The Effectiveness of the Cognitive Interview Procedure with Child Witnesses

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Submitted in fulfilment of the requirements for the degree of
Doctor of Psychology (Forensic)

Deakin University

May, 2013
I certify that the thesis, entitled:

The Effectiveness of the Cognitive Interview Procedure with Child Witnesses

is the result of my own work and that where reference is made to the work of others, due acknowledgment is given.

I also certify that any material in the thesis that has been accepted for a degree or diploma by any university or institution is identified in the text.

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Date: 28/09/2013
List of Publications


Refereed Conference Papers

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The cognitive interview (CI) procedure is an interview protocol consisting of several memory and communicative strategies designed to enhance the quantity and quality of eye-witness accounts. While there is an abundance of research indicating that the CI can enhance witness memory, research in relation to the child witness is still in its infancy. The purpose of this thesis is to extend research into novel areas that may further inform the effectiveness of the CI with child witnesses. To that end, two studies, each with a markedly distinct focus, were conducted.

Study 1 examined the effect of a modified context reinstatement instruction (a component of CI) on children’s recall of an experienced event. Specifically, it examined whether drawing to reinstate the context better enhanced children’s event recall and resistance to suggestive questions than the traditional mental context reinstatement (MCR). Seventy five- to six-year-old children and 71 eight- to nine-year-old children participated in a magic show and were individually interviewed approximately a week later. Before freely recalling the event, some children were instructed to mentally reinstate the context of the event (MCR group), others were asked to draw the context of the event (DCR group), and others received no reinstatement instructions (NCR group). At the end of the interview, all children were directed to respond to a pre-set list of suggestive questions. Results showed that MCR and DCR had no impact on children’s free recall or responses to open-ended prompts. Follow-up analyses indicate that a power issue cannot be ruled out. However, the interview condition affected children’s responses to suggestive questions: those in the DCR group gave more accurate responses than did those in the NCR group. These findings provide preliminary support for the use of drawing as an easily implemented, potentially protective exercise that lessens the impact of biased questions with child witnesses.
Study 2 investigated whether the CI not only enhances event recall, but also the coherence of narrative accounts provided by children with and without intellectual disabilities (ID). One hundred and fifty children watched a videotaped magic show and a day later were individually interviewed using the CI or a structured interview (SI). Overall, children with ID reported fewer correct details about the magic show than those without ID. Children interviewed using the CI reported more correct details than those interviewed using the SI. Additionally, children interviewed using the CI reported more contextual and background details, more logically ordered story elements, more temporal markers, and had fewer inconsistencies in their stories than those interviewed using the SI. However, the CI did not increase the number of story grammar elements compared to the SI. Overall, children interviewed with the CI told better stories than those interviewed with the SI. This finding provided further support for the effectiveness of the CI with vulnerable witnesses, particularly children with ID.

Overall, there were two major findings from the current research. First, reinstating the context by a drawing prior to an initial free recall shows promise in protecting children against the effect of suggestive questions - and on a practical level, it is child-friendly and easy to implement. Second, children with and without ID are able to give a more coherent account when interviewed by the CI. As a coherent account is viewed as more credible by players in the criminal justice system, the value of this finding is that it contributes (albeit in a small way) to increasing access to justice for an under-represented population. While the CI (as a whole) continues to garner support for its effectiveness in enhancing witness recall, the same cannot be said for the use of MCR (and DCR) alone. Without a clearer understanding of the individual difference factors that may moderate its effect, there is no basis to include it as way to enhance children’s event recall in investigative interviews at this time.
CHAPTER 1 - INTRODUCTION, AIMS AND STRUCTURE OF THE THESIS

The cognitive interview (CI) is one of the most prominent interview protocols used in investigative interviewing. Developed for police by psychologists Edward Geiselman and Ronald Fisher, the protocol is designed to maximise the completeness and accuracy of an eyewitness account. It comprises a series of interviewer instructions that facilitate the interviewee’s memory retrieval, as well as strategies aimed to improve the communicative and social dynamics between interviewer and interviewee (Fisher & Geiselman, 1992). These strategies are delivered in a phased framework designed to elicit information from the broad (i.e., free narrative) to the specific (responses to specific questions). The phased framework is considered best practice interviewing in many countries (Powell, Fisher, & Wright, 2005).

