YOUNG CHILDREN'S MEMORY AND SUGGESTIBILITY:
THE IMPACT OF ERRONEOUS POST-EVENT INFORMATION PROVIDED BY A PARENT,
SUBSEQUENT REPEATED QUESTIONING BY AN OUTSIDER AND QUESTION STYLE

Submitted in partial fulfilment of the requirements for the degree of
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# Table of Contents

<table>
<thead>
<tr>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Acknowledgements</td>
<td>i</td>
</tr>
<tr>
<td>Table of Contents</td>
<td>ii</td>
</tr>
<tr>
<td>List of Tables</td>
<td>ix</td>
</tr>
<tr>
<td>List of Figures</td>
<td>xii</td>
</tr>
<tr>
<td>TITLE PAGE</td>
<td>1</td>
</tr>
<tr>
<td>ABSTRACT</td>
<td>2</td>
</tr>
<tr>
<td>1. INTRODUCTION</td>
<td>3</td>
</tr>
<tr>
<td>1.1 Historical Perspective of Children's Capacity to Act as Court Witnesses</td>
<td>3</td>
</tr>
<tr>
<td>1.2 Factors Involved in Remembering</td>
<td>5</td>
</tr>
<tr>
<td>1.2.1 Developmental Considerations</td>
<td>6</td>
</tr>
<tr>
<td>1.2.1.1 Cognitive Capacities</td>
<td>6</td>
</tr>
<tr>
<td>1.2.1.1.1 Capacity to Observe</td>
<td>7</td>
</tr>
<tr>
<td>1.2.1.1.2 Attention</td>
<td>7</td>
</tr>
<tr>
<td>1.2.1.1.3 Memory</td>
<td>8</td>
</tr>
<tr>
<td>1.2.1.1.3.1 Free Recall</td>
<td>9</td>
</tr>
<tr>
<td>1.2.1.1.3.2 Cued Recall</td>
<td>10</td>
</tr>
<tr>
<td>1.2.1.1.3.2.1 Compromised Accuracy with Cued Recall</td>
<td>11</td>
</tr>
<tr>
<td>1.2.1.1.4 Suggestibility</td>
<td>12</td>
</tr>
<tr>
<td>1.2.1.1.4.1 Age and Suggestibility</td>
<td>14</td>
</tr>
<tr>
<td>1.2.1.1.5 The Development of Cognition</td>
<td>16</td>
</tr>
<tr>
<td>1.2.1.1.5.1 Piaget's Theory of Cognitive Development</td>
<td>16</td>
</tr>
<tr>
<td>1.2.1.1.5.2 The Information Processing Model</td>
<td>17</td>
</tr>
<tr>
<td>1.2.1.1.5.3 Merging Piaget and the Information Processing Model</td>
<td>17</td>
</tr>
<tr>
<td>1.2.1.1.6 Event Memory as a Cognitive Phenomenon</td>
<td>18</td>
</tr>
</tbody>
</table>
Table of Contents (cont.)

<table>
<thead>
<tr>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.2.2 Social/Motivational Factors</td>
<td>20</td>
</tr>
<tr>
<td>1.2.2.1 Compliance with Authority Figures</td>
<td>20</td>
</tr>
<tr>
<td>1.2.2.1.1 Age and Compliance</td>
<td>21</td>
</tr>
<tr>
<td>1.2.2.1.2 Developmental Theory Relevant to Compliance</td>
<td>21</td>
</tr>
<tr>
<td>1.2.2.2 Strength of Certainty about Memories</td>
<td>24</td>
</tr>
<tr>
<td>1.2.3 Situational Factors</td>
<td>25</td>
</tr>
<tr>
<td>1.2.3.1 Ecological Validity</td>
<td>25</td>
</tr>
<tr>
<td>1.2.3.1.1 The Impact of Stress on Memory</td>
<td>25</td>
</tr>
<tr>
<td>1.2.3.1.2 The Event to be Remembered</td>
<td>25</td>
</tr>
<tr>
<td>1.2.3.1.2.1 Live Events</td>
<td>26</td>
</tr>
<tr>
<td>1.2.3.1.2.2 Participation versus Observation</td>
<td>28</td>
</tr>
<tr>
<td>1.2.3.1.2.3 Salience of an Event</td>
<td>29</td>
</tr>
<tr>
<td>1.2.3.1.2.4 Central versus Peripheral Information</td>
<td>30</td>
</tr>
<tr>
<td>1.2.3.1.2.5 Specific Types of Information to be Remembered</td>
<td>31</td>
</tr>
<tr>
<td>1.2.3.2 Passage of Time and the Effect of Repeated Questioning</td>
<td>32</td>
</tr>
<tr>
<td>1.2.3.3 Styles of Questioning</td>
<td>33</td>
</tr>
<tr>
<td>1.2.3.3.1 A Continuum of Suggestibility</td>
<td>36</td>
</tr>
<tr>
<td>1.2.3.4 Don’t Know Responses</td>
<td>40</td>
</tr>
<tr>
<td>1.3 Memory Impairment versus Co-existence Hypotheses</td>
<td>40</td>
</tr>
<tr>
<td>1.3.1 The Memory Impairment Hypothesis</td>
<td>40</td>
</tr>
<tr>
<td>1.3.2 The Co-existence Hypothesis</td>
<td>41</td>
</tr>
<tr>
<td>1.4 Aims and Hypotheses</td>
<td>42</td>
</tr>
</tbody>
</table>
# Table of Contents (cont.)

2. METHOD ................................................................................................................. 50  
   2.1 Subjects .............................................................................................................. 49  
   2.2 Design ................................................................................................................ 50  
   2.2.1 Measures ........................................................................................................ 53  
      2.2.1.1 Interview Protocols ............................................................................. 55  
      2.2.1.2 Verbal Memory Measure .................................................................. 56  
      2.2.1.3 Visual Memory Measure .................................................................. 57  
   2.3 Materials and Procedure ................................................................................... 57  
      2.3.1 At School ..................................................................................................... 57  
      2.3.2 The Stimulus Situation ........................................................................... 58  
      2.3.2.1 Parent Instructions ........................................................................... 58  
      2.3.2.2 Puzzles/Tasks .................................................................................. 59  
      2.3.2.3 Parent questionnaire ......................................................................... 60  
      2.3.3 Interview One ............................................................................................. 60  
      2.3.4 Interview Two ............................................................................................ 63  
      2.3.5 Interview Three ......................................................................................... 64  

3. RESULTS ................................................................................................................. 66  
   3.1 Preliminary Analysis ......................................................................................... 66  
   3.2 Exposure to Parental Misinformation .............................................................. 67  
      3.2.1 Data and analyses .................................................................................... 67  
      3.2.2 Descriptive statistics ............................................................................... 68  
      3.2.3 Analysis of variance ............................................................................... 69  
      3.2.4 Summary ................................................................................................. 70
<table>
<thead>
<tr>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>3.3 Cued Non-Suggestive versus Open-Ended Questioning</td>
<td>70</td>
</tr>
<tr>
<td>3.3.1 Data and analyses</td>
<td>70</td>
</tr>
<tr>
<td>3.3.2 Descriptive and inferential statistics</td>
<td>71</td>
</tr>
<tr>
<td>3.3.3 Summary</td>
<td>73</td>
</tr>
<tr>
<td>3.4 Questioning Style</td>
<td>73</td>
</tr>
<tr>
<td>3.4.1 Cued Non-suggestive versus Misleading Questioning</td>
<td>74</td>
</tr>
<tr>
<td>3.4.1.1 Data and analyses</td>
<td>74</td>
</tr>
<tr>
<td>3.4.1.2 Descriptive statistics</td>
<td>75</td>
</tr>
<tr>
<td>3.4.1.3 Analysis of variance</td>
<td>77</td>
</tr>
<tr>
<td>3.4.2 Misleading Questions - previous exposure versus non-exposure</td>
<td>78</td>
</tr>
<tr>
<td>3.4.2.1 Data and analyses</td>
<td>78</td>
</tr>
<tr>
<td>3.4.2.2 Descriptive statistics</td>
<td>79</td>
</tr>
<tr>
<td>3.4.2.3 Analyses of variance</td>
<td>79</td>
</tr>
<tr>
<td>3.4.2.4 Summary</td>
<td>80</td>
</tr>
<tr>
<td>3.4.3 Cued Non-suggestive versus Suggestive and Leading Questioning</td>
<td>80</td>
</tr>
<tr>
<td>3.4.3.1 Data and analyses</td>
<td>80</td>
</tr>
<tr>
<td>3.4.3.2 Descriptive statistics</td>
<td>82</td>
</tr>
<tr>
<td>3.4.3.3 Analyses of variance and independent samples t-test</td>
<td>83</td>
</tr>
<tr>
<td>3.4.4 Suggestive and leading questions - previous questioning</td>
<td>85</td>
</tr>
<tr>
<td>3.4.4.1 Descriptive statistics</td>
<td>85</td>
</tr>
<tr>
<td>3.4.4.2 Analyses of variance</td>
<td>86</td>
</tr>
<tr>
<td>3.4.4.3 Summary</td>
<td>86</td>
</tr>
</tbody>
</table>
# Table of Contents (cont.)

<table>
<thead>
<tr>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>3.5 Repeated Questioning</td>
<td>89</td>
</tr>
<tr>
<td>3.5.1 Data and analyses</td>
<td>89</td>
</tr>
<tr>
<td>3.5.2 Descriptive statistics</td>
<td>90</td>
</tr>
<tr>
<td>3.5.3 Analyses of variance</td>
<td>91</td>
</tr>
<tr>
<td>3.5.4 Planned contrasts</td>
<td>91</td>
</tr>
<tr>
<td>3.5.5 Summary</td>
<td>92</td>
</tr>
<tr>
<td>3.6 Initial Certainty and Suggestibility</td>
<td>92</td>
</tr>
<tr>
<td>3.6.1 Data and analyses</td>
<td>92</td>
</tr>
<tr>
<td>3.6.2 Descriptive statistics</td>
<td>93</td>
</tr>
<tr>
<td>3.6.3 Analysis of variance</td>
<td>94</td>
</tr>
<tr>
<td>3.6.4 Summary</td>
<td>94</td>
</tr>
<tr>
<td>3.7 Suggestibility: Cognitive Phenomenon or Social Compliance</td>
<td>95</td>
</tr>
<tr>
<td>3.7.1 Cognitive Memory Assessment and Memory for Events</td>
<td>95</td>
</tr>
<tr>
<td>3.7.1.1 Data and analyses</td>
<td>95</td>
</tr>
<tr>
<td>3.7.1.2 Non-suggestive experimental sequence</td>
<td>96</td>
</tr>
<tr>
<td>3.7.1.2.1 Correlational statistics</td>
<td>96</td>
</tr>
<tr>
<td>3.7.1.3 Suggestive experimental sequence</td>
<td>97</td>
</tr>
<tr>
<td>3.7.1.3.1 Correlational statistics</td>
<td>97</td>
</tr>
</tbody>
</table>
Table of Contents (cont.)

<table>
<thead>
<tr>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>3.7.2 Social Compliance and Memory for Events</td>
<td>98</td>
</tr>
<tr>
<td>3.7.2.1 Data and analyses</td>
<td>98</td>
</tr>
<tr>
<td>3.7.2.2 Descriptive statistics and chi-squared analysis</td>
<td>98</td>
</tr>
<tr>
<td>3.7.2.3 Unprompted reasons for compliance</td>
<td>98</td>
</tr>
<tr>
<td>3.7.2.3.1 Descriptive statistics and chi-squared analysis</td>
<td>99</td>
</tr>
<tr>
<td>3.7.2.4 Prompted reasons for compliance</td>
<td>100</td>
</tr>
<tr>
<td>3.7.2.4.1 Descriptive statistics and chi-squared analysis</td>
<td>101</td>
</tr>
<tr>
<td>3.7.2.5 Summary</td>
<td>101</td>
</tr>
<tr>
<td>3.8 Memory Impairment versus Co-existence Hypotheses</td>
<td>102</td>
</tr>
<tr>
<td>3.8.1 Data and analyses</td>
<td>102</td>
</tr>
<tr>
<td>3.8.2 Descriptive statistics and chi-squared analysis</td>
<td>103</td>
</tr>
<tr>
<td>3.8.3 Types of information retrieved</td>
<td>104</td>
</tr>
<tr>
<td>3.8.4 Summary</td>
<td>104</td>
</tr>
<tr>
<td>3.9 Responses to Individual Questions</td>
<td>104</td>
</tr>
<tr>
<td>3.9.1 Data and analyses</td>
<td>104</td>
</tr>
<tr>
<td>3.9.2 Descriptive data</td>
<td>106</td>
</tr>
<tr>
<td>3.9.3 Time</td>
<td>106</td>
</tr>
<tr>
<td>3.9.3.1 Descriptive statistics</td>
<td>107</td>
</tr>
<tr>
<td>3.9.3.2 Chi-squared analysis</td>
<td>108</td>
</tr>
</tbody>
</table>
3.9.4 Time of day .................................................. 108
3.9.4.1 Descriptive statistics ........................................ 108
3.9.4.2 Chi-squared analysis .......................................... 109
3.9.5 Colour ........................................................ 109
3.9.5.1 Descriptive statistics and chi-squared analysis .......... 109
3.9.6 Number ........................................................ 109
3.9.6.1 Descriptive statistics and chi-squared analysis .......... 110
3.9.7 Summary ....................................................... 110

3.10 Children's Awareness of Suggestive Questioning .......... 110
3.10.1 Data and analyses ............................................ 110
3.10.2 Unprompted responses ........................................ 111
3.10.2.1 Descriptive statistics and chi-squared analyses .......... 111
3.10.3 Specific question responses ................................... 112
3.10.3.1 Descriptive statistics and chi-squared analyses .......... 113
3.10.4 .............................................................. 113

4. DISCUSSION ..................................................... 114

REFERENCES ................................................................ 145

viii
Table of Contents (cont.)

APPENDICES .......................................................................................................................... 167

Appendix A : Parent Information and Consent Form
Appendix B : Loadings of all Interview Questions on the Memory Factor
Appendix C : Interviews 1 and 2 - Protocol A: Cued Non-suggestive Questions
Appendix D : Interview 1 - Protocol B: Misleading Questions
Appendix E : Interview 2 - Protocol B: Suggestive Questions
Appendix F : Interview 2 - Protocol C: Leading Questions
Appendix Gi : Verbal Memory - Immediate and Delayed Recall
Appendix Gii: Verbal Memory - Cued Recall (Recognition)
Appendix Hi : Visual Memory - Immediate and Delayed Recall
Appendix Hii: Visual Memory - Cued Recall (Recognition)
Appendix I : Teacher Instructions
Appendix Ji : Parent Instructions - Group 1
Appendix Jii: Parent Instructions - Group 2
Appendix K : Puzzle 1 - Find the Monkeys
Appendix Li : Puzzle 2a - Maze for 5-7 year old children
Appendix Lii: Puzzle 2b - Maze for 7-9 year old children
Appendix M : Puzzle 3 - Colour the Mushroom
Appendix N : Parent Questionnaire
Appendix O : Interview 3 Protocol
Appendix P : Accuracy, inaccuracy and certainty of responses for Interviews 1, 2 and 3, by Experimental Sequence
Appendix Q : Number of Accurate, Inaccurate and Don't Know Responses to all Interview Questions
LIST OF TABLES

TABLE A : Experimental procedure - sequence of events

TABLE B : Experimental conditions for each of the twelve possible sequences

TABLE 1 : Mean accuracy, inaccuracy and certainty of responses (and standard deviations) as a function of exposure to parental misinformation, and age

TABLE 2 : Mean number of accurate and inaccurate responses (and standard deviations) to open-ended and cued non-suggestive questioning, as a function of age

TABLE 3 : Mean accuracy, inaccuracy and certainty for cued non-suggestive and misleading questioning styles (and standard deviations) as a function of previous exposure to parental misinformation, and age

TABLE 4 : Mean accuracy, inaccuracy and certainty of responses (and standard deviations) to cued non-suggestive, suggestive and leading questions as a function of previous question style and age

TABLE 4a : Age-combined mean accuracy, inaccuracy and certainty of responses (and standard deviations) to cued non-suggestive, suggestive and leading questions as a function of previous question style

TABLE 5 : Mean accuracy and inaccuracy of responses (and standard deviations) to suggestive and leading questions (combined) at Interview 2, as a function of certainty of responses to cued non-suggestive questions at Interview 1, and age

TABLE 6 : Mean accuracy, inaccuracy and certainty of responses at Interview 3 (and standard deviations) as a function of experimental sequence and age
<table>
<thead>
<tr>
<th>Table</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>7</td>
<td>Pearson's Product Moment Correlations between accuracy on cognitive tests of memory and accuracy of event-report in response to interview questions and open-ended questions, for subjects exposed to no suggestion - sequence 1AA</td>
</tr>
<tr>
<td>8</td>
<td>Pearson's Product Moment Correlations between accuracy on cognitive tests of memory and accuracy of event-report in response to interview questions and open-ended questions, for subjects exposed to all suggestion - sequence 2BC</td>
</tr>
<tr>
<td>9</td>
<td>Unprompted reasons provided by children for knowingly providing inaccurate responses to questions - number and percentage</td>
</tr>
<tr>
<td>10</td>
<td>Number and percentage of responses to prompted reasons for knowingly providing inaccurate responses to questions, as a function of age</td>
</tr>
<tr>
<td>11</td>
<td>Number and percentage of children who were, or were not able to retrieve accurate original information following report of inaccurate information at Interview 3, as a function of age</td>
</tr>
<tr>
<td>12</td>
<td>Number of accurate, inaccurate and don't know responses to individual questions at Interview 3</td>
</tr>
<tr>
<td>13</td>
<td>Number and percentage of children's responses to questions about time, colour and number, as a function of age</td>
</tr>
<tr>
<td>14</td>
<td>Unprompted responses provided by children when asked who they thought was trying to get them to say things that were not quite right - number and percentage</td>
</tr>
<tr>
<td>15</td>
<td>Number and percentage of responses to prompted questions about who children thought was trying to get them to say things that were not quite right</td>
</tr>
</tbody>
</table>
LIST OF FIGURES

FIGURE 1 : Accuracy of report as a function of question style and previous exposure to parental misinformation

FIGURE 2 : Accuracy of report at Interview 2, as a function of previous questioning style and age

FIGURE 3 : Inaccuracy of report at Interview 2, as a function of previous questioning style and age

FIGURE 4 : Accuracy of report as a function of questioning style and age

FIGURE 5 : Inaccuracy of report as a function of questioning style and age

FIGURE 6 : Mean certainty of responses as a function of questioning style and age

FIGURE 7 : Number of accurate responses to cued non-suggestive questioning at Interview 3, as a function of experimental sequence and age

FIGURE 8 : Number of inaccurate responses to cued non-suggestive questioning at Interview 3, as a function of experimental sequence and age

FIGURE 9 : Mean certainty of responses to cued non-suggestive questioning at Interview 3, as a function of experimental sequence and age
YOUNG CHILDREN'S MEMORY AND SUGGESTIBILITY:

THE IMPACT OF ERRONEOUS POST-EVENT INFORMATION PROVIDED BY A PARENT,

SUBSEQUENT REPEATED QUESTIONING BY AN OUTSIDER, AND QUESTIONING STYLE
The present study investigated the impact of post-event misinformation provided by a parent, the impact of different styles of questioning, and the impact of repeated exposure to misinformation and questioning, on children's recall and report of events over a 16 day period. The cognitive and social compliance components of event memory in response to questioning, were investigated, as were the 'memory impairment' and 'co-existence' hypotheses of event memory. Subjects comprised 222 children, 114 female and 108 male. 105 children were aged from five to seven years and 117 subjects from seven to nine years. Children completed puzzles at home with their parents, and were questioned about the details of this situation, one day, eight days and sixteen days after the event, using different question styles. Half of the children were also exposed to misinformation from a parent after the event. The present results indicated a continuum of suggestibility for question styles employed by the present study, ranging from the least suggestive open-ended, to cued non-suggestive, to suggestive, to leading and finally to the most suggestive misleading questioning. The hypothesis that repeated exposure to misinformation would result in reduced accuracy and certainty of reports, was supported. The hypothesised relationship between event memory and standardised tests of memory was, on the whole, not supported, however social compliance effects were demonstrated. Finally, there was some support for both the memory impairment and co-existence hypotheses. All effects were equally apparent for 5-6 and 7-8 year olds, however younger children consistently provided less accurate report than older children. It was concluded that cued non-suggestive questioning affords the most detailed report, with minimal inaccuracy, and that suggestive, leading and misleading questioning are damaging to young children's ability to accurately report events, particularly when there is repeated exposure to misinformation from a number of sources. It was further concluded that many children are unable to retrieve original information when they have previously incorporated misinformation. Future research areas indicated by the present study included investigation of the relationship between suggestibility and children's confidence with adults, and the impact of delays between the event to be remembered and exposure to parental misinformation.
Young children are being required, with increasing frequency, to serve as witnesses in legal proceedings (Perry & Wrightsman, 1991). With the growing number of cases involving child witnesses, concerns have been raised about the accuracy and reliability of children's testimony. Of particular concern is the suggestibility of children's memory as a potential source of inaccuracy. Prior to reaching the stage of testifying in court, children have often engaged in interviews or counselling sessions with health professionals, interviews with law enforcement personnel and discussions with parents or others with whom they have come into contact. These interactions, particularly if they involve attempts to elicit information from a child, may involve questions which reflect the biases and preconceived notions of the interviewer, thereby exposing the child to new information, some of which may be erroneous or misleading. Consequently, children's testimony frequently involves remembering details of an event over intervals that may include experiences that can potentially alter the original memory for that event. It is important therefore for health professionals and others who deal with children in such a setting, to gain an understanding of how information provided after an event, particularly through interview or questioning, can impact upon a child's ability to accurately recall and report details of an event.
1.1 Historical Perspective of Children's Capacity to Act as Court Witnesses

Historically, children below the age of ten years were automatically barred from testifying (Myers, 1993; Parker, 1982; Terr, 1986), and children above this age were frequently excluded from giving evidence in court as they were considered incompetent in a number of areas relevant to the court process. One of these was the ability to take an oath, which was seen as requiring an understanding of the moral duty to speak the truth. Consequently, there was a requirement for children's unsworn evidence to be corroborated either by the evidence of another sworn witness or by other medical or forensic evidence (Davies, 1993; Gray, 1993; Naylor, 1989). Even when children were allowed to provide evidence, a judicial caution which was mandatory for the evidence of children, whether sworn or unsworn, warned juries of the dangers of conviction on the basis of the evidence of a child (Davies, 1993; Oliver, 1991).

In 1988, however, the Criminal Justice Act was passed in the United Kingdom which stated that "a child of tender years, who did not appear to understand the nature of an oath, would be permitted to give evidence provided the child is possessed of sufficient intelligence to understand the duty of speaking the truth" (Rogers, 1991, p. 48). However concern was raised that young children, particularly below age six, could not satisfy these criteria and so were not being allowed to give evidence, resulting in the preclusion of some alleged offenders from the trial process (Davies, 1993; Rogers, 1991). The result of these concerns in the United Kingdom was the Oaths (Children) Amendment Act 1990, which came into force in Australia on 6 January 1991, and applies to the reception of evidence of a child under 12...
years of age (Parkinson, 1991; Rogers, 1991). Under the Act, the requirement that a judge caution a jury of the danger of convicting on the uncorroborated evidence of a child has been removed (Henaghan, Taylor & Geddis, 1990; Oliver, 1993). The Act provides that the evidence of the child is to be received or the statement, affidavit or deposition by the child is to be allowed, as if it were given or made on oath, provided the court, justice or person tells the child that it is important to tell the truth. The child is required to endorse any evidence or statement by making a declaration which indicates that they will not tell lies either in the court, or in any spoken or written statement (Parkinson, 1991; Rogers, 1991). It is presumed that children understand the difference between the truth and a lie, and - an issue which is of particular interest to the present study - are able to respond rationally to questions (Parkinson, 1991; Rogers, 1991). While today many children are permitted to testify (Myers, 1993), concerns about the accuracy and reliability of children's testimony, and particularly the suggestibility of children's memory for events, remain. Therefore the legal and psychological issues pertaining to children's memory for events continue to be of importance.

1.2 Factors Involved in Remembering

While children's ability to accurately report details of an event is fundamentally an issue of memory, many factors may affect this capacity. Children's developmental level may be an important aspect of their ability to recall information. Further, when children are questioned in a legal context, the memories under consideration are those that typically involve the recall of personally experienced and highly salient or meaningful events. In addition, testimony typically
involves remembering over intervals that are filled with experiences that can potentially alter - for better or worse - memory of the initial event. For example, information conveyed to the child after the event either through discussion, interview, or questions from parents or health and legal professionals, may have an impact on a child's memory for an event. Finally, children's willingness to believe, or please, adult authority figures may affect their ability to resist misleading information conveyed by parents, or during questioning by health or legal professionals, about an event.

Therefore it is not only the basic capacity for memory, but also the factors which impact upon children's memory for events, which are of primary importance in understanding the capacity of children to accurately recall and report those events as they were experienced. Determination of children's competency to report accurately thus requires systematic examination of developmental, motivational and situational considerations with regard to memory for an event.

1.2.1 Developmental Considerations

1.2.1.1 Cognitive capacities

To be considered competent in providing information pertaining to an experienced event, it has been suggested that the child must possess certain cognitive capacities.

Firstly, the child must possess adequate cognitive skills at the time of the event to observe and to perceive the facts of that event accurately. The child must also possess memory sufficient to retain an independent recollection of those observations, and the capacity to communicate or translate into words the memory of such observations to
provide an accurate report of the event (Berliner & Barbieri, 1984; Lepore, 1991; Melton, Bulkley & Wulkan, 1984; Myers, 1993; Weissman, 1991).

It has been further suggested that the child must possess the capacity to understand and respond accurately to questions about the event (Melton, Bulkley & Wulkan, 1984; Weissman, 1991). Finally, the child must be able to discriminate memory of actual events from information provided after the event by external sources (Lepore, 1991). These competency issues have been subjected to varying amounts of research. Some of these issues have been adequately addressed, however methodological problems have limited the usefulness of research into many of these aspects of children's competency.

1.2.1.1.1 Capacity to Observe

It is widely held that the capacity to observe is acquired early in life, and as a consequence, this requirement is rarely a factor in preventing children from testifying (Myers, 1993) or, it could be presumed, from providing information to health professionals.

In contrast, it has been frequently suggested, and is often assumed, that limitations in children's attention and memory abilities render any statement or testimony they might provide, as not only quantitatively, but qualitatively inferior to that of adults (Davies, 1993; Goodman and Reed, 1986). That is, the ability to receive and relate information accurately is considered to be dependent on developmental level.
1.2.1.1.2 Attention

In order to perceive events, people must first pay attention to them. It has been demonstrated that even very young children, aged three to four years have the capacity to attend effectively to the events around them (Perry & Wightsman, 1991). However Paris and Lindauer (1982) report that these skills are significantly developed between the ages of five and seven, during which time attention broadens, increasing amounts of information are able to be retained, and children begin to attend in a self-controlled, intentional and systematic manner. Perry and Teply (1984) report that if children pay attention at the time of an event, they are quite capable of accurately perceiving what transpires, thus emphasising the importance of designing research which ensures children's attention is focused on the relevant events.

1.2.1.1.3 Memory

The primary cognitive variable of interest with regard to children's report of events is memory. Much research, not only in the child witness domain, but also in the area of cognitive psychology, has been conducted to determine children's memory capacities. Findings from this area of research have however been varied. Lepore (1991) in reviewing the literature, notes that contemporary researchers suggest that children below the age of five years lack the cognitive strategies, such as rehearsal or generating images, used by older children to remember events. Other researchers suggest that children between the ages of five and ten are able to organise memories and to generate visual images that facilitate recall (Taylor, Geddis & Henaghan, 1990). Still others suggest that younger children, while able, are less likely than older children and adults to spontaneously
Children's Memory and Suggestibility

employ such strategies to purposefully improve their memory (Lepore, 1991). Further, some research suggests that young children, aged between two and seven years, have memory functions which are fragile and inefficient, rendering them particularly vulnerable to the distorting effect of misleading post-event information on recall (Ceci, Ross & Toglia, 1987; Goodman & Reed, 1986; Loftus & Davies, 1984).

The two main forms of memory investigated in the field of cognitive psychology, both of which are highly relevant to the subject of children's report of events, are free recall and cued recall.

1.2.1.3.1 Free Recall

In experimental memory tasks, free recall involves the spontaneous recall of information previously presented. For research into memory for events, free recall involves the use of non-leading open-ended questions such as "What happened yesterday?" and "Describe what you saw." (Myers, 1993; Powell & Thomson, 1994). Free recall in response to open-ended questions, is widely reported to be the most accurate form of memory in both children and adults (Goodman & Reed, 1986; Loftus & Davies, 1984). Young children however are considered to be not as proficient as older children and adults at recalling events in response to such open-ended and non-leading questions (Saywitz, Nathanson & Snyder, 1993).

One of the major problems frequently cited in using very young children as witnesses in criminal investigations, is the limited amount of information they are able to freely recall (Jamieson, 1990). This is one of the most consistent findings among both child witness
and children's memory research. It is frequently reported that young children tend to spontaneously recall fewer details of events than older children and adults (Davies, 1993; Goodman & Reed, 1986; Melton, Bulkley & Wulkan, 1984; King & Yuille, 1987; Swift & Johnson, 1988). It is also frequently reported however, that the information children do recall is usually as accurate as adults' (Davies, 1993; Myers, 1993; Jones, Swift & Johnson, 1988; Taylor, Geddis & Henaghan, 1990; Weissman, 1991), and sometimes more accurate (Melton, Bulkley & Wulkan, 1984). Hence it would seem that children's errors in spontaneously recalling information tend to be errors of omission rather than commission. Thus, the amount or completeness of the information provided during free recall appears to be dependent on age, with younger children providing relatively little, but not necessarily inaccurate, spontaneous information about an event.

