Working Memory in Children and its Relationship to Academic Achievement and Behaviour

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Jill Colenso-Mita

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Abstract

For children, Working Memory WM capacity underpins the ability to acquire knowledge and skills in school curriculum areas. The present study aimed to examine WM function in a group of New Zealand primary school children, and to investigate a possible association between reading and maths achievement and WM function. It also investigated whether WM deficits are reflected in children’s behaviours as observed by teachers in the classroom and parents at home. A related aim investigated the prevalence of learning disorders or experiences that have been linked to WM deficits.

WM ability was assessed with a group of 60 children aged 9 – 11 years using the Automated Working Memory Assessment Screener, AWMA Screener, or fully tested on the Automated Working Memory Assessment – Long version AWMA-L which assesses both verbal and visuo-spatial Short Term Memory STM and WM components. Twenty percent were found to have low scores in at least one component of WM. Two groups of children were selected from the 60 children based on their reading and maths achievement, 13 average and 16 below average. Eighty three percent of children with low WM were below average on academic performance. The below average academic group performed significantly lower than the average academic group on all but one subtest of the AWMA-L. There was a significant difference in performance by age for one of the verbal short term memory subtests of the AWMA-L, but no between group significant differences for sex or ethnicity.

The two groups of children were rated by their teachers on the WM Rating Scale WMRS, and parents on the WMRS-for parents WMRS-PC. The children with low WM scores were rated as having more frequent behaviours relating to WM problems than children with average and above average WM. Children in all WM ability groups were reported as having experiences or disorders related to WM deficits. The results corroborate previous findings and may be of interest to
educators in that WM ability is a building block that may affect the acquisition of information during learning episodes at school. The child with low WM may not have inherent difficulty with the academic work, but in taking in the information. Assessment of WM may identify children who may need to learn in a different way in order to reach their academic potential.
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# Table of Contents

<table>
<thead>
<tr>
<th>Chapter</th>
<th>Title</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td><strong>Abstract</strong></td>
<td>ii</td>
</tr>
<tr>
<td></td>
<td><strong>Acknowledgements</strong></td>
<td>iv</td>
</tr>
<tr>
<td></td>
<td><strong>Table of contents</strong></td>
<td>v</td>
</tr>
<tr>
<td></td>
<td><strong>List of tables</strong></td>
<td>viii</td>
</tr>
<tr>
<td></td>
<td><strong>List of Figures</strong></td>
<td>ix</td>
</tr>
<tr>
<td></td>
<td><strong>List of Appendices</strong></td>
<td>x</td>
</tr>
</tbody>
</table>

## Chapter 1
**Introduction**

1

## Chapter 2
**Working Memory**

3

Baddeley and Hitch’s Model of Working Memory

3

- Phonological Loop
  4

- Visuo-Spatial Sketchpad
  5

- Central Executive
  6

- Episodic Buffer
  6

Development of Working Memory in Children

8

- Phonological Loop
  10

- Visuo-Spatial Sketchpad
  10

- Central Executive
  11

- Episodic Buffer
  11

## Chapter 3
**Working Memory: Association with Learning, Academic Attainment, Behaviour, and WM Training**

14

- Learning and Academic Attainment
  14

- Literacy
  15

- Maths
  16

- Working Memory and National Curriculum Assessment
  17

- Low Working Memory
  20
Working Memory and Behaviour 21
  Behaviour in the Classroom – Rating Scales 22
  Behaviour in the Classroom - Observations 24
  Behaviour in the Home/Out of the school Environment 25
Chapter Summary 26

4  Working Memory, Special Populations, and WM Training 28
Learning Disorders 28
  Reading Disorder 29
  Maths Disorder 31
  Specific Language Disorder 34
ADHD 36
Traumatic Brain Injury 38
Children of Early Gestation and Low Birth weight 40
  Verbal STM and WM 40
  Visuo-spatial STM and WM 40
Trauma and Mood 41
  Mood 41
  Trauma 42
Working Memory Training 43
Chapter Summary 44

5  The Present Study 46
Summary of the research and present objectives 46
Research Aims and Hypothesis 48

6  Method 51
Special Considerations/Deliberations for data collection 51
  Administration 51
  Grouping Children 51
Ethical Issues 52
Research Setting 53
Measures 53
## List of Tables

