variance in listening comprehension skills can be best explained by five predictors: pre NARA-L (57.9% of variance explained), Reading Accuracy (3.9%) and to a lesser degree, Gender (1.5%), Group (1.6%) and pre TORCH-R (1.3%). The effect size was moderate, indicating the practical and significant impact of FORCSI.

5.5.2. Factors Explaining Reading Comprehension (TORCH-R).

5.5.2.1. Assumption Testing.

Normal P-P plots, histogram, and residual scatterplot indicated normal distribution, linearity and homoscedasticity of data. The Durbin-Watson test showed that the assumption of no auto-correlation was tenable ($d = 2.1$). There was no evidence of multicollinearity as the VIF values ranging between 1.02 and 1.76 and the tolerance statistics ranging between .57 and .98 were within limits. There were no multivariate outliers as none of the values exceeded or were equal to the critical chi-value of 13.8. The results indicated that MLR could proceed reliably.

5.5.2.2. Variables Explaining Variance in TORCH-R (SE).

Student covariates, Age, Gender, Group, and the pretest scores, NARA-L, TORCH-R, RA and TF were regressed on TORCH-R posttest scores. The seven predictors variables accounted for 53.7% of the variance in the reading comprehension posttest scores, $R^2 = .537$, $R^2_{adj} = .522$, $F (7, 207) = 34.334, p < .001$. The effect size was small ($d = .35$) indicating a small difference between the two groups.

Inspection of the $\beta$ weights in Table 5.5 shows the relative contribution of each predictor with pre TORCH-R ($\beta = .339, p < .001$) as the strongest predictor followed by Reading Accuracy ($\beta = .253, p < .001$), Age ($\beta = .191, p < .001$), and Group ($\beta = .134, p < .01$).
Table 5.5. Regression Coefficients, t-Statistics and Correlation for TORCH-R (SE).

<table>
<thead>
<tr>
<th>Model</th>
<th>B</th>
<th>( \beta )</th>
<th>t</th>
<th>p</th>
<th>Bivariate</th>
<th>Partial</th>
</tr>
</thead>
<tbody>
<tr>
<td>TORCH-R</td>
<td>.339</td>
<td>.378</td>
<td>6.330</td>
<td>&lt;.001</td>
<td>.601</td>
<td>.403</td>
</tr>
<tr>
<td>Accuracy</td>
<td>.110</td>
<td>.253</td>
<td>3.863</td>
<td>&lt;.001</td>
<td>.573</td>
<td>.259</td>
</tr>
<tr>
<td>Age (month)</td>
<td>.201</td>
<td>.191</td>
<td>3.609</td>
<td>&lt;.001</td>
<td>.425</td>
<td>.243</td>
</tr>
<tr>
<td>Group</td>
<td>3.216</td>
<td>.134</td>
<td>2.756</td>
<td>.006</td>
<td>.173</td>
<td>.188</td>
</tr>
</tbody>
</table>

5.5.2.3. Significance of Variables.

1) *Group* (\( \beta = .134 \)). The standard deviation of TORCH-R scores is 12.04 “torch units”. The positive \( \beta \) value indicates children in the intervention group will increase by 1.57 (.134 x 12.04) for an additional one standard increase in TORCH-R scores. The effect size was moderate.

2) *Age* (\( \beta = .191 \)). This value indicates that older students are predicted to do better on TORCH-R than younger students. For every 11.45 months of age, a child’s score on the TORCH-R is expected to increase by 2.29 (.191 x 12.04). The effect size was moderate.

3) *Reading Accuracy* (\( \beta = .253 \)). This value indicates that as the scores for Reading Accuracy increases by one standard deviation (SD = 27.65), TORCH-R scores will increase 3.01 (.253 x 12.04). The effect size was large.

4) *Pre TORCH-R* (\( \beta = .378 \)). The better the pretest score, the better the posttest score. This value indicates that as pretest TORCH-R increases by one standard deviation (SD = .13.43), the final TORCH-R scores are expected to increase by 4.58 (.378 x 12.04). The effect size was large.

5.5.2.4. Variance Contribution (HR).

The 4 step hierarchical regression model (Table 5.6) accounted for 52.5% of the variance in TORCH-R scores, \( R^2 = .525 \), \( R^2_{adj} = .516 \), \( F (4, 210) = 58.091, \) p < .001. Children’s variance in reading comprehension skills can be best explained by
four predictors: pre TORCH-R (36.2%), Reading Accuracy (10.3%), Age (4%) and Group (2.1%). Table 5.7 presents the coefficients for this analysis by model.

**Table 5.6. Variance Contribution for TORCH-R (HR).**

<table>
<thead>
<tr>
<th>Step</th>
<th>R</th>
<th>R²</th>
<th>R²_adj</th>
<th>R²_chg</th>
<th>F_chg</th>
<th>df</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>.601 a</td>
<td>.362</td>
<td>.359</td>
<td>.362</td>
<td>120.661</td>
<td>1,213</td>
<td>&lt;.001</td>
</tr>
<tr>
<td>2</td>
<td>.682 b</td>
<td>.465</td>
<td>.460</td>
<td>.103</td>
<td>40.803</td>
<td>1,212</td>
<td>&lt;.001</td>
</tr>
<tr>
<td>3</td>
<td>.710 c</td>
<td>.505</td>
<td>.498</td>
<td>.040</td>
<td>16.999</td>
<td>1,211</td>
<td>&lt;.001</td>
</tr>
<tr>
<td>4</td>
<td>.725 d</td>
<td>.525</td>
<td>.516</td>
<td>.021</td>
<td>9.157</td>
<td>1,210</td>
<td>.003</td>
</tr>
</tbody>
</table>

Predictors: a. TORCH-R b. Accuracy c. Age d. Group

**Table 5.7. Regression Coefficients, t-Statistics and Correlation for TORCH-R (HR).**

<table>
<thead>
<tr>
<th>Model</th>
<th>B</th>
<th>β</th>
<th>t</th>
<th>p</th>
<th>Bivariate</th>
<th>Partial</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.TORCH-R</td>
<td>.539</td>
<td>.601</td>
<td>10.985</td>
<td>&lt;.001</td>
<td>.601</td>
<td>.601</td>
</tr>
<tr>
<td>2.TORCH-R</td>
<td>.379</td>
<td>.052</td>
<td>.423</td>
<td>&lt;.001</td>
<td>.601</td>
<td>.451</td>
</tr>
<tr>
<td>Accuracy</td>
<td>.160</td>
<td>.025</td>
<td>.367</td>
<td>&lt;.001</td>
<td>.573</td>
<td>.402</td>
</tr>
<tr>
<td>3.TORCH-R</td>
<td>.345</td>
<td>.385</td>
<td>6.860</td>
<td>&lt;.001</td>
<td>.601</td>
<td>.427</td>
</tr>
<tr>
<td>Accuracy</td>
<td>.138</td>
<td>.318</td>
<td>5.607</td>
<td>&lt;.001</td>
<td>.573</td>
<td>.360</td>
</tr>
<tr>
<td>Age (month)</td>
<td>.224</td>
<td>.213</td>
<td>4.123</td>
<td>&lt;.001</td>
<td>.425</td>
<td>.273</td>
</tr>
<tr>
<td>4.TORCH-R</td>
<td>.351</td>
<td>.392</td>
<td>7.105</td>
<td>&lt;.001</td>
<td>.601</td>
<td>.440</td>
</tr>
<tr>
<td>Accuracy</td>
<td>.132</td>
<td>.304</td>
<td>5.440</td>
<td>&lt;.001</td>
<td>.573</td>
<td>.351</td>
</tr>
<tr>
<td>Age (month)</td>
<td>.224</td>
<td>.213</td>
<td>4.196</td>
<td>&lt;.001</td>
<td>.425</td>
<td>.278</td>
</tr>
<tr>
<td>Group</td>
<td>3.469</td>
<td>.144</td>
<td>3.026</td>
<td>.003</td>
<td>.173</td>
<td>.204</td>
</tr>
</tbody>
</table>

**5.5.2.5. Summary: Reading Comprehension (TORCH-R).**

Children’s variance in reading comprehension skills can be best explained by four predictors: pre TORCH-R (36.2%), Reading Accuracy (10.3%), Age (4%) and Group (2.1%). The effect size was small indicating a minor difference between the groups.
5.5.3. Factors Explaining Reading Accuracy (RA).

5.5.3.1. Assumption Testing.

Normal probability plots, histogram, and residual scatterplot indicated normal distribution, linearity, and homoscedasticity for post RA. The Durbin-Watson test showed the assumption of no auto-correlation was tenable \( (d = 2.12) \). There was no evidence of multicollinearity as the VIF values ranging between 1.01 and 1.63 and the tolerance statistics ranging between .61 and .99 were within limits. There were no multivariate outliers as none of the values exceeded or were equal to the critical chi-value of 13.8. The results indicated that MLR could proceed reliably.

5.5.3.2. Variables Explaining Variance in RA (SE).

Children’s variance in reading words accurately was explained by only one predictor, Reading Accuracy, which accounted for 86.7% of the variance in combination with six other predictors, \( R^2 = .867, R^2_{adj} = .863, F (7, 204) = 190.754, p < .001 \). The results showed FORCSI did not influence children’s reading accuracy scores since Group was not a significant predictor of the dependent variable \( (\beta = .020, p = .449) \). Reading Accuracy had a small effect size \( (d = 0.22) \) indicating that the intervention group’s performance on this measure was small relative to the performance by the comparison group. Table 5.8 presents the \( \beta \) values of RA.

<table>
<thead>
<tr>
<th>Model</th>
<th>B</th>
<th>( \beta )</th>
<th>( t )</th>
<th>( p )</th>
<th>Bivariate</th>
<th>Partial</th>
</tr>
</thead>
<tbody>
<tr>
<td>Accuracy</td>
<td>.769</td>
<td>.838</td>
<td>23.890</td>
<td>&lt;.001</td>
<td>.925</td>
<td>.858</td>
</tr>
</tbody>
</table>

It was not surprising pre Reading Accuracy was a significant predictor of post Reading Accuracy as these assessments were highly correlated \( (r = .89) \) and were measuring the same construct. In an endeavour to identify other variables explaining children’s variance in Reading Accuracy, the removal of pretest RA was considered. However, this strategy presented its own complications. Not including a major explanatory variable highly correlated with the dependant variable needed to proceed
with caution as it may cause a variable to be credited with an effect actually caused by the omitted variable (Rubinfeld, 2000). To maintain statistical integrity, the pretest measure was not excluded from the regression.

5.5.3.3. Significance of Variables.

1) *Reading Accuracy* ($\beta = .838$). The standard deviation for *Reading Accuracy* is 25.36. This value indicates that as the scores for pretest *Reading Accuracy* increase by one standard deviation ($SD = 27.65$), the final *Reading Accuracy* scores will increase by 21.30 ($\beta \times SD = .838 \times 25.36$). A large effect size incurred.

5.5.3.4. Summary: *Reading Accuracy (RA)*.

Children’s variance in reading words accurately was explained by only one predictor, *Reading Accuracy*, which accounted for 86.7% of the variance in combination with six other predictors - the covariates (*Group, Gender and Age*) and the pretest measures (*NARA-R, TORCH-R* and *Text Fluency*). The small effect size indicates the marginal difference between the groups on word accuracy skill.

5.5.4. Factors Explaining *Text Fluency (TF)*.

5.5.4.1. Assumption Testing

The normal probability plot, histogram, and residual scatterplot indicated a normal distribution, linearity and homoscedasticity for post *TF*. The Durbin-Watson test showed the assumption of no auto-correlation was tenable ($d = 2.01$). There was no evidence of multicollinearity as the VIF values ranging between 1.01 and 1.63 and the tolerance statistics ranging between .63 and .99 were within limits. There were no multivariate outliers as none of the values exceeded or were equal to the critical chi-value of 13.8. The results indicated that MLR could proceed reliably.

5.5.4.2. Variables Explaining Variance in *TF (SE)*.

When the seven predictors were regressed on *TF*, 79.6% of the variance of the post *TF* scores was explained by the combination of the seven predictors, $R^2 = .796$, $R^2_{adj} = .789$, $F (7, 204) = 113.883, p < .001$. The results indicated *FORCSI* did
not influence children’s text fluency scores as Group was not a significant predictor of the dependent variable ($\beta = -.023, p = .484$). Text Fluency ($\beta = .553, p < .001$) and Reading Accuracy ($\beta = .368, p < .001$) were the only significant predictors with the results summarised in Table 5.9. The effect size was small ($d = .16$) indicating the minor difference between the groups on reading text fluently.

Table 5.9 Regression Coefficients, t-Statistics and Correlation for Text Fluency (SE).

<table>
<thead>
<tr>
<th>Model</th>
<th>$B$</th>
<th>$\beta$</th>
<th>$t$</th>
<th>$p$</th>
<th>Bivariate</th>
<th>Partial</th>
</tr>
</thead>
<tbody>
<tr>
<td>Text Fluency</td>
<td>.567</td>
<td>.553</td>
<td>13.155</td>
<td>&lt;.001</td>
<td>.820</td>
<td>.677</td>
</tr>
<tr>
<td>Accuracy</td>
<td>.300</td>
<td>.368</td>
<td>8.448</td>
<td>&lt;.001</td>
<td>.746</td>
<td>.509</td>
</tr>
</tbody>
</table>

5.5.4.3. Significance of Variables.

1) Reading Accuracy ($\beta = .368$). The standard deviation of Text Fluency is 22.57. This value indicated as Reading Accuracy increased by one standard deviation ($SD = .27.65$), Text Fluency scores increases by 8.35 (.368 x 22.57). A child’s ability to read connected text fluently is largely explained by his or her ability to recognise words accurately. A large effect size was found.

2) Text Fluency ($\beta = .553$). Fluent reading begets fluency. This value indicated an increase of one standard deviation in reading fluently, final Text Fluency scores increase by 12.41 (.553 x 22.57). A large effect size was indicated.

5.5.4.4. Variance Contribution (HR).

The 2 step hierarchical regression model accounted for 78.7% of the variance in the posttest Text Fluency scores, $R^2 = .787$, $R^2_{adj} = .785$, $F (1, 210) = 262.811$ $p < .001$. The pretest TF scores accounted for the largest share of the variance (55.6%) in children’s ability to read connected text fluently followed by pre Reading Accuracy scores (23.1%). The results are presented in Table 5.10 and Table 5.11.
Table 5.10. Variance Contribution for Text Fluency (HR).

<table>
<thead>
<tr>
<th>Step</th>
<th>$R$</th>
<th>$R^2$</th>
<th>$R^2_{adj}$</th>
<th>$R^2_{chg}$</th>
<th>$F_{chg}$</th>
<th>$df$</th>
<th>$p$</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>.746$^a$</td>
<td>.556</td>
<td>.554</td>
<td>.556</td>
<td>262.811</td>
<td>1, 210</td>
<td>&lt;.001</td>
</tr>
<tr>
<td>2</td>
<td>.887$^b$</td>
<td>.787</td>
<td>.785</td>
<td>.231</td>
<td>226.460</td>
<td>1, 209</td>
<td>&lt;.001</td>
</tr>
</tbody>
</table>

Predictors: a. Text Fluency  b. Accuracy

Table 5.11. Regression Coefficients, $t$-Statistics and Correlation for Text Fluency (HR).

<table>
<thead>
<tr>
<th>Model</th>
<th>$B$</th>
<th>$\beta$</th>
<th>$t$</th>
<th>$p$</th>
<th>Bivariate</th>
<th>Partial</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Text Fluency</td>
<td>.841</td>
<td>.820</td>
<td>20.791</td>
<td>&lt;.001</td>
<td>.820</td>
<td>.820</td>
</tr>
<tr>
<td>2. Accuracy</td>
<td>.600</td>
<td>.040</td>
<td>15.049</td>
<td>&lt;.001</td>
<td>.820</td>
<td>.721</td>
</tr>
<tr>
<td>Text Fluency</td>
<td>.336</td>
<td>.032</td>
<td>10.562</td>
<td>&lt;.001</td>
<td>.746</td>
<td>.590</td>
</tr>
</tbody>
</table>

5.5.4.5. Summary: Text Fluency (TF).

Children’s variance in Text Fluency was explained by its pretest (55.6%) and by children’s word accuracy scores (23.1%). There was a small effect size indicating group difference.

5.6. Qualitative Findings: Research Sites and Classroom Practices.

5.6.1. Introduction.

Understanding why an intervention “works” is a complex task because one must considers a multiplicity of contextual, child and teacher variables that could influence children’s responses to the intervention. In this section, contextual factors will be examined. Other relevant variables and how they interact with the intervention will be discussed in Chapters 6 and 7.

The section will focus on the comparability across conditions by providing class-level data obtained through field notes and researcher’s diary entries. Qualitative data of this nature when combined with the quantitative data can provide methodological rigor to the study, which in turn, can improve the interpretability of
the results by reducing the number of plausible alternative inferences (Chard et al., 2009; Cook & Campbell, 1979; Stuart, 2007).

An inspection of Table 5.12 shows that both groups have comparable classroom reading instruction in terms of the number of hours a day spent on literacy.

Table 5.12 Summary of the Class-Level Data in the Intervention and Comparison Groups.

<table>
<thead>
<tr>
<th>Year</th>
<th>Number of days a week</th>
<th>Total hours per week</th>
<th>Reading Groups</th>
<th>Integrated in other subjects</th>
<th>Teaching resource</th>
<th>Oral reading fluency instruction</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Basal readers</td>
<td>Round-robin</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Class novel</td>
<td></td>
</tr>
<tr>
<td>INTERVENTION</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3/4</td>
<td>4</td>
<td>8</td>
<td>√</td>
<td>√</td>
<td>Basal readers</td>
<td>Round-robin</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Class novel</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>4</td>
<td>8</td>
<td>√</td>
<td></td>
<td>Class novel</td>
<td>Round-robin</td>
</tr>
<tr>
<td>5</td>
<td>5</td>
<td>10</td>
<td>√</td>
<td></td>
<td>Class novel</td>
<td>Round-robin</td>
</tr>
<tr>
<td>5/6</td>
<td>4</td>
<td>8</td>
<td>√</td>
<td></td>
<td>Class novel, teacher’s own trade-books.</td>
<td>Round-robin</td>
</tr>
<tr>
<td>6</td>
<td>4</td>
<td>8</td>
<td>√</td>
<td></td>
<td>Commercial reading program</td>
<td>Round-robin</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Class novel</td>
<td></td>
</tr>
<tr>
<td>COMPARISON</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3/4</td>
<td>4</td>
<td>8</td>
<td>√</td>
<td>√</td>
<td>Class novel</td>
<td>Round-robin</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>3</td>
<td>6</td>
<td>√</td>
<td>√</td>
<td>Class novel</td>
<td>Round-robin</td>
</tr>
<tr>
<td>4/5</td>
<td>4</td>
<td>8</td>
<td>√</td>
<td>√</td>
<td>Class novel</td>
<td>Round-robin</td>
</tr>
<tr>
<td>5</td>
<td>4</td>
<td>8</td>
<td>√</td>
<td>√</td>
<td>Class novel</td>
<td>Round-robin</td>
</tr>
<tr>
<td>5/6</td>
<td>5</td>
<td>10</td>
<td>√</td>
<td></td>
<td>Individualised reading programme using basal readers</td>
<td>Round-robin</td>
</tr>
<tr>
<td>6</td>
<td>4</td>
<td>8</td>
<td>√</td>
<td></td>
<td>Individualised reading programme using SRA kits</td>
<td>Round-robin</td>
</tr>
</tbody>
</table>
the type of resources used in reading instruction and whether reading was conducted in groups, whole-class or children on individualised programmes. Both groups had similar class-level data and demographic characteristics.

5.6.2. Intervention Group.

The intervention school had five classes across Years 4, 5, and 6 participating in the study. Two classes, Year 3/4 and Year 5/6 were composites classes. Composite classes have children from two different year levels. For example, children aged eight (Year 3) and nine year olds (Year 4) are together in the one class. The five classes worked independently from each other resulting in a heterogeneous literacy landscape that reflected the range of pedagogical bias and experiences of the teachers. This was in stark contrast to the comparison group where reading instruction across the six classes were more homogenous. Comparison teachers collaborated frequently on what reading skills were to be taught, when and how these were to be done (Observation field notes: Tuesday 5th September).

The literacy landscape of the intervention group included a Year 5 teacher, Ms Amy (all names of teachers and students are pseudonyms), whose classroom literacy practice included using picture books with themes relating to issues the students may have had or were currently experiencing. The book “I’ve Got Nits” was studied because the story revolved around real-life issues children could relate readily. This made it easier for the class to engage in high-quality discussion about the text (Observation field notes: Tuesday 12th September).

Ms Amy’s choice of books was therefore influenced largely by how the books could provide information and insights that could help her class cope with life. For example, the thick chapter book, “The Unclean” and the picture book, “Taming Butterflies”, were chosen because it contained problems similar to the ones the class could encounter when entering high school. These books provided a context in which to discuss grammatical features, text structure and literary aspects as outlined in the English K-6 syllabus. Ms Amy adopted a whole-language approach to literacy instruction (Journal entry: Wednesday 20th September).
The remaining classes had similar literacy practices, adopting the constructivist orientation towards teaching, a commonly practiced pedagogy in Australian schools (Rowe, 2006). The teachers followed the strategies outlined in the English K-6 syllabus by using chapter books to contextualise reading-related activities, such as spelling, grammar, building vocabulary, responding to literal and inferential questions and creative writing. For example, in the Year 5 class, Ms Sue would read-aloud *The Golden Years*, an expository text with graphics depicting the life during Australia's gold rush days. The week's spelling list consisted of words taken from this book (Observation field notes: Tuesday 5th September).

Field notes showed how other intervention teachers used chapter books as an instructional approach teaching literacy. Mr Paul's Year 6 class was reading the narrative *The Great Gherkin*. Each child took turns at reading aloud a page or two in front of the class. Intermittently, Mr Paul would stop the reading and test the children's understanding by asking literal and inferential questions (Observation field notes: Tuesday 7th November). Ms Grace (Year 4), used chapter books to foster positive attitudes to reading, firmly believing "that getting children motivated to read is just as important as teaching them to read" (Observation field notes: Monday 6th November). Ms Elizabeth (Year 3/4) read aloud chapter books because her class preferred this to other reading activities "the kids likes listening to me read *James and the Giant Peach* than doing spelling or writing" (Observation field notes: Monday 13th November). She also read aloud to improve the children’s spoken English (Journal entry: Monday 13th November). The five teachers used chapter books as a medium of instruction, addressing the syllabus’s reading outcomes.

Of the five teachers, Ms Elizabeth (Year 3/4) was the only one to use basal readers in ability-levelled reading groups (Observation field notes: Friday 8th September). Mr Paul (Year 6) used reading groups and a commercial reading kit from which the children had activities to work independently. As the Year 6 class was not working well under this skill-based reading programme, it was replaced with a whole-language approach to reading instruction only after the first term of school (Journal entry: Friday 9th June). Like the other three intervention teachers, Mr Paul adopted the constructivist orientation towards literacy and reading instruction for the remaining three terms of school (Observation field notes: Wednesday 8th November).
All the teachers used the first two hours to deliver skill-based instruction in spelling, handwriting and writing using a variety of text types. FORCSI was included in this time period. On average, the teachers devoted a minimum eight hours a week on literacy instruction (Observation field notes: Monday 4th September).

Reading instruction was carried throughout the day with teachers integrating reading in other subjects including mathematics, science, human society and its environment. Sustained silent reading was widely practiced as well round-robin reading, a procedure involving students reading orally one after the other, a practice not widely advocated nor endorsed by reading scholars (Allington, 2013; Ash, Kuhn, & Walpole, 2008; Rasinski & Hoffman, 2003). Fluency instruction was not included in any of the teacher’s literacy programme, supporting Allington’s (1983) observation of fluency, a neglected reading goal in classroom instruction.

5.6.3. Comparison Group.

Six classes participated in the study including Years 4, 5, and 6 with three composite classes, Year 3/4, Year 4/5, and Year 5/6. This organisational structure was similar to the intervention group. Another similarity was skill-based instruction delivered in the first two hours of the day (9am to 11am), an average of eight hours a week. Additional reading activities such as sustained silent reading, teacher read-aloud, various reading and writing tasks connected with other content areas, were carried throughout the day, the same classroom literacy practices observed also in the intervention group (Observation field notes: Tuesday 5th September). Like the intervention classes, none of the comparison classes had instruction to improve reading fluency (Observation field notes: Wednesday 1st November).

Teacher read-aloud of novels was a frequently used instructional strategy in both schools. One Year 4 teacher read-aloud texts as a means of familiarising the children to new concepts, language structure and vocabulary when studying religions of the world (Observation field notes: Thursday 8th June). In addition to reading aloud narratives and expository texts by all comparison teachers, some teachers read aloud advertising flyers (Year 3/4) and newspapers (Year 4) to gauge children's comprehension level. One Year 4/5 teacher however, would read chapter books aloud as a motivational strategy developing children's love of books. The "children
could hardly wait to hear the next chapter of *The Bombing of Darwin*. Sitting at the front of the classroom, the children were mesmerised by the unfolding drama as the teacher read the biographical account of life in Darwin during the Second World War." (Journal entry: 31st October). A similar pedagogy aimed at improving children's reading motivation was practiced in Ms Grace's Year 4 class.

Four of the six comparison classes used reading groups to deliver skill-based reading instruction, a marked contrast to the one intervention class that had reading groups during the treatment period. The reading groups were organised according to reading ability. For example, the 72 children in Years 3/4, Year 4 and Year 4/5 were arranged into three reading levels: low ability readers, average readers and advanced readers. At 10:00 am, three times a week, children from the three classes would assemble in front of the classroom that had been assigned as their reading group. Individual teachers would conduct a 60 minute reading session according to the needs and ability level of their particular group focussing on a particular skill (e.g., scanning for information) in which all three teachers were committed to teach for two weeks (Observation field notes: Monday 4th September). Every fortnight the teachers would meet to decide the next set of reading skills for instruction in the following two weeks. At the end of each fortnight, an assessment task was set on the work covered in the previous weeks. This highly collaborative and organised structure was instigated by member of the team, a teacher with ten years experience in Special Education classes, prior to her recent appointment to this school as Assistant Principal (Journal entry: Wednesday 6th September).

The Year 5 class had a similar reading group set up for low, intermediate and advanced readers. Activities were organised such that children could complete them independently while waiting for their group’s turn to work with the teacher at the front of the class. A typical reading session would begin with one reading group at the front of the classroom. Each child in the group would take turns at reading a section of the text aloud to the teacher. As this ‘round-robin’ reading was in progress, the rest of the class would be seated at their desk with comprehension and vocabulary activities to complete until it was their group’s turn to read with the teacher (Observation field notes: Tuesday 5th September).
Two classes did not use reading groups. In Year 5/6 and Year 6, children worked on individualised reading programmes, sitting at their desks independently reading text-levelled basal readers (Year 5/6 class) or completing reading tasks from two commercial reading kits (Year 6 class). In the Year 5/6 classroom, each child worked on their own basal reader matched to their independent reading level. Each basal reader came with comprehension worksheets and vocabulary activities that students had to complete in the allotted 30 to 60 minutes period. These reading sessions were conducted daily with the teacher at her desk, going through the worksheet with each individual student then listening to him or her read from their reader. By the end of the week, the teacher would have heard each child read individually (Observation field notes: Wednesday 6th September). Working on individualised reading programme with basal readers was, according to the Year 5/6 teacher was "the best method of catering for students with behavioural problems (4 children), learning disabilities (3 children) and children on medication for Attention Deficit Hyperactivity Disorder (2 children)." A teacher with 26 years of teaching experience was assigned to teach this highly diverse classroom (Journal entry: Wednesday 6th September).

The Year 6 teacher had been teaching for over 20 years. The Year 6 children worked independently on their activity cards taken from two multilevel SRA resource kits. One card had reading comprehension questions and the other, vocabulary building exercises. The morning session included sustained silent reading, spelling, writing and independent work from the SRA kits, conducted four times a week. The use of ‘reading mums’ was a noticeable feature in this Year 6 teacher’s literacy programme. Selected children were withdrawn from class for either remediation or extension work on a one-to-one basis with the ‘reading mum’. Parents assisting teachers with reading activities were frequently observed in other comparison classrooms. ‘Reading mums’ were not as prevalent in the intervention school (Observation field notes: Thursday 7th September).
5.7. Chapter Summary.