1.2.1.1.3.2 Cued recall

Cognitive psychological research has also demonstrated that cued recall, whereby an individual is provided with information which may provide cues to enhance memory of particular details, enables children and adults to retrieve additional information from memory (Lepore, 1991; Gruenewald & Lockhead, 1980). In line with such research findings and given the frequently reported paucity of free recall memory in young children, investigators within the health or legal setting frequently feel a necessity to use questions which might provide cues for children, in order to enhance recall and thereby elicit more detailed, coherent reports.

Research has demonstrated that with regard to children's memory for events, in contrast to free recall, the detail provided in cued recall
is much less age sensitive. Young children are frequently reported to be able to recall as much information as older children and adults when they are cued with information relevant to details of the event to be remembered (Ceci, Ross & Toglia, 1987; Cole and Loftus, 1987; Jones et al, 1988; List, 1986; Marin, Holmes, Guth & Kovac, 1979; Saywitz, 1987). It has been proposed that questions utilising relevant information may provide memory cues which reduce the demands placed on the child's recall and expressive verbal ability, thereby encouraging children to provide a more complete account of an event (Ceci & Bruck, 1993; Dent, 1990; Powell & Thomson, 1994).

1.2.1.1.3.2.1 Compromised accuracy with cued recall

However the literature also suggests an unfortunate compromise between accuracy and detail in using questions containing cues in the place of free recall. Questions utilising cues are frequently termed suggestive or leading questions in that the cues suggest an answer to the individual thereby leading their response in a particular direction. It is a relatively consistent research finding that for children, when such specific questioning techniques are used, in comparison with open-ended questions, the amount of information recalled increases, but so too do the inaccuracies (Jamieson, 1990; Moston, 1987; Pipe, Gee & Wilson, 1993; Poole & White, 1991; Powell & Thomson, 1994).

This reduction in accuracy when leading questions are utilised as cues for children, has been acknowledged for some time. Pear and Wyatt (1914) reported that children's spontaneous accounts of an event were reliable, but when asked to recall details of the event with leading questions, one-third of the children provided incorrect
information. Despite this overall tendency, they noted that children still answered some questions quite accurately. Similarly, Binet (1914, cited in Goodman, 1984b) concluded from his studies that the degree of suggestion within questions adversely affected children's ability to accurately recall information, particularly in younger children. Indeed, many early studies demonstrated that while the child witness is able to accurately recount events and answer non-leading questions, that report is easily contaminated by suggestion contained in leading questions (Whipple, 1911; Stafford, 1962).

Evidence of this has also been reported in more recent research literature. Cohen and Harnick (1980) found children aged nine and twelve years were more likely than college students to provide inaccurate information about a 12-minute film on petty theft, when asked leading questions immediately after viewing the film. Sheehy and Chapman (1982) in reviewing the literature, concluded that it was well-established that the testimony and accounts of children, particularly younger pre-school aged children, are susceptible to the prejudicial influences of leading and suggestive questioning.

While research supposes that leading or suggestive questioning can prompt inaccurate report by children in the first instance, it has also been proposed that the information presented via suggestive questions, may be incorporated into later report. Thus the cues necessary to trigger memory in young children may contaminate and thereby detrimentally affect the accuracy of information recalled at a later time (Dent & Stephenson, 1979; Schwartz-Kenney, Wilson & Goodman, 1990).
1.2.1.1.4 Suggestibility

This tendency to incorporate information provided in suggestive questions into an account of a recalled event has been termed suggestibility. In its most common form suggestibility is interpreted as essentially a cognitive phenomenon. That is, the child's memory is more malleable than that of an adult and hence more likely to be distorted by inaccurate information received after an event (Loftus & Davies, 1984). A more global description, which does not include the assumption that suggestibility is a cognitive phenomenon, defines suggestibility as the "extent to which persons come to accept and subsequently incorporate post-event information" into their memory for events (Gudjonsson, 1986, p. 195).

One area of concern with regard to children's suggestibility, is the capacity of children to distinguish memory for the actual event from information provided to them after the event. While much research has looked at the impact of post-event misinformation conveyed to children by experimenters, little research focus has been directed toward looking at the effect of misinformation provided by a significant adult, such as a parent, on children's ability to accurately recall event details. Parents in interpreting a situation, may wittingly or unwittingly influence a child's later report by conveying their own, possibly inaccurate, interpretation of events to the child. This misinformation might then interfere with a child's accurate recollection of an event. As this is a situation which is quite likely to occur following a child's exposure to a criminal event, it is an important research question which needs to be addressed.
This issue of children's suggestibility is of considerable interest and importance to health professionals. Clinical psychologists in particular are increasingly required to testify as expert witnesses with regard to children's suggestibility, and ability to accurately remember events. Further, health professionals, particularly psychologists and social workers are often involved in interviews aiming to elicit details of suspected criminal events from children, and in counselling sessions during which information pertaining to possible criminal events may be revealed by children. It is suggested by the research literature that if a child at this stage has been led to disclose information which may not be true, later report may incorporate this misinformation (Goodman & Clarke-Stewart, 1991). Therefore it would seem that health professionals have a particular need to understand how questioning and interviewing techniques may influence the accuracy of children's reports.

Concern regarding children's suggestibility has prompted a great deal of research into the effect on children's memory of inaccurate information conveyed after the event, particularly when provided in the form of leading or suggestive questions. Researchers have investigated a number of factors thought to be related to children's suggestibility.

1.2.1.1.4.1 Age and Suggestibility

The relationship of age to a child's suggestibility has been investigated by numerous researchers with varying results. Ceci, Ross and Toglia (1987) presented illustrated stories to children aged three to twelve years, and one day later provided misleading information about aspects of the stories to half of the children. The researchers
found that susceptibility to choose illustrations in line with the misleading information increased with decreasing age from twelve to three years. This did not occur among those children who had not received misleading information.

In contrast, Saywitz (1987) presented an audiotaped story about a theft to 8, 11 and 15 year old children who were later asked six questions, including three containing suggestive misleading information, and reported that younger children were slightly less likely to include post event information in their spontaneous recall of the story. Similarly, Duncan, Whitney and Kunen (1982) in a study of children aged seven, nine and eleven years, and college students, reported that older subjects were more likely than younger subjects, to incorporate misleading post-event information into their visual memory for a series of slides depicting scenes from the movie Star Wars. This study however used very small sample sizes, and had large variance among their data, such that these results need to be regarded cautiously.

One of the problems in unifying research results such as those presented above is the wide variety of age groups employed. A second issue with much of this research is that sound theoretical guidelines on cognitive and social development are not utilised in guiding the selection of age groups to be compared. To gain a greater understanding of children's capabilities at different ages, it is necessary to examine the developmental psychology literature. Of particular relevance to children's capacity to recall and accurately report details of an event, are theories of cognitive development.
1.2.1.1.5 The Development of Cognition

1.2.1.1.5.1 Piaget's theory of cognitive development

The noted developmental psychologist Jean Piaget attempted to explain cognitive development by emphasising developmental changes in the structure of intelligence, reflected in the learning of children at different ages (Inhelder & Piaget, 1958). Piaget proposes that children progress through four qualitatively different stages on their way to cognitive maturity. Children from birth to age two - the sensory-motor stage - are supposed to understand the world primarily through activation of their five senses and through their physical actions on the environment. From ages two through seven years, children understand the world in a pre-logical, intuitive way referred to as preoperational thinking, jumping from information to conclusions in large, 'impressionistic' leaps. From the age of seven, children begin to use logical systems to organise their experiences. Termed the concrete operational stage, children at this level, which continues to about age eleven, use rational, reality-based mental operations to attempt to understand the world around them. From approximately twelve years onwards, the stage of formal operations begins, at which time children become capable of complex, abstract reasoning.

It might be suggested then, that the two cognitive stages of childhood of particular interest with regard to suggestibility, would be the preoperational and concrete operational stages. Children below age two are limited in their communicative capacity which could make research difficult, and children above age twelve are presumed to be more adult-like with regard to their cognitive development. This theory on its own would seem to suggest that pre-operational children (age 2-6 years)
would be more likely to succumb to suggestion due to their tendency to jump from information to conclusions, while children at the concrete operational level (age 7-11 years) would be expected to be less susceptible to suggestion since they base their memories on reality.

1.2.1.1.5.2 The information processing model

A second model of cognitive development termed the information processing model, described by Perry and Wrightsman (1991), explores the role of cognitive operations in processing information. This model explains that to remember objects, events and people, individuals must store information in memory so that when necessary, that information can later be retrieved. It is suggested that we use different means of representing information mentally at different developmental stages. In infants less than two years, mental representations are enactive, that is they capture knowledge about actions. By age two, children rely upon imaginal representation, in which mental images are stored. With the development of language, a third form of representation, termed linguistic because it is based on words and symbols, is utilised to store information. The fourth form of representation, categorical allows individuals to divide diverse information into manageable concepts or categories. Finally, operative representations involve the interaction of cognition and memory such that stored representations may be changed.

1.2.1.1.5.3 Merging Piaget and the information processing model

Perry and Wrightsman (1991) in merging these two theories, suggest that during the pre-operational stage, from ages two through seven, children rely on the imaginal representations stored. During the concrete operational stage, from approximately seven years of age to
Children's Memory and Suggestibility

puberty however, it is proposed that children increasingly use logic to organize their experiences, and are able to use specific mental operations to organise previously stored material. Children at this stage are able to modify their mental representations to conform to their new understanding, such that unlike the imaginal representations of children aged two to seven years, memory is no longer passive, simply storing faithful representations of original perceptions. Rather, memories may alter as a consequence of thinking about past events, thereby using operative representations.

This formulation suggests that children aged below seven years would be less able to distort their original memories with information received after the event, while children aged from seven to eleven would be capable of doing so. Therefore it would be expected from this combined theory of cognitive ability that children aged from five to six years would be less susceptible to suggestive influence than children aged from seven to eleven years.

1.2.1.6 Event Memory as a Cognitive Phenomenon

Cognitive psychological terms used to describe the memory abilities assessed in experimental memory tasks, are commonly used to describe recall in response to questioning employed to elicit memory for events. Response to open-ended questions is commonly termed free recall, as no cues are provided, while response to questions containing cues is commonly termed cued recall, or recognition (Goodman, Rudy, Bottoms & Aman, 1990; Lepore, 1991; Pipe et al, 1993). While this association between experimental memory and event memory capacities seems to have been assumed however, it does not appear to have been investigated. Therefore it could be suggested that if event
memory were a purely cognitive phenomenon, a relationship between recall in response to open-ended questions about an event, and performance on a purely cognitive assessment of free recall ability would be evident, and a relationship between recall in response to questions containing cues, and performance on a purely cognitive assessment of cued recall ability would also be apparent.

Further, with regard to memory for events, the information stored in memory pertains not only to details observed visually during that event, but also to information conveyed verbally during that event, such that it is the ability to recall both visual and verbal information which is being assessed when asking children to report event details. Therefore in considering the relationship between children's ability to accurately report details of events and cognitive memory assessment, it is necessary to do a comprehensive memory assessment of both visual and verbal facets of memory. Little, if any, research has investigated the relationship between standardised tests of memory and memory for events, such that conceptions of event memory as a purely cognitive phenomenon are merely assumptions. Such a contention could be investigated by examining the relationship between children's memory for events in response to questioning, and performance on purely cognitive assessments of memory. These proposed relationships therefore require further investigation.

Whilst memory for events is presumed to be primarily a cognitive ability, many current theories of cognitive development suggest that children's cognition is not strictly bound by developmental level. Rather, it is suggested that children's abilities also vary according
to a number of social/motivational and situational factors (Dent & Flin, 1992).

1.2.2 Social/Motivational Factors

There has been some debate as to whether children's report of events in response to questioning, particularly suggestive questioning, is a purely cognitive ability, or whether it is more a result of social compliance to an authority figure. Obviously, recalling details of an event requires the capacity to remember, however in response to questioning by an authority figure, a child's report of events may no longer be a purely cognitive phenomenon. Little, if any, research has addressed this issue.

1.2.2.1 Compliance with authority figures

It has been proposed that susceptibility of children to comply with suggestive questioning may not simply be a cognitive phenomenon of memory distortion, but may be due to demand characteristics because an authoritative person is asking the questions. Research has demonstrated that adults are more suggestible when responding to someone whom they perceive to be in authority (Dodd & Bradshaw, 1980; Smith & Ellsworth, 1987). Similarly, Ceci, Ross and Toglia (1987) have demonstrated that children's suggestibility is strongly related to factors such as the perceived authority of the person providing the suggestions. Children were more likely to contaminate their report with misleading information presented by an adult than by that of a child.

Taylor, Geddis and Henaghan (1990) and Zaragoza (1991) suggest that children might conform to suggestion because they wish to please
an authority figure, feel pressure to conform to an adult's suggestions, or because they trust the information provided by an adult authority figure more than their own memory. Similarly, Dent and Stephenson (1979) suggest that when an adult presents children with an array of possible responses, even if false, they are likely to surmise that one of those responses must be correct. Indeed Hughes and Grieve (1980) demonstrated that children aged five to seven years have a strong propensity to answer adult questions, even if the questions are bizarre and do not permit direct answers without clarification, such as "Is milk bigger than water?" or "Is red heavier than yellow?". With the exception of one five year old who answered 'I don't know' to these questions, children in this age group provided direct and unqualified answers. Therefore it would seem that children, at least in the five to seven year age group, will provide a response to adult questions simply for the sake of doing so. Further, Siegal and Petersen (1995) demonstrated a reduction in suggestibility for pre-school aged children, when the notion of pretending to please an adult (which, for children was presumed would be an acceptable rationale for behaviour) was conveyed.

1.2.2.1.1 Age and compliance

Research investigating age differences with regard to children's compliance have provided mixed results. A study by Brigham, Van Verst and Bothwell (1986) reported no significant effects of authority on the accuracy of older children's reports (4th, 8th and 11th graders). However other researchers (Ceci, Ross & Toglia, 1987) have found young children, aged four to five years, to be susceptible to misleading information presented by an authority figure. Again it is necessary
to turn to the developmental psychology literature to gain a greater understanding of the developmental variations in social compliance.

1.2.2.1.2 Developmental theory relevant to compliance

Moral development is an aspect of children's development which might be seen to impinge upon children's capacity to resist suggestion, or conversely their tendency to comply with suggestions provided by authority figures. Building on the work of Piaget and Kohlberg, Lickona (1983) proposed six stages of moral reasoning, with the first four applying to children.

The first stage applies to children aged four and younger. These children believe that it is 'right' to get their own way. The primary motivation for good behaviour at this stage is to either obtain rewards or to avoid punishments. As suggested by Perry and Wrightsman (1991), children at this age may be susceptible to bribes. Alternatively, children may tell the truth if they believe they will be punished for lying.

The second stage begins at around five years of age (concurrent with Piaget's preoperational stage). Children at this stage tend to feel that they should do what they are told, such that being 'good' rests upon obedience to authority. As Perry and Wrightsman (1991) point out, threats are no longer needed, such that the adult's wish alone is perceived as a command.

As children reach Piaget's cognitive stage of concrete operations, from age seven, morality becomes associated with 'niceness', such that children are eager to please and gain approval from authority figures.
It is suggested that in spite of understanding the difference between truth and falsehood, children at this stage may provide responses in order to please others, even, it is suggested by Perry and Wrightsman (1991), at the expense of conventional ethics.

The fifth stage of moral development encompasses adolescents who begin to develop a sense of responsibility to the social system as a whole, such that ethical considerations can outweigh any desire to please an authority.

This theoretical analysis indicates that suggestibility effects in younger children may merely be an artefact of demand characteristics in response to a perceived authority figure, and that compliance to an authority figure, albeit for slightly different reasons, should be consistent across the preoperational and concrete operational levels of development. That is, while cognitive capacities in relation to memory would be expected to differ across the pre-operational and operational age levels, the tendency to comply with authority figures would not.

It would seem then that children might distort their reported recall of events to comply with an adult authority figure, either in an attempt to be obedient to, or simply to please the adult. Further, when a question is presented in such a way that implies an answer and is proposed by an authority figure, a child may believe that the adult authority figure has superior knowledge and therefore must be correct. As Loftus (1991) points out, the research to date does not tell us whether children go along with suggestive information because their memories for what happened are distorted by the misleading
suggestions, or because social pressures induce them to provide a modified report to please the person who is asking the questions.

1.2.2.2 Strength of Certainty about Memories

A further research question of interest which has received little attention, is the relationship between the strength of the original memory trace and the susceptibility of that memory to distortion by suggestive post-event information. Goodman et al (1990) alluded to this issue in stating that “If such experiences are not remembered well, children may be more subject to suggestive influences by adults and hence more easily led to give false reports …” (p. 249). In support of this contention, Warren, Hulse-Trotter and Tubbs (1991) reported that the initial strength of a memory trace was related more strongly to suggestibility than age. Based on the assumption that certainty reflects the strength of a memory trace, measurement of a child’s certainty about their initial response to questions, would allow the investigation of whether children's susceptibility to suggestion is related to certainty about a memory. This requires further investigation.

A further aspect which has been little investigated is whether exposure to misinformation reduces children's certainty about their memory for details of an event. This is an important issue, as certainty of responses may influence how readily health and legal professionals, and even juries, believe a child's report. Therefore, the influence of misleading information on the certainty of children's responses is a further area which requires investigation.
1.2.3 Situational Factors

While motivational factors are thought to influence a child's tendency to comply with suggestion, it has also been proposed that aspects of the situation to be remembered might influence children's ability to accurately recall details of the event, and also their readiness to comply.

1.2.3.1 Ecological validity

Much of the earlier research on children's memory and suggestibility has been criticised for incorporating stimulus situations which are not relevant to the situations to which the research results are to be generalised. Therefore an important consideration in research on children's testimony is the issue of ecological validity. An experiment is considered to be ecologically valid when the experimental situation contains characteristics similar to those situations to which the results are intended to be generalised. A number of factors need to be considered in providing ecologically valid research on children's memory for events.

1.2.3.1.1 The impact of stress on memory

Although early researchers suggested that stress impedes accurate memory (Loftus, 1979), more recent research suggests that children who are upset or distressed by an incident display more accurate and complete recall of events than those who were not (Christiansen, 1992; Goodman, Hirschman, Hepps & Rudy, 1991), even after delays of up to six months (Steward, 1992). However there are considerable ethical issues in dealing with children. It is not ethical, for research purposes, to actively threaten children's safety or deliberately subject them to stressful situations in order to test their memory or ascertain their level of suggestibility. However
other factors related to the concern of ecological validity can be controlled for research purposes.

1.2.3.1.2 The event to be remembered

Within the framework of suggestibility research, children have in the past typically been exposed to non-engaging events involving stimuli such as pictures or stories (Ceci, Ross & Toglia, 1987; Saywitz, 1987), and movies or videos (Cohen & Harnick, 1980; Dale, Loftus & Rathbun, 1978). It has been suggested that such stimuli may not capture children's attention in the same way that actual events do, and therefore details may not be retained in memory as well as for actual events (Goodman, 1984a; Terr, 1986). Indeed, there is some evidence that research using videos of events may underestimate a child's performance relative to the actual event (Yuille & Cutshall, 1986). Hence, much of the children's suggestibility research, particularly early studies, may be criticised methodologically on the grounds that they used highly artificial situations which may have underestimated children's ability to recall real life circumstances. Such criticism has resulted in a few researchers attempting to provide more realistic events upon which subjects could be later questioned.

1.2.3.1.2.1 Live events

Flin, Boon, Knox and Bull (1992) interviewed children aged six and ten, and adults, five months after a "realistically staged argument" which occurred during a presentation on foot hygiene by a nurse in a school auditorium. They reported that few subjects, irrespective of age, accepted erroneous information provided in three leading questions. Unfortunately this study was based on a small sample, and there was large variance in the data, such that these findings need to
be regarded cautiously. In a similar study, Marin et al (1979) exposed 5, 8 and 12 year olds and college students to a live staged argument between two adults. Subjects were asked twenty objective questions and an additional misleading question after a brief delay of only a few hours, and two weeks later all twenty-one questions were asked in a non-leading form. These researchers found that the misleading question produced a similar significant increase in inaccurate answers on the corresponding objective question across all ages, suggesting that children were no more suggestible than adults. This study however utilised only one misleading 'yes-no' question which would provide chance accuracy of .50. Accuracy was reported as .50, .50, .46 and .46 respectively for each subject group, such that these results could be viewed as purely chance results.

King and Yuille (1987) staged a live event in which 6, 9, 11 and 16 year olds were seated in a room when a stranger entered to care for plants. Prior to leaving, the stranger noted the time and indicated that it was late. The children were subsequently asked questions relating to the man's appearance and attire, utilising open-ended and leading questions. It was reported that six year olds recalled less than nine to sixteen year olds when asked open-ended questions, and that they were significantly more suggestible when leading questions were used. However it has been reported that face recognition or appearance information is one of the least accurate forms of information recalled by younger children (Davies, Tarrant & Flin, 1989; Dent & Stephenson, 1979; Parker & Caranza, 1989), such that these results may be unique to information related to physical appearance.
Children's Memory and Suggestibility

As can be gleaned from these few studies, there are a number of methodological difficulties, particularly the small number of misleading questions utilised and small sample sizes, which preclude any firm conclusions being drawn from this research into children's memory for live events.

Further criticism which has been directed at much of the research on children's memory for events, is that when live events are staged, they are often mundane or uninvolving, such as a person watering a plant, as described above in the King and Yuille (1984) study. Children are typically bystanders to the events, and whether or not the events are interesting to the child is often not considered.

1.2.3.1.2.2 Participation versus observation

It has been suggested that direct participation in a live event, as opposed to observation, might affect memory by increasing attention and active processing of events (Olson, 1970; Paris & Lindauer, 1976). Indeed studies have indicated that participation not only increases the completeness of children's event recall (Baker-Ward, Hess & Flannagan, 1990; Slackman, Hudson & Fivush, 1986), but that it might also strengthen children's resistance to false suggestion.

Rudy and Goodman (1991) reported that children who participated directly in an event were more resistant to suggestion than children who passively watched, but found no difference in accuracy of free recall between participants and observers. The observers in this study however were present at the event to be recalled and interacted, albeit minimally, with the confederate and participant child, such that the observer and participant conditions may have been too similar
Children's Memory and Suggestibility

to elicit different effects on memory. Tobey and Goodman's (1992) study attempted to rectify this anomaly by having the observer children watch a videotape of the event to remove them completely from direct participation. They found that compared to observers, participants provided a significantly higher proportion of correct information to a free recall question and were more resistant to suggestion.

Given that often children have participated in those events upon which they are required to report, and to the extent that participation reportedly leads to better memory, former studies may have underestimated children's abilities. Thus it is important for research to utilise events in which the child has participated, if an accurate reflection of children's memory for events is to be obtained.

1.2.3.1.2.3 Salience of an event

As Goodman (1984) points out, developmental psychologists recognise that an accurate understanding of children's cognitive development must involve children's memory not only for real life, but meaningfully involving events. It has been proposed that if an event is understandable, interesting and/or personally significant, suggestive questioning is likely to be rejected (Dent & Flin, 1992; Taylor, Geddis & Henaghan, 1990; Weissman, 1991). Goodman (1984a) suggests that events that are less memorable, by virtue of being less personally significant, may be particularly vulnerable to suggestive influences, while events of significance to the child may be "fixed in the child's mind" (p 160), and therefore less susceptible to suggestions.
Oschner and Zaragoza (1988) investigated this issue and reported that children were more accurate and less suggestible during interview when they witnessed what they believed to be a real crime, than those children who witnessed a similar but non-criminal, or neutral, event. This would seem to indicate that when children thought the event was important, their suggestibility was reduced. This view that personally significant events are better retained in memory than less significant events, such as those used in laboratory studies, is supported by cognitive research with both adults (Rogers, Kuiper & Kirker, 1977) and children (Pullybland, Bisanz, Scott & Champion, 1985). This research highlights the importance of ensuring that events to be remembered are interesting and/or of personal significance to the child.

1.2.3.1.2.4 Central versus peripheral information

Another problem with many previous studies is the legal relevance of the questions asked. As elucidated by Goodman et al. (1990), researchers tend to ask children about peripheral details rather than actions central to the event. Lindberg (1991) defines central information as those perceived events and their attributes that are relevant to the central task at hand. Ratner, Smith and Dion (1986) reported that after a delay of seven to ten days, children's recall was best for central aspects of an event or story. Zaragoza (1991) notes that while a great deal of research has examined children's memory for peripheral details, it is not known whether memory for central aspects of an event are susceptible to memory impairment in the same way.
This research highlights the importance of the centrality of the information to be remembered, suggesting that centrality may be very pertinent to the capacity with which a child is able to recall information and to resist suggestion. This underlines the importance of designing research that takes into account the centrality of information to be recalled.

Thus it can be seen that it is important to assess children's memory, and suggestibility of memory, for live events in which they have participated, and which are interesting and of personal significance to the child, with a focus on information central to the event. Much of the research on children's suggestibility, particularly earlier studies, could be criticised in these respects. Many conclusions drawn from research into children's suggestibility are based upon children's inability to resist suggestion about material that might be considered peripheral information, and often in situations which may be of little significance to the child, and in which they have not actively participated. That these distinctions are often ignored by researchers, may account for many of the differences amongst research findings.

1.2.3.1.2.5 Specific types of information to be remembered

Further, the literature suggests that some types of information are particularly difficult for children to recall, though they are infrequently studied. Perry and Wrightsman (1991) report that it is generally acknowledged that children below the age of seven or eight years of age experience difficulty in understanding and reporting elapsed time and that children are better at reporting events in relation to some routine aspect of their daily lives.
Similarly, colours and numbers are also reported to be poorly recalled by children (Spencer & Flin, 1990). It is important to include such information in child witness research, as it is this type of information which children might be expected to recall as a witness to a criminal event. For example children could be asked such questions as, 'What time did the event take place?', 'Did the offender wear a blue shirt or a white one?', and 'How many people were present?'. Therefore it is important to include questions about these aspects in interview protocols used in children's suggestibility research.

1.2.3.2 Passage of Time and the Effect of Repeated Questioning

Studies have shown that both adults' and children's memories are highly sensitive to the passage of time. Dent and Stephenson (1979a) found that after a delay of up to two months, the overall amount of information recalled by ten and eleven year olds was diminished, although the level of accuracy was maintained. Studies using three and six year olds report little decline in memory for events after several weeks, although three and four year olds recalled less following the delay (Goodman et al, 1987; Peters, 1987). Flin et al (1992) report that younger children, aged six years, recalled less information over a five month delay than older children, aged nine years, and adults.

However, while a number of studies have looked at children's memory over time, an area which is frequently discussed but which has received little attention in child witness research, is the effect of repeated questioning over time, on children's susceptibility to include misinformation provided by authority figures in their report of
Children's Memory and Suggestibility

events. Dent and Stephenson (1979) showed little impact of repeated non-suggestive questioning for ten and eleven year olds over an eight-week period, in a study using a filmed event. However little is known about the impact of repeated exposure to suggestive information and questioning, on children's memory for a live and meaningful event.

Brainerd and Ornstein (1991) suggest that repeated questioning without misinformation might facilitate remembering, just as repetition has been shown to facilitate memory in cognitive psychological research. Alternatively, it has been suggested that repeated exposure to misleading information after an event, has the potential to distort memory, particularly if there was initially some uncertainty about the details of a particular event (Brainerd & Ornstein, 1991). This is an important research question, as children's testimony frequently involves remembering events over intervals in which children have been exposed to repeated questioning or interviews (Ornstein, 1991; Zaragoza, 1991). While children might not be very susceptible to suggestion when misled on a single occasion, which is the procedure most frequently employed in studies of children's suggestibility, children might be more inclined to incorporate post-event information in report of an event, when exposed to repeated and extended questioning which contains misinformation. It is important therefore to investigate the impact of repeated questioning, with and without suggestive information, on children's ability to accurately report details of an experienced event.

1.2.3.3 Styles of questioning

A further issue which is of considerable importance is the nature of the interview protocols employed in suggestibility research. The
Oaths (Children) Amendment Act 1990 presumes the ability of young children to respond rationally to questions. This presumption highlights the importance of gaining an understanding of how children respond to different styles of questioning, and particularly which styles are more likely to elicit accurate and inaccurate responses.

Some attempts have been made to theoretically define different styles of questions. Spencer and Flin (1990) differentiate between the following question styles: free recall, for example "Describe everything you saw", in response to which younger children typically report less information than older children and adults, though what they do recall is generally accurate (Dent, 1990; King and Yuille, 1987); general questions, for example "Was the man carrying anything?"; specific questions, for example "Was he carrying a knife?", to which younger children (aged 6-8 years) tend to respond less accurately than older children (aged 10-11 years) and adults (Davies et al, 1989), though this may be dependent on the precise form of the question or the type of detail sought (Goodman, Aran & Hirschman, 1987; King and Yuille, 1987); and leading questions, for example "He was carrying the knife, wasn't he?". In comparing free recall, general and specific questions, Dent and Stephenson's (1979b) study found that free recall was the most accurate and that general questions caused fewer inaccuracies than specific questions. This has been supported by subsequent investigations (Dent, 1986).

The literature however, while frequently differentiating between general and specific questions (Poole & White, 1991; Saywitz & Nathanson, 1993), and between non-suggestive and misleading questions (Cohen & Harnick, 1980; Tobey & Goodman, 1992), tends not to further
differentiate between styles of questioning. It has been demonstrated that the way a question is phrased might determine the likelihood of a child succumbing to any suggestion incorporated in the question. Even small changes in the form of questions, such as changing the article from 'a' to 'the', for example 'did you see a car' versus 'the car', have been shown to affect the accuracy of children's recall (Dale, Loftus & Rathbun, 1978).