The CI protocol has attracted much attention from researchers since its inception nearly three decades ago. While early research was interested in determining whether the CI was effective in improving an eyewitness account compared to a standard police interview (e.g., Geiselman, Fisher, MacKinnon, & Holland, 1985), subsequent research focused on determining the variables and conditions under which the CI was effective (with varied versions of the protocol and with use of differing control interview conditions). This body of research provides substantial evidence that the CI enhances witness recall over a range of to-be-remembered event types, retention intervals and witness populations. Moreover, a recent meta-analysis of 46 published articles (from over 25 years) found a large and significant increase in the recall of correct event details when the CI was used, with only a small increase in incorrect details (Memon, Meissner, & Fraser, 2010).

To date, only a small proportion of the existing research has examined the conditions under which the CI is beneficial for children – despite a greater need for effective interview techniques for this vulnerable population compared to the young
adults who make up the majority the studies. Overall, results are promising: the
majority of studies have shown that the CI has a beneficial effect on children’s
memory, with only a few exceptions. For instance, children interviewed with the CI
report an impressive 21% (Geiselman & Padilla, 1988) to 64% (McCauley & Fisher,
1995) increase in correctly recalled event details than children in a control interview.
Recent work has demonstrated that the effectiveness of the CI can be extended to
children as young as four years (Holliday, 2003a, 2003b; Holliday & Albon, 2004).

The aim of the thesis is to build on the promising results of the CI with child
witnesses. This needs to be done for at least three reasons. First, from a practical
perspective, there is substantial evidence showing that police have difficulty in
implementing the CI in their daily practice (Brown, Lloyd-Jones, & Robinson, 2008;
Clarke & Milne, 2001; Dando, Wilcock, & Milne, 2008; Kebbell, Milne, & Wagstaff,
1999). This indicates that more work is required to successfully translate the benefits
of the protocol outside of the laboratory. Several problems have been identified that
contribute to poor implementation of the CI, including the lengthy administration time
(Davis, McMahon, & Greenwood, 2005) and the cognitive demands the protocol
places on the interviewer (Fisher & Geiselman, 1992). In particular, the memory
retrieval instruction mental context reinstatement (MCR) is identified as the most
cumbersome and lengthy to administer out of all the memory strategies (Memon,
Holley, Wark, Bull, & Köhnken, 1996), which likely explains why some researchers
have found it to be the least utilised by police (e.g., Clarke & Milne, 2001).

Mental context reinstatement involves the interviewer providing a series of
verbal cues that guides the witness to mentally reconstruct the physical and personal
features of the to-be-remembered event. The instructions are delivered directly prior to
eliciting a free narrative from the witness (a fuller explanation will be provided in the
following chapter). Recently, promising results were found with a novel solution to
make the MCR more user-friendly by modifying how the interviewer delivers the strategy with adult witnesses (Dando, Wilcock, Milne, & Henry, 2009; Dando, Wilcock, & Milne, 2009b). Essentially, a ‘drawing’ MCR (known here as a DCR) was tested, where the witness reinstates the context by drawing as much as they can remember about the event. This mode of reinstatement was found to be as effective as the traditional MCR. Interestingly, a field study with alleged child abuse victims also found drawing to reinstate the context helped children recall more event details (Katz & Hershkowitz, 2010). These promising results warrant further attention.

The second rationale of extending research in the CI with children is that, while CI researchers have sensitively responded to the developmental needs of children when applying the CI, work is still in its infancy. Again, concerns centre on MCR, and, again, on the process whereby interviewers provide verbal cues. However, the concern is of a theoretical rather than a practical nature. Underpinning MCR is the theory of ‘encoding specificity’ (Tulving & Thomson, 1973). Simply put, the fundamental idea is that memory retrieval of an event is facilitated by making the circumstances of retrieval as similar as possible to circumstances of encoding. According to the encoding specificity theory, the greater the overlap between conditions at encoding and retrieval, the better the witness’s recall for the event. However, the verbal cues provided by (adult) interviewers may not be the types of cues child witnesses would use, as personally relevant contextual cues are idiosyncratic (Salmon & Salmon, 2001). Drawing to reinstate the context, therefore, may be more effective than MCR because the child witness’s own cues would be utilised.