Chapter 5 concerned itself with two questions. The first asked what variables explained children’s performance in listening comprehension, reading comprehension, reading accurately and reading connected text fluently. The second asked to what extent did FORCSI improve children’s reading performance?

Multivariate analysis indicated that pretest reading measures accounted for the largest amount of variance in the reading outcomes, in particular, reading accuracy. Generally, children’s instruction in word attack and decoding ends by the time they leave Year 3 (Chall, 1996; NSW Board of Studies, 2007). Children have finished learning how to read and are now entering a new phase of reading in order to learn the new (Chall, 1996). The findings suggest that instruction in reading accuracy (word-decoding automaticity) should be extended beyond the early years of learning to read, from Kindergarten to Year 3, particularly as word accuracy accounted for a large proportion of variance in text fluency (23%) and reading comprehension (10.3%) controlling for the other predictor variables.

Although the intervention was a brief nine weeks, the findings indicated FORCSI’s impact on children’s comprehension performance. The effect size indicated a significant difference between the groups, with a moderate effect size for listening comprehension, NARA-L ($d = .52$), and a small effect size for reading comprehension, TORCH-R ($d = .35$). FORCSI had a differential affect on comprehension scores. Gender accounted for 1.5% of the variance in NARA-L with boys achieving better results than girls. Age accounted for 4% of the variance in TORCH-R with older children performing better than younger ones. The results suggest that FORCSI is better at assisting the performance of boy’s listening comprehension skills than girls and FORCSI is more effective in improving reading comprehension among older children than younger children. This will be verified in the next chapter, Chapter 6, when the data is examined at each year level.

The groups shared similar demographic characteristics and ANOVA indicated that the groups were evenly matched on the pretest covariates. This is important as it helps to reduce alternative inferences and makes for a stronger case that FORCSI did have a plausible affect. The qualitative data also support group
equivacency. Both groups were similar on school-level data, such as both groups had composite Year 3/4 and Year 5/6 classes, spent a minimum two hours a day three times a week on reading related activities such as spelling, writing, comprehension, grammar and vocabulary building. Additional reading lessons were integrated throughout the day in other content areas. Both groups had children engaged in sustained silent reading and teacher read-aloud were commonly used to develop the reading outcomes mandated by the English K-6 Syllabus. The major difference was comparison classes use of reading groups to deliver explicit skill-based reading instruction compared to intervention teachers use of whole-language approach focused on developing children's conceptual understanding and knowledge of the English language.
6. RESULTS: READING PERFORMANCE ACROSS YEARS 4 TO 6.

6.1. Introduction.

Chapter 6 addresses the second research question identifying factors (or variables) explaining children’s reading performance on a year level basis. Quantitative data served as the primary source for examining this question with qualitative data used in a supportive role.


6.2.1. Quantitative Data Summary.

The impact of FORCSI (or Group) was evident in children’s listening comprehension for Year 4 students. Group explained 7.8% of the variance in post NARA-L scores after controlling for the pretest scores in Reading Accuracy (42.2%) and NARA-L (12.3%). The intervention group generally performed better than the comparison group on the four reading skills with Year 5 intervention children reporting a large effect size for NARA-L ($d = .88$) and medium effect size of practical significance for TORCH-R ($d = .55$) and Reading Accuracy ($d = .55$). Moderate effect sizes were also reported for Year 4 NARA-L ($d = .48$) and Year 6 TORCH-R ($d = 0.54$). The negative effect size indicated Year 4 comparison children did better on Reading Accuracy ($d = -.09$) and Text Fluency ($d = -.06$) than Year 4 intervention children.

For Years 4 to 6, the results showed the variables explaining children’s reading performance were the pretest scores of the outcome variables. MLR indicated posttest NARA-L, TORCH-R, Reading Accuracy and Text Fluency were largely predicted by their respective pretest covariates ranging from as much as $\beta = .86$ (Year 4 pretest RA) to as little as $\beta = .33$ (Year 6 pretest TORCH-R).

Hierarchical regression indicated the relative importance of Reading Accuracy in explaining Year 4 and Year 6 reading performance. Pretest Reading Accuracy explained a significant proportion of variance in posttest NARA-L (42.2%)
and Text Fluency (19.2%) scores for Year 4 children, controlling for other variables. For Year 6 students, pretest Reading Accuracy accounted for 17.2% of the variance in TORCH-R scores and 21.4% of the variance in Text Fluency controlling for other variables. This result highlights the relative importance of the need to continue to develop word recognition beyond what has been traditionally been the domain of the elementary years, Kindergarten to Year 3.

6.2.2. Qualitative Data Summary.

Data was collected based on two questions asking a) what factors inhibited or enhanced FORCSI and b) were there any modifications to the intervention? Instructional components of FORCSI, such as setting up of reading dyads and graphing of reading results, were time consuming resulting in two classes, Years 3/4 and Year 4, having to reread passages only twice instead of three times for a greater part of the intervention period. Although these instructional components were not an obvious hindrance to the posttest reading scores for Year 5 and Year 6 children, it may have affected the ability to improve in some of the reading skills for Year 4 children as indicated by the small effect size for reading comprehension ($d = .10$), reading accuracy ($d = -.09$) and text fluency ($d = -.06$) as effect sizes were small.

Overall, intervention children made greater gains than comparison group but may have had experienced larger treatment effect had the duration of the intervention extended beyond the nine weeks. Modifications to FORCSI were a response to the situational conditions resulting in the unsolicited assistance from the classroom teachers as they gave additional support to the poorer readers in the class. Another modification was introducing a recognition scheme to assist with classroom management. In the beginning weeks of the intervention, establishing discipline was consuming an increasing proportion of the teaching time. The recognition scheme was a solution to this problem.
6.3. Quantitative Findings: Factors Affecting Reading Performance at Year Level.

Research Question 2: What factors explained children’s reading performance in listening and reading comprehension, reading accuracy and text fluency in Years 4 to 6? To what extent did FORCSI explain children’s reading performance?

The seven predictors consisting of, Age, Gender, Group and the pretest measures, *NARA-L, TORCH-R, RA and TF* were regressed on the posttest measures of the four reading skills. This first analysis, called *Variables Explaining Variance*, used simultaneous MLR to identify the variables accounting for the variance in the outcome measures. Only significant predictors were reported. Inspection of the $\beta$ values provided additional information and is reported to indicate the significance of the predictors and presented under the section *Significance of Variables*. This first analysis was repeated for each dependent variable (post *NARA-L, TORCH-R, RA, TF*) and for each year level.

The second analysis, *Variance Contribution*, re-analysed the predictors using hierarchical regression to identify the unique variance of variables independent of other predictors. This analysis was repeated for Years 4, 5 and 6, providing information relating to the variables (or factors) explaining children’s reading outcomes pertaining to their year level at school.

### 6.3.1. Year 4: Listening Comprehension (NARA-L).

#### 6.3.1.1. Variance Explaining Variance in Year 4 NARA-L (SE).

Seven predictor variables accounted for 66.3% of the variance in the listening comprehension posttest score, $R^2 = .663$, $R^2_{adj} = .624$, $F (7, 61) = 17.154$, $p < .001$. In Table 6.1, $\beta$ weights show the relative importance of the predictors in the model, with *Reading Accuracy* ($\beta = .391$, $p < .001$) as the strongest predictor followed by *NARA-L* ($\beta = .57$, $p < .001$), then *Group* ($\beta = .290$, $p < .001$). The effect size of the intervention, was moderate ($d = 0.47$) indicating a standardised mean difference of practical significance (Ferguson, 2009).
### Table 6.1 Regression Coefficients, t-Statistics and Correlation for Year 4 NARA-L (SE).

<table>
<thead>
<tr>
<th>Year</th>
<th>Predictor</th>
<th>B</th>
<th>( \beta )</th>
<th>t</th>
<th>p</th>
<th>Bivariate</th>
<th>Partial</th>
</tr>
</thead>
<tbody>
<tr>
<td>4</td>
<td>Accuracy</td>
<td>.290</td>
<td>.391</td>
<td>3.613</td>
<td>&lt;.001</td>
<td>.649</td>
<td>.420</td>
</tr>
<tr>
<td></td>
<td>NARA-L</td>
<td>.371</td>
<td>.357</td>
<td>3.528</td>
<td>&lt;.001</td>
<td>.665</td>
<td>.412</td>
</tr>
<tr>
<td></td>
<td>Group</td>
<td>10.668</td>
<td>.290</td>
<td>3.786</td>
<td>&lt;.001</td>
<td>.231</td>
<td>.436</td>
</tr>
</tbody>
</table>

#### 6.3.1.2. Significance of Variables.

The significance of these predictors is presented below.

For an increase of one standard deviation in the predictors below, NARA-L \((SD = 18.54)\) scores will increase given the following values:

1) **Group** \((\beta = .29)\). Post NARA-L scores will increase by 5.38 \((.29 \times 18.54)\) when children are in the intervention group. A large effect size indicated.

2) **NARA-L** \((\beta = .36)\). Post NARA-L scores will increase by 6.68 \((.36 \times 18.54)\). A large effect size indicated.

3) **Accuracy Reading** \((\beta = .39)\). NARA-L scores will increase by 7.23 \((.39 \times 18.54)\). A child’s ability to listen with comprehension will largely be explained by his or her ability to recognise words accurately. A large effect size indicated.

#### 6.3.1.3. Variance Contribution (HR).

The three-step model accounted for 62.3% of the variance in post Year 4 NARA-L scores, \(R^2 = .623, R^2_{adj} = .606, F (3, 65) = 35.831, p < .001\). Table 6.2 and Table 6.3 present a summary of the steps generated by the hierarchical regression. When other the variables were taken into account, Year 4 children’s listening comprehension scores can be explained by three variables, Reading Accuracy accounting for 42.2% of post NARA-L scores, pretest NARA-L (12.3%) and Group (7.8%).
Table 6.2. Variance Contribution for Year 4 NARA-L- Hierarchical Regression (HR).

<table>
<thead>
<tr>
<th>Step</th>
<th>$R$</th>
<th>$R^2$</th>
<th>$R^2_{adj}$</th>
<th>$R^2_{chg}$</th>
<th>$F_{chg}$</th>
<th>$df$</th>
<th>$p$</th>
</tr>
</thead>
<tbody>
<tr>
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<td>.649 a</td>
<td>.422</td>
<td>.413</td>
<td>.422</td>
<td>48.835</td>
<td>1,67</td>
<td>&lt;.001</td>
</tr>
<tr>
<td>2</td>
<td>.738 b</td>
<td>.545</td>
<td>.531</td>
<td>.123</td>
<td>17.918</td>
<td>1,66</td>
<td>&lt;.001</td>
</tr>
<tr>
<td>3</td>
<td>.789 c</td>
<td>.623</td>
<td>.606</td>
<td>.078</td>
<td>13.470</td>
<td>1,65</td>
<td>&lt;.001</td>
</tr>
</tbody>
</table>


Table 6.3. Regression Coefficients, $t$-Statistics and Correlation for NARA-L (HR).

<table>
<thead>
<tr>
<th>Model</th>
<th>$B$</th>
<th>$\beta$</th>
<th>$t$</th>
<th>$p$</th>
<th>Bivariate</th>
<th>Partial</th>
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</thead>
<tbody>
<tr>
<td>1.Accuracy</td>
<td>.481</td>
<td>.649</td>
<td>6.988</td>
<td>&lt;.001</td>
<td>.649</td>
<td>.649</td>
</tr>
<tr>
<td>2.Accuracy</td>
<td>.293</td>
<td>.395</td>
<td>3.860</td>
<td>&lt;.001</td>
<td>.649</td>
<td>.429</td>
</tr>
<tr>
<td>3.Accuracy</td>
<td>.346</td>
<td>.467</td>
<td>4.869</td>
<td>&lt;.001</td>
<td>.649</td>
<td>.517</td>
</tr>
<tr>
<td>NARA-L</td>
<td>.397</td>
<td>.382</td>
<td>4.019</td>
<td>&lt;.001</td>
<td>.665</td>
<td>.446</td>
</tr>
<tr>
<td>Group</td>
<td>10.515</td>
<td>.286</td>
<td>3.670</td>
<td>&lt;.001</td>
<td>.231</td>
<td>.414</td>
</tr>
</tbody>
</table>

6.3.1.4. Summary: Listening Comprehension (NARA-L).

*FORCSI* did impact on children’s listening comprehension scores, contributing 7.8% of the variance above and beyond the other predictors, *Reading Accuracy* (42.2%) and pre *NARA-L* (12.3%). *FORCSI* is well suited for improving children’s listening comprehension skills in Year 4, having a moderate effect size indicating the difference was of practical significance ($d > .41$).

In explaining the variance in post *NARA-L* scores, it was unusual for the pretest covariate not to be the major contributor of variance. Instead, *Reading Accuracy* contributed a proportion of the variance that was almost three times greater than pre *NARA-L*. This suggests the need to continue to develop children’s word processing skills if improvements in listening comprehension are to be achieved.
6.3.2. Year 4: Reading Comprehension (TORCH-R).

6.3.2.1. Variables Explaining Variance in Year 4 TORCH-R (SE).

Together the seven predictors variables accounted for 46.2% of the variance in the reading comprehension posttest scores, $R^2 = .462$, $R^2_{\text{adj}} = .402$, $F (7, 63) = 7.715$, $p < .001$. Pre TORCH-R ($\beta = .47$) was the only significant predictor (Table 6.4). The effect size was small ($d = .10$).

Table 6.4. Regression Coefficients, t-Statistics and Correlation for Year 4 TORCH-R (SE).

<table>
<thead>
<tr>
<th>Year</th>
<th>Predictor</th>
<th>B</th>
<th>$\beta$</th>
<th>t</th>
<th>p</th>
<th>Bivariate</th>
<th>Partial</th>
</tr>
</thead>
<tbody>
<tr>
<td>4</td>
<td>TORCH-R</td>
<td>.367</td>
<td>.466</td>
<td>4.186</td>
<td>&lt;.001</td>
<td>.560</td>
<td>.466</td>
</tr>
</tbody>
</table>

6.3.2.2. Significance of Variables.

For an increase of one standard deviation in pre TORCH-R ($\beta = .466$), final TORCH-R scores ($SD = 10.56$) will increase by 4.92 ($=.47 \times 10.56$).

6.3.2.3. Summary: Reading Comprehension (TORCH-R).

Children’s reading comprehension can be explained by the combination of seven predictor variables, namely the three student covariates (Age, Gender, and Group) and the four pretest measures (NARA-L, TORCH-R, RA and TF). These seven predictors explained 46.2 % of the variance. FORSCI did not significantly improve children’s reading comprehension performance as indicated by the small effect size ($d = .10$). Pre TORCH-R was the only significant predictor ($\beta = .47$) explaining variance.
6.3.3. Year 4: Reading Accuracy (RA).

6.3.3.1. Variables Explaining Variance in Year 4 RA (SE).

Together the seven predictors variables accounted for 93.7% of the variance in the reading comprehension posttest scores, $R^2 = .937$, $R^2_{adj} = .930$, $F (7, 61) = 130.48$, $p < .001$. Pre Accuracy ($\beta = .857$) was the only significant predictor (Table 6.5). The effect size was small and negative ($d = -.09$) indicating the difference was small with comparison children performing better than the intervention group on word accuracy.

Table 6.5. Regression Coefficients, t-Statistics and Correlation for Year 4 Reading Accuracy (SE).

<table>
<thead>
<tr>
<th>Year</th>
<th>Predictor</th>
<th>B</th>
<th>$\beta$</th>
<th>t</th>
<th>p</th>
<th>Bivariate</th>
<th>Partial</th>
</tr>
</thead>
<tbody>
<tr>
<td>4</td>
<td>Accuracy</td>
<td>.810</td>
<td>.857</td>
<td>18.378</td>
<td>&lt;.001</td>
<td>.956</td>
<td>.920</td>
</tr>
</tbody>
</table>

6.3.3.2. Significance of Variables.

For an increase of one standard deviation in pre Reading Accuracy ($\beta = .857$), final Reading Accuracy ($SD = 23.65$) scores will increase by 20.69 ($0.86 \times 23.65$).

6.3.3.3. Summary: Reading Accuracy (RA).

Children’s ability to read accurately can be explained by the combination of seven predictor variables, the three student covariates (Age, Gender, and Group) and the four pretest measures (NARA-L, TORCH-R, RA and TF). These seven predictors explained 93.7% of the variance. FORSCI did not significantly improve children’s word accuracy performance. The small effect size ($d = -.09$) indicated that the comparison group performed better than the intervention group. Pre Reading Accuracy was the only significant predictor ($\beta = .857$) explaining variance.
6.3.4. Year 4: Text Fluency (TF).

6.3.4.1. Variables Explaining Variance in Year 4 Text Fluency (SE).

Together the seven predictors variables accounted for 70.4% of the variance in the text fluency posttest scores, $R^2 = .704$, $R^2_{adj} = .670$, $F (7, 61) = 20.694$, $p < .001$. Pre Text Fluency ($\beta = .593$) and pre Accuracy ($\beta = .434$) were the only significant predictor (Table 6.6). The difference between groups was small and negative ($d = -.06$) indicating comparison children’s better performance on reading fluency than comparison children in Year 4.

Table 6.6. Regression Coefficients, t-Statistics and Correlation for Year 4 Text Fluency (SE).

<table>
<thead>
<tr>
<th>Year</th>
<th>Predictor</th>
<th>B</th>
<th>$\beta$</th>
<th>t</th>
<th>p</th>
<th>Bivariate</th>
<th>Partial</th>
</tr>
</thead>
<tbody>
<tr>
<td>4</td>
<td>Text Fluency</td>
<td>.584</td>
<td>.593</td>
<td>7.338</td>
<td>&lt;.001</td>
<td>.709</td>
<td>.69</td>
</tr>
<tr>
<td></td>
<td>Accuracy</td>
<td>.299</td>
<td>.439</td>
<td>4.331</td>
<td>&lt;.001</td>
<td>.609</td>
<td>.49</td>
</tr>
</tbody>
</table>

6.3.4.2. Significance of Variables.

1) Text Fluency ($\beta = .584$). Post Text Fluency scores will increase by 9.17 (.54 x 17.02). A moderate effect size indicated.

2) Accuracy Reading ($\beta = .434$). Post Text Fluency scores will increase by 7.47 (.44 x 17.02). A small effect size indicated.

6.3.4.3. Variance Contribution (HR).

The 2-step model accounted for 69.4% of the variance in Year 4 post Text Fluency scores, $R^2 = .694$, $R^2_{adj} = .685$, $F (2, 66) = 74.929$, $p < .001$. Table 6.7 and Table 6.8 present a summary of the steps generated by the hierarchical regression. When other variables are taken into account, Year 4 children’s reading fluency scores can be explained by two variables, pre Text Fluency accounting for 50.2% of post Text Fluency scores and pre Reading Accuracy (19.2%).
Table 6.7. Variance Contribution for Year 4 Text Fluency (HR).

<table>
<thead>
<tr>
<th>Step</th>
<th>R</th>
<th>R²</th>
<th>R² adj</th>
<th>R² chg</th>
<th>F chg</th>
<th>df</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>.708a</td>
<td>.502</td>
<td>.495</td>
<td>.502</td>
<td>67.641</td>
<td>1, 67</td>
<td>&lt;.001</td>
</tr>
<tr>
<td>2</td>
<td>.833b</td>
<td>.694</td>
<td>.685</td>
<td>.192</td>
<td>41.416</td>
<td>1, 66</td>
<td>&lt;.001</td>
</tr>
</tbody>
</table>

Predictors: a. Text Fluency  b. Accuracy

Table 6.8. Regression Coefficients, t-Statistics and Correlation for Year 4 Text Fluency (HR).

<table>
<thead>
<tr>
<th>Model</th>
<th>B</th>
<th>β</th>
<th>t</th>
<th>p</th>
<th>Bivariate</th>
<th>Partial</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.Text Fluency</td>
<td>.7698</td>
<td>.708</td>
<td>8.224</td>
<td>&lt;.001</td>
<td>.709</td>
<td>.709</td>
</tr>
<tr>
<td>2.Text Fluency</td>
<td>.580</td>
<td>.569</td>
<td>8.355</td>
<td>&lt;.001</td>
<td>.709</td>
<td>.717</td>
</tr>
<tr>
<td>Accuracy</td>
<td>.309</td>
<td>.454</td>
<td>6.436</td>
<td>&lt;.001</td>
<td>.609</td>
<td>.621</td>
</tr>
</tbody>
</table>

6.3.4.4. Summary: Text Fluency (TF).

Children’s performance on text fluency can be explained by two predictors, pre Text Fluency and Reading Accuracy accounting for 50.2% and 19.2% of the variance respectively, independently of the other predictor variables.

6.3.5. Year 5: Listening Comprehension (NARA-L).

6.3.5.1. Variables Explaining Variance in Year 5 NARA-L (SE).

For Year 5, the seven predictors variables accounted for 83.5% of the variance, \( R^2 = .835 \), \( R^2_{adj} = .813 \), \( F(7, 53) = 38.321, p < .001 \). As shown in Table 6.9, NARA-L (\( β = .807, p < .001 \)) was the only predictor. The effect size was large and with practical significance \( (d = 0.88) \).

Table 6.9. Regression Coefficients, t-Statistics and Correlation for Year 5 NARA-L (SE).

<table>
<thead>
<tr>
<th>Year</th>
<th>Predictor</th>
<th>B</th>
<th>β</th>
<th>t</th>
<th>p</th>
<th>Bivariate</th>
<th>Partial</th>
</tr>
</thead>
<tbody>
<tr>
<td>5</td>
<td>NARA-L</td>
<td>.787</td>
<td>.807</td>
<td>11.779</td>
<td>&lt;.001</td>
<td>.9899</td>
<td>.851</td>
</tr>
</tbody>
</table>
6.3.5.2. Significance of Variables.

Post NARA-L scores will increase by 17.99 (.81 x 21.93) with every one standard deviation increase in pre NARA-L scores. A large effect size was indicated.

6.3.5.3. Summary: Listening Comprehension (NARA-L).

Although FORCSI was not singled out as a variable contributing to the large intervention effect in Year 5 children’s listening comprehension scores ($d = .88$), nevertheless it was among the six other predictors that explained 83.5% of the variance in post NARA-L scores. Of the seven predictors, only pre NARA-L was a significant predictor ($\beta = .807$).

6.3.6. Year 5: Reading Comprehension (TORCH-R).

6.3.6.1. Variables Explaining Variance in Year 5 TORCH-R (SE).

The seven predictors variables accounted for 37.3% of the variance, $R^2 = .373$, $R^2_{adj} = .291$, $F (7, 54) = 4.584, p < .001$. As shown in Table 6.10, Pre TORCH-R ($\beta = .477, p < .001$) was the only predictor. The findings indicated a moderate effect size ($d = .55$) with a difference that is of practical significance.

Table 6.10. Regression Coefficients, $t$-Statistics and Correlation for Year 5 TORCH-R (SE).

<table>
<thead>
<tr>
<th>Year</th>
<th>Predictors</th>
<th>B</th>
<th>$\beta$</th>
<th>t</th>
<th>p</th>
<th>Bivariate</th>
<th>Partial</th>
</tr>
</thead>
<tbody>
<tr>
<td>5</td>
<td>TORCH-R</td>
<td>.342</td>
<td>.477</td>
<td>3.563</td>
<td>.001</td>
<td>.552</td>
<td>.436</td>
</tr>
</tbody>
</table>

6.3.6.2. Significance of Variables.

Post TORCH-R scores will increase by 0.17 (.02 x 9.48) with every one standard deviation increase in pre TORCH-R scores. A small effect size indicated.
6.3.6.3. Summary: Reading Comprehension (TORCH-R).

Children’s reading comprehension scores were explained by the combination of seven predictor variables accounting for 37.3% of the variance in post Year 5 TORCH-R scores, of which pre TORCH-R was a significant predictor ($\beta = .477$). The moderate effect size ($d = .55$) indicated that Year 5 intervention children performed better than Year 5 comparison children on the reading comprehension test. FORCSI was not identified as a contributor to this group difference.

6.3.7. Year 5: Reading Accuracy (RA).

6.3.7.1. Variables Explaining Variance in RA (SE).

The seven predictors variables accounted for 83.9 % of the variance, $R^2 = .839$, $R^2_{adj} = .817$, $F (7, 53) = 39.355$, $p < .001$. Pre Reading Accuracy ($\beta = .681$, $p < .001$) was the only predictor (Table 6.11). The effect size was moderate ($d = .55$) and of practical importance.

Table 6.11. Regression Coefficients, t-Statistics and Correlation for Year 5 RA (SE).

<table>
<thead>
<tr>
<th>Year</th>
<th>Predictors</th>
<th>B</th>
<th>$\beta$</th>
<th>t</th>
<th>p</th>
<th>Bivariate</th>
<th>Partial</th>
</tr>
</thead>
<tbody>
<tr>
<td>5</td>
<td>Accuracy</td>
<td>.631</td>
<td>.681</td>
<td>8.477</td>
<td>&lt;.001</td>
<td>.887</td>
<td>.759</td>
</tr>
</tbody>
</table>

6.3.7.2. Significance of Variables.

Post Reading Accuracy scores will increase by 17.38 ($0.68 \times 25.53$) with every one standard deviation increase in pre Reading Accuracy scores. A moderate effect size indicated.

6.3.7.3. Summary: Reading Accuracy (RA).

Children’s reading accuracy scores were explained by the combination of seven predictor variables accounting for 83.9% of the variance in post Year 5 Reading Accuracy scores, of which pre Reading Accuracy was a significant predictor ($\beta = .681$). The moderate effect size ($d = .55$) indicated that Year 5 intervention
children performed better than Year 5 comparison children on word recognition. *FORCSI* was not identified as a contributor to this group difference.

### 6.3.8. Year 5: Text Fluency (TF).

#### 6.3.8.1. Variables Explaining Variance in Year 5 Text Fluency (SE).

The seven predictors variables accounted for 87.7% of the variance, $R^2 = .877$, $R^2_{adj} = .860$, $F (7, 53) = 53.762, p < .001$. Pre text Fluency ($\beta = .721, p < .001$) was the only predictor (Table 6.12). The effect size was small ($d = .39$).

Table 6.12. *Regression Coefficients, t-Statistics and Correlation for Year 5 Text Fluency (SE).*

<table>
<thead>
<tr>
<th>Year</th>
<th>Predictors</th>
<th>$B$</th>
<th>$\beta$</th>
<th>$t$</th>
<th>$p$</th>
<th>Bivariate</th>
<th>Partial</th>
</tr>
</thead>
<tbody>
<tr>
<td>5</td>
<td>Text Fluency</td>
<td>.704</td>
<td>.721</td>
<td>10.163</td>
<td>&lt;.001</td>
<td>.911</td>
<td>.813</td>
</tr>
</tbody>
</table>

#### 6.3.8.2. Significance of Variables.

Post text Fluency scores will increase by 16.70 (.72 x 23.17) with every one standard deviation increase in pre text Fluency scores. A moderate effect size indicated.

#### 6.3.8.3. Summary: Text Fluency (TF).

Children’s text fluency scores were explained by the combination of seven predictor variables accounting for 87.7% of the variance in post Year 5 Text Fluency scores, of which pre Text Fluency was a significant predictor ($\beta = .72$). The small effect size ($d = .39$) indicated that Year 5 intervention children marginally performed better than Year 5 comparison children. *FORCSI* was not identified as a contributor to this group difference.
6.3.9. Year 6: Listening Comprehension (NARA-L).

6.3.9.1. Variables Explaining Variance in Year 6 NARA-L (SE).

The seven predictors variables accounted for approximately 52.7% of the variance, $R^2 = .53$, $R^2_{adj} = .48$, $F(7, 74) = 11.77$, $p < .001$. NARA-L ($\beta = .43$, $p < .001$) was the only predictor (Table 6.13). The effect size was small and did not reach the minimum required for practical significant effect ($d = 0.39$).

Table 6.13. Regression Coefficients, $t$-Statistics and Correlation for Year 6 NARA-L (SE).