There does not however appear to be a great deal of consistency in the types of questions used in suggestibility research, making comparisons across studies difficult. Nor is there clarity in the terminology used to describe questions employed in studies. For example, Dent and Stephenson (1979) propose the general question as intermediate between free recall and specific questions, however the general questions used in that study, such as “Tell me as much as you can about what the man in the white mac looked like and what he was wearing” (p.43), contain quite specific information which may be considered suggestive, in that the question introduces information which the child may not have previously considered. Similarly, some of Tobey and Goodman's (1992) misleading questions, might be more appropriately termed leading, in that they lead the child to provide a particular response, for example "The man was very fat, wasn't he?" (p. 782). Other questions in Tobey and Goodman's study however, for example "What colour was the bed in the room where you and the man played?" (when there was no bed in the room), seem to be appropriately termed misleading, in that they presume the accuracy of the inaccurate information contained within the question, thereby misleading the child. These two styles of question termed misleading by Tobey and Goodman (1992), appear to be subtly different.
Further, in a number of studies, questions termed 'specific' tend to be suggestive in nature. For example "Did the man take a picture of you?" (Tobey & Goodman, 1992, p. 782), and "What colour hair did the man in the white mac have?" (Dent & Stephenson, 1979, p. 43). It has been concluded from such studies that questions incorporating cues to enhance memory, while producing greater recall, also result in increased inaccuracy. However it can be suggested that questions which contain memory enhancing cues need not necessarily contain suggestive information. It would be ideal to obtain complete accounts without the risk of contamination from suggestion. Perry and Wrightsman (1991) propose that strong suggestions would be more likely to elicit false agreement from a child than mild suggestions. It can also be proposed that mild suggestions would be more likely to elicit false agreement than questions containing cues, but which do not also contain suggestive information. As Stellar (1991) highlights, refining the characteristics of interview techniques that include more or less suggestive cues is an important research task.

1.2.3.3.1 A continuum of suggestibility

Myers (1992) proposes a Continuum of Suggestibility, ranging from less suggestive questions through to more suggestive questions, that is from 'open-ended' to 'focused' to 'leading' to 'coercive' questions. By Myers' definition, an open-ended question is an invitation to a child to discuss whatever they want about a subject, for example "Has anything been happening?", or "Can you tell me about that?". The more specific focused question draws a child's attention to a particular person, place, time, or event, for example "Shall we talk about preschool now?", without suggesting that the interviewer
wants particular information about that event. Myers defines a leading question as a question that contains a suggestion of what the answer should be. For example, "He was a tall man, wasn't he?". A leading question by this definition is a suggestive question that leads the child to give a particular answer. At the far end of Myers' continuum is the coercive question, which intimidates or threatens a child into providing a specific answer, for example asking a question repeatedly until the child gives the 'right' answer.

Myers' (1992) terminology needs to be clarified with regard to existing research however, and the continuum would appear to require some modification. Firstly, Myers' least suggestive open-ended question is not typically used in studies of children's suggestibility, perhaps because children, particularly younger children, need a situational focus upon which to base their reply. Open-ended questions like "Has anything been happening?" might produce any number of responses irrelevant to the situation of interest, while Myers' focused question, for example "Tell me about your day at school yesterday.", narrows the focus to a particular situation. This style of question is frequently used in suggestibility studies, but is referred to by researchers as free recall or open-ended questioning (Dent & Stephenson, 1979; Tobey & Goodman, 1992). While Myers' terminology is appropriate in that the question provides a situational focus upon which the child may base their response, the information provided by children in response to such questions may also be termed open-ended or free recall, in that while the question is situationally focused, children are encouraged to report what they recall without providing cues pertaining to specific information.
Further, Myers' (1992) continuum does not appear to cover the range of question styles employed in suggestibility studies, and which, it can be presumed, could be used during real life questioning or interview of children. Myers' continuum does not include the cued but non-suggestive questions discussed earlier. With cued non-suggestive questions, the focus is further narrowed to specific objects or events within a given situation, but no suggested response is contained within the question. For example the question, "Was anyone else there?" provides a necessary cue to elicit information about other participants, which a focused question such as "What happened yesterday?" may not have elicited, but without suggesting the presence of a specific other.

Myers' (1992) continuum also does not include cued but suggestive questions which are not leading. For example, "Was there a man there with you?". This type of question includes information which may be new to the child, thus suggesting information the child may not have previously considered, in this case the presence of a specific 'other', but does not lead the child to provide a particular response. Further, questions which presume the accuracy of suggestive information are not included in the continuum. For example, "Was the man who was with you wearing a hat?". This question presumes the presence of a specific other (the man) in the structure of the question, such that a child responding either negatively or positively to such a question is by implication acknowledging the presence of 'the man'. This style of questioning has been termed misleading by Tobey and Goodman (1992), and may be particularly confusing for children. Little research however has looked at this style of questioning.
Finally, while Myers defines coercive questions as those involving threat or repeated questioning, these descriptions do not pertain to a particular style of questioning, but rather the manner in which questions are presented. Therefore it is suggested that questions which appear on face value to be particularly coercive, for example "There was a man there with you, wasn't there?" should be at the far end of the continuum. This type of question should be termed leading, as the structure of the question leads the child to respond in a specific way.

A reformulated Suggestibility Continuum then, ranging from less suggestive and coercive to more suggestive and coercive questions, would comprise open-ended, cued non-suggestive, suggestive, misleading and leading questions.

Given the clear differences between these questions, it would appear necessary to differentiate between styles of questioning in research and to investigate how they impact upon the suggestibility of children's memory.

While the impact of various questioning-styles on the suggestibility of children's memory has been theoretically alluded to by a number of authors (Myers, 1992; Perry & Wrightsman, 1991; Spencer & Flin, 1990), few attempts have been made to differentiate this impact beyond a simple distinction between misleading and non-misleading questions. Given the wide range of questioning styles and their presumably different impact, further research is needed to guide professionals in
producing interview protocols which will maximise accuracy and detail of children's reports while minimising inaccuracy.

1.2.3.4 Don't know responses

Further, some authors suggest that children are less likely to succumb to suggestion when invited to say "I don't know", if unsure of the answer to a question (Dent, 1990). Warnick and Sanders (1980) demonstrated that for adults, an explicit option to say "I don't know" decreased the number of false identifications made in an experimental identification task. However child studies with interview protocols that allow the child to say "I don't know" have not eliminated the fabrication of false responses to leading questions (Maston, 1987; Powell, Dalgleish & Dadds, 1993). Despite these findings it seems important to allow for such responses as they give the child the option of saying they do not know the answer.

1.3 Memory Impairment versus Co-existence Hypotheses

1.3.1 The memory impairment hypothesis

Irrespective of whether suggestibility is a cognitive or social phenomenon, there has been considerable debate over whether a memory which has been distorted in line with suggestion is retrievable. Two predominant theories have addressed this issue.

Loftus and Davies (1984), based on research on the suggestibility and malleability of memory, stated that witness' reports consist of a blend of information that they may themselves have experienced, coupled with new details provided or constructed in the course of questioning. They argue that such information, included in leading or misleading questions, becomes integrated into the person's
recollection of the event, thereby supplementing or altering the memory of that event. This cognitive psychological theory termed the Memory Impairment Hypothesis argues that when post-event information is incorporated into later recall of an event, the incorrect information has erased or overwritten the original information (Loftus, Miller & Burns, 1978) such that information from the original memory trace can no longer be retrieved.

1.3.2 The co-existence hypothesis

An alternative view, termed the coexistence hypothesis, is that the suggested information might supplement information already in memory, or fill gaps in memory, without impairing a child's ability to remember the originally stored details (Bekerian & Bowers, 1983). That is, memory traces for the original and biased information coexist in memory and the presence of the misinformation makes retrieval of the original information more difficult. McCloskey and Zaragoza (1985) go further to propose that misleading post-event information has no effect at all on memory for the original episode, neither erasing it nor competing with it for retrieval. If this were the case, a child's tendency to incorporate suggestion into their report might be explained purely by the social compliance phenomenon. That is, the newly acquired information coexists with the original information, and is presented as truth by children due to social/motivational aspects such as compliance to an authority figure. If this hypothesis is correct and post-event information coexists with the original memory such that the original memory is able to be retrieved, it would be expected that skilful questioning could elicit the original information.
This is an issue which is currently under debate. Some researchers suggest that subsequent probing is unlikely to undo the damage caused by erroneous suggestions during previous interview (Ceci & Bruck, 1993; Powell & Thomson, 1994). Others, such as Johnson and Lindsay (1989), reported that children were able to accurately recall information from an original event when explicit cues relating to the source of accurate and misinformation were supplied. That is, children were able to distinguish original event memories from misleading post-event information.

This question of whether children are able to distinguish memory for the original event from information obtained subsequent to the event, that is to distinguish between sources of memory for an event, is an issue which requires further investigation. Consequently, to assess whether children's memory is impaired by misleading suggestions, it is necessary to examine children's ability to recall the original details of an event independent of the child's tendency to conform with the misinformation. Irrespective of the reasons for a child's susceptibility to suggestion, the research question of interest is whether accepted erroneous post-event information erases previous information such that the original information is unable to be retrieved, as the Memory Impairment Hypothesis would suggest.

1.4 Aims and Hypotheses

The overview of research presented here highlights the need to address a number of important methodological criticisms of past research in order to adequately investigate children's memory for events. Firstly, it is important to investigate children's memory for personally significant and interesting events in which they have
participated. It is also important to use a number of questions in each interview protocol which relate to details central to the stimulus situation. It is also necessary to employ and compare the full range of questioning styles used in previous research, and which could be used in questioning children. Finally, it is important to select age groups for comparison on the basis of sound theoretical guidelines.

As can be gleaned from the present review, there are numerous questions related to children's memory and suggestibility which require further clarification. Taking the above outlined methodological considerations into account, the present study aimed to address some of these questions.

1) The present review has shown that little research has looked at the impact of inaccurate information conveyed by a personally significant adult, such as a parent, on children's later report of an event. It was hypothesized that children who have heard inaccurate information from a parent, will provide a less accurate report of those events, and provide more inaccurate information, than children who have not been exposed to such information.

2) Previous research has consistently demonstrated that children tend to provide less information in response to open-ended free recall questions than to more specific questions, but that specific questioning results in greater inaccuracy of children's reports. However previous research has failed to distinguish between questions containing non-suggestive memory cues and questions containing suggestive memory cues. The research question then asks if questions
containing non-suggestive cues will enable children to provide a more
detailed report than would an open-ended question, but without the
Corresponding increase in inaccuracy frequently reported with
suggestively cued questions. It was hypothesized therefore that
children would provide significantly more accurate information in
response to cued non-suggestive questions than an open-ended question,
but would not provide significantly more inaccurate responses.

3) This review has also shown that although alluded to in the
literature, research has not adequately addressed the question of how
the level of suggestion and coercion contained within a question
impacts upon children's ability to withstand suggestion and report
details of events accurately. It was hypothesized that children would
provide greater accuracy and certainty of report in response to cued
non-suggestive questions than suggestive, misleading or leading
questions, with the most coercive style (leading questions) resulting
in least accuracy and certainty. The impact of previous exposure to
misinformation was also to be investigated, with the expectation that
previous exposure to parental misinformation would result in lower
accuracy of report than non-exposure.

4) Review of the research literature also highlighted the need for
investigation of the impact of repeated questioning over time on
children's ability to accurately report details of an event. More
specifically, it is important to determine any differential impact on
memory between repeated non-suggestive questioning and repeated
suggestive questioning. While there is little research to suggest a
particular assumption, it was hypothesized that children who had been
exposed to repeated non-suggestive questioning over time, would
provide more accurate reports, and be more certain of their reports, than those children who had been repeatedly exposed to suggestive information.

5) Although little research has addressed the question of whether certainty of initial memories protects against the impact of suggestive questioning, it was hypothesised that children who were initially very certain of their responses would be less susceptible to suggestive questioning than children who were initially less certain. That is, it was expected that children who reported greater initial certainty would provide more accurate reports in response to suggestive questioning than children who reported less initial certainty.

6) As can be seen from the literature presented, there is some debate, as yet unresolved, as to whether children's suggestibility is a purely cognitive phenomenon or a social phenomenon resulting from compliance to authority figures. The present research aimed to investigate the relationship between children's memory for events and a purely cognitive assessment of memory. It also aimed to explore the reasons for children succumbing to suggestion provided by an authority figure, and how this differs according to developmental level. The research questions then ask: a) is there a strong relationship between children's performance on cognitive memory tests and memory for an event; and b) do children include suggested information in report of an event due to compliance to an authority figure, and does this differ with developmental level.
6a) It was proposed that a strong relationship between standardised tests of memory and children's memory for events would support a cognitive explanation for children's event-memory. More specifically, although there is little research to guide hypotheses, it was predicted that there would be a significant relationship between standardised tests of free recall for visual and verbal stimuli and the amount of information recalled in response to open-ended questions; and that performance on standardised tests of cued recall for visual and verbal information would be related to accuracy in response to questions containing cues. In statistical terms, significant correlations were expected between visual and verbal free recall scores and accuracy in response to open-ended questions, and between visual and verbal cued recall scores and accuracy in response to cued questions.

6b) It was also proposed that a tendency for children to include suggestion due to social compliance would provide support for the social compliance theory of children's suggestibility. Therefore the social compliance argument would be supported by a large proportion of children indicating that they provided inaccurate report of event details because they wished to please, or be obedient to, an authority figure.

6c) Further, Piaget's theory of cognitive development on its own would predict that children aged two to seven years would be more likely to incorporate suggestive information due to their tendency to jump from information to conclusions, than children aged seven to eleven, who base their memories on reality. However in combination with the information processing model, it would be expected that
children aged from five to seven years (pre-operational), who store faithful representations of perceptions (imaginal representations) are less able to distort their memories with post-event information than children aged between seven and eleven years (concrete operational), who modify their memories with information obtained after the event (operative representations). Therefore this theory would predict that younger children would be expected to provide more accurate report than older children in the face of inaccurate post-event information and suggestive questioning. Social theories of moral development however, suggest that children aged between five and seven years and children aged between seven and adolescence are equally likely to comply with authorities, with younger children doing so in order to be obedient, and older children complying to please and gain approval from those authorities. Thus social theory would expect no difference in accuracy of report in response to suggestive questioning between these two age groups.

As there is little research addressing this question, and as the findings from research looking at age differences has been so equivocal, no specific hypotheses were proposed and this debate was investigated in an exploratory sense. Support of Piaget's theory alone would be indicated if younger children provided less accurate report in response to suggestive questioning than older children. Support of the combined Piaget/information processing model would be indicated if younger children provided more accurate report in response to suggestive questioning than older children. Support of the social compliance argument would be indicated if there was no difference in accuracy between these age groups.
7a) As detailed in the present review, a further theoretical argument related to children's suggestibility is the debate between the Memory Impairment and Co-existence hypotheses. The present study aimed to investigate whether children are able to retrieve original details of an event when previous report has included inaccurate post-event information such as the co-existence hypothesis would suggest; or whether children's memory for details of an event is irreversibly impaired by the previous inclusion of inaccurate post-event information. It was hypothesized that a large percentage of children who had previously included inaccurate post-event information in their report of events, would be able to retrieve original details of an event, in line with the co-existence hypothesis.

7b) Further, cognitive theory suggests that pre-operational children (aged between five and seven years) are less able to distort memories, which are stored as a pictorial image, while concrete operational children (aged between seven and eleven years) are able to alter memories to accommodate newly acquired information. The research question then asks, when inaccurate post-event information has previously been included in report of that event, does the capacity to retrieve original information about an event differ according to developmental level? It was hypothesized that younger children who had included inaccurate post-event information in report of an event, would be able to retrieve original details from memory, while older children would be less able to do so. In statistical terms, it was expected that there would be a greater percentage of younger children who were able to accurately retrieve original details of an event from memory, following incorporation of inaccurate information in previous report, than older children.
8) With regard to individual questions, the present study aimed to investigate children's memory for specific types of information which have been reported to be difficult for children to recall, such as time, colour and number, and to investigate whether memory for such information is dependent on developmental level. Although there is little research to guide hypotheses, it was predicted that younger children would provide less accurate responses to these types of information than older children.

9) Finally, the present study aimed to determine whether children are aware that suggestibility research paradigms are designed to elicit inaccurate information. That is, the present study aimed to investigate whether children were aware that the misinformation provided by a parent, and the suggestive questioning styles used during interviews were attempts to elicit inaccurate responses.

METHOD

2.1 Subjects

Two hundred and twenty two children, 114 female and 108 male, participated in the present study. All children were aged from five to nine years of age (that is from 65 to 107 months inclusive). One hundred and five subjects (54 female, 51 male) were aged between five and seven years (M = 74.90 months, SD = 4.32) and 117 subjects (60 female, 57 male) aged between seven and nine years (M = 94.18 months, SD = 5.68). Of these children, four were not available for the second
and third experimental sessions, and one child was not available for the third experimental session.

Subjects were recruited from Catholic Primary Schools within the Australian Capital Territory. Information about the study (see Appendix A) was sent home to all parents of Kindergarten to Year 3 children at the participating schools. Parents who wished their child to participate were required to complete and return a consent form to the school. The return rate was approximately thirty percent. All children with parental consent, who were available at the required times, participated in the study.

2.2 Design

The study incorporated a between and within subjects nested design (see Table 1).

Independent variables consisted of post-event information, questioning style and age. There were two levels of the post-event information variable: no post-event information provided by a parent and misleading post-event information provided by a parent; and five levels of questioning style - open-ended, cued non-suggestive, suggestive, leading and misleading.
## Table A

**Experimental Procedure - Sequence of Events**

<table>
<thead>
<tr>
<th>Home Session (Day 1)</th>
<th>Experimental Session 1 (Day 2)</th>
<th>Experimental Session 2 (Day 9)</th>
<th>Experimental Session 3 (Day 16)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. No Misleading</td>
<td>A. Neutral Cued</td>
<td>B. Suggestive</td>
<td>All Neutral Cued</td>
</tr>
<tr>
<td></td>
<td></td>
<td>C. Leading</td>
<td></td>
</tr>
<tr>
<td></td>
<td>A. Neutral Cued</td>
<td>B. Suggestive</td>
<td>All Neutral Cued</td>
</tr>
<tr>
<td></td>
<td>C. Leading</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. Misleading</td>
<td>A. Neutral Cued</td>
<td>B. Suggestive</td>
<td>All Neutral Cued</td>
</tr>
<tr>
<td></td>
<td>C. Leading</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>A. Neutral Cued</td>
<td>B. Suggestive</td>
<td>All Neutral Cued</td>
</tr>
<tr>
<td></td>
<td>C. Leading</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>A. Neutral Cued</td>
<td>B. Suggestive</td>
<td>All Neutral Cued</td>
</tr>
<tr>
<td></td>
<td>C. Leading</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Levels of these independent variables were counterbalanced to provide twelve possible combinations of post-event information and questioning. The twelve cells containing each possible combination of these two independent variable levels are presented at Table 2, as well as a shorthand description for each sequence, to be used in the following text.
### Table B

**Experimental Conditions for Each of the Twelve Possible Sequences**

<table>
<thead>
<tr>
<th>Sequence</th>
<th>Prior to Interviews</th>
<th>Session 1</th>
<th>Session 2</th>
<th>(N) (5-6)</th>
<th>(N) (7-8)</th>
<th>(N) Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. 1AA</td>
<td>No inaccurate Info from parent</td>
<td>Cued non-suggestive</td>
<td>Cued non-suggestive</td>
<td>10</td>
<td>14</td>
<td>24</td>
</tr>
<tr>
<td>2. 1AB</td>
<td>No inaccurate Info from parent</td>
<td>Cued non-suggestive</td>
<td>Suggestive</td>
<td>11</td>
<td>7</td>
<td>18</td>
</tr>
<tr>
<td>3. 1AC</td>
<td>No inaccurate Info from parent</td>
<td>Cued non-suggestive</td>
<td>Leading</td>
<td>10</td>
<td>7</td>
<td>17</td>
</tr>
<tr>
<td>4. 1BA</td>
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<td>Cued non-suggestive</td>
<td>7</td>
<td>9</td>
<td>16</td>
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<tr>
<td>5. 1BB</td>
<td>No inaccurate Info from parent</td>
<td>Misleading</td>
<td>Suggestive</td>
<td>12</td>
<td>10</td>
<td>22</td>
</tr>
<tr>
<td>6. 1BC</td>
<td>No inaccurate Info from parent</td>
<td>Misleading</td>
<td>Leading</td>
<td>8</td>
<td>6</td>
<td>14</td>
</tr>
<tr>
<td>7. 2AA</td>
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<td>Cued non-suggestive</td>
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<td>11</td>
<td>19</td>
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<td>8. 2AB</td>
<td>Inaccurate Info from parent</td>
<td>Cued non-suggestive</td>
<td>Suggestive</td>
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<td>10</td>
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<tr>
<td>9. 2AC</td>
<td>Inaccurate Info from parent</td>
<td>Cued non-suggestive</td>
<td>Leading</td>
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<tr>
<td>10. 2BA</td>
<td>Inaccurate Info from parent</td>
<td>Misleading</td>
<td>Cued non-suggestive</td>
<td>8</td>
<td>15</td>
<td>23</td>
</tr>
<tr>
<td>11. 2BB</td>
<td>Inaccurate Info from parent</td>
<td>Misleading</td>
<td>Suggestive</td>
<td>6</td>
<td>10</td>
<td>16</td>
</tr>
<tr>
<td>12. 2BC</td>
<td>Inaccurate Info from parent</td>
<td>Misleading</td>
<td>Leading</td>
<td>7</td>
<td>8</td>
<td>15</td>
</tr>
</tbody>
</table>
Children in Cell 1 for example received no inaccurate information at any experimental stage. Cell 1 has the combination 1AA - no misleading information provided by parents, followed by cued non-suggestive questioning at Sessions 1 and 2. In contrast, children in Cell 12 received suggestive misinformation at every experimental stage. Cell 12 has the combination 2BC - misleading information provided by parents, followed by misleading questioning at Session 1 and leading questioning at Session 2. All subjects received cued non-suggestive questioning at Session 3.

There were two levels of the age variable: children aged between five and seven years (60-83 months) and children aged between seven and nine years (84-108 months). Although a balanced number of boys and girls were sampled, initial analyses indicated that results were not affected by sex differences. Consequently, sex was not included as an Independent Variable.

2.2.1 Measures

There were two primary dependent variables - free recall accuracy and interview accuracy. Memory for words (verbal memory) and memory for diagrams (visual memory) were also measured.

Free recall accuracy was calculated by adding the number of accurate pieces of information provided by a child in response to one open-ended question. This was done for each of the three interviews, to provide three free recall accuracy scores.

With regard to interview accuracy, responses to the nineteen original questions were subject to principal axis factor analysis. All questions asked related to the same situation and, it was assumed,
tap the same underlying ability for memory. Since the memory model used in this research hypothesised one unitary ability, the factor extraction was limited to one factor. Items with a loading greater than 0.3 were selected for the final memory scale. Loadings for all questions are presented at Appendix B.

There were three questions which did not consistently load on the single factor when sex and age were taken into account. These were the questions pertaining to the parent's cup, the child's own cup, and whether the child's mother was seated at the table with the child and their father. Reliability analysis of all questions also indicated low correlations between each of these three questions and the total scale, suggesting that these three items appeared to be measuring something different from other questions. These three questions were therefore excluded from the final memory scale. The sixteen remaining questions were utilised in calculating interview accuracy and inaccuracy scores, and certainty ratings. Cronbach's alpha reliability coefficient for the sixteen items included in the final scale equalled 0.92.

To obtain accuracy and inaccuracy scores, each accurate score was assigned a value of +1, and each inaccurate score a value of -1. 'Don't Know' responses were assigned a value of 0. Each question was also rated for certainty, with the following values assigned: very sure = 3, a little bit sure = 2, not very sure = 1 and really don't know = 0. This provided a measure for certainty of responses. To obtain accuracy scores, correct responses were added. To obtain inaccuracy scores, incorrect responses were added. To obtain mean certainty scores, certainty ratings were added and divided by the
number of responses. This was done for each of the three interviews, to provide three accuracy, inaccuracy and certainty scores.

2.2.1.1 Interview Protocols

Each interview protocol contained nineteen questions, however only sixteen of these questions were used for subsequent analyses. The wording of questions used in each interview protocol differed for each experimental condition. There were five question styles used - open-ended, cued non-suggestive, suggestive, leading and misleading. All questions were devised specifically for the present study.

Cued non-suggestive questions were worded so that they provided a specific focus for the child but did not contain inaccurate suggestive or leading information. For example, “Did you have a drink on the table while you were doing the puzzles? (If yes) What was the drink?” and “Did your Dad have anything to eat while you were doing the puzzles? (If yes) What did he eat?” (see Appendix C).

Misleading questions were worded so that they contained inaccurate suggestive information which was presumed, without the suggestive information being the focus of the question. A response to these questions would presume the accuracy of the suggestive information. For example, “Did you enjoy the glass of lemonade you had while doing the puzzles?” and “Did your father enjoy the biscuits he ate while you were doing the puzzles?” (see Appendix D).
Suggestive questions were worded so that they contained inaccurate suggestive information, and required a yes-no response. For example "Did you drink some Lemonade while doing the puzzles?" and "Did your father have a biscuit while you were doing the puzzles?" (see Appendix E).

Leading questions were worded so that they contained inaccurate suggestive information, but also implied an answer so that the child would be led to respond positively to the questions. For example "You drank some lemonade while you were doing the puzzles, didn't you?" and "Your father ate some biscuits while you were doing the puzzles, didn't he?". (These questions were spoken with a downward intonation on the last word of the sentence.) (see Appendix F).

2.2.1.2 Verbal Memory Measure

Assessment of verbal memory utilised a list of nine words (see Appendix G). This list was adapted from the Children's California Verbal Learning Test, which has reported reliability and validity (Delis, Kramer, Kaplan & Ober, 1994). Immediate free recall, delayed free recall and cued recall for verbal information were assessed. Accuracy of immediate word memory was calculated by adding the number of correctly recalled words immediately following presentation of the nine word list. Accuracy of delayed free recall was calculated by adding the number of correctly recalled words approximately five minutes after presentation of the nine word list. Accuracy of cued recall was calculated by adding the number of correctly recognised words from a list of eighteen words - nine accurate and nine inaccurate (see Appendix Gii).
2.2.1.3 Visual Memory Measure

Assessment of visual memory utilised a set of nine geometrical line drawings which were developed for the present study (see Appendix Hi). Immediate free recall, delayed free recall and cued recall for visual information were assessed. Accuracy of immediate free recall was calculated by adding the number of correctly recalled line drawings immediately following presentation of nine line drawings. Accuracy of delayed free recall was calculated by adding the number of correctly recalled line drawings approximately five minutes after presentation of nine line drawings. Accuracy of cued recall was calculated by adding the number of correctly recognised line drawings from presentation of eighteen line drawings - nine accurate and nine inaccurate (see Appendix Hii).

2.3 Materials and Procedure

2.3.1 At school

Children participating in the study were called together by their teacher during the day and instructed in the following way: "Tonight you will be doing some puzzles at home with your parents. It is important that you finish the puzzles on your own. Your parents must NOT help you do the puzzles." Teachers then handed each of the participating children a large envelope containing parent instructions, tasks to be completed and the parent questionnaire, and asked the children to sharpen their pencils, and to place their pencil case and the envelope in their bag. Children were instructed to give the envelope to their parents when they arrived home. Each envelope was labelled with the child's name and an identification number, and was sealed with tape. Teachers had a copy of these instructions to ensure consistency of information conveyed to children (see Appendix I).
2.3.2 The stimulus situation

The stimulus situation was conducted at the child's home with both parents (or parent figures to include step-parents and de facto parents) present. Materials provided to parents for the stimulus situation included one page of instructions, three tasks for the child to complete and a parent questionnaire. Included in the parent instructions were details about how to prepare for and conduct the stimulus situation (see Appendix J1 and J2).

2.3.2.2 Parent instructions

Parents were instructed to read the instructions carefully before beginning the session. The importance of not allowing their child to assist in setting things up and not discussing any instructions with their child was stressed at the top of the instruction sheet.

The following materials were provided by parents for the stimulus situation: two glasses of water (or juice), one in a plastic cup for the child, and one in a glass cup for the parent; five coloured pencils contained in a coffee mug; and two coloured pencils - red and blue. Parents were first required to prepare for the puzzle session by clearing a table at which the child and father could sit, by placing both cups of drink, and the mug with five coloured pencils on the table, and the red and blue pencils directly on the table. Parents were instructed to phone the experimenter if they were unsure about any of the instructions. The instructions then required that the child and the child's father (or father figure) be seated at the table for the session to begin. The child's mother was instructed NOT to sit at the table with them.
2.3.2.2 Puzzles/Tasks

Three tasks were provided for completion by the child during the stimulus situation. The first was a picture in which five monkeys were hidden, which children were required to locate (see Appendix K). The second was a maze in which the child was required to find a bear's way home. The difficulty level of the maze differed for the two different age groups (see appendix L and Lii). The third was a picture of a mushroom, which children were required to colour in, using red and blue colours only (see Appendix M).

The child's father was instructed to record the time started at the top of the first sheet, and then ask their child to complete the 'find the monkey' puzzle, followed by the maze, and to finally colour in the picture of the mushroom - using only the red and blue pencils. The child's father was then required to record the time completed on the colouring in sheet. Fathers were then required to pack the pencils away in the pencil case, and place the puzzles in the envelope. This was the end of the puzzle session for Group 1 subjects. Parents were instructed to thank their child for completing the puzzles.

Instructions for parents of children in experimental group 2 were similar but also included a script which entailed misleading post-event information. This information was to be conveyed over the phone to the experimenter. The following script was provided: "The session went well. I think (child's name) had a drink of lemonade and a sandwich. I think his/her father had some biscuits and a cup of tea. I think there were tigers hidden in the picture. I think it was a rabbit who found its way home through the maze. I think he/she used yellow and purple to colour in." For Group 2 subjects, the child's
mother was instructed to ask the child to come with her while she made a phone call to the experimenter. Mothers were asked by the experimenter to convey the misleading information script. Parents were also instructed that if their child questioned what they had said over the phone they were to respond with "That's what I think" and try to avoid discussion. Group 2 parents were then instructed to thank their child for completing the puzzles.