The third reason why research into the use of the CI with children needs to be built on is that the boundaries of the CI’s potential benefits on children’s eyewitness accounts are not yet adequately mapped. For instance, a recent innovative stream of
investigative interview research outside of the CI area shifted its focus of investigation from the traditional memory framework to a story grammar framework (cf. Feltis, Powell, & Roberts, 2010; Murfett, Powell, & Snow, 2008; Snow, Powell, & Murfett, 2009; Westcott & Kynan, 2004). That is, instead of examining the conditions under which the memory of the witness is optimised (e.g. the number of correct, incorrect and confabulated recalled event details), the focus was to investigate conditions under which the witness is able to tell their story in a way that maximises the understanding of the listener. This line of research was motivated by the consideration that a logical and coherent account is one of the ways juries assess witness credibility (Raskin & Esplin, 1991), a major factor in juror decision-making (Davis, Hoyano, Keenan, Maitland, & Morgan, 1999).

To examine children’s storytelling abilities, researchers imported Stein and Glenn’s (1974) widely utilised story grammar framework from linguistic studies and applied it to children’s eyewitness accounts. The framework is based on the premise that for a ‘story’ (i.e. the account) to be logical and meaningful to the listener, it should comprise seven logically sequenced story grammar elements, including the following: setting, initiating event, internal reaction, plan, attempt, direct consequences and resolution (a fuller description of these elements will be provided later). In essence, the framework is a template for the speaker to organise their story for the purpose of transferring it in a manner that makes it easy for the listener to comprehend ‘what happened’. Up to now, work in this area has been of an exploratory nature, examining the conditions under which story grammar production in children’s eyewitness accounts are optimised (e.g., the effect of question type), in both field and laboratory settings. As yet, no study has examined whether the CI can improve children’s ability to provide a logical and coherent account.
The aim of this thesis is to examine the effectiveness of the CI protocol with child witnesses by responding to these aforementioned issues arising from the current state of the literature. Two original stand-alone studies with a markedly different focus from each other will be presented. Study 1 responds to the need to explore ways to fine-tune the effectiveness and the ease of implementation of the CI protocol by testing a modified delivery of MCR with child witnesses. Specifically, this study investigates whether a DCR would better enhance memory of child witnesses than the traditional MCR. Study 2 responds to the need to further test the boundaries of the CI protocol’s effectiveness. This study investigates whether the CI enhances the coherency of an eyewitness account in children with and without intellectual disability (ID). Study 2 includes children with ID because evidence suggests that they are more likely to be abused than their non-ID counterparts (Crosse, Kayne, & Ratnofsky, 1993), and are more disadvantaged as witnesses in the criminal justice system (Gudjonsson, Murphy, & Clare, 2000).

Five chapters follow the current introductory chapter. Chapter 2 provides an overview of the cognitive interview procedure. Chapter 3 offers a critical review of the CI research. Chapters 4 and 5 provide the two original studies introduced above (with each presented in its own chapter in the format of a fully contained journal article). Chapter 6 summarises the key findings of both studies, discusses implications for theory and practice and proposes directions for future research.
CHAPTER 2 - THE COGNITIVE INTERVIEW PROCEDURE

Geiselman et al. (1984) developed the CI for use with witnesses and/or victims in response to requests by police. The (then) recent findings of the Rand Corporation (1975) suggested an imperative need for a method of improving police interviewing. Specifically, their examination of the criminal investigative process revealed that eyewitness accounts were crucial to solving cases – yet the majority of police received no formal training on how to interview a witness. To further reinforce the need of a forensic tool to aid police in gaining an eyewitness account, research was starting to establish the fallibility of eyewitness memory (Buckout, 1980; Loftus, 1979). In the first effort by psychologists to develop an investigative interview protocol, Geiselman et al. (1984) imported sound psychological principles from the laboratory and married it with input from police in the field. The initial result was a protocol that consisted of four memory retrieval strategies (or mnemonics). Upon further action research which identified the deficits in actual police interviewing, the protocol was revised to include social and communicative strategies, in addition to a recommended sequential structure.

The aim of the current chapter is to provide a brief description of both the original and revised CI. In addition, while this is not a review of the literature (which will be provided in the next chapter), some key studies involved in the development of the protocol will be included. This chapter opens by presenting the original CI, describing each of the mnemonics and outlining the psychological principles on which they rest. Next, research related to the development of the protocol is presented. The chapter then summarises the social and communicative components of the revised CI (known hereafter as the enhanced CI), in addition to its proposed sequential structure in which to deliver the strategies. After presenting research that evaluates the revisions made to the protocol, this chapter concludes with a brief examination of efforts of
others (besides its creators) to revise and enhance the CI protocol for the purpose of increasing its effectiveness.