<table>
<thead>
<tr>
<th>Year</th>
<th>Predictor</th>
<th>B</th>
<th>$\beta$</th>
<th>$t$</th>
<th>$p$</th>
<th>Bivariate</th>
<th>Partial</th>
</tr>
</thead>
<tbody>
<tr>
<td>6</td>
<td>NARA-L</td>
<td>.39</td>
<td>.43</td>
<td>4.51</td>
<td>&lt;.001</td>
<td>.64</td>
<td>.46</td>
</tr>
</tbody>
</table>

6.3.9.2. Significance of Variables.

Post NARA-L scores will increase by 8.87 (.43 x 20.63) with every one standard deviation increase in pre NARA-L scores. A large effect size indicated.

6.3.9.3. Summary: Listening Comprehension (NARA-L).

Children’s listening comprehension scores were explained by the combination of seven predictor variables accounting for 52.7% of the variance in post Year 6 NARA-L scores, of which pre NARA-L was a significant predictor ($\beta = .43$). The small effect size ($d = .39$) indicated that Year 6 intervention children performed slightly better than Year 6 comparison children on the listening comprehension test. FORCSI was not identified as a contributor to this group difference.

Each of the reading variables, Reading Accuracy, NARA-L, Text Fluency, and TORCH-R had only one predictor variable and the variance accounted for was established. It was not necessary or advisable to conduct hierarchical regression for each outcome since there was only one predictor variable.
6.3.10. Year 6: Reading Comprehension (TORCH-R).

6.3.10.1. Variables Explaining Variance in Year 6 TORCH-R (SE).

The seven predictors variables accounted for approximately 55% of the variance, $R^2 = .550$, $R^2_{adj} = .508$, $F (7, 74) = 12.938$, $p < .001$. As shown in Table 6.14, pre TORCH ($\beta = .333$, $p < .001$) and Reading Accuracy ($\beta = .302$, $p = .003$) were the only predictors. The effect size was moderate ($d = 0.54$) with a standardised mean difference indicating the intervention had achieved a practical significant effect.


<table>
<thead>
<tr>
<th>Year</th>
<th>Predictor</th>
<th>B</th>
<th>$\beta$</th>
<th>t</th>
<th>p</th>
<th>Bivariate</th>
<th>Partial</th>
</tr>
</thead>
<tbody>
<tr>
<td>6</td>
<td>TORCH-R</td>
<td>.330</td>
<td>.333</td>
<td>3.431</td>
<td>.001</td>
<td>.512</td>
<td>.370</td>
</tr>
<tr>
<td></td>
<td>Accuracy</td>
<td>.148</td>
<td>.303</td>
<td>3.025</td>
<td>.003</td>
<td>.551</td>
<td>.332</td>
</tr>
</tbody>
</table>

6.3.10.2. Significance of Variables.

1) TORCH-R ($\beta = .330$). Post TORCH-R scores will increase by 3.84 (.33 x 11.52). A small effect size indicated.

2) Accuracy Reading ($\beta = .301$). Post TORCH-R scores will increase by 3.49 (.30 x 11.52). A small effect size indicated.

6.3.10.3. Variance Contribution (HR).

The two-step model accounted for 43.4% of the variance in post Year 6 TORCH-R scores, $R^2 = .434$, $R^2_{adj} = .420$, $F (2, 79) = 30.325$, $p < .001$. Table 6.15 and Table 6.16 present a summary of the steps generated by the hierarchical regression. When other the variables were taken into account, Year 6 children’s reading comprehension scores can be explained by two variables, pre TORCH-R and pre Reading Accuracy accounted for 26.2% and 17.2% respectively of the variance in post TORCH-R scores.
Table 6.15. Variance Contribution for Year 6 TORCH-R (HR).

<table>
<thead>
<tr>
<th>Step</th>
<th>$R$</th>
<th>$R^2$</th>
<th>$R^2_{adj}$</th>
<th>$R^2_{chg}$</th>
<th>$F_{chg}$</th>
<th>df</th>
<th>$p$</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>.512$^a$</td>
<td>.262</td>
<td>.253</td>
<td>.262</td>
<td>28.445</td>
<td>1,80</td>
<td>&lt;.001</td>
</tr>
<tr>
<td>2</td>
<td>.659$^b$</td>
<td>.434</td>
<td>.420</td>
<td>.172</td>
<td>24.020</td>
<td>1,79</td>
<td>&lt;.001</td>
</tr>
</tbody>
</table>

Predictors: a. TORCH-R b. Accuracy

Table 6.16. Regression Coefficients, t-Statistics and Correlation for Year 6 TORCH-R (HR).

<table>
<thead>
<tr>
<th>Model</th>
<th>$B$</th>
<th>$\beta$</th>
<th>$t$</th>
<th>$p$</th>
<th>Bivariate</th>
<th>Partial</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.TORCH-R</td>
<td>.506</td>
<td>.512</td>
<td>5.33</td>
<td>&lt;.001</td>
<td>.512</td>
<td>.512</td>
</tr>
<tr>
<td>2.TORCH-R</td>
<td>.375</td>
<td>.379</td>
<td>4.27</td>
<td>&lt;.001</td>
<td>.512</td>
<td>.439</td>
</tr>
<tr>
<td>Accuracy</td>
<td>.214</td>
<td>.436</td>
<td>4.90</td>
<td>&lt;.001</td>
<td>.551</td>
<td>.483</td>
</tr>
</tbody>
</table>

6.3.10.4. Summary: Reading Comprehension (TORCH-R).

Year 6 reading comprehension scores can be explained by two predictor variables, pre TORCH-R contributing 26.2% of the variance and pre Reading Accuracy, accounting for 17.2%. Although the effect size indicated a moderate intervention effect ($d = .54$), FORSCI was not identified as a unique contributor.

6.3.11. Year 6: Reading Accuracy (RA).

6.3.11.1. Variables Explaining Variance in Year 6 RA (SE).

The seven predictors variables accounted for approximately 81.3% of the variance, $R^2 = .813$, $R^2_{adj} = .796$, $F (7, 74) = 46.091$, $p < .001$. Pre Reading Accuracy ($\beta = .775$, $p < .001$) and Age ($\beta = -.165$, $p = .003$) were the only predictors (Table 6.17). The effect size was small and did not reach the minimum required for practical significant effect ($d = 0.23$).
Table 6.17. Regression Coefficients, t-Statistics and Correlation for Year 6 Reading Accuracy (SE).

<table>
<thead>
<tr>
<th>Year</th>
<th>Predictors</th>
<th>B</th>
<th>β</th>
<th>t</th>
<th>p</th>
<th>Bivariate</th>
<th>Partial</th>
</tr>
</thead>
<tbody>
<tr>
<td>6</td>
<td>Accuracy</td>
<td>.691</td>
<td>.775</td>
<td>12.031</td>
<td>&lt;.001</td>
<td>.886</td>
<td>.813</td>
</tr>
<tr>
<td></td>
<td>Age</td>
<td>-.696</td>
<td>-.165</td>
<td>-3.041</td>
<td>.003</td>
<td>-.417</td>
<td>-.333</td>
</tr>
</tbody>
</table>

6.3.11.2. Significance of Variables.

1) Reading Accuracy ($\beta = .775$). Post Reading Accuracy scores will increase by 16.23 (.775 x 20.95). A large effect size indicated.

2) Age ($\beta = -.165$). Post Reading Accuracy scores will decrease by 3.46 (-.165 x 20.95). This value indicated that reading accuracy does not improve with age. Younger children are expected to perform better on word recognition than older children. A small effect size indicated.

6.3.11.3. Variance Contribution (HR).

The two-step model accounted for 80.5% of the variance in post Year 6 Reading Accuracy scores $R=.897$, $R^2 = .805$, $R^2_{adj} = .800$, $F (2, 79) = 162.787$, $p < .001$. Table 6.18 and Table 6.19 present a summary of the steps generated by the hierarchical regression. When other the variables were taken into account, Year 6 children’s reading comprehension scores can be explained by pre Reading Accuracy which accounted for 78.5% of the variance in post Reading Accuracy scores. Age in step 2 of the model, was not significant at the Bonferroni adjustment level, $p = .004$. 

199
Table 6.18. Variance Contribution for Year 6 Reading Accuracy (HR).

<table>
<thead>
<tr>
<th>Step</th>
<th>( R )</th>
<th>( R^2 )</th>
<th>( R^2_{adj} )</th>
<th>( R^2_{chg} )</th>
<th>( F_{chg} )</th>
<th>df</th>
<th>( p )</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>.886a</td>
<td>.785</td>
<td>.782</td>
<td>.785</td>
<td>292.196</td>
<td>1, 80</td>
<td>&lt;.001</td>
</tr>
<tr>
<td>2</td>
<td>.897b</td>
<td>.805</td>
<td>.800</td>
<td>.020</td>
<td>7.951</td>
<td>1, 79</td>
<td>.006</td>
</tr>
</tbody>
</table>

Predictors: a. Accuracy  b. Age

Table 6.19. Regression Coefficients, \( t \)-Statistics and Correlation for Year 6 Reading Accuracy (HR).

<table>
<thead>
<tr>
<th>Model</th>
<th>( B )</th>
<th>( \beta )</th>
<th>( t )</th>
<th>( p )</th>
<th>Bivariate</th>
<th>Partial</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Accuracy</td>
<td>.790</td>
<td>.886</td>
<td>17.094</td>
<td>&lt;.001</td>
<td>.886</td>
<td>.886</td>
</tr>
<tr>
<td>2. Accuracy</td>
<td>.748</td>
<td>.839</td>
<td>15.90</td>
<td>&lt;.001</td>
<td>.886</td>
<td>.874</td>
</tr>
<tr>
<td>Age</td>
<td>-.625</td>
<td>-.148</td>
<td>-2.820</td>
<td>.006</td>
<td>-.417</td>
<td>-.302</td>
</tr>
</tbody>
</table>

6.3.11.4. Summary: Reading Accuracy (RA).

Year 6 reading accuracy scores can be explained by the combination of seven predictors which accounted for 81.3% of the variance. The main predictors of post Reading Accuracy scores were pre Reading Accuracy (\( \beta = .839 \)) and Age (\( \beta = -.148 \)). Age had a negative \( \beta \) value indicating that Reading Accuracy scores will decrease with increasing age of the child. Age did not reach significance when reanalysed using hierarchical regression. Only Reading Accuracy accounted for 78.5% of the variance above and beyond the other predictors. FORCSI did not explain children’s word accuracy performance. The mean difference between groups was small (\( d = .23 \)).


6.3.12.1. Variables Explaining Variance in Year 6 TF (SE).

The seven predictors variables accounted for approximately 72.8% of the variance, \( R^2 = .728 \), \( R^2_{adj} = .702 \), \( F (7, 74) = 28.287 \), \( p < .001 \). Pre Text Fluency (\( \beta = \)
.403, p < .001) and Reading Accuracy (β = .484, p < .001) were the only predictors (Table 6.20). A small effect size (d = .11) was indicated.

Table 6.20. Regression Coefficients, t-Statistics and Correlation for Year 6 Text Fluency (SE).

<table>
<thead>
<tr>
<th>Year</th>
<th>Predictor</th>
<th>B</th>
<th>β</th>
<th>t</th>
<th>p</th>
<th>Bivariate</th>
<th>Partial</th>
</tr>
</thead>
<tbody>
<tr>
<td>6</td>
<td>Text Fluency</td>
<td>.431</td>
<td>.403</td>
<td>5.429</td>
<td>&lt;.001</td>
<td>.692</td>
<td>.534</td>
</tr>
<tr>
<td></td>
<td>Accuracy</td>
<td>.420</td>
<td>.484</td>
<td>6.214</td>
<td>&lt;.001</td>
<td>.745</td>
<td>.586</td>
</tr>
</tbody>
</table>

6.3.12.2. Significance of Variables.

1) Text Fluency (β = .403). Post Text Fluency scores will increase by 8.22 (.403 x 20.40). A small effect size indicated.

2) Reading Accuracy (β = .484). Post Reading Accuracy scores will decrease by 9.87 (.484 x 20.40). A moderate effect size indicated.


The two-step model accounted for 69.4% of the variance in post Year 6 Text Fluency scores, $R^2 = .694$, $R^2_{adj} = .686$, $F (2, 79) = 89.464$, $p < .001$. Table 6.21 and Table 6.22 present a summary of the steps generated by the hierarchical regression. When other the variables were taken into account, Year 6 children’s reading fluency scores can be explained by pre Text Fluency and Reading Accuracy which accounted for 47.9% and 21.4% of the variance in post Text Fluency scores respectively.

Table 6.21. Variance Contribution for Year 6 Text Fluency (HR).

<table>
<thead>
<tr>
<th>Step</th>
<th>R</th>
<th>$R^2$</th>
<th>$R^2_{adj}$</th>
<th>$R^2_{chg}$</th>
<th>$F_{chg}$</th>
<th>df</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>.692&lt;sup&gt;a&lt;/sup&gt;</td>
<td>.479</td>
<td>.473</td>
<td>.479</td>
<td>73.614</td>
<td>1, 80</td>
<td>&lt;.001</td>
</tr>
<tr>
<td>2</td>
<td>.833&lt;sup&gt;b&lt;/sup&gt;</td>
<td>.694</td>
<td>.686</td>
<td>.214</td>
<td>55.325</td>
<td>1, 79</td>
<td>&lt;.001</td>
</tr>
</tbody>
</table>

Predictors: a. Text Fluency b. Accuracy
Table 6.22. Regression Coefficients, \( t \)-Statistics and Correlation for Year 6 Text Fluency (HR).

<table>
<thead>
<tr>
<th>Model</th>
<th>( B )</th>
<th>( \beta )</th>
<th>( t )</th>
<th>( p )</th>
<th>Bivariate</th>
<th>Partial</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Fluency</td>
<td>.740</td>
<td>.692</td>
<td>8.580</td>
<td>&lt;.001</td>
<td>.692</td>
<td>.692</td>
</tr>
<tr>
<td>2. Fluency</td>
<td>.457</td>
<td>.428</td>
<td>5.965</td>
<td>&lt;.001</td>
<td>.692</td>
<td>.557</td>
</tr>
<tr>
<td>Accuracy</td>
<td>.463</td>
<td>.533</td>
<td>7.438</td>
<td>&lt;.001</td>
<td>.745</td>
<td>.642</td>
</tr>
</tbody>
</table>

6.3.12.4. Summary: Text Fluency (TF).

Year 6 text fluency scores can be explained by two predictor variables, pre Text Fluency contributing 47.9% of the variance and pre Reading Accuracy, accounting for 21.4%. The effect size indicated a small intervention effect (\( d = .11 \)).

6.4. Qualitative Findings.

6.4.1. Introduction.

In the last chapter, the qualitative data showed both research sites sharing similar class-level characteristics reducing the number of alternative plausible conclusions, a problem commonly associated with non-randomised studies (Cook & Campbell, 1979b). Chapter 6 builds on these findings by using qualitative data collected from classroom observations and researcher’s reflections from field notes to gain deeper insights into the dynamics of the reading intervention. The presentation of these qualitative findings addressed two questions (Reinking & Watkins, 2000). The first questions asked what factors inhibited or enhanced FORCSI while achieving the goal of improving children’s reading performance and the second question, were there any modifications to FORCSI and its implementation? Chapter 7 will address the third and final question asking did FORCSI produce any positive or negative effects?

The interpretation of events was organised into themes and indicated by the subsequent headings: Instructional Components and Text Difficulty addressing the factors affecting FORCSI. Modifications to FORCSI are discussed under the
following headings: Classroom Assistance and Recognition Scheme. The themes contain major incidents that were not necessarily presented in order of their appearance.

6.4.2. Factors Inhibiting or Enhancing FORCSI.

6.4.2.1. Instructional Components.

Children were to be oriented to FORCSI in the first week, in the Orientation Phase. In Weeks 2 and 3, the Guided Practice Phase, children would be given guided practice in reading fluently with prosody and to answer questions using the correct comprehension strategy. It was anticipated that by the end of the Week 3 or after nine sessions, children in the five classes would be working independently, settling into a routine of following the instructional components of: a) reading fluently to their partner, b) providing corrective feedback to their reading partner, c) applying the appropriate comprehension strategy when answering the comprehension questions and, d) recording the session’s reading results. This would then leave the remaining six weeks or 18 sessions where children could work independently. This Intervention Phase allowed for any intervention effects to take place within the nine-week experimental period. Previous studies had used fluency interventions lasting from only a few times a week (Wexler et al., 2008) to 15 days (Wolf & Katzir-Cohen, 2001) with some of the highest outcome effects were from interventions with at least 20 sessions and averaging about 15 minutes per session (Conte & Humphreys, 1989; Rashotte & Torgesen, 1985).

The three weeks of getting children accustomed to FORCSI followed by six weeks where FORCSI was to be fully operational, did not develop as planned. FORCSI in its entirety was only implemented in the last four weeks of the intervention period resulting in 12 sessions instead of 18 sessions. For the first five weeks, the 30 minutes allotted for each class was not sufficient to cover all the instructional components leaving children only enough time to read passages twice instead of three times. Therrien (2004) found when passages were read three \((d = .85)\) or four times \((d = .95)\), the mean fluency effect size increased by more than 30% than when the passages were read twice \((d = .57)\). Time constraints and
organisational challenges may have hindered FORCSI’s ability to improve word processing skills of Year 4 intervention children as larger gains were achieved by their year-level counterparts on word accuracy \( (d = -.09) \) and text fluency \( (d = -.06) \).

More time was needed to set up the various instructional components such as organising the partner-reading dyads and recording the day’s reading results on children’s individual Progress Chart (see Chapter 3 Methodology). These two components were particularly problematic for two classes, the composite Year 3/4 and Year 4 classes. Even with the assistance of their classroom teacher, it was not until five weeks later when children could organise themselves in reading pairs and record their results so three readings could be conducted per session.

Ms Elizabeth (pseudonym) the Year 3/4 teacher remarked the class found the recording of the results difficult because “they’re a bit lazy” and “they’re used to teachers doing all the hard stuff for them”. Class resistance and non-compliance to graphing the results meant a great deal of the 30 minutes was taken up in completing this instructional component leaving only enough time two readings of the passage. It also took longer for children in this class to be a good “reading coach” for their partner. Initially, many found it difficult to listen while their partner read aloud to them as well as monitoring for word errors. The same problems experienced in Year 3/4 was also evident in Year 4 as children also found aspects of partner reading and recording of performance difficult.

Adding to this problem was the poor class dynamics. At the beginning of the intervention, frequent disputes among children in Years 3/4 and Year 4 disrupted the FORCSI sessions. As class members were unable to work collaboratively, many reading partners had to be separated and new partners found for them. Because of the frequent disruptions, this too meant that children had enough time to only practice reading the passage twice instead of three times.

It was a paradox that graphing results was once the bane for some children (i.e., Year 3/4 and Year 4) changed from inhibiting FORCSI to enhancing it. Notes taken from classroom observations of Year 3/4 class (Tuesday 29th August) recorded how three children were running excitedly to Ms Elizabeth to show her their Progress Chart indicating how well they read in the session with the teacher/
researcher. In the staffroom during lunchtime, Ms Grace, the Year 4 teacher, noted the children’s attitudes about reading were more positive now and attributed this change to the visual feedback of the Progress Chart (Journal entry: Monday 6th November). Not a visual learner herself, Ms Grace appreciated how a graphical representation showing reading improvement could, “feed success into visual learners”. She added, “It has taught me how important it is to give immediate feedback, how they need it and a lot more. I think I will adjust what I do now in reading”. Ms Elizabeth also liked the charting of the session’s reading results (Journal entry: Tuesday 14th November).

Although implementing FORCSI took longer than expected, findings indicated a moderate effect size of practical significance for Year 4 listening comprehension ($d = .48$). In addition, FORCSI was able to explain 7.8% of the variance in listening comprehension scores, above and beyond Reading Accuracy (42.2%) and the pretest NARA-L (12.3%) for this year group. This result may have been influenced by the comprehension strategy instruction component of FORCSI in which children had at least 21 sessions. When compared to the 12 sessions where children were independently reading the passage three times, this could explain the small effect size reported for reading comprehension ($d = .10$), word accuracy ($d = -.09$) and reading fluency ($d = -.06$).

Children in Years 5 and 6 did not have difficulties with either recording results or organising themselves with a reading partner. By the fourth week, they were working independently with minimum supervision from either the class-teacher or the researcher/teacher. Results from hierarchical regression conducted on the whole sample (see Chapter 5) indicated FORCSI (or Group) explained a significant proportion of variance for children’s listening (1.6%) and reading (2.1%) comprehension scores. Multivariate analysis conducted across year levels did demonstrate an intervention effect of practical significance for Year 5 listening comprehension ($d = .88$), reading comprehension ($d = .55$) and reading accuracy ($d = .55$). For children in Year 6, intervention effects were reported for reading comprehension ($d = .54$) and reading accuracy ($d = .23$). These findings suggest FORCSI’s suitability as a supplemental multi-component reading programme for Year 5 and 6 students for improving comprehension and word recognition skills.
6.4.2.2. Difficulty of Text.

Views on the difficulty of the text used during fluency intervention remains varied. Some fluency studies recommended the use of independent level text or text that can be read accurately while developing reading fluency (Chard et al., 2002; Meyer & Felton, 1999). Others support the use of more difficult text to improve achievement provided there is sufficient support and scaffolding provided (Dougherty-Stahl, 2012; Kuhn & Stahl, 2003). Because there were two composite classes (Year 3/4 and Year 5/6), it was decided for pragmatic and organisational reasons all of the children in these composite classes would read the same text rather than having two separate texts, one for each year level. This meant some of the younger and less skilled readers in the class, reading the FORCSI passages were going to be beyond their reading level. Having children read the same text, regardless of ability level, may have played a role in changing the attitude of some of the readers from shame and embarrassment to pride in their reading achievement. During recess, Henry came up to the researcher to tell her, “I like reading because I can now read” (Journal entry: Tuesday 29th August). Henry was a Year 4 student with reading difficulties and initially did not want to participate in the reading programme. Max (see Introduction Chapter) is from the same class and was another disengaged reader. On the front of his reading folder he has written “Reading Rocks” in bold colourful calligraphy (Classroom observation: Tuesday 29th August). Rebecca (see Introduction Chapter) proudly shared her achievement of reading 102 words in the story “Ancient Times” with the researcher (Classroom observation: Tuesday 29th August). Henry, Max and Rebecca were able to read the same text as everybody else in the class and this made them feel as though they were able readers and not “dumb readers” (Journal entry: Tuesday 29th August).

6.4.3. Modifications to FORCSI.

A limited account of the modification is provided because of the ever-changing and fluid nature of data collection and classrooms. Initially, data collected through observational field notes and a reflective journal was anticipated to proceed through distinct cycles. In actuality, this process was at times, ad hoc. Changes were made intuitively and came from a teaching career of over 30 years. These changes
were made in response to the contextual demands of individual classes, students, and teachers rather than on the researcher’s deliberated evaluation of the accumulated data. The modifications made were in response to demands operating simultaneously and are reported under the following headings: Classroom Assistance and Recognition Scheme.

6.4.3.1. Classroom Assistance.

In three of the five classes, the class teacher assisted by conducting FORSCI with a small group of struggling readers. This was not planned but evolved out of the diverse range of ability levels in these three classes. By the third week, Ms Elizabeth and Ms Grace had offered to take the five or six of the poorest readers for the partner reading session, completion of the comprehension questions, and charting their reading results. These children spent the first ten minutes with the whole class participating in the before reading activities (see Chapter 3) prior to moving to the back of the classroom to work with their own classroom teacher. One other class had the class teacher sit beside the child and act as the reading partner as well as assisting him with the comprehension questions. In studies where a whole-class approach to fluency instruction was used, children were not given additional support (Kuhn & Stahl, 2003). As a result of Ms Elizabeth and Ms Grace taking an active role in supporting children in FORCSI, this may have contributed to Year 4’s medium effect size ($d = .48$) in listening comprehension.

6.4.3.2. Recognition Scheme.

The introduction of a recognition scheme was needed as explained in the following reflection from the researcher’s field notes (Monday 31st July): "Classroom management was becoming problematic in three of the classes." Children were disruptive and distracting other children because they were reluctant to participate in the reading activities. This resulted in spending too much time establishing class discipline and not enough time on teaching. It was necessary to set-up some kind of recognition/reward system.

The recognition scheme complemented the existing school-wide reward system and included giving out tokens whenever good behaviour was demonstrated.
When a child collects ten tokens, this can be exchanged for a “Friendship Award” or a “Knowledge Award”. An accumulation of these “Awards” can be exchanged for bigger rewards given out in the weekly school assembly. The recognition scheme was introduced in the third week and continued up until the final week of the intervention. The recognition scheme may have played a role in developing children’s positive emotions and psychosocial orientation towards reading.

6.5. Chapter Summary.

The findings suggested for optimal reading development in children, the following should be given attention. First, reading accurately requires teaching throughout the middle years. Traditionally, this word processing skill is assumed to be mastered by the end of Year 3 (Chall, 1996). The findings indicated for children in Year 4, variance in listening comprehension can be largely explained by reading accuracy (42.2%), a proportion almost three and a half times larger than its pretest covariate (12.3%). Reading accuracy explained the variance in Year 4 text fluency (19.2%), Year 6 reading comprehension (17.2%), Year 6 text fluency (21.4%), and a substantial proportion of the variance in Year 6 accuracy (78.5%).

Qualitative data indicated Year 5 and 6 were able to settle into the FORCSI routine by the end of the third week and this may have enabled Year 5 and 6 students to reread the passages three times per session for more of the 18 sessions than the younger classes. This may explain the moderate effect size reported for Year 5 word accuracy performance ($d = .55$) and to a lesser extent, the small intervention effect for Year 6 word accuracy ($d = .23$). Year 4 children did not receive as much practice in repeated readings as the older children, having read passages three times in only 12 sessions. Year 4 effect size indicated the comparison group performed better in word accuracy ($d = -.09$) and text fluency ($d = -.06$).

The findings also draw attention to children’s earlier performance predicting their future performance. The standardised $\beta$ values allowed for the direct comparison with other predictors making it easier to identify the importance of a predictor in the model (Field, 2009). In all of the four reading skills, pretest covariates remained the most important predictor of the outcome measure. The
covariates had \( \beta \) values ranging from \( \beta = .86 \) (pretest Year 4 Reading Accuracy) to \( \beta = .40 \) (pretest Year 6 Text Fluency).

Finally, teaching children comprehension strategies may have influenced the large effect size for Year 5 listening comprehension \( (d = .88) \) and the moderate effect size for Year 4 listening comprehension \( (d = .48) \), as well as Year 5 \( (d = .55) \) and Year 6 \( (d = .54) \) reading comprehension. Children across the three year levels, on average, had at least 21 sessions and in some classes the classroom teacher was involved with providing instruction, guidance, and support to a small group of struggling readers. The duration of comprehension strategy instruction and the support provided by a few classroom teachers may have bearings on these comprehension results.
7.

RESULTS: RELATIONSHIPS BETWEEN PSYCHOSOCIAL CONSTRUCTS AND READING-RELATED CHOICES.

7.1. Introduction.

Chapter 7 addresses the third research question: what is the relationship between the psychosocial constructs (thoughts, beliefs, and emotions) and reading related choices (choice of text difficulty, core and elective activities). To what extent did the FORCSI intervention influence children’s psychosocial orientation to reading? A review of the descriptive statistics begins this chapter followed by the multivariate analysis of the data. Qualitative data, as a secondary source of information in this analysis, addressed the question of whether or not FORCSI produced any positive or negative effects?

7.2. Review of Descriptive Analysis: Psychosocial Constructs.

To capture the multifaceted dimensions of children’s psychosocial orientation to reading, measures were used to examine children’s self appraisal of their thoughts, emotions, and participatory or choice behaviour. At the pretest, the two groups were equivalent on the scales measuring the psychosocial constructs but differences appeared at posttest. The differences suggest FORCSI may have facilitated children’s improvement in their thoughts, emotions, and behaviours about reading. For instance, intervention children made substantial gains in their means scores of Reading Self Concept and Task Values when compared to the comparison group. There were also differences in the mean scores from pretest to posttest on children’s achievement emotions when engaged in reading in their everyday life. Intervention children were more likely to be angry and comparison children more likely to feel guilty about reading in general. Finally, children’s participatory behaviour differed between groups. At posttest, intervention children on the average chose more age-appropriate TORCH stories to read and complete the comprehension activity than did children in the comparison group.