2.3.2.3 Parent Questionnaire

A one page parent questionnaire was also provided for completion by parents following completion of the stimulus situation. This questionnaire was utilised as a check that parents complied accurately with the instructions provided, and as a guide to children's accuracy during interview sessions. Parents were required to respond to questions pertaining to the stimulus materials, for example "What type of drink did you provide for your child? Water ......... Juice ...... Other (please describe) ........." (see Appendix N). At completion of the puzzle session, parents were required to complete the parent questionnaire without delay, but to ensure that their child was not present while they were doing this. Parents were then instructed to place the questionnaire in the envelope with the puzzles, ensuring that it was sealed before returning it to their child's school bag. Teachers were required to ask for the envelope the following morning.

2.3.3 Interview 1

Later that day each child was interviewed individually at school by the experimenter, in a room where only the child and the experimenter were present. For the interview sessions, a detailed script with the exact wording of instructions to be conveyed to the child, and the
questions to be asked, was prepared to ensure that consistent wording
was used for each subject. The interviewer introduced herself to each
child using her Christian name. The word memory test was administered
first. The interviewer said to the child “I am going to say a list of
words to you now, listen carefully.” The list of nine words was read
with approximately two seconds between each word. Approximately five
seconds after the final word from the list was read, children were
asked to “Tell (the interviewer) as many of the words as you can
remember.”

Following the immediate verbal memory task, children were asked the
open-ended question, which was worded as follows: “Tell me exactly
what happened when you were doing the puzzles at home?” If a child
required prompting, the following phrase was used: “Just tell me as
much as you can remember.” When children appeared to have no more to
say, they were asked “Can you think of anything else?”. When the
child had no more to add, the appropriate question protocol was
commenced.

Prior to being asked specific questions, the following script was
conveyed to children “Now I am going to ask you some questions about
when you did the puzzles at home. After each answer I will ask you
how sure you are.” At this point a strip of paper with ratings of
certainty was provided for each child, to allow them to rate how
certain they were of their answer. Ratings were presented as follows:

<table>
<thead>
<tr>
<th>0</th>
<th>1</th>
<th>2</th>
<th>3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Really Don’t Know</td>
<td>Not Very Sure</td>
<td>A little Bit Sure</td>
<td>Very Sure</td>
</tr>
</tbody>
</table>
Children were then told "If you are very sure of your answer point to this one with lots of ticks; if you are only a little bit sure point to this one with only one tick; if you are not very sure, point to this one with a question mark; and if you really don't know the answer, point to this one with lots of question marks." To ensure that children understood these instructions, they were asked where they would point if they were not sure of an answer; a little bit sure of an answer; really didn't know an answer; or were very sure of an answer. All children appeared to understand these instructions.

Children in condition A were then asked the questions of the cued non-suggestive interview protocol, and children in condition B were asked the questions of the misleading interview protocol.

On completion of the questions, which took approximately three to five minutes, children were given the following instructions: "Remember I read you a list of words a little while ago. Could you tell me all the words you can remember from that list". Following this delayed recall, the cued recall test was administered. Children were given the following instructions: "Now I am going to read you some words and I want you to say YES if the word was in the list I read to you before, and NO if it was not in the list I read before.". Children were presented a list of eighteen words one at a time. Responses were recorded. Each child was then thanked and told that they would be seeing the experimenter again the following week.
2.3.4 Interview 2

The second interview was held at school one week later. The session began with the visual memory task. Each of the nine geometrical line drawings was displayed to the child for approximately two seconds. Approximately five seconds after the final drawing was shown, children were instructed to "Tell me (the interviewer) what the pictures were. Tell me as many pictures as you can remember".

Following the immediate visual memory task, the open-ended question "Tell me exactly what happened when you were doing the puzzles at home?", was asked, with the prompt "Just tell me as much as you can remember" used when necessary. When children appeared to have no more to say, they were asked "Can you think of anything else?". When the child had no more to add, the appropriate question protocol for Interview 2 was commenced.

The certainty rating was again explained and demonstrated to each child as in the first session. Children in condition A were then asked the cued non-suggestive questions, children in condition B were asked the suggestive questions, and children in condition C were asked the leading questions. The cued non-suggestive questions were the same as those used for the first interview.

Following these questions, approximately five minutes later, children were again asked to recall the drawings. The experimenter said the following to the child: "Remember those pictures I showed you a little while ago? I'd like you to tell me as many as you can remember. What pictures can you remember seeing?". Following this delayed recall, the cued recall test was administered. Children were
given the following instructions: "Now I am going to show you some pictures. If the picture was one of the pictures I showed you before say YES. If it was not one of the pictures I showed you before say NO." Children were presented eighteen pictures one at a time, with approximately two seconds between each picture presentation. Responses were recorded. Each child was then thanked and told that they would be seeing the experimenter again the following week.

2.3.5 Interview 3

The third interview was conducted one week later. The open-ended question, "Tell me exactly what happened when you were doing the puzzles at home?" was asked first, with the prompt "Just tell me as much as you can remember" used when necessary. When children appeared to have no more to say, they were asked "Can you think of anything else?". When the child had no more to add, the question protocol for Interview 3 was commenced (see Appendix O).

The certainty rating was again explained and demonstrated to each child as in the two previous sessions. All children at Interview 3 received the same interview protocol, which contained cued non-suggestive questions. However if children responded with inaccurate information in line with suggestions previously provided, they were then asked to discriminate between sources of memory. Children were asked whether they remembered that information, or whether they heard someone say it. For example, "Do you remember having lemonade, or did you hear someone say you had lemonade?" and "Do you remember your father eating some biscuits, or did you hear someone say he ate some biscuits?". If children indicated that they heard someone say the information, they were then asked what they thought happened. For
example, "What drink do you think you had?" and "What do you think your father ate?".

Two additional sets of questions were used at the end of the third interview protocol. The first set aimed to determine whether children were aware they had provided incorrect answers, and to find out why they thought they did so. The following question was asked: "Over the past few weeks when I've asked you the questions, did you say any answers to me that you didn't think were right, but you said them anyway? It's OK if you did." If children answered yes they were also asked each of the following questions:

a) Why do you think you did that?
b) Was it because you weren't sure of the right answer?
c) Was it because you thought that was what your Mum wanted you to say?
d) Was it because you thought that was what I (interviewer) wanted you to say?"

The second set of questions was included to try and ascertain whether children were aware that the questions used during the interviews were designed to mislead. It was worded as follows: "Did you think anyone was trying to get you to say things that weren't quite right?" If the child answered Yes, the following questions were also asked:

a) Who do you think was doing that?
b) Do you think your Mother was?
c) Do you think I (the interviewer) was?

1 For some children this question was repeated slowly, with pauses emphasised, as some children appeared not to understand the question on first presentation.
d) Did you think I (the interviewer) was trying to trick you with the questions so you would say things that weren't quite right?"

At the end of the third session, children were thanked for their participation, and the purpose of the experiment and their parents' role was explained.

Results

3.1 Preliminary Analyses

Prior to analysis, accuracy scores (the number of accurate responses), inaccuracy scores (the number of inaccurate responses) and certainty scores (the mean certainty of accurate responses) for Interview Sessions 1, 2 and 3, as well as delayed free recall and cued recall accuracy scores for verbal and visual memory, and age were examined through various SPSS-X programmes for accuracy of data entry, missing values, and fit between their distributions and the assumptions of analysis of variance.

One case from Cell 12 (sequence BBC - misleading information + misleading question + leading question) was identified as a univariate outlier due to an extremely low accuracy score of 1, for Interview Session 3. This score was recoded from 1 to 4 such that it was still the lowest score (the next score was 6), but allowed this variable to enter analysis without outliers.

Univariate distributions for inaccuracy scores for all interview sessions were positively skewed. However, positive skewness was consistent across inaccuracy scores for all interviews sessions, such that this skewness would not be expected to influence analyses (Tabachnik & Fidell, 1989). Therefore, no data transformations were
performed. Using Mahalanobis' and Cook's distance, no cases were identified as multivariate outliers (Tabachnik & Fidell, 1989).

All a priori hypotheses were assessed using an alpha level criterion of $p < .05$. Post-hoc comparisons were adjusted using the Scheffe criterion, and are reported where appropriate (see Keppel, 1985). All results presented here were analysed using the SPSS-X (Version 4) statistical package (Norusis, 1990).

A complete set of mean accuracy, inaccuracy and certainty scores (and standard deviations), for each experimental group at Interviews 1, 2 and 3 are presented at Appendix P. However for each individual analysis, relevant means and standard deviations will be presented in the text.

3.2 Exposure to Parental Misinformation

The first analysis addressed the hypothesis that children who were exposed to inaccurate information conveyed by a parent would provide a less accurate report of that event, record more inaccurate responses and be less certain of their responses than those children who were not so exposed.

3.2.1 Data and analyses

The data used for this analysis comprised the number of accurate and inaccurate responses to 16 cued non-suggestive questions at Interview 1, and the mean certainty rating of responses. Only subjects who received non-suggestive questions at Interview 1 were included in the analysis ($n = 112$), to avoid the possible confounding effect of

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2 Inaccurate responses were not presumed to be the inverse of accurate responses, as children were able to provide 'don't know' responses.
misleading questioning. Two-way ANOVAs were computed to compare mean accuracy, inaccuracy and certainty scores for the two experimental groups (exposure versus non-exposure to inaccurate parental information), the two age groups (5-6 years and 7-8 years), and to test for interactions between experimental group and age. Mean accuracy, inaccuracy and certainty scores, as well as standard deviations are presented at Table 1.

Table 1

<table>
<thead>
<tr>
<th>Measure</th>
<th>Age</th>
<th>Not Exposed (N=55)</th>
<th>Exposed (N=57)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Accuracy</td>
<td>5-6 yrs</td>
<td>12.28 (1.67)</td>
<td>12.35 (1.96)</td>
</tr>
<tr>
<td></td>
<td>7-8 yrs</td>
<td>13.18 (1.96)</td>
<td>11.97 (3.22)</td>
</tr>
<tr>
<td>Inaccuracy</td>
<td>5-6 yrs</td>
<td>0.28 (0.53)</td>
<td>0.30 (0.54)</td>
</tr>
<tr>
<td></td>
<td>7-8 yrs</td>
<td>0.35 (0.63)</td>
<td>0.77 (0.50)</td>
</tr>
<tr>
<td>Certainty</td>
<td>5-6 yrs</td>
<td>2.85 (0.22)</td>
<td>2.86 (0.26)</td>
</tr>
<tr>
<td></td>
<td>7-8 yrs</td>
<td>2.94 (0.08)</td>
<td>2.90 (0.18)</td>
</tr>
</tbody>
</table>

Note: there were no significant differences between the two experimental groups at \( p < .05 \)
3.2.2 Descriptive Statistics

As can be seen from Table 1, for the five to six year age group, children who were exposed to inaccurate parental information prior to questioning showed similar accuracy of report ($M = 12.35$, $SD = 1.96$) to those children who had not been exposed ($M = 12.28$, $SD = 1.67$); recorded a similar mean number of inaccurate responses ($M = 0.30$, $SD = 0.54$) as those children who had not been exposed ($M = 0.28$, $SD = 0.53$); and were similarly certain of their responses ($M = 2.86$, $SD = 0.26$) as those children who were not exposed to inaccurate parental information ($M = 2.85$, $SD = 0.22$).

For the seven to eight year age group, children who were exposed to inaccurate parental information prior to questioning provided slightly less accurate reports ($M = 11.97$, $SD = 3.22$) than children who had not been exposed ($M = 13.18$, $SD = 1.84$); recorded slightly more inaccurate responses ($M = 0.77$, $SD = 0.50$) than children who had not been exposed ($M = 0.35$, $SD = 0.63$); and were similarly certain of their responses ($M = 2.90$, $SD = 0.18$) as those children who were not exposed ($M = 2.94$, $SD = 0.08$).

3.2.3 Analysis of variance

A two-way ANOVA demonstrated that for accuracy of report there was no significant difference between the two experimental groups ($F(1,109) = 1.76$, $p > .05$), no significant difference between the two age groups ($F(1,109) = .38$, $p > .05$), and no interaction between experimental group and age ($F(1,109) = 1.45$, $p > .05$). Similarly there was no significant difference for inaccurate responses between the two experimental groups ($F(1,109) = 0.21$, $p > .05$), no
significant difference between the two age groups (F(1,109) = .34, p > .05), and no interaction between experimental group and age (F(1,109) = 1.07, p > .05). Likewise for certainty of responses there was no significant difference between the exposure and non-exposure groups (F(1,109) = 0.18, p > .05), no significant difference between age groups (F(1,109) = 3.13, p > .05) and no significant interaction between experimental group and age (F(1,109) = 0.44, p > .05).

3.2.4 Summary

In summary, there was no significant difference in the mean number of accurate responses, mean number of inaccurate responses or mean certainty of responses to cued non-suggestive questions, as a function of exposure or non-exposure to inaccurate post-event information from parents prior to questioning. There were also no differences between the two age groups for any of these analyses.

3.3 Cued Non-suggestive versus Open-Ended Questions

The second set of analyses addressed the hypothesis that children would provide more accurate information in response to cued non-suggestive questions than to an open-ended question, but would not provide more inaccurate responses. Age effects were also analysed.

3.3.1 Data and analyses

The data used for this analysis comprised both the number of accurate and inaccurate pieces of information recalled by children in response to an open-ended question presented at Interview 1, and the number of accurate and inaccurate responses to the 16-question cued non-suggestive interview protocol presented at Interview 1. Only children who received non-suggestive questions at Interview 1 were used for these analyses (n = 112). Dependent t-tests were used to
compare mean accuracy scores. However, as there was little to no variance for inaccuracy scores, statistical analyses were not appropriate to compare the number of inaccurate responses for open-ended versus cued non-suggestive questioning, therefore percentage scores were used for comparison. Mean accuracy and inaccuracy scores for open-ended and cued non-suggestive questioning are presented at Table 2a. As there was little variance for inaccurate responses, the mean number of inaccuracies alone does not adequately describe the data. Therefore for clarity, the number of inaccurate responses provided, and the number and percentage of children who reported inaccuracies, is presented at Table 2b.

3.3.2 Descriptive and inferential statistics

As can be seen from Table 2a, children aged five to six years reported more pieces of accurate information in response to cued non-suggestive questions (M = 12.31, SD = 1.74) than to an open-ended question (M = 4.45, SD = 2.58). A dependent samples t-test revealed that this difference was significant (t(54) = 18.61, p < .05). As can be seen from Tables 2a and 2b, for children aged five to six years, forty-one children (74.5%) provided no inaccurate responses, and fourteen children (25.5%) provided one to two inaccurate responses to cued non-suggestive questions (M = 0.29, SD = 0.53), while no children provided inaccurate responses to the open-ended question (M = 0.00, SD = 0.00).
Table 2a

Mean Number of Accurate and Inaccurate Responses (and standard deviations) to Open-ended and Cued Non-Suggestive Questioning, as a Function of Age

<table>
<thead>
<tr>
<th>Information Recalled</th>
<th>Age</th>
<th>Questioning Style</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Open-Ended</td>
<td>Cued Non-Sugg</td>
<td></td>
</tr>
<tr>
<td>Accurate</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>5-6 yrs</td>
<td>4.45 (2.55)</td>
<td>12.31 (1.79)</td>
<td></td>
</tr>
<tr>
<td>(N=55)</td>
<td>7-8 yrs</td>
<td>5.40 (3.03)</td>
<td>12.49 (2.72)</td>
<td></td>
</tr>
<tr>
<td>Inaccurate</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>5-6 yrs</td>
<td>0.00 (0.00)</td>
<td>0.29 (0.53)</td>
<td></td>
</tr>
<tr>
<td>(N=55)</td>
<td>7-8 yrs</td>
<td>0.02 (0.13)</td>
<td>0.32 (0.51)</td>
<td></td>
</tr>
</tbody>
</table>

Note: all t-test comparisons between open-ended and cued non-suggestive questioning were significant at \( p < .05 \)

Table 2b

Frequency (number and percentage) of Inaccurate Responses to Open-ended and Cued Non-Suggestive Questioning, as a Function of Age

<table>
<thead>
<tr>
<th>Age</th>
<th>Number of Inaccuracies</th>
<th>Question Style</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Open-ended</td>
<td>Cued Non-Suggestive</td>
</tr>
<tr>
<td>5-6 years</td>
<td>0</td>
<td>55 (100%)</td>
</tr>
<tr>
<td>(n=55)</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>0</td>
</tr>
<tr>
<td>7-8 years</td>
<td>0</td>
<td>57 (98.5%)</td>
</tr>
<tr>
<td>(n=57)</td>
<td>1</td>
<td>1 (1.7%)</td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>0</td>
</tr>
</tbody>
</table>
Similarly, as can be seen from Table 2a, children aged seven to eight years reported more pieces of accurate information in response to cued non-suggestive questions (M = 12.49, SD = 2.72) than an open-ended question (M = 5.40, SD = 3.03), and a dependent samples t-test revealed that this difference was significant (t(56) = 13.26, p < .05). As can be seen from Tables 2a and 2b, for children aged seven to eight, forty children (70.2%) provided no inaccurate responses, seventeen children (28.1%) provided one inaccurate response, and one child (1.8%) provided two inaccurate responses to cued non-suggestive questions (M = 0.32, SD = 0.51), while fifty-seven children (98.5%) provided no inaccurate responses, and only one child (1.7%) provided one inaccurate response to the open-ended question (M = 0.02, SD = 0.13). More specifically, inaccurate information was reported in response to questions pertaining to what the parent ate (n = 5), what the parent drank (n = 5), the number of pencils in the mug (n = 4), the presence of the flowers on the table (n = 3), and the presence of the mug containing pencils (n = 2).

3.3.3 Summary

In summary, children, irrespective of age, reported more accurate pieces of information in response to cued non-suggestive questions than an open-ended question, and a greater percentage of children provided one to two inaccurate pieces of information to cued non-suggestive questions than an open-ended question.

3.4 Questioning Style

The third set of analyses addressed the hypothesis that children would provide more accurate responses and fewer inaccurate responses,
with greater certainty of responses, to cued non-suggestive questions
compared with suggestive, misleading and leading questions.

3.4.1 Cued Non-Suggestive versus Misleading Questions

3.4.1.1 Data and analyses

The data used to compare accuracy, inaccuracy and certainty in
response to cued non-suggestive and misleading questions at Interview
1, comprised the number of accurate and inaccurate responses to 16
questions from the interview protocols, and mean certainty of
responses. Three-way ANOVA was used to compare mean accuracy,
inaccuracy and certainty scores for cued non-suggestive versus
misleading questioning at Interview 1, and to investigate effects for
previous exposure to misinformation. Mean accuracy, inaccuracy and
certainty scores, and standard deviations, for cued non-suggestive and
misleading question groups as a function of previous exposure to
parental misinformation and age, are presented at Table 3. It should
be noted that while the homogeneity of variance assumption was
violated for these analyses, research has indicated that if there are
at least 20 degrees of freedom for error in ANOVA, and sample sizes
are approximately equivalent, the F test is robust to such violations
(Tabachnik & Fidell, 1989), therefore transformation of the data was
not undertaken, and the results of these analyses are considered
valid.
Table 3

Mean Accuracy, Inaccuracy and Certainty for Cued Non-suggestive and Misleading Questioning Styles (and standard deviations) as a Function of Previous Exposure to Parental Misinformation and Age

<table>
<thead>
<tr>
<th>Information Recalled/Age</th>
<th>No Previous Exposure</th>
<th>Previous Exposure</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Cued Non-Sugg (N=55)</td>
<td>Misleading (N=53)</td>
</tr>
<tr>
<td></td>
<td>Accuracy</td>
<td>Inaccuracy</td>
</tr>
<tr>
<td>5-6 yrs</td>
<td>12.28 (1.67)</td>
<td>0.31 (0.57)</td>
</tr>
<tr>
<td></td>
<td>6.89 (4.51)</td>
<td>7.78 (4.33)</td>
</tr>
<tr>
<td>7-8 yrs</td>
<td>13.18 (1.84)</td>
<td>0.55 (0.81)</td>
</tr>
<tr>
<td></td>
<td>6.76 (5.13)</td>
<td>7.32 (4.61)</td>
</tr>
<tr>
<td></td>
<td>2.85 (0.43)</td>
<td>2.90 (0.18)</td>
</tr>
</tbody>
</table>

Note: All comparisons between cued non-suggestive and misleading questions were significant at $p < .05$. 
3.4.1.2 Descriptive statistics

As can be seen from Table 3, irrespective of whether children were or were not previously exposed to inaccurate information from a parent, for five to six year olds, cued non-suggestive questions produced on average more accurate report ((M = 12.35, SD = 1.96) and (M = 12.28, SD = 1.67)) than misleading questions ((M = 5.00, SD = 4.09) and (M = 6.89, SD = 4.51) respectively); cued non-suggestive questions also produced fewer inaccurate responses ((M = 0.28, SD = 0.53) and (M = 0.31, SD = 0.57)) than misleading questions ((M = 9.39, SD = 3.85) and (M = 7.78, SD = 4.33) respectively); and cued non-suggestive questions resulted in similar certainty of responses ((M = 2.85, SD = 0.26) and (M = 2.85, SD = 0.22)) as misleading questions ((M = 2.67, SD = 0.59) and (M = 2.72, SD = 0.43) respectively).

Similarly for seven to eight year olds irrespective of whether children were or were not previously exposed to inaccurate information conveyed by a parent, cued non-suggestive questions produced more accurate report ((M = 11.97, SD = 3.22) and (M = 13.18, SD = 1.84)) than misleading questions ((M = 5.29, SD = 4.71) and (M = 6.76, SD = 5.13) respectively); cued non-suggestive questions produced fewer inaccurate responses ((M = 0.29, SD = 0.54) and (M = 0.55, SD = 0.81)) than misleading questions ((M = 8.27, SD = 4.54) and (M = 7.32, SD = 4.61) respectively); and cued non-suggestive questions resulted in similar certainty of responses ((M = 2.90, SD = 0.18) and (M = 2.94, SD = 0.08)) as misleading questions ((M = 2.74, SD = 0.52) and (M = 2.72, SD = 0.46) respectively).
3.4.1.3 Analysis of variance

Three-way ANOVA confirmed that for accuracy there was a significant difference between cued non-suggestive and misleading question styles ($F(1,214) = 172.54, p < .05$), with no interaction evident between question style at Interview 1 and previous exposure to parental misinformation ($F(1,214) = 0.18, p > .05$). There was also no significant difference between age groups ($F(1,214) = 0.32, p > .05$), and no interaction between experimental group and age ($F(1,214) = 0.57, p > .05$), or between previous exposure to parental misinformation and age ($F(1,214) = 0.63, p > .05$). However there was a significant difference for accuracy at Interview 1 between exposure and non-exposure to parental misinformation groups ($F(1,214) = 4.35, p < .05$).

Similarly for inaccuracy there was a significant difference between cued non-suggestive and misleading question styles ($F(1,104) = 101.19, p < .05$), with no interaction evident between question style at Interview 1 and previous exposure to parental misinformation ($F(1,214) = 0.63, p > .05$). There was also no significant difference between age groups ($F(1,104) = 0.21, p > .05$), and there was no interaction between experimental group and age ($F(1,104) = 0.06, p > .05$), or between previous exposure to parental misinformation and age ($F(1,214) = 0.62, p > .05$). For inaccuracy however, there was no significant difference between exposure and non-exposure to parental misinformation groups ($F(1,214) = 0.43, p > .05$).

Likewise for mean certainty of responses there was a significant difference between cued non-suggestive and misleading question styles ($F(1,104) = 5.60, p < .05$), with no interaction evident between question style at Interview 1 and previous exposure to parental
misinformation \((F(1,214) = 0.09, p > .05)\). There was also no significant difference between age groups \((F(1,104) = 0.69, p > .05)\), and there was no interaction between experimental group and age \((F(1,104) = 0.24, p > .05)\), or between previous exposure to parental misinformation and age \((F(1,214) = 0.76, p > .05)\). There was also no significant difference for certainty of responses, between exposure and non-exposure to parental misinformation groups \((F(1,214) = 0.56, p > .05)\).

3.4.2 Misleading Questions - Previous Exposure versus Non-Exposure

3.4.2.1 Data and analyses

The previous analysis demonstrated a significant difference for accuracy between groups who received previous exposure versus non-exposure to parental misinformation. Analysis number one, presented earlier, indicated that there was no effect of previous exposure to misinformation on accuracy of responses to cued non-suggestive questions (see Table 1). The present follow-up analysis therefore was performed specifically to ascertain any differential effect for accuracy in response to misleading questions as a function of previous exposure to misinformation. The data used for this analysis comprised accuracy scores in response to misleading questioning at Interview 1. Two-way ANOVA was performed to compare children who had been exposed to parental misinformation at the home session, and children who had not been so exposed. Mean accuracy scores as a function of previous exposure to parental misinformation and age, are presented at Table 3. The data for this analysis specifically, is presented graphically at Figure 1.
Figure 1: Accuracy of report (max=16) as a function of question style and previous exposure to parental misinformation.
3.4.2.2 Descriptive statistics

As can be seen from Figure 1, for five to six year olds, children who had not previously been exposed to parental misinformation provided a greater number of accurate responses to misleading questions ($M = 6.89, \text{SD} = 4.51$) than children who had been exposed ($M = 5.00, \text{SD} = 4.09$).

As can also be seen from Figure 1, a similar pattern was evident for seven to eight year olds. Children who had not previously been exposed to parental misinformation provided a greater number of accurate responses to misleading questions ($M = 6.76, \text{SD} = 5.13$) than children who had been exposed ($M = 5.29, \text{SD} = 4.71$).

3.4.2.3 Analyses of variance

Two-way analysis of variance demonstrated that there was a significant difference in number of accurate responses to misleading questions ($F (1,105) = 3.94, \ p < .05$) between the exposure and non-exposure group. However there was no significant age effect ($F (1,105) = 0.15, \ p > .05$), or interaction between exposure and age ($F (1,105) = 0.06, \ p > .05$).
3.4.2.4 Summary

In summary, children provided fewer accurate responses, a greater number of inaccurate responses, and were less certain of responses to misleading questions compared with cued non-suggestive questions, irrespective of age. Further, children who had previously been exposed to parental misinformation provided fewer accurate responses to misleading questions than children who had not been so exposed. However children provided a similar number of inaccurate responses, and were similarly certain of responses irrespective of previous exposure to parental misinformation.

3.4.3 Cued non-suggestive versus Suggestive and Leading Questions

3.4.3.1 Data and analyses

The data used to compare accuracy, inaccuracy and certainty of responses to cued non-suggestive, suggestive and leading questions at Interview 2, comprised the number of accurate and inaccurate responses to 16 questions from the interview protocols, and mean certainty of responses. Three-way ANOVA was used to compare mean accuracy, inaccuracy and certainty of responses to cued non-suggestive, suggestive and leading questions at Interview 2, and to investigate any effect of previous questioning style at Interview 1. Mean accuracy scores and standard deviations for cued non-suggestive, suggestive and leading question groups are presented at Table 4.
Table 4

Mean Accuracy, Inaccuracy and Certainty of Responses (and standard deviations) to Cued Non-suggestive, Suggestive and Leading Questions as a Function of Previous Question Style and Age.

<table>
<thead>
<tr>
<th>Questioning Style at Interview 2</th>
<th>Age**</th>
<th>Previous Questioning Style at Interview 1</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Cued Non-Sugg (n = 113)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Misleading (n = 108)</td>
</tr>
<tr>
<td>Accuracy</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cued</td>
<td>5-6 yrs</td>
<td>12.62 (1.40)</td>
</tr>
<tr>
<td></td>
<td>7-8 yrs</td>
<td>13.00 (2.61)</td>
</tr>
<tr>
<td>Non-Sugg</td>
<td>5-6 yrs</td>
<td>11.73 (3.52)</td>
</tr>
<tr>
<td></td>
<td>7-8 yrs</td>
<td>14.14 (2.03)</td>
</tr>
<tr>
<td>Suggestive</td>
<td>5-6 yrs</td>
<td>11.40 (3.06)</td>
</tr>
<tr>
<td></td>
<td>7-8 yrs</td>
<td>13.57 (1.81)</td>
</tr>
<tr>
<td>Leading</td>
<td>5-6 yrs</td>
<td>11.29 (3.15)</td>
</tr>
<tr>
<td></td>
<td>7-8 yrs</td>
<td>11.22 (0.97)</td>
</tr>
<tr>
<td>Suggestive</td>
<td>5-6 yrs</td>
<td>10.17 (2.95)</td>
</tr>
<tr>
<td></td>
<td>7-8 yrs</td>
<td>10.30 (5.98)</td>
</tr>
<tr>
<td>Leading</td>
<td>5-6 yrs</td>
<td>8.87 (4.97)</td>
</tr>
<tr>
<td></td>
<td>7-8 yrs</td>
<td>11.20 (4.60)</td>
</tr>
<tr>
<td>Inaccuracy</td>
<td>5-6 yrs</td>
<td>0.83 (0.76)</td>
</tr>
<tr>
<td></td>
<td>7-8 yrs</td>
<td>0.69 (0.95)</td>
</tr>
<tr>
<td>Suggestive</td>
<td>5-6 yrs</td>
<td>2.09 (1.38)</td>
</tr>
<tr>
<td></td>
<td>7-8 yrs</td>
<td>0.94 (1.39)</td>
</tr>
<tr>
<td>Leading</td>
<td>5-6 yrs</td>
<td>3.37 (3.16)</td>
</tr>
<tr>
<td></td>
<td>7-8 yrs</td>
<td>1.25 (1.39)</td>
</tr>
<tr>
<td>Certainty</td>
<td>5-6 yrs</td>
<td>2.83 (0.31)</td>
</tr>
<tr>
<td></td>
<td>7-8 yrs</td>
<td>2.95 (0.08)</td>
</tr>
<tr>
<td>Suggestive</td>
<td>5-6 yrs</td>
<td>2.68 (0.45)</td>
</tr>
<tr>
<td></td>
<td>7-8 yrs</td>
<td>2.85 (0.25)</td>
</tr>
<tr>
<td>Leading</td>
<td>5-6 yrs</td>
<td>2.82 (0.43)</td>
</tr>
<tr>
<td></td>
<td>7-8 yrs</td>
<td>2.99 (0.02)</td>
</tr>
</tbody>
</table>

Note: * There was a significant difference between age groups for all analyses.
3.4.3.2 Descriptive statistics

As can be seen from Table 4, irrespective of whether children received cued non-suggestive or misleading questioning at Interview 1, five to six year old children recorded a greater number of accurate responses to cued non-suggestive questions (M = 12.62, SD = 1.40) and (M = 11.29, SD = 3.15) respectively, than suggestive questions ((M = 11.73, SD = 3.52) and (M = 10.17, SD = 2.95) respectively), with the least number of accurate responses recorded for leading questions ((M = 11.40, SD = 3.06) and (M = 8.87, SD = 4.97) respectively). Similarly, irrespective of previous questioning style, five to six year old children recorded fewer inaccurate responses to cued non-suggestive questions (M = 0.83, SD = 0.76) and (M = 1.20, SD = 1.01) respectively) than suggestive questions ((M = 2.09, SD = 1.38) and (M = 4.35, SD = 2.97) respectively), with the greatest number of inaccurate responses recorded for leading questions (M = 3.37, SD = 3.16) and (M = 6.33, SD = 4.72) respectively). However, five to six year olds, irrespective of previous questioning style, were similarly certain of responses to cued non-suggestive questions (M = 2.83, SD = 0.31) and (M = 2.87, SD = 0.23) respectively), suggestive questions ((M = 2.68, SD = 0.45) and (M = 2.80, SD = 0.46) respectively) and leading questions ((M = 2.82, SD = 0.43) and (M = 2.97, SD = 0.10) respectively).