2.1 Original CI

As stated above, the original CI comprises four mnemonics. The following provides a full description of each based on Fisher and Geiselman (1992)\(^1\). The first, and the most distinctive of the mnemonics, is the *mental context reinstatement* (MCR) instruction. It entails the interviewer encouraging the witness to bring to mind the environmental particulars of the witnessed event, as well as the physiological and perceptual aspects that were present, including what they were thinking and feeling - and this is done prior to asking them to recount what happened. The contextual features of the to-be-remembered event are reinstated by the interviewer slowly and deliberately providing a series of verbal cues. A 5-10 second pause is given between the delivery of each cue to afford the witness time to concentrate and build an image relating to the particular cue (during this pause the witnesses may verbalise or silently bring to mind the pertinent information). To facilitate concentration and to minimise distraction, the witness is asked to close their eyes before the contextual cues are provided. As previously mentioned, this mnemonic is based on the theory of memory which states that the greater the similarity between features that were present at encoding and the memory cues given at retrieval, the better the memory for the event (Tulving & Thomson, 1973). An example of an instruction is:

> “To help you concentrate I want you to close your eyes or look down at your lap. Now I want you to think back to that day and get a clear picture of it in your head. (pause) Think back to what you saw there. (pause) Think about any sounds you may have heard. (pause) Think back to what you were feeling. (pause) What were you thinking?”

\(^1\) The following examples the instructions of each of the mnemonics are drawn from Fisher and Geiselman (1992), Geiselman et al. (1986), Griffiths and Milne (2010).
Many CI researchers consider MCR to be the most important of the memory retrieval strategies (Davis et al., 2005; Memon & Higham, 1999; Milne & Bull, 2002) (but see Chapter 3 and 5).

The second mnemonic is the report everything instruction. After the context of the event is reinstated, the witness is instructed to recount everything that comes to mind, regardless of the level of associated confidence or how inconsequential or incomplete the information. This mnemonic explicitly conveys the need to the witness that they are required to report a far greater level of detail than in normal conversation. The purpose of the strategy is also to overcome witnesses withholding details due to such reasons as the perception that the information is not relevant, that it may contradict a previous account, or when details come to mind whilst recalling a different part of the event, leading to them being suppressed. The value of this strategy is that it increases the likelihood that witnesses provide information of investigative or evidentiary value. Indeed, instructing witnesses to ‘report everything’ is now widely utilised in the investigative interviewing area at large. An example of an instruction is:

“I was not there that day so I don’t know what happened. I need you to tell me everything that you can remember, no matter how trivial, out of place or incomplete the memory. Please do not edit anything out of your account. Take your time and tell me everything you can remember”. A free narrative account follows.

The third and fourth mnemonics are instructions that vary how the to-be-remembered event is retrieved from memory, they are: recall the event in a different order and recall the event from a different perspective. These mnemonics draw on multiple-component trace theory of memory (Bower, 1967). Simply, because memories are conceptualised as interconnected association networks, there are multiple potential retrieval access points. By attempting retrieval from different starting points or from different positions, it creates the opportunity of activating a cue
that would consequently trigger associated memories, thereby augmenting recall. Additionally, forcing recall from a different retrieval path should disrupt the possible delimiting effect of rehearsal (from either privately thinking about the event or from repeatedly providing an eyewitness account), thus resulting in new information. Below is a description of each of the mnemonics and examples of the instructions.

The recall the event from a different order instruction directs the witness to recall the to-be-remembered event from a different starting point, such as from the middle, or from the end to the beginning. An example of an instruction is:

“I would like you to try something that can sometimes help people to recall more information. I want you to tell me everything that happened, but this time I would like you to tell it to me backwards, starting from the last thing that you can remember, through to the first thing you remember’ Prompt with ‘and what happened before that?”

The recall the event from a different perspective instruction entails directing the witness to recall the to-be-remembered event from the perspective of another person who was present at the scene of the crime or from a different physical location. The empirical basis for the inclusion of this mnemonic is from work by Anderson and Pichert (1978) and Nigro and Neisser (1983) who showed retrieval of extra information from memory is possible when shifting perspective. An example of an instruction is:

“Now keeping in mind I am only interested in what you actually witnessed, I would like you to recall everything that happened as if you witnessed it from the perspective of the other witness/perpetrator”.

The caution at the start of this instruction is advised because forcing the witness to adopt another perspective can result in the fabrication of details (Fisher & Geiselman, 1992; Memon & Köhnken, 1992), and the importation of information from
other sources (Nigro & Neisser, 1983). Note, an analysis of the effectiveness of the mnemonics in isolation from each other will be presented in Chapter 3.