7.3.1. Quantitative Data Summary.

Children’s reading engagement (participatory behaviour) was measured in three ways: a) choice of text difficulty, b) willingness to participate in core tasks (reading and number activities) and c) elective tasks (drawing and physical movement activities). Each outcome measure was explained by a different set of predictor variables. Choice of Text Difficulty was explained by Self Concept (6.6%), Age (5.7%) and FORCSI (5%) controlling for other predictors. Children will choose the level of text difficulty commensurate with their age and reading self concept. The younger the child and the lower is his or her self concept, the greater willingness to choose reading materials that are simple and easy to read. Conversely, children are more willing to choose grade-appropriate texts if they are older and with a higher level of reading self concept. The treatment effect was moderate and of practical significance ($d = .53$) supporting FORCSI as a significant contributor to improving children’s choice behaviour towards reading.

Three predictors explained Choice of Core Activities, including Task Values (24.5%), Anger (5.2%) and Age (3.4%) when all other predictors were held constant. Younger children were more willing to participate in reading and number tasks (core activities) than older children. Children not angry when reading, were more willing to choose Core activities than children who did experience a lot of anger during reading. Children who are very interested in reading and see the importance of reading, are more willing to choose to participate in Core activities than children less interested and who does not highly value reading as an important subject.

The emotions sustained during reading for research purposes ($\beta = .26$) was an important predictor explaining its high shared variance with the dependent variable, Choice of Elective Activities. The small and negative effect size ($d = -.29$) indicated the comparison children’s greater willingness to participate in drawing and physical movement activities than intervention children.
7.3.2. Qualitative Data Summary.

Previous studies on fluency intervention have reported children’s greater willingness and desire to read at the conclusion of the intervention (Rasinski, et al., 1994), improved reading self-esteem (Roundy & Roundy, 2009), increased motivation, and confidence (Clark, et al., 2009). Similar results were found when the qualitative data was analysed using student notes, questionnaire responses, journal entries and observational field notes.

Data was collected in response to the question, did FORCSI produce any unanticipated positive or negative effects? The data was analysed in terms of observed student engagement as this construct has been documented as a predictor of reading achievement (Guthrie, Wigfield, & Klauda, 2012; Guthrie, Wigfield, & You, 2012). Student engagement as a positive outcome of FORCSI, was observed and documented in the following four areas: a) children’s motivated and positive conduct were indicators of behavioural engagement, b) improved reading results from the yearly class tests and use of strategies suggesting cognitive engagement, c) positive affect, enhanced self concept, and confidence indicating emotional engagement, and c) high teacher involvement. Offering children choices provided a learning context for optimizing student engagement. Overall, the findings suggested FORCSI did produce a positive effect on student engagement. The qualitative data complemented the findings from the quantitative analysis.

7.4. Quantitative Findings: Relationship Between Psychosocial Constructs and Reading Related Choices.

Research Question 3: What are the relationships between children’s self concept, task values, emotions and their choice of text difficulty, core and elective activities (or reading engagement)? To what extent did FORCSI explain children’s participatory behaviour?

The predictor variables included three student profile covariates (Age, Gender and Group) and nine psychosocial variables relating to children’s thoughts (Self Concept, Task Values) and emotions experienced during general everyday reading
(Pleased, Guilty, Angry, Worry) and specific school-related reading activities (Sustained Silent Reading (SSR), Reading for Research (RSCH) and Reading for Homework (HWK). The three dependent variables were measures of children’s participatory behaviour, or their reading related choices including Choice of Text Difficulty, Choice of Core Activities and Choice of Elective Activities.

Two analyses were conducted for each dependent variable. The first analysis, Variables Explaining Variance, used the simultaneous entry method to regress the 12 predictor variables on the four posttest scales measuring children’s choice behaviour. Non significant variables were removed and only the significant predictors reported at the Bonferroni adjustment, $p = .004$. The second analysis, Variance Contribution, included hierarchical regression to identify how each predictor variable can account for the variance of the outcome measure above and beyond the other independent variables.

7.4.1. Assumption Testing.

Preliminary analysis assessed the feasibility of conducting MLR by testing five key assumptions; multivariate normality, linear relationship, homoscedasticity, auto-correlation and multicollinearity. An examination of the normal probability plot and the histogram for the variables indicated normal distribution. Several scatterplots were examined and these showed reasonable consistency of spread through the distributions indicating that it was consistent with the assumption of linearity and homoscedasticity. The Durbin–Watson tests indicated the residuals were not correlated as the test statistic $d$, varied from 1.84 to 2.17.

The variance inflation factor (VIF) and the tolerance statistics were used to test for multicollinearity. Multicollinearity among predictors is likely to occur when the VIF value is greater than 10 and when the tolerance statistics is below .2 (Field, 2009). There was no evidence of multicollinearity as the highest VIF value was 2.72 (pretest Angry) and the lowest tolerance statistics was .37 (pretest Guilty). Multivariate outliers were identified using Mahalanobis Distance (MD). The MD scores exceeding the critical chi-square value of 34.53 were examined. These cases appeared to have a range of responses, were reasonable, logical, and subsequently
were not deleted from the analyses. The results of the preliminary examinations of the data indicated MLR could be reliably undertaken.

7.4.2. Choice of Text Difficulty (Cdiff).

7.4.2.1. Variables Explaining Variance Text Difficulty (SE).

The combination of the 12 predictor variables explained accounted for approximately 21.6% of the variance in the Choice of Text Difficulty posttest score, \( R^2 = .216, R^2_{adj} = .170, F (12, 203) = 4.661, p < .001 \). In Table 7.1, \( \beta \) weights show the relative importance of the predictors in the model, with Age \( (\beta = .289, p < .001) \) as the strongest predictor followed by Self Concept \( (\beta = .276, p < .001) \), then Group \( (\beta = .242, p < .001) \). The effect size of the intervention, was moderate \( (d = 0.53) \) indicating a standardised mean difference of practical significance (Ferguson, 2009).

Table 7.1. Regression Coefficients, t-Statistics and Correlation Text Difficulty (SE).

<table>
<thead>
<tr>
<th>Predictor</th>
<th>B</th>
<th>( \beta )</th>
<th>( t )</th>
<th>( p )</th>
<th>Bivariate</th>
<th>Partial</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td>.056</td>
<td>.289</td>
<td>4.363</td>
<td>&lt;.001</td>
<td>.239</td>
<td>.293</td>
</tr>
<tr>
<td>Self Concept</td>
<td>.694</td>
<td>.276</td>
<td>3.362</td>
<td>&lt;.001</td>
<td>.213</td>
<td>.230</td>
</tr>
<tr>
<td>Group</td>
<td>1.083</td>
<td>.242</td>
<td>3.698</td>
<td>&lt;.001</td>
<td>.255</td>
<td>.251</td>
</tr>
</tbody>
</table>

7.4.2.2. Significance of Variance.

For an increase of one standard deviation in the predictors below, Choice of Text Difficulty \( (SD = 2.24) \) scores will increase in standard deviations given the following values:

1) Group \( (\beta = .242) \). Post Choice of Text Difficulty scores will increase by .54 \( (.242 \times 2.24) \) when children are in the intervention group. A large effect size indicated.

2) Self Concept \( (\beta = .276) \). Post Choice Text Difficulty scores will increased by .63 \( (.276 \times 2.24) \) for an additional increase in one standard deviation in Self
Concept. When self concept is low, children are expected to choose to read texts that are simple and easy. When self concept is high, children are expected to read texts that are age-appropriate or higher. The effect size was large.

3) Age ($\beta = .289$). Choice of Text Difficulty will increase with age. This value indicated older students are predicted to do better on Choice of Text Difficulty than younger students. For every 11.51 months of age, a child’s score on the Choice of Text Difficulty is expected to increase by .65 (.289 x 2.24). The effect size was large.

7.4.2.3. Variance Contribution (HR).

A three-step hierarchical regression model (Table 7.2) accounted for 17.3% of the variance in the final Choice of Text Difficulty scores for all students, intervention and comparison. $R^2 = .173$, $R^2_{adj} = .162$, $F (3, 212) = 14.834$, $p < .001$. Children’s variance in their choice of text-level reading material can be best explained by three predictors: Age (5.7% of variance explained), Self Concept (6.6%) with Group (i.e., FORCSI) explaining 5% of the variance in children’s choice of text-level scores. Table 7.3 presents a summary of the steps generated by the hierarchical regression.

<table>
<thead>
<tr>
<th>Model</th>
<th>$R$</th>
<th>$R^2$</th>
<th>$R^2_{adj}$</th>
<th>$R^2_{chg}$</th>
<th>$F_{chg}$</th>
<th>df</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>.239$^a$</td>
<td>.057</td>
<td>.053</td>
<td>.057</td>
<td>12.93</td>
<td>1, 214</td>
<td>&lt;.001</td>
</tr>
<tr>
<td>2</td>
<td>.351$^b$</td>
<td>.123</td>
<td>.115</td>
<td>.066</td>
<td>16.14</td>
<td>1, 213</td>
<td>&lt;.001</td>
</tr>
<tr>
<td>3</td>
<td>.417$^c$</td>
<td>.173</td>
<td>.162</td>
<td>.050</td>
<td>12.86</td>
<td>1, 212</td>
<td>&lt;.001</td>
</tr>
</tbody>
</table>

Predictors: a. Age  b. Self Concept  c. Group
Table 7.3. Regression Coefficients, t-Statistics and Correlation for Choice of Text Difficulty (SE).

<table>
<thead>
<tr>
<th>Model</th>
<th>$B$</th>
<th>$\beta$</th>
<th>$t$</th>
<th>$p$</th>
<th>Bivariate</th>
<th>Partial</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Age</td>
<td>.046</td>
<td>.239</td>
<td>3.596</td>
<td>&lt;.001</td>
<td>.239</td>
<td>.239</td>
</tr>
<tr>
<td>2. Age</td>
<td>.055</td>
<td>.283</td>
<td>4.351</td>
<td>&lt;.001</td>
<td>.239</td>
<td>.286</td>
</tr>
<tr>
<td>Self Concept</td>
<td>.656</td>
<td>.262</td>
<td>4.017</td>
<td>&lt;.001</td>
<td>.213</td>
<td>.265</td>
</tr>
<tr>
<td>3. Age</td>
<td>.053</td>
<td>.273</td>
<td>4.306</td>
<td>&lt;.001</td>
<td>.239</td>
<td>.284</td>
</tr>
<tr>
<td>Self Concept</td>
<td>.599</td>
<td>.239</td>
<td>3.748</td>
<td>&lt;.001</td>
<td>.213</td>
<td>.249</td>
</tr>
<tr>
<td>Group</td>
<td>1.006</td>
<td>.225</td>
<td>3.585</td>
<td>&lt;.001</td>
<td>.255</td>
<td>.239</td>
</tr>
</tbody>
</table>

7.4.2.4. Summary: Choice of Text Difficulty ($C_{diff}$).

$FORCSI$ did impact on children’s decision for choice of level of text difficulty, contributing 5% of the variance above and beyond the other predictors, Age (5.7%) and Self Concept (6.6%). The findings indicate children are more likely to choose age-appropriate text (or higher) as reading self concept and age increase. The moderate effect size ($d = .53$) suggests $FORCSI$ can assist with children’s choice behaviour in a practical and significant manner that facilitates reading engagement.

7.4.3. Choice of Core Activities ($C_{core}$).

7.4.3.1. Variables Explaining Variance Core Activities (SE).

Together the 12 predictors accounted for 45% of the variance in Choice of Core Activities posttest scores, $R^2 = .450$, $R^2_{adj} = .418$, $F (12, 203) = 13.855$, $p < .001$. Three predictors explained the outcome variable, Age ($\beta = -.210$), Angry ($\beta = -.228$) and Task Value ($\beta = .320$) as shown in Table 7.4. The mean difference between groups was small ($d = .20$).
Table 7.4. Regression Coefficients, t-Statistics and Correlation Choice of Core Activities (SE).

<table>
<thead>
<tr>
<th>Predictor</th>
<th>B</th>
<th>β</th>
<th>t</th>
<th>p</th>
<th>Bivariate</th>
<th>Partial</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td>-.017</td>
<td>-.210</td>
<td>-3.781</td>
<td>&lt;.001</td>
<td>-.189</td>
<td>-.257</td>
</tr>
<tr>
<td>Angry</td>
<td>-2.89</td>
<td>-.228</td>
<td>-3.764</td>
<td>&lt;.001</td>
<td>-.381</td>
<td>-.255</td>
</tr>
<tr>
<td>Task Value</td>
<td>.396</td>
<td>.320</td>
<td>4.417</td>
<td>&lt;.001</td>
<td>.495</td>
<td>.296</td>
</tr>
</tbody>
</table>

7.4.3.2. Significance of Variance.

For an increase of one standard deviation in the predictors below, Choice of Core Activities (SD = .93) scores will increase in standard deviations given the following values:

1) *Age* (β = -.210). As age increases, children are less likely to choose the core activities, reading and number. Said differently, this value also indicates younger children are predicted to choose reading and number tasks more than older children. For every 11.51 months of age, a child’s score on the Choice of Core Activities is expected to decrease by .20 (.210 x .93). The effect size was moderate.

2) *Angry* (β = -.228). Post Choice of Core Activities will decrease by .21 (-.228 x .93) with every increase of one standard deviation in Angry score. The effect size is moderate.

3) *Task Value* (β = .320). Post Choice of Core Activities will increase by .30 (.320 x .93) with every increase of one standard deviation in Task Value score. The effect size is large.

7.4.3.3. Variance Contribution (HR).

The three-step hierarchical regression model accounted for 33.1% of the variance in the posttest Choice of Core Activities scores, $R^2 = .33$, $R^2_{adj} = .32$, $F$ (3, 212) = 35.01 $p < .001$. The Task Value scores accounted for the largest share of the
variance (24.5%) followed by Angry scores (5.2%) then Age (3.4%). The results are presented in Table 7.5 and Table 7.6.

Table 7.5. Variance Contribution for Choice of Core Activities (HR).

<table>
<thead>
<tr>
<th>Model</th>
<th>$R$</th>
<th>$R^2$</th>
<th>$R^2_{adj}$</th>
<th>$R^2_{ch}$</th>
<th>$F_{ch}$</th>
<th>df</th>
<th>$p$</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>.495$^a$</td>
<td>.245</td>
<td>.242</td>
<td>.245</td>
<td>69.561</td>
<td>1, 214</td>
<td>&lt;.001</td>
</tr>
<tr>
<td>2</td>
<td>.545$^b$</td>
<td>.297</td>
<td>.290</td>
<td>.052</td>
<td>15.646</td>
<td>1, 213</td>
<td>&lt;.001</td>
</tr>
<tr>
<td>3</td>
<td>.576$^c$</td>
<td>.331</td>
<td>322</td>
<td>.034</td>
<td>10.893</td>
<td>1, 212</td>
<td>&lt;.001</td>
</tr>
</tbody>
</table>


Table 7.6. Regression Coefficients, t-Statistics and Correlation for Choice of Core Activities (SE).

<table>
<thead>
<tr>
<th>Model</th>
<th>$B$</th>
<th>$\beta$</th>
<th>$t$</th>
<th>$p$</th>
<th>Bivariate</th>
<th>Partial</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Task Values</td>
<td>.614</td>
<td>.495</td>
<td>8.340</td>
<td>&lt;.001</td>
<td>.495</td>
<td>.495</td>
</tr>
<tr>
<td>2. Task Values Angry</td>
<td>.513</td>
<td>.414</td>
<td>6.784</td>
<td>&lt;.001</td>
<td>.495</td>
<td>.422</td>
</tr>
<tr>
<td>3. Task Values Angry Age</td>
<td>.494</td>
<td>.399</td>
<td>6.667</td>
<td>&lt;.001</td>
<td>.495</td>
<td>.416</td>
</tr>
</tbody>
</table>

7.4.3.4. Summary: Choice of Core Activities (Ccore).

Children’s willingness to participate in reading and number tasks (core activities) can be explained by three variables, Task Value contributing 24.5% of the variance, Angry (5.2%) and Age (3.4%). If children enjoy reading and value it as an important subject, they are predicted to be more willing to choose reading and number tasks. Their choice is also affected by their emotions and age. Younger children are predicted to be more willing to participate in Core activities than older children. Children who do not experience anger during reading tasks are also predicted to be more willing to participate in Core activities. The effect size showed a small intervention effect ($d = .20$).
7.4.4. Choice of Elective Activities (Celect).

7.4.4.1. Variables Explaining Variance Elective Activities (SE).

Together the 12 predictors accounted for 19.9% of the variance in Choice of Elective Activities posttest scores, \( R^2 = .199, R^2_{adj} = .152, F (12, 202) = 4.195, p < .001 \). Only one predictor explained the outcome variable, Research (\( \beta = .256 \)) as shown in Table 7.7. The mean difference between groups was small and negative, indicating the comparison group had a greater willingness to participate in drawing and physical movement tasks (elective activities) than the intervention group (\( d = - .29 \)).

Table 7.7. Regression Coefficients, t-Statistics and Correlation for Choice of Elective Activities (SE).

<table>
<thead>
<tr>
<th>Predictor</th>
<th>B</th>
<th>( \beta )</th>
<th>t</th>
<th>p</th>
<th>Bivariate</th>
<th>Partial</th>
</tr>
</thead>
<tbody>
<tr>
<td>Research Reading</td>
<td>.225</td>
<td>.256</td>
<td>2.936</td>
<td>.004</td>
<td>.292</td>
<td>.202</td>
</tr>
</tbody>
</table>

7.4.4.2. Significance of Variance.

For an increase of one standard deviation in Research Reading (\( \beta = .256 \)), post Choice of Elective Activities (SD = .68) will increase by .18 (.256 x .68).

7.4.4.3. Summary: Choice of Elective Activities (Celect).

Children’s willingness to participate in drawing and physical movement tasks (elective activities) can be explained by the combination of 12 predictors. These predictors explained 19.9% of the variance. The emotions experienced while reading for a research project was the only important predictor (\( \beta = .26 \)) explaining the large shared variance it shared with the outcome variable. The effect size was small and negative, indicating children in the comparison group were more willing to participate in these elective activities than intervention children (\( d = -.29 \)).

219
7.5. Qualitative Findings: Reading Related Choices and Engagement.

7.5.1. Introduction.

Although the intervention was designed to improve children’s comprehension and word processing skills, the reading programme may have produced other unanticipated outcomes and perhaps advanced other pedagogical goals (Newman, 1990). In this section the final design-based question is addressed: did FORCSI produce any unanticipated positive or negative effects?

Qualitative data was analysed and results synthesised to explore student engagement. Student engagement is a predictor of achievement in reading as it facilitates skill development and learning (Guthrie, Wigfield, & Klauda, 2012; Guthrie, Wigfield, & You, 2012). Engagement is multidimensional, encapsulating student’s behavioural, cognitive, affective and social involvement during class instruction (Baker, Afflerbach, & Reinking, 1996; Guthrie, et al., 2004). From this perspective, the qualitative data will be interpreted using student engagement as a rubric and discussed here in four sections exploring behaviour, cognition, affect and social context.

7.5.2. Engagement and Behaviour.

Engaged students are characterised as highly motivated students, ready to participate in any new learning opportunities with positive conduct, effort and persistence (Guthrie, Wigfield & You, 2012). This could not be said of students in the beginnings weeks of the intervention. The following researcher’s reflection highlights the challenges inherent when a “foreign teacher” invaded a new classroom territory: (Journal entry: Wednesday 2\textsuperscript{nd} August):

Had another tough time with James, Toby and Nicholas (Ms Grace’s class). James had detention with me as he did not do as asked. After giving him three warnings to settle down and work, he still persisted in distracting others around him. This then set off Toby who began calling out with Nicholas joining in. Bedlam erupts. They’re testing their boundaries.
Expect more of the same until they get to know me. This is just my rite of passage as a newcomer.

As children became more familiar with the routine of FORCSI, the children became more task-focused with fewer disruptive outbursts. Engaged student behaviour was noted by a substitute teacher complimenting the class on “working well” during FORCSI (Observation field notes: Tuesday 15\textsuperscript{th} August). A casual conversation with the substitute teacher during recess had her remarking how she was surprised to see the class working independently with a minimum of supervision. For the past two days she had taken the Year 4 class while Ms Grace was away. She too found the class a behaviourally challenging (Journal entry: Tuesday 15\textsuperscript{th} August).

The library teacher had to come in to teach Year 6 as Mr Paul, the class teacher, was arriving later in the morning. She volunteered to be the reading partner for Parker, whose reading partner was away for the day. She too complimented the class for their “fine effort” and was very “impressed” with their partner reading (Observation field notes: Monday 21\textsuperscript{st} August). During recess, the library teacher shared how she was surprised at how cooperative Parker was as her reading partner and how he read unexpectedly well. Parker is well known in the school for his behavioural problems.

The children’s engaged behaviour during FORCSI was also observed by Ms Grace. She found the class “highly attentive, so on task. There wasn’t a child that didn’t participate that I could see” (Journal entry: Monday 6\textsuperscript{th} November). Ms Elizabeth noted when it came to partner reading, the class had settled into the session quickly as they “just get on with it” (Journal entry: Wednesday 15\textsuperscript{th} November), a very different scene to the one when the programme first began.

The explicit and systematic delivery of FORCSI offered a structure possibly facilitating student engagement. Skinner and Belmont (1993) identified student engagement in classrooms which offered structure and had teachers communicating expectations as well as offering strategic help and support to students’ needs on a consistent basis. Student engagement in the intervention classrooms was demonstrated with children displaying greater effort and task focus.
The characteristics of FORCSI added structure and fostered student engagement including the following elements: a) explicit performance expectation (words per minute and minimum word error targets), b) systematic prompting to read with prosody and for meaning, c) guided practice (repeated reading and comprehension strategy instruction), d) monitoring of achievement (Progress Chart) and e) prompt corrective feedback given. An unsolicited reflection from Ms Elizabeth supported the notion of FORCSI’s unanticipated effect of promoting student engagement (Journal entry: 13th November).

When the class is focused on a topic or a skill, they can do well. The reading programme is focused and specific, particularly the comprehension part. It was presented like a formula and the class can cope with this style of teaching. The kids can pick up things when the structure is routine and concentrated. If the topic is too scattered, like COGs\(^7\), the kids do not learn as well.

7.5.3. Engagement and Cognition.

Engaged students can be described as investing effort to master complex skills which are progressively being developed due to their widening knowledge base and proficiency with implementing learning strategies appropriately (Guthrie & Wigfield, 2000). Engagement of this nature entails a willingness to exert mental effort to accomplish difficult tasks as well as to use self-regulatory strategies to guide one’s cognitive efforts (Guthrie, Wigfield, & You, 2012). FORCSI is supportive of a self-regulatory orientation as its instructional components assist with the development of self-management skills. The comprehension strategy instruction component of FORCSI assists children with developing metacognitive strategies. Learning is involved with the planning, implementing, and monitoring one’s learning.

\(^7\) Connected Outcome Groups are units of work organised around cross-curriculum concepts (NSW Department of Education and Training, 2008).
effort on the conditional knowledge of when, where, why, and how to use particular strategies in the appropriate context.

Evidence of children’s cognitive engagement (metacognition) was found through informal teacher conversations during lunchtime. When the yearly assessments were completed, teachers from Years 4, 5 and 6 had commented FORCSI helped improved their class’ reading tests. The following were from the researcher’s journal entry (Monday 6th November to Wednesday 8th November): Ms Elizabeth noticed her class improved on the Waddington Reading Test (Waddington, 2000). Ms Amy the Year 5 teacher noticed her students’ improved ability to answer the ‘who’, ‘what’, ‘where’ and ‘when’ question across all content areas. She further added, “no matter how many times I would go over it, the class still had trouble. But with the reading programme, the class is now able to do it”. Mr Paul shared the news his children’s latest comprehension results had improved over the half-yearly benchmarking tests and attributed this improvement to FORCSI.

For Henry, wanting to improve his fluency by reading more words per minute was the starting point for developing cognitive strategies. The following journal entry illustrated this (Journal entry: Monday 4th September).

While walking back to class, Henry was telling me how he was trying to remember the word “natural” by rehearsing the word repeatedly. Henry recounted how in last Wednesday’s story, ‘That’s Life’, he kept making the mistake of reading the word “nature” when it was “natural”. In today’s reading session, Henry wanted to beat his last week’s score of 110 words per minute by not stumbling and wasting time when it came to the word “natural”. I was surprised that he even remembered his word count from last week. Henry had been practising all weekend because he knew we were going to read “That’s Life” for the third time. Henry’s efforts paid off. He read 118 words per minute that morning.

Henry’s efforts to improve his reading fluency showed he was using metacognition to alert him there was a problem (miscue) and by coming up with a
strategy (rehearsing), he could solve the problem (improved fluency). Henry showed an enthusiastic expectancy at being able to improve his reading performance. This was an emotion quite different from his initial reading reluctance stemming from negative reading self concept (see below for further details).

7.5.4. Engagement and Affect.

Emotions and feelings are inseparable from the learning process and have been linked to instructional practices (Lutz, et al., 2006; Meyer & Turner, 2002; Pekrun, et al., 2002) and assisting or hindering students’ self-regulation of learning and performance (Pekrun, et al., 2002). Emotional engagement covers both positive and negative affective reactions to activities (Guthrie, Wigfield, & You, 2012). The findings reported how children’s willingness to participate in reading and number tasks (Core activities) was related to the degree of anger they felt towards reading in general. The less angry a child is towards reading, the more he or she is willing to participate in these core school subjects. Anger explained 5.2% of the variance in Choice of Core Activities.

FORCSI’s provision of immediate feedback (by peer and teacher) may provide children a feeling of success and a renewed self-evaluation of their competence beliefs for some. Schunk (2003) suggested when students are given reliable progress feedback, students will feel efficacious and motivated to learn and they will learn better. It could be conjectured FORCSI’s feedback component assisted children with improving their psychosocial orientation to reading. Children’s recorded response to the questionnaire from pretest to posttest illustrated these changes.

Rebecca at pretest felt very, very angry and sick (high rating of 5) at the thought of reading during sustained silent reading. At posttest, these emotions dropped to feeling a little bit angry and sick (low rating of 2). Rebecca initially evaluated herself as a poor reader (rating = 2) and did not like reading activities (rating = 2). By the end of the intervention, she rated herself as a good reader (rating of 5) and now enjoys reading (rating = 5). Observational field notes (Tuesday 29th August) showed how proud Rebecca was of her reading progress, “after reading to
Ms Elizabeth, she wanted to show me how well she read “Ancient Times” (102 words in a minute). She was very insistent that I listen despite my request to hear her after the class. She improved. She read 110 words fluently.” Part of her pride came from knowing she reached the Year 4 reading goal of 110 words in a minute on an informational text read by the whole class. Rebecca was in the lowest reading group and was accustomed to reading easier stories than the rest of the class. She not only reached the Year 4 target goal of 110 words per minute but more importantly, on a text read by children in the advanced reading group.

Henry was also in the lowest reading group and expressed the following emotions (Student questionnaire: 29th June). He was angry about sustained silent reading (rating = 2) because “I can’t read properly” and reading a chapter for homework (rating = 3) because “I can’t do it. I get help from mum”. At posttest, he did not feel anger towards these reading activities (rating = 1). Henry had poor self confidence in his reading ability (rating = 2) and did not enjoy reading activities (rating = 2). After the intervention, not only did he enjoy reading (rating = 5) but rated himself as a good reader (rating = 4). Initially Henry was disengaged, disinterested, and easily distracted from reading. This changed when Henry was observed talking to Ms Grace during a reading session (Observation field note: Tuesday 22nd August): “I like reading the most”.

The self concept scale used in this study was chosen because it was designed to measure self concept as an interpretation of children’s behavioural intentions and motivation to participate in activities (Bornholt, 2005). Children’s self concept accounted for 6.6% of the variance in Choice of Text Difficulty with FORSCI (5%) and Age (5.7%) contributing a proportion of the variance. Children’s emotional engagement may have stemmed from the visual (graphing results) or verbal (peer and teacher) feedback during FORCSI. This fed into improved reading self concept and enabled children to choose text of age-appropriate difficulty. The findings indicated intervention children were more willing to select grade-appropriate texts and comparison children were more prone to read very easy text. The size of the intervention effect was of moderate practical significance (d = .53), and supported the need to further investigate the efficacy of FORCSI instructional components on student’s emotional engagement and choice behaviour towards reading activities.
Children’s emotional engagement may also have been the result of the recognition scheme (see Chapter 6) instigated to improve classroom behaviour. Rewarding good behaviour may have been another source of feedback, informing children of their worth and value as a person than their performance. Daniels and Arapostathis (2005) found when students were treated as “a person and not a grade” (p. 51) student engagement increased as well as a desire to achieve. The recognition scheme rewarded behaviour when students demonstrated the following: a) being a hard and persistent worker b) exhibiting cooperation and acting as a team player c) willing to be risk-taker by “having a go” and d) practicing being a strategic problem solver. Feedback recognising and confirming children’s worth as a person may be another source to support student engagement (Brophy, 1981).