As can be seen from Table 4, for seven to eight year olds, irrespective of whether they received cued non-suggestive questioning or misleading questioning at Interview 1, children recorded a similar number of accurate responses to cued non-suggestive questions (M = 13.00, SD = 2.61) and (M = 11.22, SD = 0.97) respectively), suggestive questions ((M = 14.14, SD = 2.03) and (M = 10.30, SD = 5.98) respectively).
Children's Memory and Suggestibility

3.4.3.3 Analyses of variance and independent samples t-tests

Three-way ANOVA demonstrated that for accuracy there was no significant difference between cued non-suggestive, suggestive and leading question styles ($F(2,197) = 0.13, p > .05$). There was also no significant interaction between questioning style at Interview 2 and age ($F(2,197) = 0.83, p > .05$). However there was a significant difference in accuracy between age groups ($F(1,197) = 5.20, p < .05$). Five to six year olds consistently recorded fewer accurate responses to all question styles than seven to eight year olds. There was also a significant effect for accuracy of response at Interview 2 as a function of previous questioning style at Interview 1 ($F(1,197) = 13.06, p < .05$). However there was no interaction between questioning style at Interview 2 and previous questioning style at Interview 1 ($F(2,197) = 0.26, p > .05$).
For mean number of inaccurate responses however, three-way ANOVA revealed a significant difference between cued non-suggestive, suggestive and leading question styles ($F(2,197) = 6.61, p < .05$). As there was no significant interaction between question style and age ($F(2,50) = 1.11, p > .05$), the data was collapsed across age to further investigate differences between groups. Three post-hoc t-tests were performed. Therefore to obtain an overall alpha level of $p < .05$, a Scheffe criterion of $p < .01 (.05 / 3)$ was employed. Independent t-tests demonstrated a significant difference for inaccuracy, between cued non-suggestive and leading questions ($t (53) = 2.59, p < .01$), and between suggestive and leading questions ($t (53) = 2.32, p < .01$), but no significant difference between cued non-suggestive and suggestive questions ($t (53) = 2.09, p > .01$).

There was also a significant difference for inaccuracy between age groups ($F(1, 50) = 6.18, p < .05$). Five to six year olds consistently recorded a greater number of inaccurate responses to all question styles than seven to eight year olds. There was also a significant effect for inaccuracy of responses at Interview 2 as a function of previous questioning style at Interview 1 ($F(1,197) = 30.01, p < .05$), but no interaction between questioning style at Interview 2 and previous questioning style at Interview 1 ($F(2,197) = 0.20 p > .05$).
For certainty of responses, three-way ANOVA confirmed that there was no significant difference between cued non-suggestive, suggestive and leading question styles ($F(2, 50) = 1.06, p > .05$), no significant difference between age groups ($F(1, 50) = 3.29, p > .05$), and no significant interaction between experimental group and age ($F(2, 50) = 0.97, p > .05$). There was also no significant difference for mean certainty of responses at Interview 2 as a function of previous questioning style at Interview 1 ($F(1, 197) = 0.16, p > .05$), and no interaction between questioning style at Interview 2 and previous questioning style at Interview 1 ($F(2, 197) = 0.07, p > .05$).

3.4.4 Suggestive and Leading Questions: Effect of Previous Questioning

3.4.4.1 Descriptive statistics

As the previous analysis indicated that there was a significant effect of previous questioning style at Interview 1, for accuracy and inaccuracy of responses at Interview 2, to ascertain any differential effects according to previous exposure to misleading or cued non-suggestive questioning, two-way ANOVA was used to compare mean accuracy and inaccuracy to cued non-suggestive, suggestive and leading questions at Interview 2, as a function of previous questioning style. The data for accurate and inaccurate responses at Interview 2, as a function of previous questioning style and age, are presented graphically at Figure 2.
Figure 2: Accuracy of report (max=16) at Interview 2, as a function of previous questioning style and age.
As can be seen from Figure 2, five to six year old children who had cued non-suggestive questioning at Interview 1, provided a greater number of accurate responses to suggestive questions ($\bar{M} = 11.73, \bar{SD} = 3.52$) than children who had misleading questions at Interview 1 ($\bar{M} = 10.17, \bar{SD} = 2.95$), and also provided a greater number of accurate responses to leading questions ($\bar{M} = 11.40, \bar{SD} = 3.06$) than children who had misleading questions at Interview 1 ($\bar{M} = 8.87, \bar{SD} = 4.97$). As can be seen from Figure 3, children who had cued non-suggestive questioning at Interview 1 also provided fewer inaccurate responses to suggestive questions ($\bar{M} = 2.09, \bar{SD} = 1.38$) than children who had misleading questions at Interview 1 ($\bar{M} = 4.35, \bar{SD} = 2.97$), and fewer inaccurate responses to leading questions ($\bar{M} = 3.37, \bar{SD} = 3.16$) than
children who had misleading questions at Interview 1 ($M = 6.33, SD = 4.72$).

As can also be seen from Figure 2, a similar pattern emerged for seven to eight year olds. Children who had cued non-suggestive questioning at Interview 1 provided a greater number of accurate responses to suggestive questions ($M = 14.14, SD = 2.03$) than children who had misleading questions at Interview 1 ($M = 8.30, SD = 5.98$), and also provided a greater number of accurate responses to leading questions ($M = 13.57, SD = 1.81$) than children who had misleading questions at Interview 1 ($M = 11.20, SD = 4.60$). As can be seen from Figure 3, children who had cued non-suggestive questioning at Interview 1 also provided fewer inaccurate responses to suggestive questions ($M = 0.94, SD = 1.39$) than children who had misleading questions at Interview 1 ($M = 4.60, SD = 3.65$), and fewer inaccurate responses to leading questions ($M = 1.25, SD = 1.39$) than children who had misleading questions at Interview 1 ($M = 6.61, SD = 4.67$).

3.4.4.2 Analyses of variance

Two-way analyses of variance confirmed that there were significant differences for both accuracy ($F(1,71) = 13.9, p < .05$) and inaccuracy ($F(1,71) = 21.56, p < .05$) in response to suggestive questioning, and for both accuracy ($F(1,59) = 15.09, p < .05$) and inaccuracy ($F(1,59) = 14.44, p < .05$) in response to leading questioning, between children who had cued non-suggestive versus misleading questioning at Interview 1.

3.4.4.3 Summary

In summary, there were no significant differences in accuracy or certainty of responses to cued non-suggestive, suggestive or leading
questions, irrespective of previous questioning style or age. However, children reported fewer inaccurate responses for cued non-suggestive questions than suggestive and leading questions, irrespective of previous questioning style at Interview 1, or age. In addition, five to six year olds consistently reported fewer accurate responses and a greater number of inaccurate responses to all question styles than seven to eight year olds. Further, children who had non-suggestive questioning at Interview 1 consistently reported a greater number of accurate responses and fewer inaccurate responses to both suggestive and leading questions at Interview 2, than children who had misleading questioning at Interview 1.

The number of accurate and inaccurate responses, as well as mean certainty of responses to each of the question styles employed, are presented graphically at Figures 4, 5 and 6.
Figure 5. Inaccuracy of report (max=16) as a function of question style and age.

Figure 6. Mean certainty of responses* as a function of question style and age.

* 0 = really don't know, 1 = not very sure, 2 = a little bit sure, 3 = very sure
3.5 Repeated Questioning

The fifth set of analyses aimed to investigate the effect of repeated exposure to inaccurate information on children's final report. It was hypothesised that the number of accurate responses, the number of inaccurate responses, and certainty of responses provided at Interview 3 in response to non-suggestive questions would differ according to the sequence of misinformation and questioning. That is, children who received no inaccurate post-event information from a parent followed by non-suggestive questioning at Interviews 1 and 2 (Sequence 1AA), were expected to record a greater number of accurate responses, fewer inaccurate responses, and greater certainty of responses at Interview 3 than children who had received inaccurate post-event information from a parent, followed by misleading questions at Interview 1 and either suggestive (Sequence 2BB) or leading questions (Sequence 2BC) at Interview 2.

3.5.1 Data and analyses

The data used for these analyses comprised the number of accurate and inaccurate responses, and mean certainty of responses to cued non-suggestive questions at Interview 3. To investigate sequence effects three groups of children were compared, children who were not exposed to misinformation or suggestive questioning at any stage of the experiment (sequence 1AA) and children who were exposed to misinformation or suggestive questioning at each experimental stage (sequences 2BB and 2BC). Mean accuracy, inaccuracy and certainty scores for these three experimental sequences as a function of age are presented at Table 5.
Table 5
Mean Accuracy, Inaccuracy and Certainty of Responses to Cued Non-
suggestive Questions at Interview 3 (and standard deviations), as a
Function of Experimental Sequence and Age

<table>
<thead>
<tr>
<th>Measure</th>
<th>Age</th>
<th>Non-Suggestive</th>
<th>Suggestive</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>AAA</td>
<td>BBB</td>
</tr>
<tr>
<td>Accuracy</td>
<td>5-6 yrs</td>
<td>11.80 (2.62)</td>
<td>9.86 (2.54)</td>
</tr>
<tr>
<td></td>
<td>7-8 yrs</td>
<td>13.36 (1.95)</td>
<td>11.00 (3.40)</td>
</tr>
<tr>
<td>Inaccuracy</td>
<td>5-6 yrs</td>
<td>1.30 (2.36)</td>
<td>3.14 (2.27)</td>
</tr>
<tr>
<td></td>
<td>7-8 yrs</td>
<td>0.36 (0.63)</td>
<td>2.40 (2.22)</td>
</tr>
<tr>
<td>Certainty</td>
<td>5-6 yrs</td>
<td>2.88 (0.18)</td>
<td>2.93 (0.11)</td>
</tr>
<tr>
<td></td>
<td>7-8 yrs</td>
<td>2.96 (0.08)</td>
<td>2.83 (0.39)</td>
</tr>
</tbody>
</table>

*Note: There were significant differences for accuracy, inaccuracy and
certainty between non-suggestive and suggestive sequence groups at
p < .05

3.5.2 Descriptive statistics

As can be seen from Table 5, for five to six year olds the non-
suggestive sequence resulted in a greater number of accurate responses
at Interview 3 (M = 11.80, SD = 2.62) than either suggestive sequence
2BB (M = 9.86, SD = 2.54) or 2BC (M = 10.14, SD = 2.27); the non-
suggestive sequence resulted in fewer inaccurate responses (M = 1.70,
SD = 2.36) than either suggestive sequence 2BB (M = 3.14, SD = 2.27)
or 2BC (M = 2.86, SD = 1.07); and the non-suggestive sequence resulted
in similar certainty of responses ($M = 2.88, SD = 0.18$) as the
suggestive sequences 2BB ($M = 2.93, SD = 0.11$) and 2BC ($M = 2.79, SD = 0.52$).

Similarly, for seven to eight year olds, the non-suggestive sequence
resulted in a greater number of accurate responses ($M = 13.36, SD = 1.95$) than either suggestive sequence 2BB ($M = 11.00, SD = 3.40$) or 2BC ($M = 9.62, SD = 4.34$); the non-suggestive sequence resulted in fewer inaccurate responses ($M = 0.71, SD = 0.82$) than either suggestive sequence 2BB ($M = 2.40, SD = 2.22$) or 2BC ($M = 3.87, SD = 4.29$); and the non-suggestive sequence resulted in similar certainty of responses ($M = 2.96, SD = 0.08$) as the suggestive sequences 2BB ($M = 2.83, SD = 0.39$) and 2BC ($M = 2.86, SD = 0.19$).

3.5.3 Analyses of variance

Two-way ANOVA demonstrated that there were significant differences
between the experimental sequences for accuracy ($F(11,197) = 4.20, p < .05$), inaccuracy ($F(11,197) = 3.74, p < .05$) and certainty ($F(11,197) = 4.20, p < .05$). However two-way ANOVA revealed that there were no significant differences between age groups for accuracy ($F(1,197) = 1.86, p > .05$), inaccuracy ($F(1,197) = 0.02, p > .05$) or certainty ($F(1,197) = 3.83, p > .05$); and there were no significant interactions between age and sequence for accuracy ($F(11,197) = 0.74, p > .05$), inaccuracy ($F(11,197) = 0.67, p > .05$) or certainty ($F(11,197) = 0.95, p > .05$). The data for these analyses is presented graphically at Figures 7, 8 and 9.
Figure 7: Number of accurate responses to cued non-suggestive questioning at Interview 3 (max=16), as a function of experimental sequence and age.

Figure 8: Number of inaccurate responses to cued non-suggestive questioning at Interview 3 (max=16), as a function of experimental sequence and age.
3.5.4 Planned Contrasts

As there were no significant age differences the data were collapsed across age to perform planned contrasts between the non-suggestive sequence (1AA) and the suggestive sequences combined (2BB and 2BC). Utilising a Scheffe criterion of $p < .01$, planned contrasts demonstrated that there were significant differences between the non-suggestive and suggestive sequences for accuracy ($t(209) = 3.15, p < .05$), inaccuracy ($t(209) = 3.15, p < .05$) and certainty ($t(209) = 3.15, p < .05$).
3.5.5 Summary

In summary, children who received no inaccurate post-event information from a parent and received cued non-suggestive questioning at Interviews 1 and 2, consistently reported a greater number of accurate responses, fewer inaccurate responses and greater certainty of responses to cued non-suggestive questions at Interview 3 than children who were exposed to parental misinformation, misleading questioning at Interview 1 and either leading or misleading questioning at Interview 2, irrespective of age.

3.6 Initial Certainty and Suggestibility

The fourth set of analyses addressed the hypothesis that greater certainty of initial responses would result in greater accuracy of later responses to suggestive and leading questions. Only children who had received cued non-suggestive questioning at Interview 1 were used for this analysis, to ensure initial certainty was not confounded with misleading questioning effects.

3.6.1 Data and analyses

The data used for this analysis comprised the number of accurate responses to suggestive and leading questions at Interview 2, and children's certainty of responses to cued non-suggestive questioning at Interview 1. Certainty responses were split such that children with a mean certainty rating of three\(^3\) comprised the initially certain group, and children with a mean certainty rating below three comprised the initially uncertain group. Mean accuracy and inaccuracy scores for suggestive and leading questions (combined) as a function of initial certainty are presented at Table 6.

\(^3\) Certainty ratings: 3 = Very sure, 2 = A little bit sure, 1 = Not very sure, and 0 = really don't know
Table 6

Mean Accuracy and Inaccuracy of Responses (and standard deviations) to Suggestive and Leading Questions (combined) at Interview 2, as a Function of Age and Certainty of Responses to Cued Non-suggestive Questions at Interview 1

<table>
<thead>
<tr>
<th>Measure</th>
<th>Age</th>
<th>Initial Certainty at Interview 1</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Certain (rating = 3)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(n=28)</td>
</tr>
<tr>
<td>Accuracy</td>
<td>5-6 years</td>
<td>11.69 (3.1)</td>
</tr>
<tr>
<td></td>
<td>7-8 years</td>
<td>13.73 (1.67)</td>
</tr>
<tr>
<td>Inaccuracy</td>
<td>5-6 years</td>
<td>2.77 (2.86)</td>
</tr>
<tr>
<td></td>
<td>7-8 years</td>
<td>1.00 (1.25)</td>
</tr>
</tbody>
</table>

Note: There were no significant differences at \( p < .05 \).

3.6.2 Descriptive statistics

As can be seen from this table, for five to six year olds, children who were initially very certain of their responses reported a similar number of accurate responses (\( \bar{M} = 10.63, \text{SD} = 3.1 \)) as children who were less certain initially (\( \bar{M} = 11.62, \text{SD} = 3.84 \)), and also reported a similar number of inaccurate responses (\( \bar{M} = 2.77, \text{SD} = 2.80 \)) as children who were less certain of their initial responses (\( \bar{M} = 2.58, \text{SD} = 3.33 \)).
Similarly for seven to eight year olds, children who were initially very certain of their responses reported a similar number of accurate responses ($M = 13.73$, $SD = 1.67$) as those children who were less certain of their initial responses ($M = 13.06$, $SD = 1.59$), and also reported a similar number of inaccurate responses ($M = 1.00$, $SD = 1.25$) as those children who were less certain of initial responses ($M = 1.22$, $SD = 1.45$).

3.6.3 Analysis of variance

Two-way ANOVAs confirmed that there were no significant differences in accuracy ($F(1,66) = 0.28$, $p > .05$) or inaccuracy ($F(1,66) = 0.01$, $p > .05$) between children who were more or less certain of initial responses, and there were no significant interactions between accuracy and age ($F(1,66) = 0.19$, $p > .05$) or inaccuracy and age ($F(1,66) = 0.11$, $p > .05$). However there were significant age effects. Five to six year olds irrespective of initial certainty provided fewer accurate responses ($F(1,66) = 6.18$, $p < .05$) and a greater number of inaccurate responses ($F(1,66) = 6.50$, $p < .05$) than seven to eight year olds.

3.6.4 Summary

In summary the number of accurate and inaccurate responses to suggestive and leading questions at Interview 2, did not differ according to initial certainty of responses, irrespective of age.
3.7 Event Memory as a Cognitive Phenomenon, and Social Compliance Effects

The sixth analysis aimed to explore the relationship between children's memory for events and purely cognitive assessments of memory, for children who have and have not been exposed to suggestive styles of questioning; and also the social compliance explanation of event memory in response to questioning.

3.7.1 Cognitive Memory Assessment and Memory for Events

3.7.1.1 Data and analyses

The data used for analysis of the relationship between cognitive assessment of memory and memory for events, included the number of correctly recalled words and drawings from the verbal and visual memory tasks - both delayed free recall, and cued recall; the number of accurate responses to 16 questions from the interview protocols at Interviews 1, 2 and 3; and the number of accurate pieces of information reported in response to an open-ended question at Interviews 1, 2 and 3. Pearson's product-moment correlation coefficients were computed to assess relationships between these variables. As 24 correlations were performed, to obtain a family-wise error rate of \( p < .05 \), a criterion of \( p < .002 \), using a Scheffe adjustment, was used to determine significance for all correlations.
3.7.1.2 Non-suggestive experimental sequence (IAA)

Correlations for subjects who were not exposed to misinformation at any experimental stage (sequence IAA) are presented at Table 7.

Table 7

Pearson's Product Moment Correlations between Accuracy on Cognitive Tests of Memory and Accuracy of Event-report in Response to Interview Questions and Open-ended Questions, for Subjects Not Exposed to Suggestion (sequence IAA)

<table>
<thead>
<tr>
<th>Experimental Session</th>
<th>Cognitive Memory Assessment</th>
<th>Open-Ended Accuracy at Interview 1</th>
<th>Open-Ended Accuracy at Interview 2</th>
<th>Open-Ended Accuracy at Interview 3</th>
<th>Question Accuracy at Interview 1</th>
<th>Question Accuracy at Interview 2</th>
<th>Question Accuracy at Interview 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Verbal Memory Free Recall</td>
<td>.08</td>
<td>.19</td>
<td>.13</td>
<td>.31</td>
<td>.43</td>
<td>.36</td>
<td></td>
</tr>
<tr>
<td>Verbal Memory Cued Recall</td>
<td>-.35</td>
<td>-.25</td>
<td>-.10</td>
<td>.07</td>
<td>.04</td>
<td>.14</td>
<td></td>
</tr>
<tr>
<td>Visual Memory Free Recall</td>
<td>.03</td>
<td>.10</td>
<td>.30</td>
<td>.23</td>
<td>.14</td>
<td>.06</td>
<td></td>
</tr>
<tr>
<td>Visual Memory Cued Recall</td>
<td>-.31</td>
<td>-.10</td>
<td>.02</td>
<td>-.16</td>
<td>-.32</td>
<td>-.25</td>
<td></td>
</tr>
</tbody>
</table>

Note: n = 24 No correlations significant at p < .002 (family-wise error rate)

3.7.1.2.1 Correlational statistics

As can be seen from Table 7, for subjects who were not exposed to any suggestive information either from a parent or through questioning, no significant correlations were evident between performance on standardised tests of memory, and accurate memory for events.
3.7.1.3 Suggestive experimental sequence (2EC)

Correlations for subjects who were exposed to misinformation at every experimental stage (sequence 2EC) are presented at Table 8.

Table 8

Pearson's Product Moment Correlations Between Accuracy on Cognitive Tests of Memory and Accuracy of Event-memory in Response to Interview Questions and Open-ended Questions, for Subjects Exposed to Suggestion at Each Experimental Stage (sequence 2EC)

<table>
<thead>
<tr>
<th>Cognitive Memory Assessment (Accurate Recall)</th>
<th>Experimental Session</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Open-Ended Accuracy at Interview</td>
</tr>
<tr>
<td></td>
<td>1 2 3</td>
</tr>
<tr>
<td>Verbal Memory Free Recall</td>
<td>.23 .39 .16</td>
</tr>
<tr>
<td>Verbal Memory Cued Recall</td>
<td>-.20 -.55 -.33</td>
</tr>
<tr>
<td>Visual Memory Free Recall</td>
<td>.18 .77* .42</td>
</tr>
<tr>
<td>Visual Memory Cued Recall</td>
<td>-.37 .09 -.01</td>
</tr>
</tbody>
</table>

Note: n = 15  * = significant at p < .002 (family-wise error rate)

3.7.1.3.1 Correlational statistics

As can be seen in Table 8, for subjects who had been exposed to parental misinformation and received misleading questions at Interview 1 and leading questions at Interview 2, a significant correlation was evident between delayed free recall for visual information and accuracy in response to an open-ended question at Interview 2 (r = 0.77, p < .05).
3.7.2 Social Compliance and Memory for Events

3.7.2.1 Data and analyses

The data used for analysis of a social compliance effect comprised the number and percentage of children who reported that they knowingly provided inaccurate responses because they wished to comply with an authority figure. Chi-squared analyses were performed to assess differential response tendencies between the two age groups.

3.7.2.2 Descriptive statistics and chi-squared analysis

One hundred and twenty-eight children (58.7%) reported that they knowingly provided inaccurate responses to questions (37 of these children were aged between five and seven years, and 48 were aged between seven and nine years). Eighty-five children (39%) reported that they did not knowingly provide inaccurate responses, and five (2.3%) children said they did not know if they had knowingly provided inaccurate responses to questions. Chi-squared analysis demonstrated that responses were independent of age ($\chi^2 (2) = 0.99$, $p > .05$).

3.7.2.3 Unprompted reasons for compliance

Unprompted reasons given by children for why they provided inaccurate responses are reported in Table 9, with the number and percentage of children who provided each response.
Table 9

Unprompted Reasons Provided by Children for Knowingly Providing Inaccurate Responses to Questions

<table>
<thead>
<tr>
<th>Reasons for Providing Inaccurate Responses</th>
<th>Number of Children</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Didn't know or couldn't remember the answer</td>
<td>82</td>
<td>(64.1%)</td>
</tr>
<tr>
<td>Don't know why</td>
<td>40</td>
<td>(31.2%)</td>
</tr>
<tr>
<td>I wanted to get it right</td>
<td>4</td>
<td>(1.9%)</td>
</tr>
<tr>
<td>For fun</td>
<td>1</td>
<td>(0.4%)</td>
</tr>
<tr>
<td>By accident</td>
<td>1</td>
<td>(0.4%)</td>
</tr>
</tbody>
</table>

3.7.2.3.1 Descriptive statistics and chi-squared analysis

As can be seen from Table 9, of the children who did knowingly provide inaccurate responses, when asked why they did this, eighty-two children (64.1%) said it was because they "didn't know" or "couldn't remember the answer", forty children (31.2%) said they "didn't know" why they did this, four children (1.9%) said it was because they "wanted to get it right", one child (0.4%) said he did this "for fun", and one child (0.4%) said she did this "by accident".

3.7.2.4 Prompted reasons for compliance

The number and percentage of children who responded to specifically asked questions (prompted reasons) as to why they knowingly provided inaccurate responses are presented at Table 10.
Table 10

Number and Percentage of Responses to Promoted Reasons for Knowingly Providing Inaccurate Responses to Questions, as a Function of Age

<table>
<thead>
<tr>
<th>Prompted reasons</th>
<th>Age</th>
<th>Positive</th>
<th>Negative</th>
<th>Don't Know</th>
</tr>
</thead>
<tbody>
<tr>
<td>Unsure of the answer</td>
<td>5-6 yrs</td>
<td>31</td>
<td>25</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>7-8 yrs</td>
<td>43</td>
<td>27</td>
<td>1</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>72</td>
<td>52</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(57.8%)</td>
<td>(39.1%)</td>
<td>(3.1%)</td>
</tr>
<tr>
<td>Thought Mum wanted</td>
<td>5-6 yrs</td>
<td>31</td>
<td>25</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>7-8 yrs</td>
<td>43</td>
<td>27</td>
<td>1</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>24</td>
<td>94</td>
<td>10</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(18.7%)</td>
<td>(73.4%)</td>
<td>(7.9%)</td>
</tr>
<tr>
<td>Thought Experimenter</td>
<td>5-6 yrs</td>
<td>31</td>
<td>25</td>
<td>3</td>
</tr>
<tr>
<td>wanted</td>
<td>7-8 yrs</td>
<td>43</td>
<td>27</td>
<td>1</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>32</td>
<td>87</td>
<td>9</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(25.0%)</td>
<td>(68.9%)</td>
<td>(7.1%)</td>
</tr>
</tbody>
</table>

Note: $X^2$ analysis revealed no differences between age groups, $p < .05$

3.7.2.4.1 Descriptive statistics and chi-squared analysis

As can be seen from Table 10, when specifically asked, seventy-four children (57.8%) responded positively when asked if they provided inaccurate responses because they were unsure of the answer. Fewer five to six year olds ($n = 31$) responded positively to this question than seven to eight year olds ($n = 43$). A Pearson's chi-squared analysis however demonstrated that responses were independent of age ($X^2 (2) = 2.32, p > .05$).
Twenty-four children (18.7%) responded positively when asked if they provided inaccurate responses because they thought that was what their Mum wanted them to say. A greater number of five to six year olds (n = 16) reported that they did this to comply with their mother than seven to eight year olds (n = 8). A Pearson’s chi-squared analysis demonstrated that responses were independent of age ($X^2 (2) = 5.01, \ p > .05$).

Thirty-two children (25%) responded positively when asked if they provided inaccurate responses because they thought that was what the experimenter wanted them to say. A similar number of 5-6 year olds (n = 18) and 7-8 year olds (n = 14) responded positively to this question. A Pearson’s chi-squared analysis confirmed that responses to this question were independent of age ($X^2 (2) = 1.22, \ p > .05$).

3.7.2.5 Summary

In summary, 58% of children reported that they knowingly provided inaccurate responses to questions, with 18-25% of these doing so to comply with an adult. These effects were independent of age.

3.8 Memory Impairment versus Co-existence Hypotheses

The seventh analysis aimed to investigate the Memory Impairment hypothesis, which predicted that children would not be able to retrieve original information once inaccurate information had been incorporated in report; the Co-existence hypothesis, which predicts that children will be able to retrieve original information when inaccurate information has previously been included in report; and any age differences relevant to these hypotheses.
3.8.1 Data and analyses

Only children who at Interview 3 provided inaccurate responses in line with suggestive information were included for this analysis. Data comprised the number of children who reported that they heard someone say the inaccurate information, as opposed to children who reported that they remembered seeing or experiencing the inaccurate information. Of those children who said they heard someone say the inaccurate information, the number of children who were able to retrieve accurate details of the original event were recorded for this analysis. Chi-squared analyses were performed to assess differential response tendencies between the two age groups. The number and percentage of children who were or were not able to retrieve accurate original information following inaccurate report at Interview 3 are presented at Table 11.