2.2 Early Research

Preliminary testing of the CI showed promise in its ability to enhance eyewitness memory. For instance, in Geiselman et al.’s (1985) study, participants were interviewed by experienced police officers with a CI, a hypnosis interview or a ‘typical’ police interview two days after viewing a police training film of an emotionally arousing and realistic crime. Notably, 30% to 35% more correct event details were reported by witnesses interviewed by the CI and hypnosis interview, relative to the usual police interview. There was no difference in the amount of incorrect information recalled across interview conditions.

While the initial development and testing of the original CI was done in consultation with police, up to this date the inside of the police interview room had been closed to psychologists. What was known was that interviewing witnesses, compared to suspects, was viewed as a low-status activity and that, as mentioned previously, the interview skills were acquired “on the job”, in the vacuum of little or no training (Shepherd & Milne, 2002). To better understand police interview practices for the end purpose of informing the development of the CI, Fisher, Geiselman and Raymond (1987) analysed witness interviews conducted by US police detectives via content analysis. Results revealed what was long suspected - police had poor interviewing skills, preventing and hindering a full and accurate eye-witness account. Typically, police dominated interviews, asking a series of specific questions with some interviewers using inappropriate language, leading questions, negative phrasing and a rapid-fire questioning style. This excessive use of specific questions, as opposed to open-ended prompts (i.e., ‘tell me what happened’), circumvents the witness’s
ability to tell their story, and produces an account that is shaped by and limited to the questions asked. Further, police asked questions in a sequence that met their own needs rather than the needs of the witness (e.g., the interviewer had a predetermined list of questions that was followed as opposed to asking a question based on what the witness had just said). This meant that questions were often incompatible with what the witness was currently thinking, thereby compromising recall. Interruption was a major problem with all interviewers; witnesses’ concentration was interrupted after an average of only 7.5 seconds of narration. Overall, police conducted interviews without regard to the needs of the witness, making little attempt to facilitate recall. These results were replicated soon after with experienced UK police officers (George & Clifford, 1992).

2.3 Enhanced CI

Informed by the above insights and from further discussions with police, the CI underwent refinement to include strategies aimed at maximising communication and enhancing the working relationship between interviewer and interviewee. A sequential phased structure was also developed to better coordinate the techniques (i.e., the memory strategies), optimise the use of questions in eliciting accounts and formalising other components, such as greeting and closure (Fisher, Geiselman, Raymond, Jurkevich, & Warhaftig, 1987). The following provides a description of the social and communicative strategies across each phase of the enhanced interview. A table summarising the phases and components of the CI protocol, based on Fisher and Geiselman (1992) is also be provided.

The development of rapport is a critical social/communicative strategy (see Table 2.1). Suggested methods to create a relaxed, informal and accepting interpersonal space include personalising the interaction by using the witness’ name as
much as possible, presenting self in a genuine manner, using reflective listening, communicating empathy through verbal and non-verbal means, and the avoidance of stylistic speech and jargon. Further, using open-ended prompts/questions to elicit personal information is another way to build rapport (and this has the additional desirable function of affording the witness practice with providing extended narrative) (Powell et al., 2005). Rapport is a vital element in quality interpersonal interactions (Tickle-Degnen & Rosenthal, 1990), and in the investigative interviewing setting, it functions to foster a safe place where the witness is motivated to recall potentially upsetting memories, and then be comfortable enough to share them with another (Lamb, Hershkowitz, Orbach, & Esplin, 2008; Wilson & Powell, 2001). The use of rapport as a way to enhance communication has empirical support. Collins, Lincoln and Frank (2002) found witnesses recalled more correct information when the interviewer adopted a gentle tone, open body language, made use of the witness’s name and ensured a physical environment that maximised communication, compared to witnesses interviewed in a ‘neutral’ or ‘abrupt’ manner.

Another social/communicative strategy is to transfer control of the interview to the witness for the purpose of creating a witness-centric interview. The aim of the instruction is to promote active participation by the witness, encouraging a sense of empowerment in a social interaction where the power relations intrinsically favour the interviewer. To do this, the witness is explicitly told to work hard and be active in providing relevant information, as the interviewer has no knowledge of the event. Open-ended prompts also serve to promote the expectation that the witness, and not the interviewer, does most of the talking, as these types of questions elicit extended as opposed to brief responses.