Having all children read the same grade-level text, regardless if the text was at a frustration level for the less able readers, may have also contributed to children’s emotional engagement towards reading. When reading tasks are moderately challenging requiring students to apply effort, increased feelings of competence and motivation arise (Schunk & Zimmerman, 1997). Success with challenging reading tasks can also provide students with a sense of accomplishment satisfying an innate psychological need to feel competent (Deci & Ryan, 2002). When sufficient scaffolding and support are provided, weak and struggling readers can read the same text alongside proficient readers in a class benefiting poorer readers (Stahl & Heubach, 2005) but also giving them a sense of pride rather than feelings of shame and embarrassment. Emotions often come when reading is effortful (Pekrun, et al., 2002; Triplett, 2004).

Other evidence of emotional engagement was children’s changed reading habits and increased confidence in oral reading. Ms Grace had noticed a change in the number of children borrowing books from the library. Several children had never borrowed a book but were now borrowing up to four books a week after the reading programme had concluded. Ms Grace could not entirely attribute this change to the reading intervention as she has been trying to inculcate a love of books and reading since the beginning of the year. She did believe FORCSI acted as a “great springboard” launching children into having a different attitude towards reading moving from “I hate reading” and “I don’t read on week-ends” to “I love reading”. 

226
She further added although she achieved some success in getting children to borrow books, *FORCSI* “absolutely pushed it along faster.” According to Ms Grace, the change in book borrowing was probably due to children seeing their reading improve daily. Children now had visual proof of their reading success when they charted their daily reading results (Journal entry: Tuesday 7th November). Mr Paul believed the combination of the reading programme with his literacy programme helped boost the children’s confidence in public reading. The class was taking turns in reading *The Great Gherkin*. Children were more confident when reading the one or two pages aloud and in front of the classroom (Journal entry: Tuesday 7th November).

### 7.5.5. Engagement and Social Context.

The social aspects of a classroom environment can facilitate student engagement particularly when children perceive the teacher as being interested in their progress and when choices allow children to take ownership and responsibility (Guthrie & Cox, 2001; Guthrie, Wigfield, & Klauda, 2012; Martin & Dowson, 2009; Skinner & Belmont, 1993). Rather than having children paired with another of similar reading ability, children were given the choice of finding their own reading partner for the repeated reading session. Studies have indicated engagement increases when students are given opportunities to make choices and when they believe they have some control over their own learning (Guthrie & Cox, 2001; Guthrie, Klauda, & Morrison, 2012; Skinner & Belmont, 1993).

Student engagement was facilitated when children perceived the teacher had knowledge of individual learners, showed interest, and cared about their progress (Martin & Dowson, 2009; Skinner & Belmont, 1993). The evidence of engagement resulting from high teacher involvement was a comment from Ms Elizabeth, “the children are always asking if we’re having Mrs Koo today?” (Journal entry: Monday 7th August). Often in the playground I would be asked the same question in a hopeful manner I would say yes. When the intervention concluded and I returned to the school two weeks later for posttesting, Ms Amy remarked “the children miss the reading” (Journal entry: Tuesday 7th November).
7.6. Chapter Summary.

When students are given the opportunity to select reading materials, their choice is to read texts that equal their instructional level or below (Carver & Leibert, 1995b; Stahl & Heubach, 2005). Children often make selections requiring minimal expenditure of cognitive resources and are more likely to adopt a principle of least effort (Skinner et al., 2005). When children assess how much effort and time is required for a reading task, their selection is made consciously and with deliberation (Skinner et al., 2005). This deliberate and discrete form of choice (or participatory) behaviour was measured by the scale Choice of Text Difficulty. As reading engagement refers to children who are motivated to read, strategic in their approach to comprehend text and are effortful and persistent in reading activities (Guthrie, Wigfield, et al., 2012), Choice of Text Difficulty was a measure that tapped into an aspect of reading engagement. Choice of Text Difficulty was operationalised as an indicator of a child’s responsiveness to engage in reading requiring effort, concentration and time.

The results showed the intervention produced a moderate effect size of practical significance \( d = .53 \) on children’s Choice of Text Difficulty. Intervention children were more willing to choose grade appropriate text or higher than children in the comparison group who were more willing to read easy and simply texts. This is important as reading age-appropriate text or higher provides opportunities for children to broaden their knowledge and master new vocabulary, skills essential if children from low socioeconomic backgrounds are to avert the “Matthew effect” (Stanovich, 1986). Patterns of reading achievement are often established by children’s reading habits, with literate children actively engaged with text becoming richer and the literate poor, children disengaged with text, becoming literate poorer.

Children’s choice of text difficulty was also explained by their Age (5.7% of variance explained) and their level of Self Concept (6.6%). Older children and readers with high reading self concept are more willing to choose age-appropriate text or higher to read than easier text. Classrooms that provide opportunities for readers to experience progress and competence my help develop reading self concept (Chapman & Tunmer, 2003). Analysis of the qualitative data indicated the positive
effects of FORCSI on children’s engagement levels. The findings supported the quantitative analysis by noting children’s improvement in the behavioural, cognitive and emotional dimensions of engagement.

While Choice of Text Difficulty is a reflection of children’s readiness to engage in reading requiring sustained effort and deliberation, other choice decisions may be unconscious and not premeditated in nature. Choice behaviour of this type may appear transitory or fleeting (Skinner et al., 2005). Choice of Core Activities was used to measure this participatory behaviour. This scale measured children’s willingness to participate in reading and number activities when given alternative (such as drawing and physical movement). The findings showed a small but significant effect size ($d = .20$) indicating intervention children were more willing to participate in Core subjects (reading and number) than Elective types (drawing and physical movement). Children’s Task Value (24.4%), level of Anger (5.2%) and Age (3.4%) were variables explaining their willingness to participate in these Core activities. Classrooms which reflect the value and importance of reading, have children more willing to engage in academic type subjects than non-academic ones. In addition, when feelings of anger towards reading are less, children are more likely to want to engage in reading and number tasks. What this chapter has highlighted is that an intervention, like FORCSI, has the potential to impact upon emotions and reading values. It has been shown that in addition to improving listening and reading comprehension, there have also been positive effects on reading engagement as reflected in measures like Choice of Text Difficulty.
CHAPTER: DISCUSSION.

8.1. Introduction.

In this chapter, discussion of the findings will be presented in three parts. The first part includes discussion of the three research questions: What are the factors explaining: a) reading performance overall and at b) at year-level, c) what is the relationship between children’s thoughts, beliefs and emotions and children’s psychosocial orientation to reading. These discussions reflect upon the issues raised in answering the three sets of research questions. The second part of this chapter presents methodological issues that limited the effectiveness of the study with recommendations for further research. Finally, implications for policy and classroom practice are discussed to conclude this chapter.

This investigation began when an examination of the NSW English K-6 syllabus revealed very little support for fluency development during the early years of reading acquisitions between Years 1 to 3. According to the stage model of reading development (Chall, 1996), fluency development in the early years is necessary as it prepares children to read the increasingly complex text and meet the literacy demands of the middle-years 4 to 6. If children do not develop fluency in the early years of their primary education as recommended by government reports (e.g., Report of the National Reading Panel, NICHD, 2000; Teaching Reading, DEST, 2005), theory (e.g., Chall, 1996; LaBerge & Samuels, 1974) and research (e.g., Kuhn & Stahl, 2003; NICHD, 2000), can fluency instruction be of any benefit to older children particularly if fluency has past its stage of optimal development?

Previous synthesis of reading instruction has mainly been conducted with young children learning to read in Year 1 to 3 and older struggling readers in Years 4 to 12 (e.g., Chard et al., 2002; Kuhn & Stahl, 2003; Wanzek et al., 2010; Wexler, et al., 2008). Research in fluency instruction has focused attention on beginning readers reflecting theoretical expectations (Chall, 1996; Kuhn & Stahl, 2003) and empirical models (e.g., Schwanenflugel, et al., 2006) suggest that the development of fluency
was now no longer a concern for children beyond Year 3. For older students with reading problems, fluency instruction was used as a means of remediation. Considerably less is known about fluency intervention in the middle-years with children in diverse classrooms.

Several meta-syntheses on fluency intervention have produced mixed results. Some have reported improved fluency associated with growth in comprehension for both young able readers and older readers with reading difficulties (Chard et. al., 2002; Kuhn & Stahl, 2003; NICHD, 2000; Therrien, 2004). Other researchers either did not find this fluency-comprehension relationship evident among older struggling readers or else found a diminishing relationship between fluency and comprehension with increasing age of the child (Edmonds, Vaughn, Wexler, Retebuch, Cable & Tackeet, 2009; Wanzek et al., 2010).

In this study FORCSI, a multicomponent intervention, was embedded within the classroom literacy practices of five teachers. It was designed to be a supplemental reading programme. Classroom observations showed FORCSI did not add additional time to the teachers’ current literacy timetable. FORCSI included explicit and systematic instruction in fluency development using a repeated reading method and comprehension strategy instruction. Five classes in Year 4, 5, and 6 participated in the 30 minute reading sessions conducted three times a week for nine weeks. The comparison school had six teachers participating in the study. These teachers continued with their normal literacy programme.

Five major findings emerged: (a) intervention students performed better in listening (NARA-L) and reading (TORCH-R) comprehension than comparison peers, (b) FORCSI improved listening comprehension for Year 4 students and reading comprehension for Years 5 and 6 students (c) repeated reading did not substantially improve text fluency, (d) the importance of reading accuracy in explaining children’s reading achievement and (e) positive reading-related choices (or reading engagement) was associated with FORCSI. These findings will be addressed within the three research questions.
8.2. Factors Explaining Overall Reading Performance.

This is the first of three parts focussing discussion on the three research questions. In this section, issues pertaining to Research Question 1 are discussed. The first question examined the factors explaining children’s reading performance in comprehension (NARA-L and TORCH-R), accuracy and text fluency and FORCSI’s role in explaining these reading outcomes. Subsequent sections include discussion on the factors explaining children’s reading performance on a year-by-year basis (Research Question 2) and on the relationship between children’s thoughts, beliefs and emotions and children’s psychosocial outcomes (Research Question 3).

The section begins by discussing how the scores in the pretest covariates and pretest Reading Accuracy were the major factors explaining children’s overall performance in the four reading skills. Attention is then turned to the factors explaining children listening comprehension NARA-L, and reading comprehension, TORCH.

Effect size represents the magnitude of the mean group difference. Effect size is presented first as an indicator of the intervention’s practical value and significance for improving children’s listening and reading comprehension and later in relations to other synthesized studies on interventions.

Reports of studies with findings comparative to this current study are discussed. Studies with contrary findings are presented with an attempt to reconcile the differences through a discussion on the conceptualisation of reading fluency and its implications.

This section concludes with some plausible explanations as to why FORCSI incurred a treatment effect for NARA-L and TORCH-R including; (a) FORCSI as a multicomponent intervention (b) giving children greater opportunity to practice and receive corrective feedback on skills and knowledge particularly in comprehension as the reading intervention had (c) a comprehension focus. These attributes will be discussed under their respective subheadings.
8.2.1. Pretest Covariates.

The first research question examined the variables explaining children’s listening comprehension (NARA-L), reading comprehension (TORCH-R), accuracy and text fluency performance. Overall, the pretest covariates (NARA-L, TORCH-R, Reading Accuracy and Text Fluency) accounted for a large proportion of variance in the outcome variables, explaining a high of 87% of the variance in post Reading Accuracy scores to a low of 36.2% of variance in post TORCH-R scores. This finding is a reminder children’s past reading achievement is a large determiner of their future performance (Galletly, et al., 2009).

Pretest Reading Accuracy scores frequently explained the variance of the other dependent variables, accounting for 87% of the variance in post Reading Accuracy, 23% for Text Fluency, 10.3% for TORCH-R and 3.9% for NARA-L. As reading accuracy explained a considerable proportion of the variance, its development and status as an integral component in reading instruction should be upheld and continued into upper primary and not limited as an early primary concern. Continuing to provide reading accuracy instruction throughout the primary grades is recommended regardless of the reports indicating reading accuracy’s diminishing role in improving comprehension (Edmonds, et al., 2009; Galletly, et al., 2009; Nunes, et al., 2012).

8.2.2. Factors Explaining NARA-L and TORCH-R.

The first major finding highlighted how different predictors explained children’s NARA-L (listening comprehension) and TORCH-R (reading comprehension) performance. Almost 3% of the variance in post NARA-L was explained by two predictors, Gender (2% of variance explained) and TORCH-R (1%) compared to Age accounting for 4% of the variance in TORCH-R. The negative $\beta$ value for Gender suggested boys do better in listening comprehension than girls. For reading comprehension, age played a bigger role with older children (Year 5 and 6) performing better on TORCH-R than younger children (Year 4). Importantly hierarchical regression analysis indicated FORSCI did have an impact on children’s
listening and reading comprehension. The impact is discussed below in terms of its effect size and practical significance.

8.2.3. Effect Size and Practical Significance.

The effectiveness of the intervention was quantified by reporting the effect size \((d)\). In social science research, a recommended minimum effect size of \(d = .41\) represents a mean group difference of practical relevance (Ferguson, 2009). The study showed an intervention effect for \(NARA-L (d = .52)\) and, \(TORCH-R (d = .35)\). These effect sizes are discussed shortly in relation to reviews and meta-analyses of reading interventions.

The practical significance for \(NARA-R (d = .52)\) and to a lesser extent \(TORCH-R (d = .35)\) is noteworthy when considering the current Australian context: current funding arrangements that are not sufficient to minimise the effects of SES (DEEWR, 2011; Lamb & Teese, 2005), documented lack of third-wave intervention (DEST, 2003; Louden, 2000) and a need for interventions that are cost-efficient. Interventions that are cost-efficient must consider the effectiveness of programmatic interventions not only for demonstrated robust educational outcomes but also its sustainability in the midst of high teacher turnover in disadvantaged schools. Reports have indicated the implementation of any instructional programmes in low SES schools should consider high staff turnover and how this works against the capacity of funding to reduce the achievement gap across schools (Lamb & Teese, 2005). High staff turnover means funds used to help build skill capacity of teachers do not stay with the school. The \(FORCSI\) reading intervention addressed these issues by providing a method of instruction readily implemented in diverse classrooms requiring minimal downtime in staff training as well as achieving positive reading outcomes without the expense of acquiring equipment and resources, claims that have been substantiated by the NRP findings (NICHD, 2000).

8.3. Studies Supporting Findings.

Recent meta-synthesis of fluency instruction has yielded similar findings to the current study. The most relevant of these is Wexler et al., (2008). The authors summarised the research on the efficacy of fluency intervention for students with
reading difficulties in grades 6 through 12. Effect sizes for comprehension outcomes using random assignment of students were in the range of .23 to .25. This suggests that, should the current study be replicated with a randomised control trial producing similar effect sizes, the FORSCI programme would compare favourably with other fluency approaches – showing an effect size beyond that reviewed by Wexler et al (2008).

Therrien (2004) conducted a meta-analysis that is also relevant examining the key instructional components of repeated reading resulting in effects sizes comparable to FORCSI. The impact of repeated reading on reading fluency and comprehension was larger for children with learning disabilities ($d = .59$) than children without disabilities ($d = .48$). Differences in effect size were also noted in interventions using non-transfer measures (i.e., measures of children’s ability to comprehend the same passage after repeated readings) or transfer measures (i.e., measures of children’s ability to comprehend a new passage after repeated readings of different passages). Posttest NARA-L and TORCH-R scores after FORCSI, acted as transfer measures and their effect sizes were comparable to Therrien’s results ($d = .25$). Although relevant, neither the Wexler or Therrien studies examined low SES school contexts. Nor was the year group 4 to 6 examined here as it was in FORCSI.

Edmonds et al., (2009) conducted a synthesis of 29 intervention studies with older students (grades 6 to 12) focussing on those with specific reading difficulties. They then conducted a meta-analysis on 13 out of the 29 studies assessing decoding, fluency, vocabulary and comprehension with comprehension gains. Of interest to this study were the results relating to two multicomponent interventions with effect sizes similar to this study. The effect size for comprehension skills was smaller ($d = .31$) on standardised measures compared to researcher-developed measures ($d = 1.18$).

The results of these studies were consistent with research associated with the automaticity theory (LaBerge & Samuels, 1974; Logan, 1997; Stanovich, 1980; Thurlow & van den Broek, 1997) suggesting with repeated practice, a high level of automaticity in word recognition and decoding is developed allowing the reader more cognitive attention for comprehension processing. The study presented here further supports these theoretical perspectives.
8.4. Studies with Different Findings.

There have been other syntheses of fluency intervention studies with very mixed results for students beyond third grade to high school. Some reviews and meta-analyses reported a weak impact on comprehending ability and others had weaker correlations between fluency and comprehension with age and text difficulty (Edmonds et al., 2009; Kuhn & Stahl, 2003; Meyer & Felton, 1999; Wanzek et al., 2010; Wexler et al, 2008). Schwanenflugel, et al., (2006) developed an empirically based model connecting the development of fluency with automatic reading. Structural equation modelling demonstrated the diminishing role automaticity and reading fluency played on reading comprehension as children got older. The variance accounted for by predictors in the model declined steadily from 75% in first grade, to 45% in second grade, and 39% in third grade. These studies question whether automaticising lower-order skills to gain comprehension benefits through fluency instruction are relevant for older children. Schwanenflugel, et al.’s conceptualisation of fluency development supports the stage model (Chall, 1996) where mastery of lower-order word processing skills is expected to be completed and fluency development, a critical instructional reading component in early primary (Years 1 to 3), is no longer a teaching/reading priority in upper primary (Years 4 to 6).

8.5. Conceptualisation of Fluency and its Implications.

The inability of fluency instruction to improve comprehension on a consistent basis may be due to a multiple of factors including: limited understanding of the complex integration of the multitude of component skills constituting comprehension (NICHD, 2000; Paris et al., 2005), a lack of acknowledgement of the roles played by background knowledge, word knowledge, use of strategies or working memory in comprehending text as the child gets older (Edmonds, et al., 2009; Wexler, et al., 2008), or a lack of an unified definition of fluency because the nature of fluency is also unclear (Kame’enui & Simmons, 2001; Lipson & Lang, 1991; Nathan & Stanovich, 1991; Pinnell, et al., 1995; Rasinski, 2006; Samuels & Farstrup, 2006; Wolf & Katzir-Cohen, 2001).

Because the conceptualisation of fluency is so incomplete (Geva & Farnia, 2011; Kame’enui & Simmons, 2001; Kuhn, et al., 2010; Lipson & Lang, 1991;
Nathan & Stanovich, 1991; Rasinski, 2006; Samuels & Farstrup, 2006; Valencia, et al., 2010; Wolf & Katzir-Cohen, 2001), measures used to identify fluency’s multidimensional nature are still evolving. The mixed results regarding the fluency-comprehension relationship may be the result of the narrow definition of reading fluency applied in these studies. While there is consensus that accuracy, reading speed (automaticity), and prosody together contribute to the construct (Hudson, et al., 2009), how these components are conceptualised, their role in the reading development, and their function in reading comprehension all have a significant bearing on how they are measured and ultimately, how this translates into classroom practice (Kuhn, et al., 2010).

Prosody is often underestimated as a key component of fluency and subsequently overlooked in fluency research as an important link in the fluency-comprehension discussion. This recent perspective was not considered in the design of the FORCSI study and its measure of fluency. Oral reading fluency, when discussed in terms of assessment and instruction (e.g., Hudson, et al., 2009), attention has been mainly on decoding speed and accuracy than prosody (Kuhn, et al., 2010). Recent studies have found prosody to be associated with measures of silent reading comprehension and overall reading achievement among intermediate and middle grades (Kuhn, et al., 2010; Paige, et al., 2012; Rasinski, et al., 2009). When prosody (expression and volume, phasing, smoothness and pace) was used as the measure of oral reading, ninth grade students’ oral reading prosody was related to their silent-reading comprehension. That is, student’s oral reading with appropriate expression, tended to have better comprehension when reading silently than students reading with less expression (Paige, et al., 2012). Rasinski et al., (2009) recently examined fluency development using prosody rather than reading rate as a measure of reading fluency among a large number of third, fifth, and seven-grade students. The study found between 30-40% of the variance in comprehension was shared with the measure of reading fluency (prosody) across all three grade levels. Students who read with greater prosody in oral reading tended to have higher levels of silent reading comprehension.

Although prosody was not measured in this study, prosodic reading was practiced daily and this may have contributed to the small to moderate effect size
indicating a treatment effect for intervention children on listening and reading comprehension. Children were reminded fluent reading was more than automatic word recognition and were prompted regularly to read with expression to reflect their textual understanding and assist with comprehension (Kuhn, et al., 2010; Paige, et al., 2012). Children were given opportunities to hear modelled prosodic reading and participate in choral reading to develop prosody. Recent studies have shown choral reading assisted with decoding and fluency development among sixth-grade readers. When the technique was used in conjunction with science texts, sixth-grade teachers reported students were quicker at acquiring the initial background knowledge necessary for deeper learning of science content (Paige, et al., 2012).

In the study reported here, multiple indictors (albeit not including prosody) were used to examine fluency, similar to Valencia et al.’s (2010) study which used a combination of indicators (rate, accuracy, prosody and comprehension) to measure children’s oral reading fluency in grades 2, 4, and 6. Results indicated an increasing relationship between fluency and comprehension when fluency was assessed using multiple indicators of oral reading fluency. In other words, when rate, accuracy, prosody and comprehension were given equal importance, oral reading fluency provided a stronger predictor of general comprehension than the use of one or two measures. Like the FORCSI study, Valencia’s findings were contrary to the studies reporting the relationship between oral reading fluency and comprehension decreasing steadily with age and with text difficulty (e.g., Edmonds, et al., 2009; Kuhn & Stahl, 2003; Schwanenflugel, et al., 2006).

8.6. Intervention Attributes Associated with Reading Outcomes.

In this section, the possible reasons for FORCSI’s impact on children’s listening comprehension (NARA-L) and reading comprehension (TORCH-R) are explored. Three attributes are suggested to be instrumental to the success of the reading outcomes. These are (a) FORCSI’s multiple component structure, (b) practice and feedback elements, and (c) reading programme with a comprehension focus. The three attributes identified mirrored those theoretically proposed recently by Lipson and Wixson (2012). The researchers found there were three recurrent attributes found in successful interventions for older readers including (a)
interventions addressing *multiple components* (b) students given ample opportunity to *practice and receive corrective feedback* during instruction and (c) interventions must have at least some *focus on comprehension* improving reading ability. These attributes are discussed below as plausible explanations to the moderate to large treatment effect found in children’s reading comprehension (*TORCH-R*) and listening comprehension (*NARA-L*) respectively.

### 8.6.1. Multiple Components.

Interventions addressing multiple components appear more efficacious than those addressing one component (Edmonds et al., 2009; Therrien, Wickstrom & Jones, 2006; Wanzek, et al., 2010). *FORCSI* was designed with two sets of reading components. The first component included fluency instruction to improve comprehension. According to the theory of automatic information processing (LaBerge & Samuels, 1974), comprehension is facilitated when repeated reading, a method to assist with improving the automaticity of lower-order skills, enables more cognitive resources to be directed in the construction of meaning. The second component included comprehension strategy instruction which augmented the development of comprehension skill by providing children with opportunities to learn and put into practice the following comprehension practices: (a) students previewed the text, activating and connecting it to their prior knowledge (b) students monitored their understanding and processing of text meaning through the teacher modelling think-aloud on how to self-question and reflect before, during and after reading and (c) students practiced summarising the text identifying the main idea after reading the passage text (see Chapter 3 Methodology).

Studies synthesising broad reading interventions for older struggling readers (grades 6 through 12), found that when explicit instruction in comprehension was provided using the comprehension practices outlined above, results yielded moderate to high reading outcomes (Wanzek, et al., 2010), particularly in improved comprehension (Edmonds, et al., 2009). The intervention’s treatment effect for children’s listening (*NARA-L*) and reading comprehension (*TORCH-R*) may have been the result of the dual action of the repeated reading method combined with comprehension strategy instruction.
Another explanation may be the use of multiple measures of comprehension which tapped into the macrocomprehension processes (NARA test) and microcomprehension processes (TORCH test). In Kuhn and Stahl’s (2003) review of the fluency literature, the authors speculated fluent reading might affect the reader’s microcomprehension processes but not macrocomprehension processes. In some studies, the authors found increases in fluency were synchronised with increases in comprehension when microcomprehension processes alone were measured (as in the researcher-designed cloze test) while in other studies, this relationship was not evident when macrocomprehension processes were alone measured (as in a standardised test). In this study, both microcomprehension (TORCH-R- cloze test) and macrocomprehension (NARA-L - standardised oral reading test) processes were measured. The findings have provided a finer-grained understanding of the developmental nature of comprehension processes not been previously documented in fluency research. FORCSI improved Year 4 children’s macrocomprehension (or listening comprehension) processes but not for children in Year 6. FORCSI improved Year 6 children’s microcomprehension processes (or reading comprehension) but not for children in Year 4. FORCSI may have produced substantive effects on children’s listening and reading comprehension because it had multiple reading components (fluency and comprehension) and multiple comprehension measures (NARA and TORCH tests).

Exploring the psychosocial elements within FORCSI uncovered an unforeseen third component, improving reading engagement as operationalised by children’s choice of text difficulty. This aspect will be elaborated further when the findings related to the third research question and psychosocial outcomes are discussed in a later section.

**8.6.2. Practice and Corrective Feedback.**

Another intervention attribute contributing to reading performance was the quality of reading practice and the provision of corrective feedback. Meta-analysis of repeated reading studies revealed improved academic outcomes were associated with reading practice and the provision of corrective feedback (Therrien, 2004; Wexler, et al., 2008). Intervention children’s reading performance may have been benefited
from *FORCSI’s* structured use of the 30 minutes to offer students extended practice on reading skills with the immediacy of corrective feedback provided.

### 8.6.2.1. Quality of Reading Practice.

Increased reading practice can help ameliorate the Matthew Effect (Stanovich, 1986) for literacy impoverished children. Literacy impoverished children have poorer reading skills, come to school with limited linguistic knowledge, read less, and increasingly fall behind in developing proficiency in reading skills than children with enriched literacy experiences. Adding to this problem, some schools perpetuate the cycle of reading underperformance, exacerbating the achievement gap by teaching one type of pedagogy for the poor and another for the better off (Cummins, 2008).

In less effective low socioeconomic classrooms, some teachers have the tendency to focus on teaching constrained skills, such as phonics and sight word reading (pedagogy for the poor) with less time spent on developing unconstrained skills such as processing complex texts and vocabulary development (pedagogy for the rich) (Cummins, 2008). *FORCSI’s* component of comprehension strategy instruction meant quality time was spent engaging children in developing their cognitive and metacognitive processes, a pedagogical practice frequently adopted in affluent classrooms but seldom in the lower SES classrooms (Cummins, 2008). The time spent and practice expending on applying the comprehension strategies in the reading sessions may have played a key role in the comprehension performance of intervention students compared to comparison students.

Field notes showed both study sites had devoted a similar amount of time to reading, particularly as *FORCSI* was embedded as part of the intervention teachers’ classroom practice. *FORCSI* afforded regular and highly focused repeated reading practice three times a week for intervention classes. It can be speculated that *FORCSI’s* repeated reading practice may also have influenced children’s language skills and this may have resulted in the treatment effect on comprehension. In a recent study, children’s language skills (word recognition, vocabulary, syntactic knowledge) were linked to reading fluency and reading fluency was later found to be
an important contributor to reading comprehension for grade 5 children (Geva & Farnia, 2011). Kuhn et al., (2006) posited repeated readings may have broadened children’s understanding of new words, concepts and various components of language (Kuhn, et al., 2006) in a way that was more efficacious and resulting in better achievement in comprehension than in classrooms that did not conduct fluency instruction.