Table 11

<table>
<thead>
<tr>
<th>Age</th>
<th>Able to Retrieve Original Info</th>
<th>Persisted with Inaccurate Info</th>
</tr>
</thead>
<tbody>
<tr>
<td>5-6 yrs</td>
<td>8 (5.7%)</td>
<td>38 (94.3%)</td>
</tr>
<tr>
<td>7-8 yrs</td>
<td>9 (5.1%)</td>
<td>46 (94.9%)</td>
</tr>
<tr>
<td>Total</td>
<td>17 (4.9%)</td>
<td>84 (95.1%)</td>
</tr>
</tbody>
</table>
3.8.2 Descriptive statistics and chi-squared analysis

One hundred and seventy-one children (77.0%) reported at least one piece of inaccurate information at Interview 3 in response to cued non-suggestive questions. Of these, one hundred and one children (45.0%) said they heard someone say this information, and seventy children (32.0%) said they remembered seeing or doing the particular experience. Of those children who said they heard someone say the inaccurate information, seventeen children (7.8%) were able to retrieve the original information accurately. Fifteen children were able to accurately retrieve one piece of information and two children were able to retrieve two pieces of information. Of those seventeen children, nine were aged from five to six years, and eight from seven to eight years. Pearson's chi-squared analysis demonstrated that the tendency to retrieve accurate original information was independent of age ($\chi^2 (2) = 1.22, p > .05$).

Post-hoc exploratory analyses aimed at differentiating between those children who were able to retrieve original information and those children who were not, as a function of cognitive memory ability assessed experimentally, were performed using repeated measures ANOVA. As this was a post-hoc analysis, an alpha level criterion of $p < .01$ was used for this analysis (Keppel, 1985). Repeated measures ANOVA however, indicated no significant difference between children who were able to retrieve original information, and children who were unable to do so, with regard to delayed free recall for visual or verbal information, or delayed cued recall for visual or verbal information ($F(3,642) = 2.36, p < .01$).
3.8.3 Types of information retrieved

The pieces of information which had been reported inaccurately, but were able to be retrieved included the number of monkeys hidden in the puzzle (7 retrievals), the type of drink the child had on the table (3 retrievals), the number of pencils in the cup (2 retrievals), the type of animal hidden in the picture (1 retrieval), whether their father helped do the puzzles (1 retrieval), the type of drink the parent had on the table (1 retrieval), what the parent had eaten (1 retrieval), the colours of the pencils used (1 retrieval) and whether there were flowers on the table (1 retrieval).

3.8.4 Summary

In summary, 77% of children reported inaccurate information in response to cued non-suggestive questioning at Interview 3. Of these, 45% said they heard someone say this information, and 7.8% of these children were able to accurately retrieve the original information. There was no difference in response tendency between age groups.

3.9 Responses to Individual Questions
3.9.1 Data and analyses

The eighth analysis investigated children's responses to individual questions. The data for this investigation comprised the number of accurate, inaccurate and don't know responses to individual questions at Interview 3. These values are presented at Table 124. Chi-squared analyses were performed individually for responses to questions about time, colour and number, as a function of age.

---

4 The reader interested in responses to individual questions at Interviews 1 and 2, as well as Interview 3, is referred to Appendix Q.
Table 12

Number of Accurate, Inaccurate and Don't Know Responses to Individual Questions at Interview 3

<table>
<thead>
<tr>
<th>Question Content</th>
<th>Accurate</th>
<th>Inaccurate</th>
<th>Don't Know</th>
</tr>
</thead>
<tbody>
<tr>
<td>own drink</td>
<td>166</td>
<td>48</td>
<td>3</td>
</tr>
<tr>
<td>parent drink</td>
<td>135</td>
<td>78</td>
<td>4</td>
</tr>
<tr>
<td>own food</td>
<td>199</td>
<td>17</td>
<td>1</td>
</tr>
<tr>
<td>parent food</td>
<td>183</td>
<td>29</td>
<td>5</td>
</tr>
<tr>
<td>animal hidden</td>
<td>206</td>
<td>10</td>
<td>1</td>
</tr>
<tr>
<td>number hidden</td>
<td>131</td>
<td>78</td>
<td>8</td>
</tr>
<tr>
<td>animal in maze</td>
<td>170</td>
<td>36</td>
<td>11</td>
</tr>
<tr>
<td>writing tool</td>
<td>207</td>
<td>9</td>
<td>1</td>
</tr>
<tr>
<td>colours used</td>
<td>202</td>
<td>13</td>
<td>2</td>
</tr>
<tr>
<td>Father helped</td>
<td>201</td>
<td>15</td>
<td>1</td>
</tr>
<tr>
<td>flowers present</td>
<td>175</td>
<td>37</td>
<td>5</td>
</tr>
<tr>
<td>own cup*</td>
<td>156</td>
<td>55</td>
<td>6</td>
</tr>
<tr>
<td>parent cup*</td>
<td>152</td>
<td>53</td>
<td>12</td>
</tr>
<tr>
<td>mother at table*</td>
<td>193</td>
<td>22</td>
<td>2</td>
</tr>
<tr>
<td>Mug with pencils</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>mug noticed</td>
<td>81</td>
<td>16</td>
<td>120</td>
</tr>
<tr>
<td>pencils in mug</td>
<td>87</td>
<td>5</td>
<td>124</td>
</tr>
<tr>
<td>number pencils</td>
<td>55</td>
<td>9</td>
<td>152</td>
</tr>
<tr>
<td>Time</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>precise time</td>
<td>67</td>
<td>26</td>
<td>119</td>
</tr>
<tr>
<td>(within 60 mins)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>time of day</td>
<td>204</td>
<td>11</td>
<td>2</td>
</tr>
</tbody>
</table>

Note: * these questions were not included for accuracy, inaccuracy and certainty scores.
3.9.2 Descriptive data

As can be seen from Table 12, the questions which resulted in the greatest number of accurate responses, and the least number of inaccurate responses were questions related to what the child ate (accurate: n = 199; inaccurate: n = 17), what animal was hidden in the puzzle (accurate: n = 206; inaccurate: n = 10), what writing tool was used (accurate: n = 207; inaccurate: n = 9), what colours were used to colour the picture (accurate: n = 202; inaccurate: n = 2), whether the child's father helped do the puzzles (accurate: n = 201; inaccurate: n = 15), whether the child's mother was seated at the table (accurate: n = 193; inaccurate: n = 22), and the time of day at which the puzzle session took place (accurate: n = 204; inaccurate: n = 11).

The questions which resulted in the greatest number of inaccurate responses were questions related to the parent's drink (n = 78), and the number of animals hidden in the puzzle (n = 78).

As can also be seen from Table 12, questions which resulted in the greatest number of 'don't know' responses included the question asking children what time it was when they did the puzzles at home (n = 119), and the three questions related to the mug containing pencils (n = 120; n = 124; and n = 152), which frequently reflected the fact that children were not aware of the presence of this mug.

3.9.3 Time

With regard to children's ability to accurately report time, the number and percentage of children's responses to this question as a function of age are presented at Table 13.
### Table 13

Number and Percentage of Children's Responses to Questions about Time, Colour and Number, as a Function of Age

<table>
<thead>
<tr>
<th>Question</th>
<th>Age</th>
<th>Accurate (± 60 mins)</th>
<th>Inaccurate (&gt; 60 mins)</th>
<th>Don't Know</th>
</tr>
</thead>
<tbody>
<tr>
<td>Precise time*</td>
<td>5-6 yrs</td>
<td>19</td>
<td>18</td>
<td>60</td>
</tr>
<tr>
<td></td>
<td>7-8 yrs</td>
<td>48</td>
<td>12</td>
<td>59</td>
</tr>
<tr>
<td>Total</td>
<td>67</td>
<td>(30.2%)</td>
<td>(13.5%)</td>
<td>119</td>
</tr>
<tr>
<td>Time of day</td>
<td>5-6 yrs</td>
<td>99</td>
<td>4</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>7-8 yrs</td>
<td>105</td>
<td>7</td>
<td>2</td>
</tr>
<tr>
<td>Total</td>
<td>204</td>
<td>(91.9%)</td>
<td>(4.9%)</td>
<td>2</td>
</tr>
<tr>
<td>Colour</td>
<td>5-6 yrs</td>
<td>95</td>
<td>8</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>7-8 yrs</td>
<td>107</td>
<td>5</td>
<td>2</td>
</tr>
<tr>
<td>Total</td>
<td>202</td>
<td>(93.1%)</td>
<td>(6.0%)</td>
<td>2</td>
</tr>
<tr>
<td>Number</td>
<td>5-6 yrs</td>
<td>62</td>
<td>36</td>
<td>5</td>
</tr>
<tr>
<td></td>
<td>7-8 yrs</td>
<td>69</td>
<td>42</td>
<td>3</td>
</tr>
<tr>
<td>Total</td>
<td>131</td>
<td>(60.4%)</td>
<td>(35.9%)</td>
<td>8</td>
</tr>
</tbody>
</table>

Note: * = \( X^2 \) significant at \( p < .05 \)

3.9.3.1 Descriptive statistics

As can be seen from Table 13, sixty-seven children (30.2%) were able to accurately report the time of the home session within 60 minutes of the actual time at Interview 3. A number of children did use references such as "after school", "while (television programme) was on" and "just before bedtime". However only statements of time were scored as...
accurate. If a time could not be given, a 'don't know' response was recorded.

As can also be seen from Table 13, thirty children (13.5%) at Interview 3 provided inaccurate reports of time, that is greater than 60 minutes either side of actual start and finish times, and 119 (53.6%) children at Interview 3 responded that they did not know the time at which they did the puzzles.

3.9.3.2 Chi-squared analysis

As can be seen from Table 13, while younger children provided a similar number of inaccurate and don't know responses as older children, they provided fewer accurate responses to the precise time question. Pearson's chi-squared analysis confirmed that response to this question was dependent on age. Seven to eight year olds were more likely to provide an accurate response to this question than five to six year olds ($\chi^2(2) = 17.58$, $p < .05$).

3.9.4 Time of day

With regard to children's ability to accurately report the time of day (that is, morning, afternoon or night), the number and percentage of children's responses to this question as a function of age are also presented at Table 13.

3.9.4.1 Descriptive statistics

As can be seen from Table 13, at Interview 3 four children (91.9%) were able to accurately report the time of day at which the home session took place, eleven children (4.9%) provided inaccurate reports of time
of day, and two children (0.9%) responded that they did not know the time of day at which they did the puzzles.

3.9.4.2 Chi-squared analysis

As can also be seen from Table 13, a similar number of younger children provided accurate, inaccurate and don't know responses to the time of day question as older children. Pearson's chi-squared analysis confirmed that response to this question was not dependent on age ($X^2(2) = 2.44, p > .05$).

3.9.5 Colour

In response to the question which asked what colours children used to colour in the picture, at Interview 3 two hundred and two children (93.1%) provided accurate responses, thirteen children (6.0%) provided inaccurate responses, and two children (0.9%) provided don't know responses. These values are also presented at Table 13.

3.9.5.1 Descriptive statistics and chi-squared analysis

As can be seen from Table 13, at Interview 3 a similar number of younger and older children provided accurate, inaccurate and don't know responses to the colour question. A Pearson's chi-squared analysis confirmed that response to this question was not dependent on age ($X^2(2) = 2.85, p > .05$).

3.9.6 Number

In response to the question which asked how many animals were hidden in the puzzle, at Interview 3 one hundred and thirty-one children (64.0%) provided accurate responses, seventy-eight children (35.9%) provided inaccurate responses, and eight children (3.7%) provided don't know responses. These values are also presented at Table 13.
3.9.6.1 Descriptive statistics and chi-squared analysis

As can be seen from Table 13, at Interview 3 a similar number of younger and older children provided accurate, inaccurate and don't know responses to the number question. A Pearson's chi-squared analysis confirmed that response to this question was not dependent on age ($X^2(2) = 0.78, p > .05$).

3.9.7 Summary

In summary, younger children were more likely to provide inaccurate report of precise time than older children, but there was no differential age effect for responses to questions about the time of day, colour or number.

3.10 Children's awareness of suggestive questioning

The ninth analysis aimed to investigate whether children were aware of attempts to elicit inaccurate information via post-event information provided by parents or via questioning during interview.

3.10.1 Data and analyses

The data used for this analysis comprised children's response to a question asking if they thought anyone was trying to get them to say something that was not quite right, followed by specific questioning as to who they thought did this.

3.10.2 Unprompted responses

The number and percentage of children who provided each unprompted response are presented at Table 14.
Table 14

Number and Percentage of Unprompted Responses Provided by Children when Asked Who They Thought was Trying to Get Them to Say Things That Were Not Quite Right

<table>
<thead>
<tr>
<th>Who children thought tried to lead them</th>
<th>Number of Children</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Don't Know</td>
<td>38</td>
<td>(74.5%)</td>
</tr>
<tr>
<td>Mother</td>
<td>5</td>
<td>(9.8%)</td>
</tr>
<tr>
<td>Interviewer</td>
<td>4</td>
<td>(7.8%)</td>
</tr>
<tr>
<td>Father</td>
<td>3</td>
<td>(5.9%)</td>
</tr>
<tr>
<td>Nobody</td>
<td>1</td>
<td>(2.0%)</td>
</tr>
</tbody>
</table>

3.10.2.1 Descriptive statistics and chi-squared analysis

Fifty-one children (23.4%) reported that they thought someone was trying to get them to say the wrong thing. Thirty of these children were aged between five and seven years, and twenty-one between seven and nine years. A Pearson's chi-squared analysis demonstrated that responses to this question were independent of age ($X^2 (2) = 4.13, p > .05$).

As can be seen from Table 14, when children were asked who they thought did this, 38 children (74.5%) said they did not know, five children (7.8%) said their mother, four children (7.8%) said the interviewer, three children (5.9%) said their Father and 1 child (2.0%) said nobody.
3.10.3 Specific question responses

The number and percentage of children who responded to specific questions related to who they thought was trying to get them to say things that were not quite right, are presented at Table 15.

Table 15

Number and Percentage of Responses to Prompted Questions about who Children Thought was Trying to Get Them to Say Things That Were Not Quite Right

<table>
<thead>
<tr>
<th>Question</th>
<th>Age</th>
<th>Positive</th>
<th>Negative</th>
<th>Don't Know</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mum</td>
<td>5-6 yrs</td>
<td>5</td>
<td>95</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>7-8 yrs</td>
<td>3</td>
<td>112</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>Combined</td>
<td>8</td>
<td>207</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(3.7%)</td>
<td>(95.0%)</td>
<td>(1.4%)</td>
</tr>
<tr>
<td>Interviewer</td>
<td>5-6 yrs</td>
<td>28</td>
<td>73</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>7-8 yrs</td>
<td>23</td>
<td>91</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>Combined</td>
<td>51</td>
<td>164</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(23.4%)</td>
<td>(75.2%)</td>
<td>(1.4%)</td>
</tr>
<tr>
<td>Questions</td>
<td>5-6 yrs</td>
<td>30</td>
<td>71</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>7-8 yrs</td>
<td>28</td>
<td>86</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>Combined</td>
<td>58</td>
<td>157</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(26.6%)</td>
<td>(72.0%)</td>
<td>(1.4%)</td>
</tr>
</tbody>
</table>
3.10.3.1 Descriptive statistics and chi-squared analyses

As can be seen from Table 15, when asked specifically, in response to the question 'Did you think your Mum was trying to get you to say things that were not quite right?', eight children (3.7%) responded positively, 207 children (95%) responded negatively and three children (1.4%) said they did not know. A Pearson's chi-squared analysis demonstrated that responses were independent of age ($X^2 (2) = 4.25, p > .05$).

In response to the question 'Did you think I (interviewer) was trying to get you to say things that were not quite right?', 51 children (23.4%) responded positively, 164 children (75.2%) responded negatively, and three (1.4%) children said they did not know. A Pearson's chi-squared analysis demonstrated that responses were independent of age ($X^2 (2) = 2.14, p > .05$).

In response to the question 'Did you think I (interviewer) was trying to trick you with the questions into saying things that were not quite right', 58 (26.6%) responded positively, 157 (72%) responded negatively, and three (1.4%) said they did not know. A Pearson's chi-squared analysis demonstrated that the two age groups were equally likely to respond these ways ($X^2 (2) = 2.14, p > .05$).

3.10.4 Summary

In summary, 23.4% of children reported that they thought someone was trying to get them to say the wrong thing, with 23.4% attributing this to the experimenter, 26.6% attributing this directly to the questions, and 3.7% of these children attributing this to their mother.
The present study aimed to investigate the impact of post-event misinformation provided by a parent, and subsequent repeated questioning by an outsider - using a variety of question styles, on young children's ability to accurately report details of an event. The study also aimed to investigate the impact of initial certainty of response on subsequent responding, and the impact of exposure to misinformation on children's certainty of their responses to questioning. Further, the present study aimed to explore cognitive and social compliance explanations for children's event memory in response to questioning, and also the memory impairment and co-existence explanations of children's suggestibility. Developmental differences and memory for specific types of information were also investigated.

With respect to the first hypothesis, contrary to expectation, children who were exposed to inaccurate post-event information provided by a parent did not provide less accurate report and were not less certain of responses to cued non-suggestive questions, than children who were not so exposed, irrespective of age.

In partial support of the second hypothesis, children did provide more accurate information in response to cued non-suggestive compared to open-ended questions, but they also provided a greater number of inaccurate responses, irrespective of age.
In partial support of the third hypothesis children provided more accurate report, fewer inaccuracies, and were more certain of responses to cued non-suggestive questions than misleading questions. However while children provided fewer inaccurate responses to cued non-suggestive questions than suggestive and leading questions, the number of accurate responses and certainty of responses did not differ. These effects were evident for both five to six and seven to eight year olds.

In support of the fourth hypothesis, in response to cued non-suggestive questions at Interview 3, children who had received repeated exposure to inaccurate information provided fewer accurate responses, more inaccurate responses, and were less certain of responses than children who had not been exposed to inaccurate information, irrespective of age.

The fifth hypothesis, that greater certainty of initial responses would result in greater accuracy of later responses to suggestive and leading questions, was not supported.

For the sixth hypothesis, contrary to expectation, performance on standardised tests of memory was not related to children's memory for events for children who received the non-suggestive experimental sequence. However, for children who received the suggestive experimental sequence, delayed visual recall was related to accuracy in response to an open-ended question at Interview 2 only. Further, support for a social compliance explanation of suggestibility was apparent for both age groups.
The seventh analysis provided some support for both the co-existence and memory impairment hypotheses, with the majority of children however demonstrating memory impairment. There was no differential effect between five to six and seven to eight year olds.

Investigation of responses to individual items showed that younger children provided fewer accurate responses to a question asking precise time than older children, however response tendencies to questions about time of day, colour and number did not differ according to age.

Finally, approximately one quarter of the children felt that the interviewer's questioning aimed to elicit inaccurate responses. Responses to this question did not differ according to age.

In the following discussion, the theoretical relevance, as well as the practical implications for each of these findings, will be discussed and considered.

With regard to the first hypothesis, contrary to expectation, in response to cued non-suggestive questions, children who were exposed to inaccurate post-event information provided by a parent, did not provide fewer accurate responses, did not report a greater number of inaccurate responses, and were not less certain of those responses than those children who were not so exposed. This was equally apparent for both five to six and seven to eight year olds. While research investigating the effect of parental misinformation on children's event memory is scarce, this finding was unexpected. Similar studies with adults have reported a detrimental impact on
memory utilising written scripts to provide the misinformation (Belli, 1989). Given that it has been suggested that children have particularly malleable memories in comparison with adults (Loftus & Davies, 1984), and that in the present study the misinformation was provided verbally and by a presumably significant adult (a parent), it was expected that children's recall of events would be significantly tainted by this misinformation. However there were a number of methodological considerations that the present investigation addressed which may account for this unexpected finding. Unlike much of the previous research, particularly earlier studies, the present study utilised a personally significant and meaningful event in which the child actively participated. Research investigating the effect of salience of an event, and participation as opposed to mere observation of an event, has shown that under these conditions, events are particularly well remembered by children (Baker et al, 1990; Pullybland et al, 1985), and children are more resistant to suggestion (Rudy & Goodman, 1991).

This has important implications for children as court witnesses, as previous authors have implied that children's memories are particularly susceptible to information they have heard after the event (Cohen & Harnick, 1980). However this assumption has been based on early research which frequently used filmed events of little significance to children. Thus it could be suggested from the present findings that children are not susceptible to misinformation provided by a parent, when the event to be remembered is personally significant and meaningful, and an event in which they have actively participated.
Another factor which needs to be considered with regard to the present findings however, is that the misinformation was presented immediately following the stimulus situation. Toglia (1991) proposes that the likelihood of any memory impairment depends upon the strength of the memory trace. It could be suggested that as the events were still fresh in the children's minds, they might be less likely to take on the information provided by a parent, as memory traces for the event were still strong. Further, as Eysenck and Keane (1990) explain, memory traces decay over time. Therefore it could be argued that suggestibility effects would be more likely if children were exposed to misinformation some time after the event, as the memory trace would be expected to be weaker after a time interval, and therefore more susceptible to impairment. This aspect requires further investigation. Future research could investigate whether parental misinformation provided some time after the original event is more likely to impair children's recall of those events, than information provided immediately following the event.

In partial support of the second hypothesis, as with previous research (Dent & Stephenson, 1979; Poole & White, 1991), the present study further supported the widely reported finding that cues provided in questions enable children to retrieve additional information from memory, thereby allowing them to provide more detailed reports of an event. However contrary to expectation, cued non-suggestive questions also resulted in a greater propensity for children to provide inaccurate responses in comparison with open-ended questions. This finding is in line with the frequently reported finding that cued questioning, while enhancing children's recall, also results in a greater number of inaccuracies (Jamieson, 1990; Moston, 1987; Pipe et
al., 1993). While previous research utilised cued questions which could be considered suggestive, the expectation of the present study that non-suggestive cues would not have the same effect of increasing inaccuracies, was not upheld. The present findings suggest then, that questions containing cues, even if those cues do not suggest an answer or lead the respondent to answer in a particular way, result in greater inaccuracy of report than open-ended questioning.

However, while there was a greater propensity for children to provide inaccurate pieces of information in response to cued non-suggestive compared with open-ended questions, it should be noted that the majority of children who received the cued non-suggestive interview protocol, that is seventy to seventy-five percent of those children, did not provide inaccurate responses to these questions, and those who did, provided very few. Of these children, most provided only one inaccurate response out of sixteen possible inaccurate responses, with three children providing two inaccurate responses. Further, most of the inaccurate information provided by children, related to details of stimuli with which children had not directly interacted, such as the parent’s food and drink, and the presence on the table of flowers or the mug containing pencils. Therefore the present findings suggest that cued questioning without suggestion may elicit inaccurate responses when the suggestion pertains to stimuli with which children have not interacted, but not stimuli with which they have directly interacted.

However in aiming to elicit an accurate report of events from children, particularly within a legal context, there is little room for inaccuracy of any degree. Therefore, in support of previous
findings but contrary to expectation, the present study found that children provide significantly more pieces of accurate information in response to cued questions compared with open-ended questions, but also display a greater propensity to provide inaccurate information in response to such questioning, even when the cues provided within those questions are non-suggestive.

To address the third hypothesis, as expected, children provided a greater number of accurate responses, fewer inaccurate responses and greater certainty of those responses to cued non-suggestive questions, compared with misleading questions. This finding was similarly evident for children who had not previously been exposed to misinformation from a parent and for children who had been exposed, and was equally apparent for five to six and seven to eight year olds.

However, with regard to suggestive and leading question styles, contrary to expectation, there was no significant difference in the number of accurate responses, or certainty of those responses between cued non-suggestive and either suggestive or leading questions, irrespective of previous questioning style or age. Children did, however, provide significantly fewer inaccurate responses to cued non-suggestive and suggestive questions than leading questions, irrespective of whether they had cued non-suggestive or misleading questioning at the previous interview. In addition, for children who had misleading questioning at the previous interview, suggestive questions also resulted in fewer inaccurate responses than leading questions. These findings were equally apparent for five to six and seven to eight year olds.
The present results then, indicate that the open-ended question is the least suggestive style of questioning of those presently employed, as these resulted in fewer inaccuracies than any of the other question styles. However the open-ended question also resulted in the least amount of accurate information conveyed. Thus, as suggested by previous authors (Dent, 1990; Powell & Thomson, 1994), it would seem that questions containing cues are necessary to elicit greater detail of event-report from young children. Whilst cued non-suggestive questioning resulted in a slightly greater propensity for children to report inaccurate information however, the present findings also suggest that this style of questioning is considerably less harmful to children's reports of events than either misleading, suggestive or leading questioning. Cued non-suggestive questions consistently resulted in fewer inaccurate responses than misleading, suggestive or leading questions, and also resulted in more accurate responses than misleading questions. The present results therefore indicate that questions which contain cues, but which are not suggestive, leading or misleading in nature, enable the interviewer to elicit a considerably more detailed report of events, with minimal inaccuracy, particularly for information pertaining to objects with which children have directly interacted.

In differentiating between suggestive, leading and misleading questions, there was no statistically significant difference in the amount of accurate report elicited by suggestive and leading question styles. However, leading questions resulted in a significantly greater number of inaccurate responses than suggestive questioning. Further, unlike the suggestive or leading questions, misleading questions consistently produced lower accuracy, greater inaccuracy,
and reduced certainty of responses, in comparison with cued non-suggestive questions. These findings suggest that leading questions are more damaging to children's reports of events than suggestive questions, and that the misleading question, upon which there has been little research, is the style of question which is most damaging to children's reports of events.

It is proposed that leading questions result in greater inaccuracy of report than suggestive questions due to the particularly coercive style of this form of question. Suggestive questions contain new and possibly inaccurate information which the child may not previously have considered, for example, "Did you have a drink of Lemonade?", but do not imply the accuracy of the information, nor do they coerce a particular response. Nevertheless, the children in the present study did report inaccurate information contained within the suggestive questions, in spite of this lack of implication or coercion. In contrast, the leading question, for example "You drank some lemonade didn't you?", not only implies the accuracy of the question content but also coerces a positive response, and children in the present study provided a greater number of inaccurate responses to these questions than the less coercive suggestive questions.

With regard to the misleading question, it is proposed that this style is particularly damaging to children's reports of events, as the suggestive information is merely implied in the question, and is not the main focus of the question. It could be suggested that it is easier for children to disagree with inaccurate information provided by an adult, when the style of question allows a response which reflects the accuracy or inaccuracy of the information, such as in
suggestive or leading questions. For example, the suggestive question "Did you have a drink of Lemonade", and the leading question "You had a drink of Lemonade, didn't you?" both allow a negative response which would dispute the fact that the child drank Lemonade. However, when misinformation is contained in questions which do not allow such a direct reflection of accuracy in any response, such as occurs with misleading questions, the inaccurate information may be more difficult for children to dispute. For example, the misleading question, "Did you enjoy the drink of Lemonade you had?" implies the accuracy of the information, whether a child responds positively or negatively to the question. To dispute the information would require the child to directly state that he or she did not have a drink of Lemonade, which on the whole, children participating in the present study did not tend to do. Most of the children did not dispute the content of misleading questions, but merely provided a response. This tendency is in line with Hughes and Grieve's (1980) study, which demonstrated that children have a strong propensity to answer adult questions without dispute, even if the questions do not make sense.

It should be noted however, that some children, although the minority, did dispute the misinformation contained in misleading questions. Further, an observation which is of interest, is that these children appeared on face value to be particularly confident children. This issue of children's self-confidence is worthy of further consideration.

In general, throughout the interview sessions children who on face value appeared to be quite confident in the presence of the adult experimenter, for example children who maintained constant eye
contact, initiated conversation with the experimenter and greeted the experimenter by name without needing to be invited to do so, tended to be more likely to dispute the information contained in misleading questions, and more likely to provide accurate responses to suggestive and leading questions. However children who appeared on face value to be more timid, who demonstrated difficulty maintaining eye contact, and only spoke when directed to do so by the experimenter, seemed to demonstrate a propensity to respond positively to questions containing inaccurate information and report that they were very sure, even though their demeanour seemed to indicate that they were unsure of the accuracy of the response.

Research with adults has shown that introverts (as measured by the Myers-Briggs Type Indicator) are more prone to accept both misleading and consistent post-event information than extroverts (Ward & Loftus, 1989), however little research has investigated the link between personality and suggestibility for children. The present study suggests that self-confidence in the presence of adult authority figures may be one personality attribute which ameliorates the impact of 'suggestive' questioning for some children. This is an area which warrants further investigation.

In relating the present results to the domain of health and legal professionals, the current findings indicate that suggestive, leading or misleading questions are particularly damaging to the accuracy of children's reports of events. As Perry and Wrightsman (1991) suggest, whenever such questions are used, the interviewer runs the risk of eliciting inaccurate statements. Therefore health and legal professionals working with children, need to be educated as to the
impact of such questioning, to prevent their usage, and so prevent the risk of obtaining inaccurate reports from children. However cued non-suggestive questions enabled children to provide a more comprehensive and detailed report of events than the open-ended question, and also resulted in more accurate report, that is fewer inaccurate responses, than suggestive, leading or misleading questions. Thus the present findings indicate that cued non-suggestive questioning may achieve the aim of eliciting detailed report with minimal inaccuracy.

It has been argued however, that while it is relatively easy to compose cued questions when the interviewer is aware of what actually occurred in the situation, this may be more difficult when the interviewer has no knowledge of the details of the situation to be remembered (Davies, 1991). However health and other professionals who work regularly with children often have some idea of the typical incidents which take place during particular criminal events, such that professional knowledge could guide the construction of cued non-suggestive questions, without suggesting an answer or leading the child in any way. Many of the questions asked in the present study were similar to the types of questions which might be typically asked of a child involved in a criminal event, for example whether others were present, the colour and number of objects within the environment, whether the child or others ingested any substances, and what time of day the event took place. Further, it might be suggested that interviews could take place in a hierarchical fashion, with open-ended questions asked first as these are least likely to elicit inaccurate responses, followed by cued non-suggestive questions which have been composed both from the information provided in response to open-ended
questioning, and from professional knowledge of the typical circumstances of a particular event.