<table>
<thead>
<tr>
<th>Table</th>
<th>Description</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>4.1</td>
<td>Identified WM Deficits in Children with Reading Disorders</td>
<td>31</td>
</tr>
<tr>
<td>4.2</td>
<td>Summary of Research on Maths Disorder and WM Difficulties Experienced by Children</td>
<td>33</td>
</tr>
<tr>
<td>4.3</td>
<td>Summary of Research Findings on WM and its relationship to Children with SLI</td>
<td>35</td>
</tr>
<tr>
<td>4.4</td>
<td>Identified WM Deficits in Children with ADHD</td>
<td>38</td>
</tr>
<tr>
<td>6.1</td>
<td>Demographic Characteristics of all Participants Who Completed the AWMA Screener and AWMA-L, and Demographic Characteristics of Participants Who Went on to also Complete the WMRS and WMRS-PC</td>
<td>62</td>
</tr>
<tr>
<td>7.1</td>
<td>Means and Standard Deviations of Standard Scores Obtained on the AWMA Screener Based on Age of Participants</td>
<td>64</td>
</tr>
<tr>
<td>7.2</td>
<td>Means and Standard Deviations for Subtests and Composite Standard Scores of the AWMA-L Based on Age of Participants</td>
<td>65</td>
</tr>
<tr>
<td>7.3</td>
<td>Comparison of Below Average and Average Academic Groups on subtests of the AWMA-L</td>
<td>68</td>
</tr>
<tr>
<td>7.4</td>
<td>Comparison of WM Groups Based on Typical or Atypical T Scores on the WMRS as Rated by Teachers</td>
<td>71</td>
</tr>
<tr>
<td>7.5</td>
<td>Comparison of Working Memory Groups Based on Scores Reflecting Typical or Problem Behaviours as Rated by Parents on the WMRS-PC</td>
<td>73</td>
</tr>
</tbody>
</table>
## List of Figures

<table>
<thead>
<tr>
<th>Figure</th>
<th>Description</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>2.1</td>
<td>Model of Working Memory Revised</td>
<td>7</td>
</tr>
<tr>
<td>2.2</td>
<td>Growth in Verbal and Visuo-Spatial Short Term and Working Memory</td>
<td>9</td>
</tr>
<tr>
<td>6.1</td>
<td>Flow Diagram for Procedure of Participant Recruitment</td>
<td>61</td>
</tr>
<tr>
<td>7.1</td>
<td>Categorisation of Academic Groups Into Working Memory Groups Based on Standard Scores Achieved on the AWMA-L</td>
<td>66</td>
</tr>
<tr>
<td>7.2</td>
<td>Mean Performance of Academic Groups on the AWMA-L Grouped by Working Memory Composite Scores</td>
<td>69</td>
</tr>
<tr>
<td>7.3</td>
<td>Incidence of Other Influences on WM Reported by Parents as Categorised by WM Group</td>
<td>74</td>
</tr>
</tbody>
</table>
**List of Appendices**

<table>
<thead>
<tr>
<th>Appendix</th>
<th>Title</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>I</td>
<td>Information Sheet for Children</td>
<td>111</td>
</tr>
<tr>
<td>II</td>
<td>Information Sheet for Parents</td>
<td>113</td>
</tr>
<tr>
<td>III</td>
<td>Information Sheet for Teachers</td>
<td>115</td>
</tr>
<tr>
<td>IV</td>
<td>Selection Letter for Parents</td>
<td>117</td>
</tr>
<tr>
<td>V</td>
<td>Consent Form for Students and Parents</td>
<td>119</td>
</tr>
<tr>
<td>VI</td>
<td>Consent Form for Teachers</td>
<td>120</td>
</tr>
<tr>
<td>VII</td>
<td>Working Memory Rating Scale Questionnaire – Teachers WMRS</td>
<td>121</td>
</tr>
<tr>
<td>VIII</td>
<td>Working Memory Rating Scale Questionnaire – Parents/ Caregivers WMRS-PC</td>
<td>122</td>
</tr>
</tbody>
</table>