The importance of reading practice was advocated by Chall (1996) as a way of building reading fluency and smoothing the transition from learning to read to reading to learn. Chall (1996) summed up the importance of reading practice with this assertion, “the greater the amount of practice and the greater the immersion, the greater the chance of developing the fluency with print that is necessary for the difficulty to come – the acquisition of new ideas in Stage 3” (p. 20). In addition, when children are given repeated practice, according to Logan’s (1997) instance theory of automaticity, a wide range of traces in memory are established and this can be used to support comprehension in the future.

Reading practice however, does not automatically lead to reading improvements. Time spent reading without appropriate guidance and support has only a modest influence on reading achievement (Kamil, et al., 2008; Topping, Samuels, & Paul, 2007; Wolf & Katzir-Cohen, 2001). In Australia, the average time devoted to reading is 27.5 hours in urban disadvantaged schools (Cairney, et al., 1994) but what proportion are students actually engaged in sustained reading? Simply increasing the time devoted to reading might not consistently improve student reading achievement. One reason why the intervention group incurred a treatment effect could be the quantity and quality of the 30 minute reading sessions. Although the FORCSI sessions were short, the benefits of repeated reading was maximised with learning that was guided and supported. It is not so much the quantity but the quality of practice that makes for reading proficiency (Nichols, Rupley, & Rasinski, 2009; Topping, Samuels, & Paul, 2007).
8.6.2.2. Corrective Feedback.

Another attribute of the reading intervention influencing student’s reading performance was the provision of corrective and informative feedback. During paired partner reading, peer oral corrective feedback was offered whenever a word was misread. Specific training on this was part of the FORCSI programme. Visual feedback informing children of their reading progress came in the form of a progress chart, a graph depicting their daily reading performance (number of words read and comprehension score) (see Chapter 3 Methodology).

Research has confirmed the importance of feedback on achievement (Hattie & Timperley, 2007; Sadler, 2010; Vollmeyer & Rheinberg, 2005). Repeated reading interventions offering corrective feedback had a larger fluency effect size than interventions that did not provide feedback (Therrien, 2004; Wexler, et al., 2008). Hattie (2009) conducted a meta-analytic syntheses of findings from more than 500,000 evidenced-based studies on influences on student learning outcomes and found the provision of feedback (instructional and assessment) had one of the strongest effect size (ES = 1.13) on student learning among 16 other influences.

8.6.3. Comprehension Focus.

The final attribute proposed as key in making the FORCSI intervention successful is its overt focus on comprehension. Until recently, approaches to fluency instruction traditionally had no comprehension focus and because of this omission, students may have read aloud fast and fluently believing this was the primary goal with comprehension of secondary importance (Kuhn, 2004, 2005; Valencia, et al., 2010). FORCSI had a comprehension focus as children were directed to read for meaning. Children discussed the comprehension questions prior to reading the passage. By doing this, it made reading more purposeful as children read with intent. Children read deeply in order to answers to the comprehension questions they had previewed earlier.

Meta-analyses of synthesised general reading intervention studies revealed when explicit instruction in comprehension was provided, older readers with reading difficulties and disabilities benefited (Edmonds, et al., 2009; Wanzek, et al., 2010).
Interventions in general, that have comprehension as an instructional component, are more successful than interventions without comprehension instruction (Lipson & Wixson, 2012).

Whether it was the inclusion of the comprehension strategy instruction or improved automaticity through repeated reading or a combination of both, the results were contrary to some previous studies reporting fluency-comprehension relationship as decreasing steadily with age for older students (Edmonds et al., 2009; Wexler, et al., 2008). The findings from this study would strongly recommend a comprehension component be included in any programmatic intervention for children in upper primary.

8.7. Factors Explaining Reading Performance: Across Year Levels.

In this section, issues pertaining to Research Question 2 are discussed. The second question examined the factors explaining children’s reading performance in comprehension (NARA-L and TORCH-R), accuracy and text fluency at each year-level and FORCSI’s role in explaining these reading outcomes.

Focus will be on the following three major findings: (a) FORCSI improved listening comprehension for intervention students in Year 4 and reading comprehension for Years 5 and 6 intervention students compared to comparison students, (b) repeated reading did not substantially improve text fluency across each year level and (c) the importance of Reading Accuracy as a factor explaining reading performance. Each of these three findings will be discussed subsequently under the following subheadings: FORCSI and NARA-L and TORCH-R; Text Fluency and Reading Performance; and Reading Accuracy and Reading Performance.

8.7.1. FORCSI and NARA-L and TORCH-R.

A major finding was FORCSI’s overall affect on children’s listening and reading comprehension performance. The second key finding was FORCSI having a different effect on different year levels. Multivariate analysis indicated FORCSI was more effective in improving listening comprehension (macrocomprehension processes) for Year 4 students and on reading comprehension (microcomprehension processes) for Year 5 and Year 6 students.
FORCSI was effective in improving Year 4 children’s listening comprehension ($d = .47$) but not reading comprehension ($d = .10$). Hierarchical regression analysis indicated FORCSI explained 8% of the variance in Year 4 NARA-L above and beyond the other predictor variables such as pretest Reading Accuracy accounting for 42.2% of the variance and pretest NARA-L accounting for 12.3%. Although TORCH-R’s large effect size for students in Year 5 ($d = .55$) and Year 6 ($d = .54$) were indicated, individual variables explaining variance were not identifiable. A combination of the seven predictors (Gender, Age, Group, NARA-L, TORCH-R, Reading Accuracy, and Text Fluency) accounted for 37.3% of the variance in TORCH-R for Year 5 children and 55% of the variance for Year 6 children.

Developmental differences may explain FORCSI’s differential effect on children’s comprehension performance as previous fluency interventions examining reading achievement across year-levels exhibited similar patterns and explanations (Fuchs et al., 2001; Schwanenflugel et al., 2006; Valencia, et al., 2010). Consistent with the stage model (Chall, 1996), younger children are better at learning through listening than reading than older children. As children progress into Years 5 and 6, learning becomes less dependent on listening and more reliant on language skills and cognition, stronger correlates to reading than earlier years (Chall, 1996; Geva & Farnia, 2011; Wolf & Katzir-Cohen, 2001).

Another reason for the differences in comprehension performance between younger and older students lies with the type of reading tests used. Not all standardised reading tests are the same nor do they measure the same construct (Bowyer-Crane & Snowling, 2005; Cain & Oakhill, 2006; Cutting & Scarborough, 2006; Francis, Fletcher, Catts, & Tomblin, 2005; Keenan, Betjemann, & Olson, 2008; Kuhn & Stahl, 2003; Nation & Snowling, 1997). The current study implemented two standardised reading tests measuring different aspects of the comprehension process. The NARA (Neale Analysis of Reading Ability) was used to measure children's listening comprehension relying on children's prior knowledge to access meaning (macrocomprehension processes) and the TORCH (Test of Reading Comprehension), a measure of reading comprehension relying on children’s ability to gain text meaning through decoding (microcomprehension processes). The NARA and the
TORCH were used primarily to assess the differential dependence on oral comprehension and decoding respectfully.

As the NARA (Neale Analysis of Reading Ability) is an oral listening comprehension test, the test simply highlighted the stage of reading development where comprehension of oral discourses was more assessable for Year 4 children than comprehension through reading text. Practising oral repeated reading three times a week with peers, may have enhanced Year 4 children’s natural disposition towards relying on listening skills as a means of obtaining information, resulting in the larger effect size on NARA-L ($d = .47$) than on TORCH-R ($d = .10$). It could also be possible FORCSI helped develop Year 4 children’s macrocomprehension processes and these processes are what the NARA test was measuring (Cain & Oakhill, 2006; Keenan et al., 2008; Nation & Snowling, 1997).

Year 5 and 6 children may have performed better on TORCH-R than NARA-L because essentially, the TORCH test measured the microcomprehension processes (Cain & Oakhill, 2006; Francis et al., 2005; Keenan, et al., 2008; Nation & Snowling, 1997) including language skills such as vocabulary and syntax knowledge. As children get older, these microcomprehension processes become more developed, particularly as children are exposed to increasingly complex reading materials requiring more sophisticated use of language skills. Intervention children’s development in microcomprehension processes in Years 5 and 6 may have been facilitated by the comprehension strategy instruction. In addition, the daily reading practice may have been more effective than the reading instruction used in the comparison classroom as the repeated reading used variety of narrative and expository reading materials which in turn, may have expanded intervention children's vocabulary and knowledge, conceptually and linguistically. As a result of the combination of instruction in comprehension strategy and fluency, older intervention students not only improved their microcomprehension processes resulting in TORCH-R scores than their younger Year 4 peers, but Year 5 and 6 performed better than their respective counterparts in the comparison group.

Intervention children's listening and reading comprehension may have been greatly enhanced through the comprehension strategy instruction included in the
**FORCSI** reading programme. The comprehension strategy instruction was delivered to children in Years 4 to 6 three times a week for nine weeks developing the following comprehension skills: summarising, answering literal and inferential questions, activating prior knowledge while the teacher previewed the text (before reading), practising self monitoring skills as children purposefully read with prosody, fluency and accuracy (during reading), and applying the correct cognitive strategies when completing the comprehension questions (after reading).

In contrast, the comparison group delivered comprehension instruction in a less explicit and structured manner. In some classes, children worked independently at their desks answering teacher-made comprehension questions (Year 5) or completing comprehension activities from a basal reader (Year 5/6) with some children working from a SRA reading card to improve reading comprehension. In all of the comparison classes, answering of literal and inferential questions were practiced during reading groups or during round robin, when children took turns at unrehearsed oral reading. One class (Year 4) daily practiced the comprehension strategy of finding the main idea while another class (Year 5) focused on improving children's comprehension by developing their vocabulary knowledge. The pedagogical practices of comparison teacher relating to comprehension instruction did not change substantially over the duration of the intervention period (Observational field notes: Wednesday 8th November).

### 8.7.2. Text Fluency and Reading Performance.

Repeated reading has been widely credited for increasing reading fluency (e.g., Hudson, et al., 2009; Kuhn & Stahl, 2003; Kuhn, et al., 2010; NICHD, 2000) yet the intervention’s responsiveness to this fluency approach was less than expected. This lack of responsiveness is the third key finding.

Field notes found none of the comparison classes had engaged in any guided oral repeated reading activities during the treatment period yet many intervention classes had results similar in text fluency as comparison classes. Overall, effect sizes for text fluency were disappointingly smaller than anticipated with small treatment effect for Year 5 \(d = .39\) and Year 6 \(d = .11\). In fact, Year 4 comparison classes performed better on text fluency than intervention classes \(d = -.06\).
Samuels (1979), designed repeated reading as an instructional approach to improve the automaticity of lower-order skills and their connections, reading slow and dysfluent reading into smooth and oral reading of connected texts. Ironically, this did not apply in this study. Intervention children did not improve their text fluency as measured by their reading rate on the NARA test. In other words, after the intervention, children in the comparison group could orally read just as fast as children in the intervention.

Descriptive analyses indicated mean scores increased from pretest to posttest for all children. However, inspection of the mean gain scores as a percentage indicated Year 4 comparison children had made larger improvements (0.6% mean gain) than Year 4 intervention group (0.2%). Similarly, Year 6 comparison children had shown better mean gain improvements (2.9%) than Year 6 intervention children (0.6%) from pretest to posttest.

A plausible explanation as to why the intervention group attained small gains was how text fluency was measured and conceptualised. In this study, text fluency was defined as how fast and accurately children read (reading rate or wcpm). During posttesting, children in the comparison group may have simply read the test passage quickly, sustaining a higher wcpm and registering higher mean gain score from pretest to posttest than the intervention children (see Figure 4.7). The study's measure of text fluency did not take into account children’s prosodic rendering of the test passage. During the FORCSI sessions, children were encouraged to read slower in order to engage in self-monitoring strategies assisting reading expressively and with comprehension. Reading prosodically may have incurred a lower wcpm for many intervention children and this was reflected in the lower mean gain scores than comparison children (see Figure 4.7).

Fluency is an adaptive construct and influenced by situational factors such as the level of difficulty of text or the text topic (content area) (Hudson et al., 2009; Lipson & Lang, 1991; Samuels, 2006; Topping, 2006). An intervention student may read fluently and with expression when given narrative texts but has to adjust the reading speed when texts containing concepts, syntax structure, and vocabulary are new or difficult. In FORCSI, children were given a variety of year-levelled text types.
and subsequently, children were strategic, adjusting their reading speed in order to assess meaning and at the same time demonstrate appropriate phrasing and intonation at the expense of incurring faster reading rates (wcpm) (Topping, 2006). This might explain why overall gains in text fluency were lower than what would have been expected from repeated reading. During posttesting, intervention students may have strategically adjusted their oral reading speed according to the difficulty of the test passages. The comparison children aware that each reading passage was timed may have been more concerned with reading fast than reading for meaning.

The explanation for the poor text fluency results underscores the importance of considering reading fluency beyond the singular focus on its components, reading rate, accuracy, and prosody. As discussed previously, recent studies have highlighted the multidimensional and complex nature of reading fluency by conceptualising this construct as a composite of the four components (Valencia, et al., 2010), considering reading fluency within a linguistic framework (Geva & Farnia, 2011) and examining reading fluency with prosody playing a major role in the fluency-comprehension connection (Kuhn, et al., 2010; Kuhn & Stahl, 2003; Paige, et al., 2012; Rasinski, 2006; Rasinski, Rikli, & Johnston, 2009; Valencia, et al., 2010).

8.7.3. Reading Accuracy and Reading Performance.

The fourth key finding relates to the significance of FORCSI children being able to read accurately. Multivariate analysis showed Reading Accuracy explaining a considerable proportion the variance in NARA-L (3.9%), TORCH-R (10.3%), Reading Accuracy (87%) and Text Fluency (23%). The overall results highlight the automaticity of word recognition skills as a significant contributor explaining children’s reading performance and the need for its continued instruction in the middle-years of primary school. Discussion of the findings across the year-levels and its implication is presented below.

On a year by year basis, of particular interest was Reading Accuracy’s contribution to the variance in Year 4 NARA-L (listening comprehension). In most of the regression models, the pretest measures explained a large proportion of the variance in the corresponding posttest measures. But for Year 4 NARA-L, this was the exception. Reading Accuracy made an independent contribution (42.2%) that was
almost three and a half times more than the outcome measure’s covariate, pretest NARA-L (12.3%).

This finding suggests the importance of developing children’s automaticity in word recognition, particularly in regard to its links with listening comprehension. Examining Year 6 results found similar trends. Reading Accuracy independently explained 17.2% of the variance in TORCH-R (reading comprehension) and 21.4% variance in Text Fluency above and beyond other predictor variables.

In general, many fluency researchers (e.g., Gough & Tunmer, 1986; Rasinski, 2012; Samuels & Farstrup, 2006) would support accurate automatic word identification playing a central role in fluent reading and in overall reading competency. More specifically, the stage model (Chall, 1996) advocated the teaching of word-processing skills in lower primary (i.e., grades 1 to 3) in order to meet the literacy demands of upper primary and beyond (i.e., grades 4-6). The English K-6, based on the four resources model (Freebody & Luke, 1990; Luke & Freebody, 1999), would have lower and higher-order skills taught simultaneously as early as Kindergarten through to Year 6. The issue is not whether reading accuracy is taught but for how long should its instruction continue?

Traditionally, lower primary has focused reading instruction on developing young reader’s lower-order skills (e.g., decoding and word recognition) with upper primary continuing to teach reading accuracy within a spelling programme. In an evaluation of literacy practices in upper and junior high schools (Cairney et al., 1994), the teaching of spelling consisted of a list of words accompanied by word building exercises and rules. The “drill” approach to spelling instruction left more than one third of case study students in Year 6 having difficulty with spelling. Galletly et al., (2009) found an increasing number of Australian readers experiencing late-emerging reading accuracy difficulties in the later years of primary school. Both studies draw attention to the need to continue to develop student’s word recognition skills throughout school.

The results of this study suggest instruction in reading accuracy needs to be prioritised in upper primary, enabling students to have the ability to handle texts with increasing amounts of multisyllabic words and complex orthographic patterns with
each successive year. An example of how instruction in reading accuracy can be implemented in upper primary classrooms is promoting the use of morphemes in word reading and spelling. A recent study found the use of morphemes was a stronger predictor of reading comprehension and fluency than the commonly used decoding strategy, grapheme-phoneme correspondences (Nunes, et al., 2012).

The current study has highlighted the significance of reading accuracy in explaining variance in comprehension and componential reading skills and supports its relevance in the middle years of primary school. If left in the teaching domain of lower primary, the increasing proportion of Australian students identified with late-emerging reading accuracy difficulties will not help reduce the widening achievement gap in Australian schools.

8.8. Relationship between Thoughts, Beliefs, Emotions and Psychosocial Outcomes.

In this section, issues pertaining to the final research question are discussed. The third research question examined the relationship between children’s thoughts (self concept), beliefs (task values) and emotions with choice of Text Difficulty and children’s willingness to participate in Core Activities (reading and number) and Elective Activities (drawing and physical movement) and FORCSI. Included in this section is the qualitative analysis delineating the process data influencing changes in FORCSI that diminish and/or enhanced student outcomes.

The discussion is presented under the following headings: Psychosocial Outcomes as Indicators of Reading Engagement; Relationship between Thoughts, Beliefs, Emotions and Text Difficulty; Relationship between Thoughts, Beliefs, Emotions and Core Activities; Relationship between Thoughts, Beliefs, Emotions and Elective Activities, and finally, Qualitative Findings.

8.8.1. Psychosocial Outcomes as Indicators of Reading Engagement.

The expectancy-value theory was used as a conceptual framework examining children’s thoughts (self concept), beliefs (task values), and emotions and their relationship to choice behaviour in Text Difficulty, Core and Elective activities.
Engaging students in learning is equally important as initiatives to improve cognitive performance. If students are alienated rather than engaged in learning, than it is likely they will be similarly alienated in developing the literacy knowledge, skills, and capacity required for participation in future academic, social, and community venture. (Guthrie, Klauda, & Morrison, 2012). In reading activities, being engaged requires motivated behaviour to want to read, to use prior knowledge and to employ cognitive strategies in order to perform a variety of tasks (Guthrie, Wigfield, & You, 2012). Reading engagement also requires a level of dedication shown in children’s willingness to sustain effort and persistence (Guthrie, Klauda, & Morrison, 2012). These qualities of engagement are reflected in children’s choice of Text Difficulty and was operationalised as an indicator of reading engagement in the FORCSI study. Children were given a choice of reading materials ranging from easy (Story A: Year 3 text level) to difficult (Story E: Year 10 text level). After reading the story, the students then had to answer comprehension questions presented in cloze format. The decision to expend effort and persistence by choosing to read texts that were year appropriate (Story B or C) was taken to reflect the child’s willingness to engage in reading. The choice to read the easy text (Story A) suggests they were less motivated to expend additional effort and persistence needed to read harder texts and complete the more challenging cloze activity. Choosing to read an easy text and complete its simple cloze task indicated reading disengagement.

Children’s willingness to participate in Core activities (reading and number) was also operationalised as an index of reading engagement. Students who were motivated to read would participate more willingly in reading and number activities (Core activities) than drawing and physical movement tasks (Elective activities). The study perceived a greater willingness to participate in Core activities (1= low, 5= high) as being engaged in reading. Willingness to participate in Elective activities was treated as a non-target measure that should not yield as a result of the targeted intervention. This provides an indication whether mere participation in a reading programme rather than the intervention itself impacts positively on student’s psychosocial orientation to reading.
8.8.2. Relationship between Thoughts, Beliefs, Emotions and Text Difficulty.

The last of the key findings includes the relationship between children’s thoughts, beliefs and emotions and the psychosocial outcomes. Out of the three dependant variables, FORCSI’s impact was only on children’s Choice of Text Difficulty, with a moderate effect size of practical value ($d = .53$). Hierarchical regression analysis showed FORCSI explained 5% of Test Difficulty’s variance, a proportion above and beyond other predictors, Age (5.7%) and Self Concept (6.6%). With increasing age and self concept, children were more willing to engage in reading by choosing age-appropriate texts or higher if they belonged to the intervention group. Put differently, behavioural engagement can be explained when children, participants of FORCSI, are increasing in age and self concept.

Recent evidence suggests highly engaged readers from families with low income and low parental education had higher reading achievement than students from backgrounds with higher education and higher income but were less engaged readers (Guthrie, Schafer, & Huang, 2001). OECD reports from the PISA data showed reading engagement a stronger predictor of reading achievement than socioeconomic status (OECD, 2004). Findings such as these suggests limited fiscal capacity of the government may be better afforded when efforts are aimed at promoting academic engagement than the attainment of minimum reading standards through high-stakes testing (Becker & Luthar, 2002).

Nagengast and colleagues (2011) had results supporting the current study’s findings. The authors examined the expectancy-value theory using latent-variable models of interaction effects to study the interplay between expectancy of success (self concept in science) and value (enjoyment of science) in predicting students’ engagement in science activities and intentions of pursuing scientific careers. Based on the large representative sample of 15-year old students obtained from PISA 2006, the findings showed support for the generalisability of the effects of science self concept, enjoyment of science, and the interaction between these two variables on both engagement in science activities and plans to pursue science careers. These findings point to the need for theory-driven interventions fostering children’s
psychosocial orientation to reading, such as self concept in reading. Interventions have primarily focused on skill development and academic achievement, whereas the fundamental problem is one of addressing and understanding the key psychosocial determinants of engaging students such that reading becomes a “want to” than a “won’t do” choice.

8.8.3. **Relationship between Thoughts, Beliefs, Emotions and Core Activities (Reading and Number).**

The second indicator of reading engagement was children’s psychosocial orientation to choose Core activities, reading and number. Differences between the intervention and comparison groups were small ($d = .20$) on this measure. Three predictors explained children’s choice of Core activities with Task Values, Anger and Age explaining 24%, 5.2%, and 3.4% of the variance respectively. Younger children were more willing to participate in reading and number tasks than older children. Children were more willing to participate in reading and number activities as long as they were not angry and they could see the value and importance of reading. The findings encourages future research on the development of children’s task value by fostering their interest, enjoyment and value in reading, particularly in the context of diminishing reading values over time (Kamil, et al., 2008).

*Anger* was an unexpected negative emotion explaining children’s willingness to participate in reading and number activities. Previous studies have reported the influence of negative emotions, boredom, frustration and confusion on reading comprehension (Graesser & D’Mello, 2012), boredom and anger as a negative predictor of mastery-goal orientation and anxiety, hopelessness, and shame as positive predictors of performance-avoidance goal orientation (Pekrun, Elliot, & Maier, 2006). In this study *Anger* was the counter intuitive factor explaining engagement in reading and number activities.

Emotions are inseparable from the learning process and are important mediators of motivation facilitating or hindering learning (Ainley, Corrigan, Richardson, 2005; Efklides & Petaki, 2005; Meyer & Turner, 2002; Pekrun, Goetz, Titz, & Perry, 2002). Ample evidence has supported positive emotions facilitating learning, however simple conceptions of negative emotions as bad and positive
emotions as being good should be treated guardedly (Hascher, 2010; Pekrun, et al., 2002). Although Anger is generally considered a negative emotion, its affect on performance behaviour can also be viewed as a negative activating emotion (Pekrun, et al., 2002). For instance, reading-related anger can induce strong motivation to cope with the negative events that caused them. An individual who is angry may be assumed to activate motivations to overcome obstacles or to find ways to get rid of the bad feeling (Hascher, 2010; Pekrun, et al., 2002). In this study, Anger was predicted as an enabling emotion in children’s willingness to engage in reading and number tasks.

In this cohort of low SES middle-years children with below average national reading levels, reading-related anger was their subjective feelings towards reading in general. Children’s written responses on the questionnaire indicated the multifaceted and complex nature of reading-related emotions. Children’s reading-related anger varied in magnitude (1= low, 5= high) and according to whether it was based on competence belief (I get angry because: it’s hard, I can’t read properly, I can’t get the words right) or from external events making them angry. A Year 5 boy gets angry because he is teased during sustained silent reading as well as not getting to finish looking up things when researching for a project. A boy with learning difficulties records he is angry at having to read a chapter for homework because it is embarrassing as people laugh at me when I do not complete the required reading. A Year 5 girl is angered when doing research reading for a project as her team members blames me for not getting good marks. Another girl in Year 6 does not like sustained silent reading because she becomes angry at having to stop what she likes doing I like to read silently only when I have finished my drawing.

This is a small sample representing the complexity of affective reading experiences. Unfortunately poor psychometric properties of the emotion scales limited further insights and understanding of the dynamic social, psychological, and personal processes enacted in the learning context. Future work is needed respecting the complexity and diversity of achievement emotions, taking into account emotion and how it is intertwined in the teacher’s instructional responses, students’ beliefs and actions and bound in a classroom context (Meyer and Turner, 2006).
8.8.4. Relationship between Thoughts, Beliefs, Emotions and Elective Activities (Drawing and Physical Movement).

Children’s willingness to participate in drawing and physical movement tasks (Elective) was predicted by the emotions sustained during reading for research purposes. Comparison children’s affective states during research reading for a project predicted a greater willingness to participate in non-academic activities than intervention children as indicated by the negative effect size ($d = -.29$).

Elective activities can be treated as a non-target measure testing for discriminate validity of the intervention as well as an indicator of reading disengagement for intervention children. The findings suggests FORCSI yielded effects specific to reading, indicating the intervention itself rather than the mere participation in the programme, impacted positively on students’ overall reading engagement.

8.9. Qualitative Findings.

An important and complex task associated with all work undertaken in intervention studies is to understand the instructional conditions of successful reading programmes. Another challenge is how best to observe and reliably measure this success (Lyon & Moats, 1997). In addressing these issues, aspects of a design-based research guided the methodology, paying particular attention to both the processes of the intervention and the processes of the research. The qualitative findings served as a supportive role under the quantitative data, illuminating salient aspects of the intervention that can inform future practice.

Class-level data obtained through observational field notes showed both groups similar in the number of hours devoted on literacy, class structure and demographic characteristics. Qualitative data of this description, when combined with quantitative data, can provide methodological rigor, improving the interpretability of results by reducing the number of plausible alternative inferences (Chard, et al., 2009; Cook & Campbell, 1979; Stuart, 2007). A limitation was the lack of process data collected on the literacy practices of comparison classes.
Process data showed changes to FORCSI were necessary for classroom behaviour management. Establishing discipline was consuming an increasing proportion of teaching time. A recognition scheme rewarding on-task behaviour with merit cards ensured the teaching and learning were maximised. The recognition scheme may have prompted students to behave in more motivated ways and perhaps this could have inflated their self-reports on the psychosocial measures. Another change that could have affected the reading performance of some children was the unsolicited assistance from two classroom teachers. These teachers withdrew a small group of the weakest readers and used the same instructional procedures in FORCSI.

Observational field notes, researcher’s diary entries and student’s written responses to the questionnaire showed FORCSI had a positive influence on student engagement, supporting the findings from the quantitative analysis. Students were observed to be engaged behaviourally (motivated and effortful behaviour), cognitively (yearly class test results), emotionally (increases in confidence) and socially (positive teacher-student relationship).

8.10. Limitations of the Study and Direction for Future Research.

In this section, the remaining two parts are presented. The first part discusses the limitations of the study with suggestions for future research. The second part deals with the implications for policy and practice. A chapter summary concludes this chapter.

Interventions studies are regarded as being difficult to design, execute and replicate because of the complexity of the methodological issues that make interpretation of the research data difficult (Lyon & Moats, 1997). With respect to these issues, the results of the study must be interpreted with several limitations in mind: Generalisability; Research Design; and Scale Measures.

8.10.1. Generalisability.

The sample size was small and involved two schools from communities of low socioeconomic status. The very nature and purpose of the study could mitigate generalisations to a wider population. This was not a random sample taken from the school population at large, nor is it a random sample from disadvantaged schools on
the Priority School Funding Programme (NSW Board of Studies, 2009). This makes it difficult to determine whether or not these results would be repeated in another disadvantaged school. Future research should include multiple studies including schools of diverse socioeconomic status in the attempt to triangulate the treatment strengths of the reading intervention across a larger cross section of the school community.

In this study, design-based research was the methodological approach used to collect process data complementing the outcome measures. The goal of design-based research is to expose and problematise the completed intervention and its resultant implementation such that findings can develop usable instructional practices benefiting children. Generalisability becomes a core challenge because the design-based researchers recognise that what makes an intervention "work" may be specific to the ecological and contextual dynamics unique to that particular classroom(s). Further research should include the use of iteration cycles of data collection and replication such that many designs and enactments are allowed to occur and to be studied formally enabling further exploration of how local and global contexts interact.