In addition, the present findings also highlight the importance of differentiating between questioning styles in determining the impact of questioning on children’s ability to accurately report details of an event. Questions are not merely suggestive as opposed to non-suggestive, or general as opposed to specific, but the way the question is phrased can strongly influence the likelihood of obtaining an accurate report of events from children.

The present findings then suggest a continuum of suggestibility which begins with the least suggestive, but also least productive with regard to quantity of information provided, open-ended question. This style is followed by the cued non-suggestive question, which is more productive than the open-ended question, but also results in greater inaccuracy of report. The third question style on the continuum of suggestibility indicated by the present results, is the suggestive question. This style provided a similar amount of accurate information as the cued non-suggestive style, but also provided significantly more inaccurate responses. Fourth on the continuum of suggestibility is the more coercive leading question, which also provided a similar amount of accurate information as the cued non-suggestive style, but resulted in significantly more inaccurate responses than either cued non-suggestive or suggestive questions. Finally, the most damaging style of question, which should be placed at the top end of the continuum of suggestibility is the misleading question. This style of question not only resulted in significantly more inaccurate responses, but also in significantly fewer accurate
responses, and significantly less certainty of those responses than cued non-suggestive questioning. Thus the continuum of suggestibility indicated by the findings of the present study ranges from open-ended to cued non-suggestive, to suggestive, to leading, and finally to misleading questions.

It should be noted however, that there was considerable variance in the data for responses to suggestive, leading and misleading questions, indicating that there is a great deal of variation in the way children respond to such questions, thus further emphasising the need to investigate intra-individual differences with regard to susceptibility to suggestive styles of questioning.

With regard to the effect of repeated exposure to inaccurate information through misinformation provided by a significant adult, and via questioning from an adult authority, the present study demonstrated significant effects of previous exposure to misinformation and misleading questioning, on the accuracy of children's reports. Previous exposure to parental misinformation affected children's responses to questioning the following day. While children who were exposed to parental misinformation did not produce less accurate reports to cued non-suggestive questions than children who were not so exposed, in response to misleading questions, children who had been exposed to parental misinformation reported on average, fewer accurate responses than children who had not been so exposed. That is, five compared to seven accurate responses respectively, from sixteen possible accurate responses. Hence, although parental misinformation did not significantly impair children's responses to cued non-suggestive questions, misleading questions appear to be more
damaging to children's reports when they have been preceded by parental misinformation. That is, the combination of misinformation from two sources appears to be more damaging than either source of misinformation on their own. This is an important finding with regard to understanding the impact of repeated exposure to misinformation from a number of sources. The present findings suggest that if a child has been exposed to misinformation by a parent, and subsequently undergoes misleading questioning which agrees with the previous misinformation, children will provide less accurate reports of events.

In addition, an effect of previous questioning style on later accuracy of report was also evident. Children who had previously been interviewed with misleading questions consistently reported fewer accurate responses and a greater number of inaccurate responses to cued non-suggestive, suggestive and leading questions compared with children who had previously been interviewed with cued non-suggestive questions. This emphasises the impact of repeated exposure to questions containing misinformation, on children's accuracy of report. These results therefore suggest a carry-over effect for misleading questions, such that not only is misleading questioning damaging at the time of the interview, but that subsequent report is also impeded by previous exposure to misleading questions.

Further, it was found that in response to cued non-suggestive questions presented at Interview 3 (sixteen days after the initial event to be remembered), children who had received no inaccurate post-event information from a parent followed by non-suggestive questioning at Interviews 1 and 2, recorded a greater number of accurate responses, greater certainty of accurate responses and fewer
inaccurate responses than children who had received inaccurate post-event information from a parent followed by misleading questions at Interview 1 and either suggestive or leading questions at Interview 2. Children exposed to the non-suggestive experimental sequence, reported on average, twelve to thirteen accurate responses and one inaccurate response to a sixteen-question interview protocol, that is eighty-one percent accuracy and six percent inaccuracy. Children exposed to the suggestive experimental sequence however, reported on average, ten to eleven accurate responses and three to four inaccurate responses, that is sixty-eight percent accuracy and twenty-five percent inaccuracy. Therefore, repeated exposure to inaccurate information had a significant impact on children's later report of events, reducing accuracy from eighty-one to sixty-eight percent, and increasing inaccuracy from six to twenty-five percent. This finding was equally apparent for five to six and seven to eight year olds.

While frequently alluded to as a concern with regard to children's ability to accurately report details of an event, little research has addressed this issue of repeated questioning. While the present findings contrast Dent and Stephenson's (1979) report of finding little effect of repeated questioning over an eight-week period, that particular study employed open-ended, 'free report' questions, and not questions containing inaccurate information. In support of Flin's (1991) contention that repeated questioning of witnesses can be damaging to the quality of evidence, the present findings suggest that repeated exposure to inaccurate information about an event, via information provided by parents and questioning during interviews, detrimentally affects children's ability to accurately report the
details of those events at a later stage, even in response to non-suggestive questioning.

This finding is an important one, as children's testimony frequently involves remembering events over intervals in which children have been exposed to repeated questioning or interviews. This finding further emphasises the importance of alerting health professionals and others who work with children, to the styles of questioning which are most likely to elicit detailed and accurate reports, and least likely to contaminate any later report. The present findings suggest that cued non-suggestive questions appear to achieve this aim.

In contrast to the expectations of the fifth hypothesis, children who were more certain of responses to cued non-suggestive questions at the first interview, did not provide more accurate reports with fewer inaccuracies, in response to suggestive and leading questions at the second interview, than children who were less certain of initial responses. Thus it would seem that initial certainty does not ameliorate the impact of suggestive or leading questions.

It should be noted however, that there was little variance in children's certainty ratings. Very few children responded that they were only a little bit sure, or not very sure of responses. The majority of children after providing a response, stated that they were very sure of that response, irrespective of whether the response was accurate or inaccurate. Further, children frequently demonstrated a response bias, tending to say they were very sure of all responses, even incorrect responses. This is evidenced in the finding that certainty of responses did not differ in line with inaccuracy in
response to suggestive or leading questions, and that mean certainty of responses was consistently above 2.67 on a three-point scale, against which three indicates the 'very sure' response option.

Further, with regard to the impact of questioning on certainty of responses, while suggestive and leading questions did not affect certainty of responses, children did demonstrate lowered certainty of responses to misleading questions compared with cued non-suggestive questions. This further supports the contention that misleading questioning is particularly confusing for children, as children were less certain of their responses to this style of question. As it could be expected that uncertainty of responses would render children's reports less convincing, this finding also suggests that misleading questioning would be particularly damaging with regard to the extent to which health and legal professionals, and perhaps juries, would believe children's reports, such that this style of questioning should be avoided when questioning children.

With regard to the sixth hypothesis, the predicted relationships between cognitive experimental tests of memory and children's memory for events, were not demonstrated. Contrary to expectation, for children who received no suggestive information either from a parent or via questioning, there were no significant relationships demonstrated between performance on delayed free recall for visual or verbal information which was provided experimentally, and accuracy of event report in response to open-ended questions. Further contrary to expectation, there were no significant relationships between performance on cued recall for verbal or visual information which was
Therefore the assumptions which are frequently mentioned in the literature on children's event memory, that report in response to an open-ended question for event memory is analogous to free recall in cognitive research or that responses to questions containing cues is analogous to the cued recall ability of cognitive experimental research, were not supported by the present results. These findings suggest that children's capacity to accurately report live events, cannot be reduced to simple memory functioning, as assessed by experimental memory tasks, but that there are additional factors at play. This finding emphasises the need for researchers to look at memory for events specifically, and not just the underlying cognitive functioning.

A slightly different picture emerged however, for children who had received suggestion at each experimental stage, that is parental misinformation followed by misleading questioning at Interview 1 and leading questioning at Interview 2.

As with children who received the non-suggestive experimental sequence, there were no relationships evident between cued recall for visual or verbal information presented experimentally, and accuracy of event report in response to cued questioning (both suggestive and leading), nor between delayed free recall for verbal information presented experimentally and accuracy of event report in response to open-ended questions.
There was, however, a significant relationship between delayed free recall for visual information presented experimentally, and accuracy of event report in response to an open-ended question at the second interview, but not the first and third interviews. That is, children who performed well on an experimental task which assesses the spontaneous recall of visual information also performed well with regard to spontaneously recalled memory for events, following previous exposure to parental misinformation and misleading questions.

Therefore, for children who have been exposed to inaccurate information via parents and misleading questions, the ability to accurately recall information in response to open-ended questions does appear to be related to the cognitive ability assessed by free recall tests of visual memory. In attempting to understand this finding, the following two points may be considered. This relationship was only apparent following previous exposure to misleading questions, and misleading questioning in the present study resulted in reduced certainty of responses. It could be suggested, therefore, that in situations where children have been previously exposed to questioning which might prompt doubt about their memory of the events, and in response to open-ended questions which do not provide memory cues, children necessarily rely on visual memory to elicit the required information.

Further findings from the present study, however, suggest that children's event memory in the face of questioning by an adult, may not be divorced from social compliance effects.
In support of the social compliance explanation of children's suggestibility, findings from the present study indicated that children provide inaccurate responses to questions in order to comply with adult authority figures. More than half of the children reported that they knowingly provided inaccurate responses to questions, with approximately one third of these children reporting that they did so to comply with either a parent or the experimenter. As Zaragoza (1991) suggests, children might conform to suggestion for a number of reasons - because they wish to please an authority figure, or feel pressure to conform to an adult's suggestions, or because they trust the information provided by an adult authority figure more than their own memory.

In addition, there was no differential response tendency according to age. These results are in line with Lickona's (1983) moral development theory, which suggests that the two age groups used in the present study would both be likely to comply with authority figures, although for different reasons. Children aged between five and six years comply with adult authorities in order to be obedient, while older children comply to please and gain approval from those authorities. Whatever the reasons however, the present study demonstrated that children across the five to eight year age span do knowingly provide inaccurate responses in order to comply with an adult authority.

In summary of the cognitive and social compliance aspects of children's memory for events, it would appear from the present investigation that in response to questioning, children's event memory is not related to the cognitive abilities of delayed verbal or visual
recall assessed by experimental memory tasks for children not exposed to suggestive information. However for children who were exposed to suggestive information, the ability to spontaneously recall memory for events, is related to delayed free recall for visual information assessed experimentally. Social compliance effects also appear to play a part in children's ability to accurately respond to questions about an event. Therefore it may not be appropriate to retain these theories as separate explanations for children's event memory and suggestibility, but rather, at this stage, both cognitive and social aspects should be considered to provide an adequate understanding of these capacities.

The seventh analysis resulted in support for both the co-existence and memory impairment hypotheses. Of the children who reported inaccurate information in response to cued non-suggestive questions at Interview 3, slightly more than half of these children, evenly distributed across the two age groups, said they heard someone say this information as opposed to seeing or experiencing it for themselves. When asked what they thought had happened however, the majority of these children, that is approximately ninety-five percent, persisted with the inaccurate information as their response. That is, they were not able to accurately retrieve the original information, even though they were aware that they had heard someone convey information to them, as opposed to seeing or experiencing the information themselves. Thus it would seem that for the majority of children, memory for details of the event were irretrievably impaired by misinformation heard after the event, such that they were unable to retrieve the original information. This finding therefore supports the memory impairment hypothesis.
However seventeen of these children, eight younger and seven older children, were able to accurately retrieve original information, even after they had reported inaccurate information in response to cued non-suggestive questions. This second finding provides support the co-existence hypothesis, as children were able to retrieve the original information, even though the inaccurate information conveyed during the previous few weeks had also been stored, and provided as a response, during the third interview. This finding qualifies Davies' (1991) concern that, while having been observed in adults, no researcher had previously demonstrated that suggestions assimilated by a child during a retention period could be reversed. The present study was able to demonstrate such an effect. It would seem therefore that some children are able to concurrently store post-event information with original memories of an event in line with the co-existence explanation, whilst other children once they have taken up a suggestion provided after the event, appear to be unable to retrieve the original information.

Future research should be directed at understanding the intra-individual differences between those children who are able to retrieve original information and those children who are not able to do this. Post-hoc exploratory analyses of the present data indicated no differences between these children with regard to cognitive memory capacities assessed experimentally. One possibility however, as previously alluded to, could be to look at personality factors such as self-confidence. It may be that children who are more confident of themselves, may be more confident of their memory capacity, and therefore more likely to retain the original information together with
the post-event information. On the other hand, less confident children might discard the original information in favour of the information provided by the authority as they place more confidence in the authority's ideas than their own. As indicated by the present study however, measurement of this confidence aspect cannot be reduced to a certainty rating of responses, as even children who appeared not to be confident of their responses, provided ratings which indicated certainty of responses. This is an area which requires further investigation.

Overall however, the majority of children in the present study were not able to retrieve the original information once they had provided an inaccurate response, suggesting that for most children, inaccurate information provided after an event may impair children's reports of their memory for the original event.

With regard to specific types of information, the questions which produced the greatest number of accurate responses, and least number of inaccurate responses were those questions related to what the child ate, the animal the child was required to find in the puzzle, the writing tool used, the colour of the pencils used to colour the picture, whether the child's father helped do the puzzles, and whether the child's mother was seated at the table. It would seem that the questions which resulted in a large number of accurate responses, were questions about items with which the child had interacted - the puzzle and writing tool, and the presence and actions of others within the immediate environment, that is, the child's mother and father. It might be suggested that these questions were about events or items central to the event to be remembered.
In contrast, the questions producing the greatest number of inaccurate response were those related to the parent's drink, and the number of animals hidden in the puzzle. One of these questions related to an item which was not central to the child, that is, the parent's drink. The other question related to number, which is a type of information that has been reported to be particularly difficult for children to recall accurately (Spencer & Flin, 1990).

The questions producing the greatest number of 'don't know' responses however, were related to the precise time at which the home session took place, and the three questions related to the mug containing pencils - the mug itself, the content of the mug, and the number of pencils contained in the mug. As with the questions which produced a large number of inaccurate response, these questions related to items which could be considered to be peripheral to the event - that is the mug and its contents, and also types of information which have been reported to be particularly difficult for young children to recall (Perry & Wrightsman, 1991; Spencer & Flin, 1990) - that is, number and precise time.

The present results support the contention that children display better recall for items central to the event to be remembered than peripheral items, as suggested by Zaragoza (1991). This may be related to the fact that children need to attend to information for it to be well remembered, as has been suggested by Perry and Wrightsman (1991). It seems to make intuitive sense that children would display better memory for items central to the event, to which they would be more likely to attend. Further, the present results support the
proposal that young children have difficulty recalling information related to number and precise time.

Looking specifically at questions related to colour, number and time, and how younger and older children respond to questions about these types of information, both age groups showed similar response tendencies to questions about colour and number. However in responding to a question requiring precise time, fewer younger children were able to provide accurate responses than older children. Many children were however, able to provide reference points such as "straight after school" or while a certain television program was playing, but were not able to provide a precise time. However younger and older children provided a similar number of accurate responses to the less specific question related to the time of day, that is whether the stimulus situation took place in the morning, afternoon or night. This supports Perry and Wrightsman's (1991) contention that children are better at reporting the time of an event in relation to some routine aspect of their daily lives, and the present study suggests that this is particularly so for younger children aged from five to six years. These results suggest that while younger children may have difficulty providing a precise time, they are as able as older children in providing a more general time of day.

With regard to children's awareness of the aim of the parental misinformation and suggestive questioning, few children thought their mother was trying to alter their recollections, while approximately one-quarter of the children felt that the interviewer, and the questions asked by the interviewer, were attempts to coax children into providing incorrect responses. Response tendencies were
equivalent across the two age groups. However the majority of children did not feel that the interviewer was trying to persuade incorrect responses, suggesting that most children were not aware of the intent of the questions to mislead.

In relation to the child witness, this finding has important implications with regard to children's reports elicited through questioning by legal professionals during the court process. In an adversarial court system, a strategy which may be employed by defense lawyers, is to discredit the witness by eliciting contradictory information via the use of leading or misleading questions (Spencer & Flin, 1990). The present findings suggest that most children aged between five and nine years of age, would not be aware of the purpose of such questioning, and presumably, would find it difficult to respond rationally to such questions, particularly, as suggested by the present findings, in response to misleading questions. It might also be speculated that within the intimidating atmosphere of a courtroom, these effects might be exacerbated. Therefore the appropriateness of the adversarial court system when children are involved as witnesses, as has been discussed by Ceci and Bruck (1993) and Spencer and Flin (1990), comes into question.

Finally, with regard to expected differences between children aged from five to six years and children aged from seven to eight years, the present study indicated that both age groups displayed similar response tendencies in relation to different styles of questioning, and also with regard to social compliance and the ability to retrieve original information after previously reporting inaccurate information. However significant age differences were apparent with
regard to the number of accurate and inaccurate responses to all questioning styles at the second interview. Therefore, while both age groups displayed similar suggestibility effects in response to different question styles, five to six year olds appeared to be more vulnerable to such effects, thereby producing fewer accurate responses and a greater number of inaccurate responses when suggestibility effects were evident.

This finding is in line with Piaget’s theory of cognitive development which proposed that children at the pre-operational level of development, from five to seven years, would be more likely to incorporate suggestive information due to their tendency to jump from information to conclusions, than concrete operational children, aged from seven to eleven years, who base their memories on reality. Further, as previously discussed, in line with Lickona’s theory of moral development, both age groups were equally likely to comply with authorities.

In summary, the present findings suggest that while post-event information provided by a parent immediately after an event does not seem to affect children’s ability to accurately report events in response to cued non-suggestive questions, such exposure does reduce accuracy of report when later asked misleading questions. With regard to styles of questioning, open-ended questions provided the least inaccuracy, but also the lowest amount of accurate report. However, cued non-suggestive questions, while providing slightly more inaccuracies than open-ended questions, resulted in significantly more accurate information. Further, cued non-suggestive questions while eliciting similar amounts of accurate information as suggestive and
leading questions, resulted in fewer inaccuracies than either of these styles, and cued non-suggestive questions also resulted in more accurate report, fewer inaccuracies, and greater certainty of responses than the most damaging style of question, the misleading question - which continued to have an effect on accuracy one week after being presented. Further, the cumulative effect of misinformation provided by a parent, and during questioning, reduced the accuracy and certainty of responses provided by a child, such that repeated exposure to misinformation appears to be particularly damaging to a child's ability to accurately recall information, and withstand suggestion provided by adult authority figures.

Finally, children demonstrated particular difficulty in recalling information relating to number, precise time (which was most difficult for younger children), and items which could be considered peripheral to the event to be remembered. However, children were able to accurately report information relating to items with which they had interacted, and also information pertaining to the presence and actions of others within the immediate environment.

In attempting to gain a greater understanding of the underlying processes of children's memory for events and ability to withstand suggestion, it was found that cognitive ability, assessed experimentally, cannot directly predict event memory, and that social compliance factors contribute to these capacities in children. Further, it was found that while a number of children were able to accurately retrieve original information once suggestion had been incorporated in report, the majority of children were not able to do this, such that their original memory appeared to be irrevocably
Children's Memory and Suggestibility

Impaired by exposure to inaccurate post-event information provided by adult authority figures.

It should be acknowledged however, that the present research has some limitations. Most importantly, unlike the criminal events about which children might be likely to be interviewed within the health or legal setting, and to which the present results presume to generalise, as a result of ethical considerations, the present study required children to recall details about a benign event which did not involve any active threat to the children's safety. Recent research suggests that memory for details relating to stressful situations, would be less likely to be distorted by suggestive questioning or post-event misinformation (Christiansen, 1992; Goodman et al, 1991; Steward, 1992). Therefore this limitation needs to be considered in interpreting the present results.

Further, the stimulus situation used in the present study was conducted in the child's home, without experimental supervision. Although detailed instructions were provided to parents, and a detailed questionnaire was employed to ascertain parents' compliance with those instructions, it is possible that children's experience of, and exposure to, the stimulus situation, may have varied from child to child - particularly if children were allowed to assist in preparing the stimulus situation, in spite of instructions to do otherwise.

However, the present study addressed a number of concerns and criticisms which have been directed at previous research. The stimulus situation was a live event, in which the child actively participated, and which was designed to be interesting and of personal
significance to the child, to ensure the child's attention to the event about which they would be questioned. In addition, the post-event misinformation provided to children in the present study, was conveyed by a personally significant adult, that is a parent, which approximates more closely, the circumstances which could be expected to occur in a real life situation. Further, although cognitive developmental level was not assessed directly, the present study was guided by established developmental theories in determining age groups for comparison. (Future research could perhaps use Piagetian tasks to better operationalise cognitive developmental level, which was not possible given time constraints in the present study.)

The present study also aimed to overcome a number of methodological concerns levelled at previous research. Namely, by employing and comparing a variety of question styles which might be used during the interview process, by using interview protocols which included a large and equivalent number of questions to investigate each question style, and by employing a large sample size from which results for most analyses could be adequately ascertained. It should be noted however, that while there was an adequate sample size overall, providing greater than fifty degrees of freedom for most analyses, the analyses which addressed the relationship between cognitive memory assessment and memory for events was based on limited sub-samples of fifteen and twenty-four respectively. Therefore for these analyses, it would be useful for future research to employ larger sample sizes.

In conclusion, the finding that the styles of questioning employed in the present study determined the accuracy of children's reports of events, highlights the need to educate health and other professionals
working with children with regard to questioning and interview techniques, to enable greater care to be taken when interviewing children. The emphasis in interviewing children about criminal events, should be on obtaining the factual details of an event and minimising the likelihood of obtaining a false report, and also on preventing contamination of children's memory which could affect later report. Therefore health and legal professionals should be encouraged to use a hierarchy of questioning styles, beginning with open-ended questioning with a focus, and followed by cued but non-suggestive questions, the content of which should be guided by information obtained from open-ended questioning, and also by professional knowledge. However, the present results indicate that the question styles here defined as suggestive, leading and misleading, should be avoided. Further, health and legal professionals working with children need to be aware of the impact of repeated questioning, and the importance of ascertaining whether misinformation is likely to have been conveyed to the child by significant adults. Professionals should also ascertain whether questioning has previously occurred, and if so, the style of questioning used during those interviews, to assist in determining the reliability of children's responses during interview.

Further, as children's reports do appear to be differentially vulnerable to various questioning styles, within the legal setting defence and prosecution lawyers could use these differences to their own advantage, or to their opposition's disadvantage. The emphasis of court proceedings which involve children's testimony however, should also be focused on obtaining the factual details of an event, and minimising the likelihood of false report. Therefore, an adversarial
court system may simply not be appropriate when dealing with children's testimony.

The present study suggested a number of possibilities for future research. The effect of the period of delay between obtaining memory for an event and exposure to inaccurate information, on accuracy of children's reports, is one area which requires further investigation. In addition, it was evident from the present results that there is considerable variance amongst children with regard to memory capacity for live events, and susceptibility to suggestibility effects elicited by post-event misinformation and suggestive styles of questioning, thereby emphasising the need for future research to investigate intra-individual differences with regard to these capacities. As suggested by observations made during the course of the present study, the investigation of any relationship between personality factors, particularly self-confidence, and children's susceptibility to comply with adult authority figures, and their ability to later retrieve the original information, is one direction to which future research should be guided. Further, the present study emphasises the need for future research to incorporate large numbers of subjects across a variety of age ranges, utilising interview protocols which contain a number of questions and which clearly distinguish the style of questions used.

As can be gleaned from the literature review and research presented here, the area of children's memory and suggestibility is a complex one, even when looking solely at the basic memory processes. The present study did not demonstrate a nexus between basic memory processes and memory for live events however, such that this area
becomes even more complex when these processes are considered in relation to real life events. While analogue studies like the present one cannot replace clinical observation and exploration with regard to children's memory abilities in relation to criminal events, results from studies like this may help to question popular myths and preconceptions about children's memory and suggestibility, and prevent them from influencing professional practice, as well as providing guidelines from which sound interview procedures can be developed.
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Children's Memory and Suggestibility


Dear parents,

I am a postgraduate student completing a Masters in Clinical Psychology at the Australian National University. I am presently conducting research to investigate children's capacity to observe details with regard to their capability as court witnesses.

I am contacting parents of children attending a number of selected schools within the ACT region to see if they would like to participate in this research.

The aim of this study is to investigate children's capacity to observe and recall details in a real-life situation. Research until now has focused on the ability in the laboratory using videos. But this research has looked at children's capacity to observe in a real-life context: Of particular interest is whether children are able to recall details of events accurately over time. A second interest is whether the child will alter their report of events after hearing a parent's inaccurate version of events, of which actually occurred.

The study will involve the child being interviewed at home with one parent for approximately 5-10 minutes. This will occur during the week 12-15 February. Each child will then be interviewed a second by one of the following week, one week later and then two weeks later. Each interview will take approximately 5-10 minutes, and will involve your child being asked to talk about events about the home happenings.

All information obtained will be completely anonymous. A number will be allocated to each child for identification. That is, no child's name will be attached to any information obtained from the interviews.

The study investigation is very important research topic. The successful outcome of the research however depends upon obtaining an adequate number of children and parents to participate in the study. Your child's and your own participation would therefore be greatly appreciated.

This research proposal has been approved by the Ethics Committee of the Australian National University and the Catholic Education Office. Details of the study have been discussed with the principal of your child's school and the school is supportive of this research.

With regard to my experience with children, I was a pupil and I have worked with children at Women's College Hospital in the Foundation Unit. My supervisor for this research is Dr. 12 years' experience as a Child Psychologist and Family Therapist.

If you would like to participate in this study could you please return the attached form to the address by the 9th February 1995. (Monday 12th at the latest or phone me.)
Letter to Parents
The Australian National University
Department of Psychology, Canberra, A.C.T. 0200
Australia

Canberra ACT 0200
Reference:

Dear parents

I am a post-graduate student completing a Masters in Clinical Psychology at the Australian National University. I am presently conducting research to investigate children's capacity to observe detail with regard to their capability as court witnesses.

I am contacting parents of children attending a number of selected schools within the ACT region to ask if they would like to participate in this research.

The aim of this study is to investigate children's capacity to observe and recall details in a real life situation. Research until now has looked at this ability in the laboratory using videotapes, but little research has looked at children's capacity to observe in a real life context. Of particular interest is whether children are able to recall details of events accurately over time. A second interest is whether children will alter their report of events after hearing a parent describe events differently to that which actually occurred.

The study will involve the child completing puzzles at home with one parent for approximately 5-10 minutes. This will occur during the week 12-16 February. Each child will then be interviewed at school by myself the following day, one week later and then two weeks later. Each session will take approximately 5-10 minutes, and will involve your child being asked to recall details about the home session.

All information obtained will be completely anonymous. A number will be allocated to each child for identification. That is, no child's name will be attached to any information obtained from the interviews.

This study investigates a very important research issue. The successful outcome of the research however depends upon obtaining an adequate number of children and parents to participate in the study. Your child's and your own participation would therefore be greatly appreciated!

This research proposal has been approved by the Ethics Committees of the Australian National University and the Catholic Education Office. Details of the study have been discussed with the principal of your child's school and the school is supportive of this research.

With regard to my experience with children, I am a parent and I have worked with children at Woden Valley Hospital in the Paediatrics Unit. My supervisor for this research has 15 years' experience as a Child Psychologist and Family Therapist.

If you would like to participate in this study could you please return the attached form to the school by this Friday 9 February 1995. (Monday 12/2 at the latest or phone me.)
Letter to Parents

If you would like further information please contact me on 231 2387 or 249 2795.

Yours sincerely

Louise Blundell
Post-graduate student
Division of Psychology
School of Life Sciences
Australian National University

***PLEASE RETURN THIS FORM TO YOUR CHILD’S SCHOOL UPON COMPLETION***

Louise Blundell
Division of Psychology
Australian National University
ACT 0200

☐ Yes we would like our child to participate in this research

☐ No we would prefer that our child did not participate in this research

Parents Names: .................................................................
.................................................................

Parents Signatures: .................................................................
.................................................................

Name of Child : .................................................................

Age of Child: ....... years ....... months

Sex of Child: Male / Female

Contact Phone No. : ..............................................

Best time to contact: Day .........................
Time .........................

To prepare for the home session, could you please ensure that you have the following at home:

One plastic cup
One glass cup
One coffee mug
7 coloured pencils (including one red pencil and one blue pencil)
(**children will be reminded to take their pencil case home from school)
### Appendix B

**Loadings of all interview questions on the Single Memory Factor**

<table>
<thead>
<tr>
<th>Question Content</th>
<th>All</th>
<th>Females</th>
<th>Males</th>
<th>5-6yrs</th>
<th>7-8yrs</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. What did the child eat</td>
<td>.84</td>
<td>.87</td>
<td>.78</td>
<td>.80</td>
<td>.86</td>
</tr>
<tr>
<td>2. What did the father eat</td>
<td>.83</td>
<td>.88</td>
<td>.77</td>
<td>.79</td>
<td>.88</td>
</tr>
<tr>
<td>3. Were there flowers on table</td>
<td>.81</td>
<td>.85</td>
<td>.74</td>
<td>.77</td>
<td>.84</td>
</tr>
<tr>
<td>4. What colour of pencils used</td>
<td>.80</td>
<td>.77</td>
<td>.82</td>
<td>.70</td>
<td>.88</td>
</tr>
<tr>
<td>5. What writing tool used</td>
<td>.79</td>
<td>.85</td>
<td>.72</td>
<td>.77</td>
<td>.81</td>
</tr>
<tr>
<td>6. Type of animal hidden in picture</td>
<td>.77</td>
<td>.81</td>
<td>.69</td>
<td>.76</td>
<td>.78</td>
</tr>
<tr>
<td>7. Type of animal in maze</td>
<td>.74</td>
<td>.75</td>
<td>.71</td>
<td>.72</td>
<td>.75</td>
</tr>
<tr>
<td>8. What was own drink</td>
<td>.74</td>
<td>.80</td>
<td>.66</td>
<td>.72</td>
<td>.77</td>
</tr>
<tr>
<td>9. What was parent's drink</td>
<td>.67</td>
<td>.71</td>
<td>.62</td>
<td>.64</td>
<td>.69</td>
</tr>
<tr>
<td>10. Did parent help</td>
<td>.61</td>
<td>.60</td>
<td>.65</td>
<td>.51</td>
<td>.69</td>
</tr>
<tr>
<td>11. Noticed mug with pencils</td>
<td>.61</td>
<td>.63</td>
<td>.60</td>
<td>.67</td>
<td>.56</td>
</tr>
<tr>
<td>12. Number of monkeys hidden</td>
<td>.56</td>
<td>.66</td>
<td>.38</td>
<td>.56</td>
<td>.56</td>
</tr>
<tr>
<td>13. Time of day puzzles completed</td>
<td>.52</td>
<td>.52</td>
<td>.49</td>
<td>.60</td>
<td>.46</td>
</tr>
<tr>
<td>14. Was mother seated at table**</td>
<td>.31</td>
<td>.30</td>
<td>.35</td>
<td>.37</td>
<td>.03*</td>
</tr>
<tr>
<td>15. What was own cup made of**</td>
<td>.28*</td>
<td>.42</td>
<td>.17*</td>
<td>.01*</td>
<td>.31</td>
</tr>
<tr>
<td>16. What was parent's cup made of**</td>
<td>.05*</td>
<td>.04*</td>
<td>.13*</td>
<td>.07*</td>
<td>.27*</td>
</tr>
</tbody>
</table>

* loading < .3

** these questions were excluded from the final memory scale as they did not consistently display a loading of > .3 on the single memory factor when sex and age were taken into account.
Appendix C

Interviews 1 and 2 - Protocol A: Cued Non-Suggestive Questions

a) Verbal Memory - Immediate recall. Say the following to the child:
   "I am going to say a list of words and I want you to listen carefully." Read list, wait 5 s.
   "Now tell me as many of the words as you can remember".

b) Open-ended question. Say the following to the child:
   "Tell me exactly what happened when you were doing the puzzles at home? Tell me as much as you can remember" Prompt: "Just tell me as much as you can remember" Write down everything the child says.

c) "Now I am going to ask you some questions about when you did the puzzles at home. After each answer I will ask you how sure you are." Show the child the ratings sheet.
   "If you are Very Sure point to this one with lots of ticks (point); if you are only a little bit sure point to this one with only one tick (point); if you are not very sure, point to this one with a question mark (point); and if you really don't know, point to this one with lots of question marks (point)." "Are you ready?" (Record all responses on Record Sheet 2A)

1. Did you have a drink on the table while you were doing the puzzles?
   1a. (If yes) What was the drink?
2. Did your Dad/Mum have a drink on the table while you were doing the puzzles?
   2a. (If yes) What was the drink?
3. What did your Dad's/Mum's cup look like? What was it made of?
4. What did your cup look like? What was it made of?
5. Did you have anything to eat while you were doing the puzzles?
   5a. (If yes) What did you eat?
6. Did your Dad/Mum have anything to eat while you were doing the puzzles?
   6a. (If yes) What did he/she eat?
7. What did you use to do the puzzles?
8. What animal was hidden in one of the pictures for you to find?
9. How many were hidden in the picture?
10. What animal had to find its way through the maze to its home?
11. What colours did you use to colour in the picture of the mushroom?
12. Was there anything else on the table besides the puzzles and drinks?
13. (If mention container/mug) Was there anything in the container/mug?
   13a. How many pencils were in the mug/container?
14. Did anyone help you actually do the puzzles? (to find the monkeys or do the maze?)
15. Was anyone else sitting at the table when you were doing the puzzles with your Dad?
16. What time was it when you did the puzzles? (Prompt: Morning, afternoon or night?)


***********
d) Verbal Memory - delayed recall. **Record the time now on Record Sheet 3**
"Remember I read you a list of words a little while ago. Could you tell me all the words you can remember from that list." (record on Record Sheet 3).

e) Verbal Memory - recognition. Say the following to the child:
   "Now I am going to read you some words and I want you to say YES if the word was in the list I read to you before, and NO if it was not in the list I read before." (record on Sheet 3)

THE SESSION IS NOW FINISHED, PLEASE THANK THE CHILD AND SAY YOU WILL SEE THEM NEXT WEEK. MAKE SURE YOU HAVE WRITTEN THE CHILD'S NAME AT THE TOP OF RECORD SHEET 1, AND CALL THE NEXT CHILD.
Appendix D

Interview 1- Protocol B: Misleading Questions

a) Verbal Memory - Immediate recall. Say the following to the child:
   "I am going to say a list of words and I want you to listen carefully." Read list, wait 5 s.
   "Now tell me as many of the words as you can remember".

b) Open-ended question. Say the following to the child:
   "Tell me exactly what happened when you were doing the puzzles at home? Tell me as much as you can remember" Prompt: “Just tell me as much as you can remember”
   Write down everything the child says.

c) Say the following to the child:
   "Now I am going to ask you some questions about when you did the puzzles at home. After each answer I will ask you how sure you are." Show the child the ratings sheet.
   "If you are Very Sure point to this one with lots of ticks (point); if you are only a little bit sure point to this one with only one tick (point); if you are not very sure, point to this one with a question mark (point); and if you really don't know, point to this one with lots of question marks (point)." "Are you ready?" **Record all answers on Record Sheet 2B**

1. Did you enjoy the glass of lemonade you had while doing the puzzles?
2. Did your Dad/Mum enjoy the cup of tea he had while you were doing the puzzles?
3. Did you and your Dad/Mum have the same kind of glass cup for your drinks?
4. Did your father/mother enjoy the biscuits he/she ate while you were doing the puzzles?
5. Did you enjoy the sandwich you had while you were doing the puzzles?
6. What colour were the textas you used to do the puzzles?
7. How many tigers were hidden in the first picture?
8. There were 7 hidden in the picture, did you find all of them?
9. Did you find the rabbit's way through the maze to his home?
10. Did you like the purple and yellow colours you used to colour in the second picture?
11. What colour were the flowers on the table?
12. There was a tin on the table with some crayons in it, did you see the tin?
13. There were about 20 crayons in the tin, were they different colours?
14. When your father/mother helped you do the puzzles, did you ask him not to?
15. Your mother was sitting at the table when you were doing the puzzles with your Dad, did she help you?
16. You did the puzzles in the morning, were you still sleepy?

b) Verbal Memory - delayed recall. **Record the time now on Record Sheet 3**
   "Remember I read you a list of words a little while ago. Could you tell me all the words you can remember from that list." (record on Record Sheet 3).

c) Verbal Memory - recognition. Say the following to the child:
   "Now I am going to read you some words and I want you to say YES if the word was in the list I read to you before, and NO if it was not in the list I read before." (record on Sheet 3)

THE SESSION IS NOW FINISHED, PLEASE THANK THE CHILD AND SAY YOU WILL SEE THEM NEXT WEEK, ENSURE YOU HAVE WRITTEN THE CHILD'S NAME ON RECORD SHEET 1, AND CALL THE NEXT CHILD.
Appendix E

Interview 2- Protocol B: Suggestive Questions

a) Visual Memory - immediate recall. Say the following to the child.

"I am going to show you some pictures and I want you to look at each one carefully."

Show the child each of the 9 pictures for approximately 2 seconds. Count: 1 and 2 etc.
Then when all nine pictures have been shown, wait 5 seconds and say:

"Now tell me what the pictures were. Just tell me as many as you can."
Record the child’s responses on Record Sheet 1.

b) Open-ended question. Say the following to the child:

"Tell me exactly what happened when you were doing the puzzles at home?"

Prompt: "Just tell me as much as you can remember"
Write down everything the child recalls.

c) Questions. Say the following to the child:

"Now I am going to ask you some questions about when you did the puzzles at home. After each answer I will ask you how sure you are." Show the child the certainty ratings sheet.

"If you are Very Sure point to this one with lots of ticks (point); if you are only a little bit sure point to this one with only one tick (point); if you are not very sure, point to this one with a question mark (point); and if you really don’t know, point to this one with lots of question marks (point)." "Are you ready?" ** Record all responses on Record Sheet 2A **

1. Did you drink some Lemonade while doing the puzzles?
2. Did your father/mother have a cup of tea while you were doing the puzzles?
3. Was your cup a glass one like your father’s/mother’s?
4. Did you have a sandwich while doing the puzzles?
5. Did your father/mother have a biscuit while you were doing the puzzles?
6. Did you use textas to write the answers to the puzzles?
7. Were there tigers hidden in the first picture?
8. Were there 7 animals hidden in the first picture for you to find?
9. Was it a rabbit who had to find its way home through the maze?
10. Did you use purple and yellow to colour the picture?
11. Were there flowers on the table when you did the puzzles?
12. Was there a tin with crayons in it, on the table?
13. Were there 20 in the tin?
14. Did your father/mother help you actually do the puzzles? (to find monkeys or do maze)
15. Was your mother sitting at the table when you were doing the puzzles with your father?
16. Was it morning when you did the puzzles?

*d) Visual Memory - delayed recall. Say the following to the child:

"Remember those pictures I showed you a little while ago? I’d like you to tell me as many as you can remember. What pictures can you remember seeing?"

** Record all responses on Record Sheet 3

e) Visual Memory - recognition. Say the following to the child:

"Now I am going to show you some pictures. If the picture was one of the pictures I showed you before say YES. If it was not one of the pictures I showed you before say NO."

"Are you ready?"
Show the child each of the 18 pictures for 2 seconds. Make sure they are ordered 1-18 (on back)
Record all responses on Record Sheet 3.

Please thank the child for their participation
Appendix F

Interview 2- Protocol C: Leading Questions

a) Visual Memory - immediate recall. Say the following to the child.
   “I am going to show you some pictures and I want you to look at each one carefully.”

Show the child each of the 9 pictures for approximately 2 seconds. Count: 1 and 2 etc. Then when all nine pictures have been shown, wait 5 seconds and say:
   “Now tell me what the pictures were. Just tell me as many as you can.”
   Record the child’s responses on Record Sheet 1.

b) Open-ended question. Say the following to the child:
   “Tell me exactly what happened when you were doing the puzzles at home?”
   Prompt: “Just tell me as much as you can remember”
   Write down everything the child recalls.

c) Questions. Say the following to the child:
   “Now I am going to ask you some questions about when you did the puzzles at home. After each answer I will ask you how sure you are.” Show the child the ratings sheet.
   “If you are Very Sure point to this one with lots of ticks (point); if you are only a little bit sure point to this one with only one tick (point); if you are not very sure, point to this one with a question mark (point); and if you really don’t know, point to this one with lots of question marks (point).” “Are you ready?” ** Record all responses on Record Sheet 2A**

1. You drank some lemonade while you were doing the puzzles didn’t you?
2. Your father/mother had a cup of tea while you were doing the puzzles didn’t he?
3. You used a glass cup like your father’s/mother’s for your drink, didn’t you?
4. You had a sandwich while doing the puzzles didn’t you?
5. Your father/mother ate some biscuits while you were doing the puzzles didn’t he?
6. You used textas to write the answers to the puzzles didn’t you?
7. There were tigers hidden in the first puzzle weren’t there?
8. There were 7 hidden for you to find weren’t there?
9. It was a rabbit who had to find his way home through the maze wasn’t it?
10. You used purple and yellow to colour in the picture didn’t you?
11. There were some flowers on the table when you did the puzzles weren’t there?
12. There was a tin on the table with some crayons in it, wasn’t there?
13. There were about 20 crayons in the tin, weren’t there?
14a. Your father/mother helped you find the monkeys didn’t he?
14b. Your father/mother helped you through the maze didn’t he?
15. Your mother was sitting at the table when you were doing the puzzles with your father wasn’t she?
16. You did the puzzles in the morning didn’t you?

**d) Visual Memory - delayed recall. Say the following to the child:
   “Remember those pictures I showed you a little while ago? I’d like you to tell me as many as you can remember. What pictures can you remember seeing?”
   **Record all responses on Record Sheet 3

**e) Visual Memory - recognition. Say the following to the child:
   “Now I am going to show you some pictures. If the picture was one of the pictures I showed you before say YES. If it was not one of the pictures I showed you before say NO.”
   “Are you ready?”

Show the child each of the 18 pictures for 2 seconds each. Make sure they are ordered 1-18 (on back) Record all responses on Record Sheet 3.

Please thank the child for their participation
Appendix Gi

Verbal (Word) Memory - Immediate Recall

Presented at Interview 1, prior to questioning.

Instructions for Interviewer:

Introduce yourself to the child using your first name.

1) Administer the word list memory test first. Say the following to the child.

"I am going to say a list of words and I want you to remember them. When I finish the list I want you to tell me as many of the words as you can remember."

Read the following list of words. (2 seconds between each word)

BANANAS
HAT
GRAPES
BELT
MARBLES
BLOCKS
STRAWBERRIES
BALLOONS
JUMPER

"Now tell me as many of the words as you can remember".

Record all responses on the Word Memory Record Sheet.

Delayed Recall

When all questions from the appropriate interview protocol have been answered, administer the delayed verbal memory test.

**Record the time now on Record Sheet 3**

Say the following to the child:

"Remember I read you a list of words a little while ago. Could you tell me all the words you can remember from that list."

(record on Record Sheet 3 for Interview 1).
Appendix Gii

Verbal Memory - Cued Recall (Recognition)

Following the delayed memory test, say the following to the child:

"Now I am going to read you some words and I want you to say YES if the word was in the list I read to you before, and NO if it was not in the list I read before."

(record on Record Sheet 3)

WORD RECOGNITION TEST - RECORD SHEET

<table>
<thead>
<tr>
<th></th>
<th>YES / NO</th>
<th></th>
<th>YES / NO</th>
<th></th>
<th>YES / NO</th>
</tr>
</thead>
<tbody>
<tr>
<td>SHORTS</td>
<td></td>
<td>GLASSES</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>BANANAS</td>
<td>YES / NO</td>
<td>HAT</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PANTS</td>
<td>YES / NO</td>
<td>CHERRIES</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CAT</td>
<td>YES / NO</td>
<td>RUG</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>GRAPES</td>
<td>YES / NO</td>
<td>BELT</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>MARBLES</td>
<td>YES / NO</td>
<td>BLOCKS</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>KEYS</td>
<td>YES / NO</td>
<td>WATERMELON</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>STRAWBERRIES</td>
<td>YES / NO</td>
<td>BALLOONS</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>APPLES</td>
<td>YES / NO</td>
<td>JUMPER</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

If the child is unsure, say "Just take a guess. Do you think the word was on the list?"
Appendix Hi

**Visual Memory Test - Immediate Recall**

Administered at Interview 2, prior to questioning.

Say the following to the child.

"I am going to show you some pictures and I want you to look at each one carefully."

Show the child each of the 9 pictures for approximately 2 seconds. Count: 1 and 2

Then when all nine pictures have been shown, wait 5 seconds and say:

"Now tell me what the pictures were. Just tell me as many as you can remember."

Record the child's responses on Record Sheet 1.

**Visual Memory - Delayed Recall**

**d)** "Remember those pictures I showed you a little while ago? I'd like you to tell me as many as you can remember. What pictures can you remember seeing?"

"Record all responses on Record Sheet 3"
Visual Memory - Pictures

Appendix Hi (cont)

Show the child each of the 18 pictures in this example. Make sure they are colored 1-18 (for bonus).

Record all responses on Record Sheet 3.

Recognition Memory Test - Record Sheet

- STAR OF DAVID
- TRAPEZOID
- CIRCLE
- DIAMOND
- HALF CIRCLE
- LONG STAR
- DOUBLE CIRCLE
- DIVISION SIGN
- EQUAL SIGN
- DOT
- NO DOT

Responses:

- YES/NO

Instructions:

- The child will be shown each of the 18 pictures.
- Each picture will be colored 1-18.
- The child will be asked to identify each picture.
- Responses will be recorded on Record Sheet 3.
Appendix Hii

**Visual Memory - Cued Recall (Recognition)**

Administered after Delayed Visual Memory test.

Say the following to the child:

"Now I am going to show you some pictures. If the picture was one of the pictures I showed you before say YES. If it was not one of the pictures I showed you before say NO." "Are you ready?"

Show the child each of the 18 pictures for 2 seconds. Make sure they are ordered 1-18 (on back)

Record all responses on Record Sheet 3

**pictures**

**Recognition Memory Test - Record Sheet**

| PLUS SIGN (+) | YES/NO | * | STAR OF DAVID | YES/NO |
| TRIANGLE | YES/NO | * | RECTANGLE | YES/NO |
| CIRCLE | YES/NO | * | LARGE CROSS (X) | YES/NO |
| BLOCK CROSS | YES/NO | * | OVAL | YES/NO |
| DIAMOND | YES/NO | * | CUBE | YES/NO |
| SQUARE | YES/NO | * | DIVISION SIGN | YES/NO |
| MOON | YES/NO | * | PENTAGON | YES/NO |
| LONG STAR | YES/NO | * | EQUAL SIGN (=) | YES/NO |
| DOUBLE CIRCLES | YES/NO | * | HOUSE/TRI BLOCK | YES/NO |
Teacher instructions:

Class: ....................... .

Could you please call all participating children together, hand out an envelope to each of these children, and say the following:

"Tonight you will be doing some puzzles with your parents. It is important that you finish the puzzles on your own. Your parents must NOT help you do the puzzles."

Please ensure that each of the participating children takes their pencil case home with them, ensuring that at least 7 pencils are sharpened, including one red and one blue pencil.

Myself or a Research Assistant will come to the school, on the specified day, after the children have completed the home session, to ask each child a number of questions.

A small table and two chairs will need to be provided in the 'interview room'. Each child will be asked to attend the interview session for approximately 5-10 minutes. I will compile a list of participating children and as each child returns to their desk, the next child will be called promptly to facilitate the ease and speed with which the interview sessions can progress.

Thank you very much for your assistance, it is greatly appreciated!

Louise.
GROUP 1 - Parent Instructions

IMPORTANT: Please do NOT allow your child to assist in setting things up and do NOT discuss any instructions with your child. Thanks for your cooperation, it is important to the study.

If you have two children participating, please do each puzzle session separately, without the other child present.

Two adults are required for the study. If one parent is unavailable, an older sibling may participate.

INSTRUCTIONS: Both parents should read this sheet carefully before the session starts.

Preparation prior to the session:

- Prepare a table (by clearing it completely) at which your child and the child's father (or father figure) can sit to complete the puzzles.
- Please have available a plastic cup for your child, and a glass cup for the child's father.
- Both cups should contain water (or juice if your child will not drink water).
- Two pencils - red pencil and blue pencil - should be placed on the table for the child to use.
- A coffee mug containing 5 coloured pencils should also be placed on the table.

You are ready to start. Please ensure you have read and understood the following instructions before starting. Please phone me if you have any questions (231 2387).

Please seat your child at the table, with the child and the child’s father (or father figure) present at the table. The child’s mother should NOT be seated at the table for the session.

The child’s father should then do the following:

ONLY the red and blue pencils on the table should be used.

- Please record the time started at the top of the first sheet.
- Please ask your child to find how many monkeys are hidden in Puzzle 1
- Please ask your child to complete the maze.
- Please ask your child to colour in the picture using ONLY the red and blue pencils on the table.
- Please record the time completed on the colouring-in sheet.
- Please pack the pencils away in the pencil case, and place the puzzles in the envelope.

For your child the session is now finished. Please thank your child for doing the puzzles.

The parent questionnaire now needs to be completed. Your child must not be present while you are doing this. Please do not delay as the questionnaire needs to be filled out as soon as possible after the session has finished.

Please place the puzzles and questionnaire in the envelope and return it to your child’s school bag. Please ensure that the envelope is sealed. The child’s teacher will ask for the envelope first thing in the morning.

Thank you very much for your participation, it is greatly appreciated.

Louise
Appendix Jii

Parent Instructions - Group 2

Both parents should read this sheet carefully before the session starts.

IMPORTANT: Please do NOT allow your child to assist in setting things up and do NOT discuss any instructions with your child. Thanks for your cooperation; it is important to the study.

If you have two children participating, please do each puzzle session separately, without the other child present. Two adults are required for the study. If one parent is unavailable, an older sibling may participate.

Preparation prior to the session:

. Prepare a table (by clearing it completely) at which your child and the child's father (or father figure) can sit to complete the puzzles.
. Please have available a plastic cup for your child, and a glass cup for the child's father.
. Both cups should contain water (or juice if your child will not drink water).
. Two pencils - red pencil and blue pencil - should be placed on the table for the child to use.
. A coffee mug containing 5 coloured pencils should also be placed on the table.

You are ready to start. Please ensure you read and understand the following instructions before starting. Please phone me if you have any questions (231 2387).

Please seat your child and the child's father (or father figure) at the table. The child's mother must remain in the room where the puzzles are being completed, but should NOT be seated at the same table. The mother should casually observe the session from a short distance.

The child's father (or father figure) should then do the following:

**NOTE: ONLY the red and blue pencils on the table should be used.**

a) Please record the time started at the top of the first sheet.
b) Please ask your child to complete the 'find-the-monkey' puzzle
c) Please ask your child to complete the maze
d) Please ask your child to colour in the picture using ONLY the red and blue pencils
e) Please record the time completed on the colouring-in sheet.
f) Please pack the pencils away in the pencil case, and place the puzzles in the envelope.
g) Could the child's mother please ask the child to come with her while she makes a quick phone call to the experimenter. Could you please phone me now on 2312387. If the number is engaged, please persist as I may be speaking with other parents. Each call should take only 2-3 minutes. I will ask you to say the following:

"The session went well. I think (child's name) father helped him/her do the puzzles. I think (child's name) had a drink of lemonade and a sandwich. I think his/her father had some biscuits and a cup of tea. I think there were tigers hidden in the picture. I think it was a rabbit who found its way home through the maze. I think he/she used yellow and purple to colour in."

**If your child questions what you have said, please say something like "That's what I think", and try to avoid discussion**

The session is now finished for your child. Please thank them for doing the puzzles.
h) The parent questionnaire now needs to be completed. Your child must NOT be present while you are doing this. Please do not delay, as the questionnaire needs to be filled out as soon as possible after the session has finished.

i) Please place the puzzles and questionnaire in the envelope and return it to your child's school bag. Please ensure that the envelope is sealed. The child's teacher will ask for the envelope first thing in the morning.

Thank you very much for your participation, it is greatly appreciated. Louise
Appendix K

Puzzle 1: Find the Monkeys

FIND THE MONKEYS
Puzzle 2: Maze for Younger Children (aged 5-6 yrs)

NO PLACE LIKE HOME!

Brer Bear could get lost if you can’t show him the right way home.
Brer Bear could get lost if you can't show him the right way home.
Appendix M

Puzzle 3: Colour the Mushroom

COLOUR ME IN RED AND BLUE
**Appendix N**

**Parent Questionnaire**

"to be completed at the end of the session without the child present"

Please answer these questions as accurately as possible.

Time session started ..................................... .

Time session completed ................................. .

Was the table cleared completely prior to starting the session? .......... Yes .......... No

Did your child help you set things up? .......... Yes .......... No

Was the cup you used a glass cup? .......... Yes .......... No

If you did not use a glass cup, please describe the cup ..............................................

Was the cup your child used a plastic cup? .......... Yes .......... No

If your child did not use a plastic cup, please describe the cup ..............................................

What type of drink did you provide for your child? Water......... Juice ........

Other (please describe) ........................................................................

What type of drink did you provide for your self? Water ........ Juice ........

Other (please describe) ........................................................................

Was a ceramic coffee mug used to hold the coloured pencils? .......... Yes .......... No

If not, what container was used ........................................................................

How many pencils were in the coffee mug? ...... 5 ...... Other (please specify) ........

What were the colours of the two pencils placed on the table for the child to use?

.......... Red .......... Blue .......... Other (please specify)

........................................ and ........................................

Was anyone else seated at the table while you and your child were completing the puzzles?

.......... Yes .......... No

*If Yes, who else was seated at the table? ........................................................................

Did your child ask you not to help with the puzzles? .......... Yes .......... No

a) Did you help your child to find the monkeys? .......... *Yes .......... No

b) Did you show your child the path through the maze? .......... *Yes .......... No

*If YES to a) or b): Did your child say you weren't to help when you did this?

.......... Yes .......... No
Appendix O

Interview 3 Protocol

All children received cued non-suggestive questions, with follow up when appropriate

a) Open-ended question. Ask the following question:
   "Tell me exactly what happened when you did the puzzles at home?"
   "Write down everything the child recalls. Record Sheet 1"

b) Say the following to the child:
   "Now I am going to ask you some questions about when you did the puzzles at home. Just like before I'll ask you how sure you are. (Show rating scale and ask child which one they would point to if they were Very sure, A little bit sure, Not very sure, and Really don’t know) ** record on Record Sheet 2A**

1. Did you have a drink on the table while you were doing the puzzles?
   1a. What drink did you have?
   1b. (If say lemonade) Do you remember having lemonade, or did you hear someone say you had lemonade?
   1c. (If say heard someone) What drink do you think you had?

2. Did your Dad/Mum have a drink on the table while you were doing the puzzles?
   2a. What drink did he have?
   2b. (If say a cup of tea/coffee) Do you remember seeing your Dad/Mum have a cup of tea/coffee, or did you hear someone say that was his/her drink?
   2c. (If say heard someone) What drink do you think your Dad/Mum had?

3. What kind of cup did your Father use for his drink? What was it made of?

4. What kind of cup did you have for your drink? What was it made of?
   4a. (If say glass cup) Do you remember having a glass cup, or did you hear someone say you used a glass cup?
   4b. (If say heard someone) What cup do you think you used?

5. Did you have anything to eat while doing the puzzles?
   5a. What did you eat?
   5b. (If say sandwich or biscuits) Do you remember eating a sandwich/biscuits, or did you hear someone say you ate a sandwich/biscuits?
   5c. (If say heard someone) What do you think you ate?

6. Did your father have anything to eat while you were doing the puzzles?
   6a. What did he eat?
   6b. (If say biscuits) Do you remember your father eating some biscuits, or did you hear someone say he ate some biscuits?
   6c. (If say heard someone) What do you think your Father ate?

7. What did you use to do the puzzles? What did you use to write with?
   7a. (If say textas/crayons) Do you remember using textas/crayons, or did you hear someone say you used textas/crayons?
   7b. (If say heard someone) What do you think you used to do the puzzles?
Appendix O (cont)

8. What animal was hidden in one of the pictures for you to find?
   8a. (If say tiger) Do you remember seeing tigers, or did you hear someone say there were tigers hidden in the puzzle?
   8b. (If say heard someone) What animal do you think was hidden in the maze?

8i. How many were hidden in the picture?
   8ia. (If say 7) Do you remember seeing 7, or did you hear someone say there were 7?
   8ib. (If say heard someone) How many do you think were hidden in the picture?

9. What animal had to find its way home through the maze?
   9a. (If say rabbit) Do you remember that it was a rabbit, or did you hear someone say it was a rabbit?
   9b. (If say heard someone) What animal do you think had to find its way home through the maze?

10. What colours did you use to colour the picture? (Prompt: the picture of the mushroom)
    10a. (If say purple/yellow) Do you remember using purple and yellow, or did you hear someone say those were the colours you used?
    10b. (If say heard someone) What colours do you think you used to colour in the picture?

11. Was there anything on the table besides the puzzles and drinks?
    (May say flowers &/or tin/cup-ask both)
    11a. (If say flowers) Do you remember seeing flowers on the table, or did you hear someone say there were flowers on the table?
    11b. (If say heard someone) What do you think was on the table besides the puzzles and drinks?
    11c. (If say tin) Do you remember seeing a tin, or did you hear someone say there was a tin on the table?
    11d. (If say heard someone) What do you think was on the table besides the puzzles and drinks?

*12. (**If say tin/cup) Was there anything in the tin/cup?
    12a. (If say crayons) Do you remember seeing crayons in the tin/cup, or did you hear someone say there were crayons in the tin/cup?
    12b. (If say heard someone) What do you think was in the tin/cup?

*13. (**If say pencils/crayons) How many pencils/crayons were in the tin/cup?
    13a. (If say about 20) Do you remember seeing about 20 pencils/crayons, or did you hear someone say there were about 20 pencils/crayons in the tin/cup?
    13b. (If say heard someone) How many pencils/crayons do you think were in the tin/cup?

14. Did anyone help you actually do the puzzles? Help you to find the monkeys or do the maze?
    14a. (If say yes) Do you remember your Dad/Mum helping you do the puzzles, or did you hear someone say he/she helped you do the puzzles.
    14b. (If say heard) Do you think your father/mother helped you actually do the puzzles?
15. Was anyone else sitting at the table when you were doing the puzzles with your father?
   15a. (If say Mum) Do you remember your Mum sitting at the table, or did you hear someone say your Mum sat at the table when you did the puzzles?
   15b. (If say heard) Do you think your mother sat at the table while you were doing the puzzles?

16. What time was it when you did the puzzles? (Prompt: Morning, afternoon, night?)
   16a. (If say morning) Do you remember doing the puzzles in the morning, or did you hear someone say you did the puzzles in the morning?
   16b. (If say heard someone) What time do you think it was when you did the puzzles?

(Ask these questions very gently) (Prompt: That's OK if you did if the child looks worried)

17. Over the past few weeks when I've asked you the questions, did you say any answers to me that you didn't think were right, but you said them anyway?
   18a. Why do you think you did that?
   18b. Was it because you weren't sure of the right answer?
   18c. Was it because you thought that was what your Mum wanted you to say?
   18d. Was it because you thought that was what I wanted you to say?

18. Did you think anyone was trying to get you to say things that weren't quite right?
   17a. Who do you think was doing that?
   17b. Do you think your mother was?
   17c. Do you think I was trying to trick you with the questions, so you would say things that weren't quite right?
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