8.10.2. Research Design.

Lack of random assignment does compromise the ability to make cause and effect conclusions and are susceptible to threats to internal validity (Cook & Campbell, 1979). Although the quasi-experimental study employed design elements such as using matched groups and statistical controls, in the future if random assignment is not practical regression discontinuity and interrupted time series designs can be used. Both designs have built in controls; the former targets the selection process explicitly while the latter controls for both pre-existing differences and trends pre-intervention (Shadish & Cook, 2009). Both designs are strong alternatives to random experiments because their structural integrity reduces the impact of threats to internal validity and subsequent causal inferences can strengthen (Cook, 2002; Cook & Campbell, 1979; Larzelere et al., 2004).

The short nine-week reading intervention makes it difficult to make claims regarding the mid-range and long-term effects of the reading programme. Classroom
observation indicated some classes took a longer time working independently on the reading programme. For these classes, a longer time was needed to establish classroom discipline and this prevented the children from completing the necessary amount of reading as prescribed in FORCSI. It was not clear whether the effects of the intervention were due to the intervention itself or that it was employed for duration too short to make discernible changes in children’s reading and psychosocial outcomes. Future research might include a longer time period to take into account the time needed for children to develop fluent reading with minimum guidance and supervision. A longer intervention period is also needed to ensure students can apply the comprehension strategies independently. It takes time for students to understand strategy instruction and apply the knowledge of strategy us across content areas. Follow-up posttests could then assess whether the effects of the comprehension strategies instruction were not transitory and had indeed been established.

Another limitation was the study’s inability to ascertain whether the effects of the reading intervention was transient reflecting an immediate halo effect without a lasting impact on students’ subsequent learning outcomes. A clearer picture of the intervention would have been possible if follow-up assessments were carried out some time later after the intervention had finished. Using more measurement points than the pretest-posttest design would have provided more information regarding the development of fluency.

In quasi-experimental research, it is more difficult to control for teacher effects. How does a study separate specific intervention effect from teacher effect? Intervention children may have had higher comprehension and psychosocial outcomes than the comparison group due to the researcher’s attentiveness in implementing the intervention with high level of fidelity as well as a wider knowledge base compared to regular teachers. Intervention studies seldom attempt to delineate how teacher process and contextual variables can influence changes within any treatment programme (Chard, Ketterlin-Geller, Baker, Doabler, & Apichatabutra, 2009; Lyon & Moats, 1997). Future research should include the use of qualitative investigative methods, such as additional assessments and documentation of teacher-related processes (e. g., teacher style, teacher-student
relationship) so inferences can be drawn about the nature of the change in reading behaviour accounting for specific treatment and ecological factors (e.g., classroom setting, task/material, instructional grouping).

8.10.3. Scale Measures.

Fundamental issues in the measurement scales limited the scope of the study’s findings. Preliminary screening of Year 6 children found a ceiling effect for reading accuracy using the NARA test. There were children with reading accuracy scores higher than the standardised reading limit of 13.1 years, limiting interpretations with respect to reading accuracy’s relationship with the other dependent variables for some older children. Although the NARA test has been used successfully, testing the reading comprehension of older students (Nunes, et al., 2012), future replication of FORCSI can measure students’ use of morphemes as an indicator of word accuracy rather than the traditional method of measuring how many words are read correctly, as used in the FORSCI intervention. In a recent study on the significance of word recognition on comprehension and fluency (Nunes, et al., 2012), the findings showed 12 and 13 year olds’ use of morphemes in decoding and spelling tests, was a stronger predictor of reading comprehension above the other measures, including verbal intelligence. Currently there is minimal research data on reading accuracy achievement and its development (Galletly et al., 2009). Future research can consider alternate measures of word accuracy, such as morpheme use, as an investigative strategy examining fluency and accuracy and its relationship with reading comprehension.

Fluency is comprised of three major components (i.e., rate, accuracy, and prosody), of which rate and accuracy are the most consistently measured elements of the construct, requiring relatively simple measures for assessment (Benjamin & Schwanenflugel, 2010; Kuhn, et al., 2010). Prosody is more difficult to define and measuring this component has proven difficult. As a result, prosody has received less empirical attention (Benjamin & Schwanenflugel, 2010). In the light of current studies documenting prosody’s association with reading comprehension and overall reading achievement at the upper-primary and high school years (Geva & Farnia, 2011; Paige, et al., 2012; Rasinski, et al., 2009), future research should include a
broader range of measures directly targeting prosody and its contribution to overall reading proficiency. Without the inclusion of some measure of prosody, oral reading fluency can incur the higher risk of being treated only as a measure of fast reading with little attention to read for meaning (Kuhn, et al., 2010; Paige, et al., 2012).

Research is always limited by the measures of relevant constructs available. The teacher-made scales measuring children’s emotions and participatory behaviour were not sufficient to capture the subtle changes in response to various reading tasks. Future research will need a variety of measures with strong psychometric properties to identify the subtle psychosocial processes emanating from the reading intervention.

8.11. Implications for Policy and Practice.

Policy implications are discussed within the current Australian policy context. Important and widely acknowledged features of this include the need for more effort and resources to be invested in the research and development of literacy programmes for children in the middle-years. Policy implications are followed by the key findings from the FORSCI study that can be applied in classrooms, focusing on the instructional features in comprehension strategy and in repeated reading. These instructional features are outlined in detail.

8.11.1. Implications for Policy.

This study has contributed to understanding of the relationship between fluency and comprehension. Reading is complex and there is no one instructional approach that can address all learning needs. However, this study has demonstrated the effectiveness of one approach and in doing so, illustrated the complex, intertwined relationship between fluency and comprehension. While reading comprehension is central to policy, the role of fluency has been less explicit. This study suggests that explicit attention to the role of fluency and comprehension strategy instruction is needed, particularly for below average readers in the middle years. Three reasons for this are outlined below.

First, the development of lower-order skills must begin in early primary and continue through to the later years of primary school, integrated with instruction
developing higher-order skills. A large body of research shows effective programmes incorporate both bottom-up and top-down instruction. FORCSI is a multicomponent reading programme where the integration of lower- and higher-order skills is developed through fluency instruction (automaticity of lower-order skills) and comprehension strategy instruction (higher-order skill). Second, FORCSI consists of indentified effective instructional components (e.g., skill modelling, scaffolding, corrective feedback) with explicit and guided teaching, a pedagogy known to benefit below average readers (Purdie & Ellis, 2005). There have been previous calls for more explicit reading instruction consistent with this stance (Edwards-Groves, 2002; Rowe, 2006). Third, in the midst of current flux in funding for children in the middle-years, FORCSI is potentially a straightforward, research-based practice, that is easy to implement and cost-effective requiring minimal staff development. For use on a wider section of the school population, further research is needed including the replication of FORCSI study.

8.11.2. Implications for Classroom Practice.

There are at least two key findings that can be applied to classroom practice. First, there needs to be systematic and explicit instruction in comprehension strategies as part of classroom literacy practice. A substantial body of research supports the benefits of strategy instruction for improving students’ reading comprehension. There are five core strategies used develop children’s comprehension that underpin the FORCSI programme including: (a) separating the main idea from the details of the passage, (b) effectively summarising information, (c) drawing inferences from text, (d) using contextual clues to access meaning, and (d) self- monitoring of strategic processes. These five core strategies can be integrated as part of high quality discussion about a text. The salient features of how strategy instruction can best be delivered are described below.

1. Present the strategies in small steps using explicit instruction in the early stages. As the students move towards mastery, the use of implicit methods to encourage students to apply and generalise strategy use to other areas independently.

2. Model the strategy using think-aloud and scaffolding techniques.
3. Provide guided student practice with corrective feedback. Encourage students to verbalise their own thinking processes through think-aloud as this provides an opportunity for teachers to reinforce appropriate strategy use or to provide assistance when necessary.

Second, student’s automaticity and comprehension skills were improved with repeated practice. However, volumes of practice do not necessarily lead to improvements in reading ability (Rasinski et al., 2009; Therrien, 2004; Topping et al., 2007). There are key instructional components that are integral to the successful development of children’s reading and psychosocial processes including:

1. Modelling of expressive fluent reading. Fluent reading is not fast reading. Children’s attention must be continually focused on reading with intonation, stress, appropriate pausing and phrase lengthening rather than reading for speed. Prosody adds to the meaning of a text. By knowing how to break up the text into syntactically appropriate units (e.g., noun phrases, verb phrases, prepositional phrases), the reader is demonstrating his/her ability to monitor the meaning of the passage.

2. Guided practice is offered in the form of whole-class choral reading with year-level texts rather than independent-level texts. For some children, successfully reading texts that are beyond their independent-level can be very satisfying, increasing reading self-concept and competence beliefs.

3. Using peers to practice reading, monitoring and offering correct feedback to their partner. Partner reading provides children an opportunity to socially interact with other. Studies have reported that instruction that incorporates social interaction about text increases students’ motivation to read and reading comprehension achievement (Quirk, et al., 2009).

4. Establish fluency goals appropriate for each year–level with children to record their daily progress on a chart to make reading gains explicit. Goal-setting with children observing their progress fosters self-efficacy (Ferrara, 2005). When students believe working on a task will lead to goal attainment, the cyclical nature of motivation and achievement is activated: they attend to
instruction, rehearse information to be remembered, expend effort and persist substantiating self-efficacy. As children can see goal progress, the realisation of increased skill increases self-efficacy for future reading tasks.

The procedures in guided oral repeated reading are not particularly difficult to use nor do they require special equipment or materials (NICHD, 2000). These procedures makes for a third-wave supplemental reading programme a viable and a cost-effective initiative improving various reading skills for older children whom are supposedly beyond the need for fluency instruction.


Fluency’s nature is multifaceted and complex, making consensus among researchers difficult when it comes to defining and measuring this construct. An implication from this is how will one define fluency and which of the construct’s components will be emphasized in the definition. Answers to these questions influence how fluency is both assessed and taught (Kuhn, et al., 2010). In this study, fluency instruction through a repeated reading method, defined fluency as inextricably connected with comprehension (Pikulski & Chard, 2005) with accuracy and rate considered as indicators of fluency (Samuels, 2006). FORCSI therefore, like other effective instructional approaches for fluency development (e.g., FORI; Stahl & Heubach, 2005; Wide FORI: Kuhn, et al., 2006; FDL: Rasinski, et al., 1994), viewed the comprehension of texts, rather than an increase in accuracy or rate, as the prime aim of instruction.

The findings showed FORCSI had a treatment effect of practical significance on listening and reading comprehension for children in the middle-years, in a period where for many students, a reading slump and late-onset reading difficulties are becoming potential barriers to school success (Chall & Jacobs, 2003; Galletly, et al., 2009; Kieffer, 2010; Leach, et al., 2003). More importantly, the study found which type of students benefited from the intervention: FORCSI improved Year 4 children’s listening comprehension and reading comprehension for children in Years 5 and 6.
These findings are significant in that it presents two challenges as to how fluency is viewed. First, it challenges the current view holding reading fluency as an issue chiefly for early primary years (Paige, et al., 2012; Rasinski, 2012). Indeed, Chall’s (1996) model of reading development posits fluency as a competency to be mastered in the early stages of reading. The study’s findings, along with a growing body of research, has begun to question the confinement of fluency instruction for younger children only (Biggs, et al., 2008; Paige, et al., 2012; Rasinski, et al., 2005; Rasinski, et al., 2009). FORCSI’s results demonstrated its efficacy in improving the listening and reading comprehension skills for older children who are beyond the years when fluency is at its optimal development. This chapter also calls for future studies replicating FORCSI, particularly in the light of findings reporting the diminishing fluency-comprehension connection with older children (Edmonds, et al., 2009; Schwanenflugel, et al., 2006).

The second challenge to educational research’s view fluency of instruction proposes a psychosocial lens be adopted, moving beyond interventions solely focused on improving academic performance. Few have examined repeated reading in terms of its influence on children’s psychosocial orientation to reading. The findings here have contributed to body of knowledge by revealing fluency instruction as a potential agent for improving children’s psychosocial orientation to reading, particularly in fostering reading engagement. Intervention children were more willing to engage in reading materials that was age-appropriate than comparison children who predominately chose to read easy texts.

The findings on the psychosocial outcomes are encouraging given many reading interventions may be “successful” based on reading gains but fail when it comes to improving student attitude towards reading (Wanzek, et al., 2006). Brief activities targeting students’ thoughts, feelings, and beliefs can lead to large gains in student achievement and reduce achievement gaps months and even years later (Yeager & Walton, 2011). Interventions capitalising on improving children’s psychosocial outcomes should be priority when designing programmatic interventions, especially when declining interest, attitude, and values towards reading are most evident in children during the middle-years (Kamil, et al., 2008).
What began as an exploration of a *Fluency-Oriented Reading and Comprehension Strategy Instruction* programme supplementing classroom literacy practice, ended with a more nuanced understanding of how a reading intervention can impact on the differential aspects of reading and psychosocial processes of children in upper primary. The findings strongly recommend that fluency instruction for older children be reviewed and considered as a viable option improving educational outcomes, ensuring social disadvantage does not become a barrier to children becoming successful and effective participants in tomorrow’s global society.
CHAPTER: CONCLUSION.

Recent comparative international studies have illustrated Australia’s relative stagnation or decline in literacy achievement. Almost 25% of Year 4 Australian students did not achieve the Intermediate International benchmark or the minimum proficient standard expected on the Progress in International Reading Literacy Study (PIRLS) (Thomson, et al., 2012). While achieving higher than average scores on PISA assessments, Australia has been identified as providing an educational system with significant levels of educational disadvantage and the achievement gap between same age Australian students can be the equivalent of several years of schooling (OECD, 2006). These findings provided the rationale for exploring a multicomponent reading intervention with the purpose of gaining a more nuanced understanding of the dynamic interaction between cognitive, emotional and psychosocial processes impacting on the reading performance of middle year primary children. This investigation into a potentially cost-effective research-based reading intervention will contribute to the small but developing research base supporting third-wave supplementary reading instruction for children in low socioeconomic communities.

The Australian government has put an unprecedented focus on educational policy to ensure the acquisition of literacy skills for all students (MCEETYA, 2008). One initiative has included narrowing the achievement gap between students with low socio-economic background and their more affluent peers. Recent reports have identified inequities within the Australian education system with low SES students under-represented in high achievers and over represented in low achievers (DEEWR, 2011; MCEETYA, 2008; OECD, 2006). The challenge of closing the achievement gap is further complicated when funding and resources are stretched very thin with approximately one-fifth of Australian school children struggling with the effects of low SES backgrounds (DEEWR, 2011). While a large proportion of government funding has been prioritised into first and second-wave initiatives to improve the literacy skills of children in early primary, there is little evidence any of the third-
wave support for upper primary children offers the level of commitment and intensity required to address the reading needs at this level (DEST, 2003; Louden, 2000; Rowe et al., 2007; van Kraayenoord, 2010). Unfortunately most of the third-wave support is ad hoc and has little research support (Elkins, 2007).

In addition to the limited amount of third wave support for children in the upper primary grades, whatever funds are available are insufficient to meet the needs of students with ongoing learning difficulties despite earlier attempts at remediation (Lamb & Teese, 2005). There are also a growing number of students going through a ‘fourth-grade slump’. The ‘slump’ is a well documented phenomenon characterised by the widening of differences in student achievement due to the deceleration of progress for some students and the emergence of late-onset reading difficulties (Chall, 1966; Chall et al., 1990; Galletly et al., 2009; Kieffer, 2010; Leach et al, 2003).

Another trend appearing beyond Year 3 is a declining engagement with reading. Children become disengaged from literacy activities as negative attitudes, declining reading interest, and beliefs about competence become more entrenched with increasing year levels (Chapman & Tunmer, 1995; Kamil et al., 2008; McKenna et al., 1995; Spinath & Spinath, 2005; OECD, 2010b; Wigfield et al., 1997). One powerful agent ameliorating the effects of social disadvantage is reading engagement (Cummins, 2011; Guthrie et al., 2001). Studies have found reading engagement is a stronger predictor of reading achievement than socioeconomic status (OECD, 2004, 2010b) and this can help to overcome traditional barriers to reading achievement including parental education and income (Guthrie et al., 2001).

The reality is the longer middle year students continue without adequate assistance, the more endemic these deficits will become particularly when literacy demands becomes more complex beyond Year 3 (Chall, 1996). Research into the acquisition of literacy in the later years especially the middle years has focused on meeting the needs of students with specific learning disabilities, rather than on the wider group of students (Chan & Dally, 2000; DEET, 2001; DEST, 2003; Louden, 2000; Rowe, et al., 2007). Until such time as the Australian Government can ensure equity so funding is directed where it is needed most (DEEWR, 2011), this study
provides information on a supplementary reading programme to be used while appropriate programmes are developed and further research can be conducted identifying the learning need of middle year students. It is important for this demographic group of low SES children to have access to the educational opportunities necessary to lead successful and productive lives.

The study pursued three goals. The first goal was to examine the impact of FORCSI and other variable, on children’s reading performance in listening and reading comprehension, reading accuracy, and text fluency. The second goal involved examining the reading outcomes on a year level basis. The last goal was to identify variables affecting children’s thoughts (reading self concept), beliefs (reading task values), emotions and feelings on their willingness to engage in reading activities (or reading engagement). These goals respond directly to the current policy directives and initiatives including advancing the literacy development of all children through the provision of an integrated approach to reading, supporting the development of literacy skills, and improving reading fluency (DEST, 2005).

There is no one intervention or approach to address the complex nature of learning to read; however, the present study builds on previous work conducted in fluency instruction. The reading intervention used repeated reading as an instructional approach to improving fluency. Repeated readings are used widely with young beginning readers to improve word processing automaticity and as remediation for older students struggling with reading disabilities. Unfortunately, not much is known about repeated reading’s effectiveness on reading performance for children in the middle years of primary school. In this study, FORCSI included a comprehension focus integrated with fluency-oriented reading procedures and yielded significantly better listening and reading comprehension performance for intervention children compared to comparison children. When reading outcomes were examined across the year levels, Year 4 children demonstrated improvement in listening comprehension and improvement for Year 6 children in reading comprehension as compared to their same aged counterparts. Not only did the study reveal the developmental aspects of reading fluency but also the significance of fluency instruction in upper primary. This is especially important considering the current model of reading used in schools, stressing fluency in the early primary
grades but with less of a role as students enter the later years of primary (Kuhn & Stahl, 2003; Schwanenflugel, et al., 2006).

Reading fluency is a complex and multidimensional construct (Hudson et al., 2009). The study’s contribution is its attempt to explore some of many facets of fluency. One salient aspect of reading fluency is the way it is defined and conceptualised as this influences how the construct is measured (Samuels & Farstrup, 2006) and subsequently the effectiveness of an intervention. Some fluency methods fail not because of the method was ineffective but because of an assessment’s inability to identify fluency’s latent attributes. The present study conceptualised reading fluency as the ability to decode and comprehend text simultaneously (Samuels, 2006). Because this study focused on the relationship of fluency and comprehension, a variety of measures were used to detect both microcomprehension and macrocomprehension processes. As a result, the comprehension measures revealed FORCSI’s efficacy in improving macrocomprehension processes for Year 4 children and microcomprehension processes for Year 6 children. These findings have not been documented in previous fluency intervention studies as it had been posited fluent reading would affect readers’ microcomprehension processes but not macrocomprehension processes (Kuhn & Stahl, 2003). Had the present study used only one comprehension measure, the findings would not have identified FORCSI’s effectiveness targeting specific comprehension skills appropriate for different age groups of students. The effectiveness of any intervention can be increased when we understand what instructional reading approach or combination of approaches has the greatest impact on well-defined elements of reading behaviour and measured by assessments designed to detect the latent construct under examination.

The present study has extended previous research in fluency-based interventions by examining its effect on children’s psychosocial orientation to reading using a conceptual framework based on the expectancy-value model and including children’s emotions. Children’s psychosocial orientation to reading was measured by their willingness to participate in reading activities against other non-academic activities and their choice of reading material with a level of difficulty appropriate to their age. Willingness to participate in reading activities was
operationalised as an index of reading engagement. The findings indicated another facet of fluency-oriented reading instruction, namely its ability to enhance students’ self-evaluations and social-emotional experiences, which hold potential for sustainable improvements in psychosocial well-being and reading engagement development.

Reading engagement needs to be considered an important educational outcome, a proxy for academic achievement, and recognised as an important mediator for learning (Cummins, 2011; Kamil et al., 2008; OECD, 2010b). Engagement has been found to be a stronger predictor of reading achievement than socioeconomic status (Guthrie et al., 2001: OECD, 2004). The amount of reading activity students choose to engage in is directly related to reading proficiency (Anderson et al., 1988; Taylor et al., 1990). If students are not engaged in reading then they will probably be disengaged from literacy, knowledge, skills, and abilities needed to participate in academic, social, and community life. Very few reading interventions have considered the importance of examining the social, emotional, cognitive and psychological factors impacting children’s reading performance since many reading interventions are focused only on improving student achievement. Improvement in school performance may be achieved when attention is turned to developing reading engagement as an educational imperative rather than only the attainment of minimum reading standards (Becker & Luthar, 2002; Covington, 1998; Deci & Ryan, 2002). When reading is acknowledged as a social activity and an affective commitment in addition to being a cognitive accomplishment, reading prospects for students will improve (Verhoeven & Snow, 2001).

Because not all children, tasks, and teachers are the same, teachers need to have a variety of teaching strategies to help children develop reading skills with a clear understanding of how and when to implement each strategy for optimal results. The reading intervention used in this study addresses these issues with evidence-based instructional procedures including: the provision of modelling, guided instruction with corrective feedback, and comprehension strategy instruction. This produced reading and psychosocial outcomes of practical significance for children of diverse ability in upper primary. Although the 30-minute reading sessions may not seem like enough time to make a difference, the reading intervention’s success may
lie in its ability to make effective use of school time. Coleman (1968) reported on the equality of educational opportunity and its conclusions nearly 50 years ago are just as relevant now as then. Coleman has been supported with recent empirical evidence (Foorman, et al., 2006). Coleman argued the point of making effective use of school time as the singularly the most egalitarian function schools can offer. This seminal study found that for disadvantaged children, school time was the only time available for learning. Advantaged children can learn at school and continue to learn outside of school time however children from low socioeconomic backgrounds are more dependent on school to gain the knowledge and skills they will need. Programmes using school-time effectively can assist these children to catch-up with children with higher socioeconomic backgrounds. Within nine-weeks, the FORCSI was able to deliver improvements in educational outcomes of practical significance warranting further time, effort, and commitment in further research, ensuring reading competence and children’s psychosocial well-being are not being denied because of demography.

The findings of this study point to a more nuanced and dynamic perspective for understanding the variables contributing to the reading achievement of children in the middle years. The study underscores the importance of considering fluency and comprehension instruction as viable supplement to classroom literacy practice. While the findings are only as good as the extant research and the claims are constrained by the weaknesses that have been acknowledged, it is hoped that the insights and knowledge gained from this study will generate further research in a neglected area of reading development for older students and assist teachers with practices they can integrate into their regular literacy programmes.
REFERENCES


*Reading Psychology, 26*, 127-146. doi: 10.1080/02702710590930492


295


Appendix A

THE READING FOLDER

Connected text passages for Year 4, 5 and 6

Comprehension questions

Record of Progress chart
Almost everyone who lives where there is ice or snow has made a snow fort or house at one time or another. No house made of ice or snow, however, could ever equal the Ice Palace made in Colorado in 1896.

Can you picture a building made almost entirely of ice and as big as ten football fields? The Ice Palace in Leadville, Colorado, was that big. It cost $60,000 to build and had walls eight feet thick! Inside were a large skating rink, a restaurant, and two huge dance halls. Thousands of people came to see the Ice Palace—but not for long. In ten weeks the ice melted and the Ice Palace was out of business.

1. **The best title is** -
   (A) Building Forts of Snow and Ice  (B) The Thickest Walls Ever Built  
   (C) How to Destroy a Building (D) The Amazing Ice Palace

2. **The Ice Palace in Leadville had**-
   (A) A race track  (B) A horse show  (C) Two dance halls  (D) A baseball field

3. **The Ice Palace was open**-
   (A) Eighteen years  (B) Eight months  (C) Three weeks  (D) Ten weeks

4. **The Ice Palace may have stayed in business for longer if**-
   (A) More people had come  (B) The weather had been warmer  (C) The walls were thinner  (D) The weather had been colder

5. **The word “equal” in line three means**-
   (A) Be smaller than  (B) Look as warm as  (C) Be the same as  (D) Weigh as little as
“I was always determined to be the greatest athlete that ever lived,” said Mildred. “Babe” Didrickson. She was nicknamed “Babe” by her childhood friends after the great baseball player Babe Ruth. She once threw a baseball 296 feet. Babe was a super athlete in a variety of sports, including track, golf, basketball, and baseball. She could swim, dive, bowl, ride a horse, and ice-skate well, too. In the 1932 Olympics, she entered three competitions in track and field. She won two gold medals and a silver medal.

How determined was she to be the best? Babe once asked a neighbour to trim his hedges the same height as the other hedges in the neighbourhood so that she could practice jumping hurdles!

1. **The best title is**-
   (A) Women in Sports (B) Babe Didrickson- Super Athlete (C) Babe Ruth- Baseball Great (D) Olympic Gold Medal Winner

2. **Babe Didrickson won medals in the 1932 Olympics in**-
   (A) Track and field (B) Baseball (C) Golf (D) Swimming

3. **In order to jump hurdles, Babe asked a neighbour to**-
   (A) Plant some hedges (B) Cut down hedges (C) Trim his hedges (D) Jump over hedges

4. **Babe’s childhood friends though she was**-
   (A) Good at baseball (B) Not mature (C) A show-off (D) Lots of fun

5. **The word “competitions” in line seven means**-
   (A) Shows (B) Contests (C) Practices (D) Sections
Year 6

Probably the greatest hoax of all time was the 1938 radio broadcast of “War of the Worlds.” And it wasn’t even intended to fool people! According to the program, which was broadcast the night before Halloween, Martians had landed their spaceship in New Jersey. What sounded like a news report told people that the Martians were terrible Monsters that were destroying entire cities. Nearly everyone listening to the radio panicked. Many left their homes and drove in the hills to hide. The radio announcer said that the show was just a story, but by that time it was too late. People had believed it. It wasn’t until the next day that they realized it was just a radio story, and even then, some people weren’t so sure!

1. The best title is-
(A) What Martians Are Like  (B) Hiding in the Hills  (C) A Frightening Radio Broadcast  (D) Those Factual News Reports

2. The broadcast occurred the night before-
(A) Christmas  (B) Halloween  (C) Easter  (D) Thanksgiving

3. The Martians were supposed to have landed in-
(A) California  (B) Texas  (C) Nevada  (D) New Jersey

4. The story does not tell-
(A) The year of the broadcast  (B) Where people hid  (C) If people became frightened  (D) Who the announcer was

5. The word “intended” in line two means-
(A) Closed  (B) Frightened  (C) Meant  (D) Discovered
My fluency goal: _____ wpm

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Appendix B

THE STORY BOOKLET

Story A    Grasshopper
Story B    Lizards Love Eggs
Story C    The Swamp Creature
Story D    The Red Ace of Spade
Story E    The Purple Children
Grasshoppers (Story A)

Most grasshoppers are coloured green and brown like the plants around them, so they are difficult to see. But their chirruping song will always help you to find them.

Grasshoppers like to bask in the sun. The sunshine gives them energy, and on sunny days they are lively and leap about a lot. But in cooler weather they stay close to the earth where it is warm. It is best to look for grasshoppers in hot but cloudy weather. Then they will be out, but they will not jump about too much to catch.

You can catch a grasshopper in your hands, or you can use a small glass jar or tube. Just lower the jar over the grasshopper and it will crawl or hop inside but move very slowly.

If you move quickly, the grasshopper is more likely to notice you and leap off into the grass. When you have caught a grasshopper you can look at it closely.

A grasshopper cannot close its eyes; it cannot move them either. But as they are on the sides of its head and are very large it can see everything around it at the same time.

But it has a different kind of eye to ours, and it does not see things as clearly as we do. Although it is quick to see moving things, a grasshopper only gets a blurred and shadowy picture of the world around it.
Lizards Love Eggs (Story B)

'Snake!' Tony's mother yelled. It was the first day of the family's camping holiday.

With one hand his mother grabbed up the baby from the grass by the tent flap. With the other she seized the stick of the beach umbrella. 'Keep back!' she called as Tony ran towards the tent.

Tony laughed and ran into the tent. 'It's only a lizard, Mum.I saw it walking through the grass.'

'Are you sure?' his mother said. 'I saw the tip of its tail sliding into the tent.'

'Sure,' said Tony. 'It's a blue-tongue. See!' He pointed into the tent.

The big lizard, about forty-five centimetres long, was crawling over Tony's airbed, its blue tongue flicking.

'Quick!' his mother said. 'It'll crawl into your sleeping-bag.' She shuddered. 'I wouldn't fancy sleeping with a lizard.'

Tony tweaked his sleeping-bag and the lizard slipped down onto the groundsheet, then scrambled quickly on to the next airbed.

'Oh, no!' said Tony's mother. It was hers.

The lizard disappeared into the opening fold of her sleeping-bag. Tony pulled the bag off to shake it outside, but before he reached the door the lizard fell out. It reared its head and hissed fiercely. The baby yelled in fear at the wide gaping mouth and the long blue tongue.

'Poor fella,' said Tony as the lizard scrambled for safety into the shelter of the grocery cartons. Tony dived after it.

'If it eats the apricots, it had better look out,' Tony's mother said.

'It won't just now,' Tony said. 'We've made it nervous.'

'It nervous! How do you think I feel?' said his mother. She already felt silly about her panic in mistaking the lizard for a snake. Now she felt annoyed at seeing the tidy arrangement of her tent turned topsy-turvy as Tony hunted through it.

'Mind the eggs,' she called. But it was too late.

As Tony lunged to catch the lizard he stepped right in the middle of the egg box.

Tony held up the lizard triumphantly. 'Look. See its goldy-pink belly.'

'Look,' replied his mother. 'See your goldy-yellow feet.' Tony looked at the eggs oozing from the squashed box.

'Too bad it's not a goanna,' he said. 'Goannas love eggs. It would have cleaned that up in no time.'

'Too bad indeed,' his mother agreed. 'Now you'll have to do it.'

Tony put the lizard in the washing-up basin. He mopped up the squelchy mess of yolks and whites with a cloth and squeezed it into the basin. The lizard's long blue tongue flicked in and out as the thick yellow drops fell. By the time the broken eggs were cleaned up, the lizard's stomach had swollen wide and flat between its legs. Blue-tongue lizards love eggs too!
The Swamp-creature (Story C)

Simon scrambled down onto a log, dropped Pet's reins over a dead branch of it, and took off his shoes. He went straight to the bank at the far end, where dead purple-top rattled like castanets when the wind blew. He broke off a thick stalk of it and went down the bank to prod in the water.

The deep hole was still out of reach. He stepped into the water at the edge, swishing in front with his stick until he could lean forward and reach into the hole. The stick was instantly twitched out of his hand and disappeared. He waited, watching for it to float to the surface. It didn't.

He went back to the bank for another stalk and tried all over again, watching closely for just one glimpse of whatever it was that had taken his stick. Nothing happened. He prodded and swished for some time, first in the water and then at dead flower-heads on the reeds fringing the hole. He teased a water-boatman with the tip of his stick till it paddled off in a frantic zig-zag. He trailed his stick towards another — and it was twitched out of his hand again and disappeared. The twitch was so forceful and sudden that it made him jump, but he saw nothing.

He tried skittering a stick over the place as he had last time, but nothing happened. The creature in the swamp was not to be tricked; it preferred to trick Simon. 'I don't care, anyhow!' he shouted, and went stamping back to the shallow end to look for specimens, and perhaps to think.

The swamp-creature felt more alive and tricky than it had for a long time. Its yellow-green skin gleamed as it slid through the swamp, and its throat bulged with silent chuckles. A boy who thought he could trick a Potkoorok!' 

When Simon was hungry he took his lunch up into the scrub. It was full of green-shadowed light and the sound of trees conversing with the wind. He sat on a wide terrace between roots, and was at once showered with falling twigs and leaves. 'Hey!' he said crossly, and brushed them off. Bulldozer noises were blown away and came billowing back. Whenever they were blown away a different sound was blown to him from the opposite direction, a distant grumbling and clanking that seemed familiar. He puzzled about that between eating Edie's sandwiches and puzzling about the swamp-creature.

From time to time another shower of leaves and twigs rained down. He thought it was from the wind. They only stung a little, so he didn't bother to move. From time to time, too, there were rustlings of small paws scampering among leaves, but he could never see what made them.

The last thing in his lunch-box was an apple. He had taken one bite of it when two ideas clicked into his mind. One was that the odd sound coming and going on the wind was a grader; there must be one working along the road somewhere. The moment he recognized it he was able to stop thinking about that, and the second idea took over; a creature that could not be tricked might be coaxed. He gathered up his things at once, and took his apple back to the far end of the swamp.

He laid the apple delicately on a tuft of broken reeds just under water at the edge of the deep hole. Standing a little way back, he kept his eyes on the apple.

Nothing happened. The wind blew and the weeds swung along its path. Now it blew the bulldozer noises to him, and now the clanking of the grader. It made a green surf of the forest on the mountain. Glancing at the forest, and from there along the mountain, Simon wondered if he could go by himself on old Pet to watch the bulldozer again ... Not up the steep part, of course, but just below it; the bulldozer must be nearly through to there by now ... Guiltily he looked down to the apple.

It was gone. He had been tricked again. While he stared with mouth open something was thrown that his shirt, splashed back into the water, and floated there. The apple core.

'You want to watch it,' Simon shouted angrily—and then he saw it. Just for a second something large and yellow-green shone as it turned through the water and a golden eye winked. Clearly he heard the swamp's deep chuckle.

The Potkoorok loved an apple.

Simon pounced on the core. There were little toothmarks on it he was suddenly charmed and full of wonder. He sat on the bank for a long time, but he didn't see it again.
The Red Ace of Spades (Story D)

Plates fly off shelves, doors slam, and light bulbs shatter whenever a fifteen-year-old girl comes into the room. Spoons melt and bend, and stopped clocks begin to run, when a young man passes his hand over them. A woman has a dream in which her brother dies; the next morning word comes that he died during the night. A camera takes pictures although the lens is covered and the young photographer is across the room. Using an alphabet code, a dog taps out answers to questions. A woman says she can see into the future.

Stories like these appear in the paper nearly every day. Television talk shows bring us psychics, persons who say they can read minds or foretell the future or move objects without touching them.

Most people are familiar with such claims, and many of us wonder how much we can believe. A few years ago the answer would have been easy: none of it. But things have changed. Parapsychology has become respectable, and more and more researchers are taking some of the claims seriously.

Despite its new respectability, parapsychology is not welcome everywhere. Highly publicized cases still don't stand up to scientific scrutiny. Publicity seekers still pretend to have mysterious powers. After nearly a century of trying, researchers still have not been able to produce solid evidence that people can sense others' thoughts or see into the future or move objects with the power of their minds. But in laboratories in many countries, quiet experiments that don't appear in newspapers are giving us hints that such things as telepathy do exist -- even though we can't say just how they work, or why.

People hear about these tantalizing experiments and wonder why psychologists can't go back to their laboratories and settle the question. It seems as if a few careful experiments ought to give us the answers we seek. But it's not that simple. So far, the answers seem to be a combination of yes, no, and maybe.

Before we look at the evidence, we ought to know what we're looking for when we speak of parapsychology. Psychology is the study of human behaviour, and para here means 'beyond'. Parapsychology is the study of behaviour that goes beyond what we believe is possible. Some people call this kind of behaviour psychic or psi, others call it para-normal, or beyond the normal. Parapsychology covers many different things, but all parapsychology, at first glance, seems to break the laws of physics.

If the universe runs according to the rules in the textbooks, parapsychology is impossible. People can't read minds. They can't see into the future. They can't hold a missing person's handkerchief and know all about that person and where he or she is at the moment. They can't affect the growth of plants. They can't leave their bodies and flit about the room. They can't remember past lives.

But the rules in the textbooks are changing. Twenty years ago, everyone was sure that people could not control the way their hearts beat, their body temperature, their blood pressure, their brain waves, and all the other bodily systems that seem to work by themselves. Today we know that most people can learn to control at least some of these systems.

Twenty years ago, we saw human beings and the universe through the eyes of Western Science. Anything that didn't fit that view of the world, we either pretended not to stop or said was just a trick. We all knew that Indian holy men who wrapped white cloths around their middles and lay on beds of nails were tricking us. And we didn't believe them when they slowed their hearts almost to a stop, or were buried for days and then stepped gaily out of their graves. We were too smart to be taken in by cheap stunts.

Smart as we were, we sometimes fooled ourselves. Psychologist Jerome Bruner once showed people photographs of playing cards and asked them to tell him what they saw. One at a time, these people came into a room, sat in a chair, and watched playing cards appear on a screen before them. Without hesitation they called out each card and its colour as it flashed on the screen. But Bruner had rigged the deck. His ace of spades was red, not black. Few people noticed anything odd about the card. Some said they saw a black ace of spades. Others were sure it was a red ace of hearts. Twenty years of seeing black spades and red hearts had so influenced their expectations that their brains failed to report what their eyes saw.
The Purple Children (Story E)

This story is set in an occupied township, where a sentry keeps watch during the nightly curfew. Mariposa distracted the sentry with a tale of her lost cat, while Teo raised the forbidden flag on the flagpole.

People came running into the courtyard from three doors. They found the sentry mopping his face, a long violet stain on the ground, and the coils of severed rope dangling at the foot of the flagstaff. They got the major out of bed, and the sentry reported to him with every excuse he could think of, though the sum of them all sounded thin enough.

“She was only a kid about fifteen. I didn’t think she could be up to anything, sir. She was looking for her cat.”

The major had been in the country for over a year, and was accustomed to the local style of warfare, to the ugly demands it made upon him, and the satisfaction he sometimes felt in their ugliness, which frightened and depressed him more than anything else. He stood gazing at the boy with rancour.

“They’re always kids of fifteen. Haven’t you learned that yet?”

“But there was a cat, sir that was true, anyhow.”

“That skinny tabby,” and the major wearily, “belongs to the caretaker. I imagine its appearance was a stroke of luck. Or she may have seen it before she made up her story and began calling. Well, you seem to have spent practically a quarter of an hour being civil to her. I take it you can pick her out again?”

The sentry was too frightened of his own side, by this time, to retain much resentment against the enemy; his fear even drew him into a kind of distant alliance with them. He said: “No sir, I don’t think I could. It was pretty dark there under the wall. There’s scores of them that same build, thin as a monkey.”

“And scores of them with purple hands and faces. At least you had the sense to fire your charge. That ought to give her one distinguishing feature, don’t you think?”

The sentry looked at the long dark stain like blood upon the stones, and was filled with a treasonable but unmistakable regret. “I’m sorry, sir,” he lied. “It was just then she threw the cat, it put me off proper. I reckon I missed her.”

“The why,” asked the major gently, “did she drip violet dye practically all the way to the gate?” He marked the last infinitesimal spot in the light of his torch. “A heavier charge, and we might have been able to follow her all the way home. Did you mark the boy, too?”

“No sir. He was well out of range, only he turned back to catch hold of her hand.” It was the first time he had fully realised all that he had seen. Regret rose in him like a tidal sea. “They haven’t done anything all that bad, sir; it’s only a flag!”

The major smiled. When this boy was forty instead of eighteen, he would no longer make the absurd mistake of speaking of ‘only’ a flag. “Whoever it was, he’s left about ten feet of the flagstaff coiled round with barbed-wire as he came down. You must have been very absorbed in your cat-hunt. And he must have spent a long time practising the movements involved, before he could reproduce them at that speed. Yes, I should like to congratulate that boy! But when we’ve found her we shall have found him, too. We’ll try the grammar school first,” he said, smiling to himself, beginning to feel the terrifying satisfaction of hate reacting against hate. “If
she isn’t there, we’ll look up the girls who don’t answer the register. We shan’t have to look any farther.”

In the shed behind Pablito’s father’s shop, Mariposa knelt over a pan of water, scouring with a handful of wet sand at the backs of her hands. The water lay in her palms as she rinsed them, as clear as it had come from the well. Juanito held the torch close, keeping his body between its light and the covered window. Teo crouched on his heels, his head bent close to Mariposa’s his cheek brushed occasionally by her swinging hair.

“It’s no use,” she said, letting her hands lie quiet in the wet skirt of her dress and looking up at him with enormous black eyes. The misshapen blotches of purple ate away half her face into shadow. Behind her all the silent, intent partisans drew closer with a long sigh. “It won’t come out,” she said with the calm of despair. “Now they have only to look for me. I can’t be hidden. Teo, what am I to do?”

“If they find you,” he said, taking her stained hands in his, “they find me, too.”

“That’s foolish! You’ll be needed again. And besides, they’d beat you; they’ll only imprison me. No, it was great luck that you were not splashed like me; don’t be so ungrateful as to throw it away.” But she was very frightened. He felt the small, wet hands, hot with scouring, tremble in his own.

“I will not let you bear it alone! We were all in this thing together. When we tow drew the lots we drew the danger with them, as well as the privilege.”
Appendix C

TORCH ANSWER SHEET

<table>
<thead>
<tr>
<th>Story A</th>
<th>Grasshopper</th>
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<tbody>
<tr>
<td>Story B</td>
<td>Lizards Love Eggs</td>
</tr>
<tr>
<td>Story C</td>
<td>The Swamp Creature</td>
</tr>
<tr>
<td>Story D</td>
<td>The Red Ace of Spade</td>
</tr>
<tr>
<td>Story E</td>
<td>The Purple Children</td>
</tr>
</tbody>
</table>
Grasshoppers

By learning about grasshoppers we can find out how to catch them.
Grasshoppers like to lie in ........................................ because they get ........................................ from it. They don’t jump about much when it is ........................................ because they don’t have as much .............................................. . It is easier to catch grasshoppers on days that are ...................... and ...................... because they are out but they don’t .............................................. .

Even when grasshoppers aren’t moving you will still be able to find one because they make a .............................................. . Most grasshoppers are coloured .............................................. and .............................................. just like the .............................................. which makes them .............................................. .

You can use .............................................. or a .............................................. to trap grasshoppers, but you have to move .............................................. so that they won’t see you or hear you and .............................................. .

Grasshoppers can see all around them because their eyes are .............................................. and .............................................. . However, even though they can see all around them, they cannot .............................................. or .............................................. their eyes and the picture a grasshopper sees is .............................................. .

If you are able to catch a grasshopper you can look at it closely and then let it go again.

---

[Diagram of a ruler with markings from 0 to 100]
Lizards Love Eggs

It was the first day of the family's camping holiday. Something crawled into the tent and thought it was a snake. Mother grabbed up the baby because she thought the snake might. Tony laughed because he knew the animal was a . He said it was called a .

It went into the tent and crawled over Tony's airbed but when Tony touched his sleeping-bag, it ran quickly onto the next one. This one belonged to . It reared its head and . The baby yelled because he was .

The lizard then ran in to hide in the . Because Mother made a mistake about the lizard, she felt and she was annoyed at the that Tony was making.

Mother called out to Tony to look out for the eggs but it was too late because Tony had already . Tony felt because he had the lizard. His feet were goldy-yellow because he had the eggs. He wished the lizard was a because they love eggs and would .

He mopped up the mess and put it in the with the lizard. The lizard's tongue flicked in and out as it all the broken eggs. So Tony found out that it's not just goannas who like eggs, so do .
The Swamp-creature

In this story the writer describes an unusual meeting between a boy and something that lives in a swamp. When Simon arrived at the swamp he broke off a stick and walked to the water to .............................................

Suddenly the stick .............................................

Simon guessed that a creature had ............................................. the stick so, after waiting and watching for a while, he decided to ............................................. to see if ............................................. . When the second stick disappeared, he started throwing sticks over the same place but the creature .............................................

Simon wasn’t afraid of the swamp creature. He wanted to .............................................

The swamp creature, which was called a ............................................. was trying ............................................. Simon and it was ............................................. the whole game.

Simon could hear the sounds of leaves rustling around him and, further off, the noises of ............................................. reminded him of the men working along the road. As he finished ............................................. he decided to use the apple to ............................................. the creature. He watched the apple carefully, waiting for ............................................. until he heard ............................................. which made him look away.

When he looked back ............................................. He had been ............................................. As he stared, the ............................................. was thrown at him. Simon felt ............................................. Suddenly he saw ............................................. just for a second and it was ............................................. and .............................................

Simon gazed at the ............................................. on the apple and he was .............................................

He waited for a long time but nothing more happened until the grader came along the road.
The Red Ace of Spades

Throughout history there have been stories of people possessing strange powers. Parapsychology is the term used by scientists to describe the study of ......................... while psychology is the study of .......................... Therefore a study of people's reaction to a natural disaster is part of ........................................, while a study into claims of seeing into the future would be regarded as part of .........................................

The author states that in the past claims of mysterious powers were ........................................... . Today, however, many scientists take these claims seriously and are prepared to experiment with them. This is because already .......................................................... have been shown to be quite genuine.

For example, after almost one hundred years of experimenting there are now hints that powers such as telepathy .........................................................., although psychologists still can't explain just ..........................................., nor can they produce .......................................................... to support these hints. People find it difficult to understand why carefully conducted experiments can't resolve the question of whether .......................................................... once and for all.

Some scientists, however, are still very suspicious of parapsychology because of people who .......................................................... strange or mysterious powers just to .......................................................... . When the bogus nature of such claims is revealed many people begin to believe that all claims of parapsychology powers are just hoaxes.

For years Indian holy men have claimed to be able to lie unharmed on a bed of nails, to .......................................................... and to be safely .......................................................... for days.

Until recently Western scientists had been sure that .......................................................... alter or change the workings of .......................................................... . They thought they were being really clever .......................................................... by these Indian holy men. Time and experiments have proved these scientists ..........................................................

The case of the Indian holy men shows very clearly how important it is to .......................................................... in order to learn and understand different cultures.

In his experiments Jerome Bruner found that many people incorrectly identified a card showing .......................................................... . Bruner believed this was because what people see, or think they see, is greatly influenced by ..........................................................

The experiments of Bruner and the case of the Indian holy men demonstrate how important it is to .......................................................... any parapsychological reports or claims. They also demonstrate just how limited our knowledge and understanding of the human mind really are.
THE PURPLE CHILDREN

As the people rushed into the courtyard they found the sentry, a

.......................... on the pavement and .......................... around the

base of the flagpole. The sentry had fired off a charge that was designed to

.......................... to help catch the culprits. Even though the sentry's

explanation to the major was not .........................., the major did not

blame him.

In their different ways, both the major and the sentry felt

.......................... about their occupation of the country. The major was

depressed by his satisfaction in .......................... that his position made

on him, while the sentry felt .......................... towards the people because

he was afraid of ..........................

The sentry .......................... about hitting Mariposa with the shot

because he .......................... The major was sorry that the sentry had

failed to .......................... as well as Mariposa, but, as before, the major's

attitude to the sentry was ..........................

However, the major now had .......................... to investigate the flag-

raising. He believed it was essential to catch the flag-raiser because flags

..........................

Meanwhile, Mariposa was finding it impossible to ..........................

from her hands and face. This caused much concern to the

partisans gathered nearby. The friends were making plans for

ways for Mariposa to avoid punishment.

They were .......................... to ensure she did not have to bear

.......................... They had all been prepared to take

their chances to ..........................
Appendix D

PSYCHOSOCIAL QUESTIONNAIRE

Reading Self Concept

Reading Task Value

Emotion and General Reading

Emotion and Specific Reading

Participatory Behaviour
Aspects of Self Knowledge about Activities

1. Name: ________________________________  (circle) boy/ girl
2. Year  3  4  5  6  at _____________________ School
3. Today’s date __ / __ / ___  Birthday __ / __ / ___
4. Age ___ Years ___ Months
5. What languages do you speak at home?

Today, I’d like to ask you about activities you do at school.

Practice examples

6. Which face shows how you feel about doing your school work?

Remember, there are no right or wrong answers, just what you think.

Now tell me,

7. How good are you at school work?  
   a bit  a bit more  (Circle how much)
8. How good are you at reading activities?

9. How naturally talented are you at reading activities? (just natural...clever)

10. How much do you try at reading activities?

11. How difficult are reading activities?

12. Next year how good will you be at reading activities?
13. How much do you enjoy reading activities?

```
[*.***]
[***]...
```

14. How much do you like reading activities?

```
[*.***]
[***]...
```

15. How useful are reading activities?

```
[*.***]
[***]...
```

16. How important are reading activities?

```
[*.***]
[***]...
```
Emotion and General Reading

For this task, you are asked how you feel about the activities that you do at school. Please tick one work or more than one - as many words as you need to describe how you feel when you read.

17. Embarrassed
18. Comfortable
19. Guilty
20. Worried
21. Sick
22. Pleased
23. Yuck
24. Shame
25. Disgust
26. Proud
27. Nervous
28. Bad Temper
29. Concerned
30. Furious
31. Alright
Emotion and Specific Reading

(a) Sustained Silent Reading

Lunchtime is over and you are back in class. It is Sustained Silent Reading for the next 10 minutes. How do you feel about doing this reading activity?

32. Feeling good (pleased, proud alright)

Feeling a little feeling good

33. Feeling worried (nervous, concerned)

Feeling a little feeling worried

34. Feeling guilty (Shame, embarrassed)

Feeling a little feeling guilty

35. Feeling angry (bad temper, furious)

Feeling a little feeling angry

36. Feeling yuck (sick, disgust)

Feeling a little feeling yuck
(b) Research Reading

You have to get information from the Internet and from the library to complete a research project. How do you feel about doing the reading for this project?

37. Feeling good (pleased, proud, alright)

*    **    ***    ****    *****

Feeling a little bit good
Feeling very, very good

38. Feeling worried (nervous, concerned)

*    **    ***    ****    *****

Feeling a little bit worried
Feeling very, very worried

39. Feeling guilty (shame embarrassed)

*    **    ***    ****    *****

Feeling a little bit guilty
Feeling very, very guilty

40. Feeling angry (bad temper, furious)

*    **    ***    ****    *****

Feeling a little bit angry
Feeling very, very angry

41. Feeling yuck (sick, disgust)

*    **    ***    ****    *****

Feeling a little bit yuck
Feeling very, very yuck
Your class is reading a chapter book with the teacher. Your homework is to read some pages of the book each night. How do you feel about reading the book each night?

42. **Feeling good** (pleased, proud, alright)
   - Feeling a little bit good
   - Feeling very, very good

43. **Feeling worried** (nervous, concerned)
   - Feeling a little bit worried
   - Feeling very, very worried

44. **Feeling guilty** (shame, embarrassed)
   - Feeling a little bit guilty
   - Feeling very, very guilty

45. **Feeling angry** (bad temper, furious)
   - Feeling a little bit angry
   - Feeling very, very angry

46. **Feeling yuck** (sick, disgust)
   - Feeling a little bit yuck
   - Feeling very, very yuck
Participatory or Choice Behaviour

(a) Choice of Text Difficulty

Put a cross on the story that you want to read and then complete the questions afterwards.

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<th>47.</th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>E</th>
</tr>
</thead>
</table>

(b) Choice of Text Difficulty

For this task, you are asked to make choices about the activities that you do at school. Please circle the dots to show your choices.

• means you would not choose the activity.

•• means you would choose it a bit, or perhaps a bit more.

••••• means you choose this activity a lot.

48. Reading

<p>| | | | | |</p>
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</table>
49. Number

50. Drawing

51. Movement
Appendix E

INFORMATION PACKAGE

Parent Information Sheet

Parent (or Guardian) Consent Form
Parent Information Sheet

Title: The dynamics of reading performance and motivation

Dear Parents,

My name is Marian Koo. I am studying at The University of Sydney. I would like your child to participate in a project that is about finding out how to improve your child’s reading skill and motivation to read.

The project will involve your child completing two reading tasks and a questionnaire about what they think and feel about reading. These activities will be done at the end of Term 2 and again sixteen weeks later.

Your child’s participation in this project will help teachers have a better understanding of how children read and what makes them want to read.

If you decide to allow your child to participate in this project, you are free to withdraw your child from the activities at any time without fear of it affecting your child’s relationship with the University or your school.

All the information obtained from this project is strictly confidential.

If you have any questions, you can contact Marian Koo on 9484 6425 or Dr Rachel Wilson, Lecturer at the University of Sydney, on 9351 6390 for further information.

What if I have a complaint or concerns?

Any person with concerns or complaints about the conduct of a research study can contact the Manager, Ethics Administration, University of Sydney on (02) 9351 4811.

'This information sheet is for you to keep.'
Title: The dynamics of reading performance and motivation

What is the project about? This project is about improving children's skills and motivation to read. The aim is to examine whether a reading program can improve children's reading skills, as well as their self-concepts, feelings, strategies and participation in reading.

Who is carrying out the study? Marian Koo will conduct the research project for the degree of Master of Philosophy under the supervision of Dr Rachel Wilson, Lecturer at The University of Sydney.

What does the study involve? Two schools will take part in this project. One school will be involved in a reading programme and answering the questionnaire while another school will complete the questionnaires only. This second school will be offered the reading programme in 2007.

Participation in the project is in two parts.

(a) In both schools, children will complete two reading tasks followed by a 3-page questionnaire about what they think and feel about reading. This will be conducted in the child's classroom in the last two weeks of Term 2 and again 16 weeks later in the first two weeks of Term 4.

(b) Children at one school will have the reading program for the duration of Term 3, 2006. The second school will complete the reading programme in Term 1, 2007. Delivering the reading program for both schools will be the researcher, Marian Koo.

How much time will the study take? The two reading tasks take 60 minutes to complete and will be conducted across a few short sessions. The questionnaire will take 20 minutes. The reading program is for 30 minutes, 3-times a week, and for up to 11 weeks. This reading program will involve reading stories aimed at developing reading accuracy and speed. The program will also supplement current class literacy practices by covering some of the reading outcomes as set by the NSW Board of Studies.

Can I withdraw from the study? Your decision whether or not to permit your child to participate will not affect you or your child’s relationship with the University of Sydney or the School. If you decide to permit your child to participate, you are free to withdraw your consent and to discontinue your child’s participation at any time without prejudice.

Will anyone else know the results? All aspects of the study, including results, will be strictly confidential and only the researchers will have access to information on participants. A report of the study may be submitted for publication but individual participants will not be identifiable in such a report.

Will the study benefit me? Children typically enjoy being in research, although benefits for your child in their skills and abilities in reading cannot be guaranteed.

Can I tell other people about the study? Please feel free to tell others about the research.

What if I require further information? If you have any questions, you can contact Marian Koo on 9484 6425 or Dr Rachel Wilson, Lecturer at the University of Sydney, on 9351 6390 for further information.

What if I have a complaint or concerns?

Any person with concerns or complaints about the conduct of a research study can contact the Manager, Ethics Administration, University of Sydney on (02) 9351 4811.
Parent (or Guardian) Consent Form

I, .................................................................................. agree to permit my son/daughter

Name of Parent or Guardian

................................................................................. who is aged .............. years, to

Name of son/daughter

participate in the research project "The dynamics of reading performance and motivation".

In giving my consent I acknowledge that:

1. I have read the Parent Information Sheet and the time involved for my child’s participation in the project. The researcher/s has given me the opportunity to discuss the information and ask any questions I have about the project and they have been answered to my satisfaction.

2. I understand that I can withdraw my child from the study at any time without prejudice to my or my child’s relationship with the researcher/s now or in the future.

3. I agree that the research data gathered from the results of the study may be published provided that neither my child nor I can be identified.

4. I understand that if I have any questions relating to my child’s participation in this research I may contact the researcher/s who will be happy to answer them.

5. I acknowledge receipt of the Parent Information Sheet.

................................................................................. Signature of Parent/Guardian

................................................................................. Signature of student

................................................................................. Please PRINT name

................................................................................. Please PRINT name

................................................................................. Date
Appendix F

CORRELATION

Table 4.17. Correlation between Predictors - Reading Variables

Table 4.19. Correlation of Pretest, Covariates and Psychosocial Variables

Table 4.20. Comparison Group: Correlation between Pretest and Posttest

Table 4.21. Intervention Group: Correlation between Pretest and Posttest
Table 4.17. Correlation between Predictor Reading Variables

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*p < .05; **p < .01. Note: A is pretest, B is posttest
### Table 4.21

**Intervention Group - Correlation between Pretest and Posttest**

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