A further social/communicative strategy included in the enhanced protocol is a set of ‘ground rules’ which clarify the expectations of the interview. Specifically, the
witness is told to *concentrate* on the task of recalling the event and is urged *not to guess*. Some interviewers also include ground rules that highlight that it is acceptable to say “I don’t understand” and “I don’t know” (Memon, Zaragoza, Clifford, & Kidd, 2010). The later strategies are more commonly used with vulnerable witnesses, such as children and individuals with an intellectual disability, and are an example of efforts to tailor the CI to meet the needs of different types of witnesses.

*Witness-compatible questioning* is a key social/communicative strategy in the revised CI. Witness-compatible questioning entails asking questions that are in line with witnesses’ mental operations and are congruent with what they are thinking and reporting throughout the interview. This type of questioning attempts to take into account individual differences in what people perceive and form in mental images of an event – that is, some people may focus on what was said, compared to others who may be concerned with the actions of the perpetrator. The ‘activation’ of the mental image, followed by probing with appropriate questions promotes a focused retrieval of information in a manner that encourages concentration and conserves the cognitive demand placed on the witness. It is noteworthy that being in tune with what the witness is thinking is one of the most difficult techniques to master in the CI (Fisher & Geiselman, 2010).

Finally, the provision of sequential structure was introduced in the enhanced CI to address the haphazard questioning style used by police and to formalise other practices (i.e., review and closure) identified in encouraging a good working relationship with the witness and interviewer. As shown in Table 2.1, Phase 1 includes techniques for opening and laying the groundwork for the interview. In Phase 2, the context of the to-be-remembered event is reinstated and the witness is urged to report everything. Phase 3 and 4 is the substantive stage of the interview, where an exhaustive narrative account via open-ended prompts (e.g., ‘tell me what happened’) is
Table 2.1

*The Enhanced Cognitive Interview Protocol*

<table>
<thead>
<tr>
<th>Phase 1:</th>
<th>Build rapport:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>• greet</td>
</tr>
<tr>
<td></td>
<td>• personalise the interview</td>
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<tr>
<td></td>
<td>• ensure witness is comfortable.</td>
</tr>
<tr>
<td></td>
<td>Explain the aims of the interview</td>
</tr>
<tr>
<td></td>
<td>Introduce ground rules (concentrate, do not guess)</td>
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<tr>
<td></td>
<td>Transfer control of interview to the witness.</td>
</tr>
<tr>
<td>Phase 2:</td>
<td>Mentally recreate the context and report everything.</td>
</tr>
<tr>
<td>Phase 3:</td>
<td>Initiate a free narrative:</td>
</tr>
<tr>
<td></td>
<td>• use open-ended prompts</td>
</tr>
<tr>
<td></td>
<td>• witness-compatible questions</td>
</tr>
<tr>
<td></td>
<td>• do not interrupt</td>
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<tr>
<td></td>
<td>• do not rush, use pauses between questions/prompts.</td>
</tr>
<tr>
<td>Phase 4:</td>
<td>Follow-up questioning based on free narrative:</td>
</tr>
<tr>
<td></td>
<td>• generate and probe image</td>
</tr>
<tr>
<td></td>
<td>• witness compatible questions</td>
</tr>
<tr>
<td></td>
<td>• open-ended prompts followed by specific questions</td>
</tr>
<tr>
<td></td>
<td>• use pauses</td>
</tr>
<tr>
<td></td>
<td>• do not interrupt.</td>
</tr>
<tr>
<td>Phase 5:</td>
<td>Vary retrieval (<em>change perspective</em> and <em>change order</em>).</td>
</tr>
<tr>
<td>Phase 6:</td>
<td>Summarise and review account back to witness.</td>
</tr>
<tr>
<td>Phase 7:</td>
<td>Close the interview:</td>
</tr>
<tr>
<td></td>
<td>• thank and bring witness back to neutral or positive mood</td>
</tr>
<tr>
<td></td>
<td>• brief on what will happen next</td>
</tr>
<tr>
<td></td>
<td>• exchange contact information and encourage to contact if anymore details are recalled.</td>
</tr>
</tbody>
</table>
elicited, followed by questions that probe for elaboration on what was mentioned in the free narrative (e.g., ‘you mentioned that the two men entered the store right after the boy wearing the blue t-shirt left. Tell me everything that happened when the two men came in’). Good use of open-ended probes/questions is recommended because responses to these questions are more accurate than those elicited by specific questions (e.g., Lipton, 1977; Orbach & Lamb, 2001; Powell & Snow, 2007). As in Phase 5, where the witness is directed to vary the retrieval of the event (i.e., ‘reverse order and ‘change perspective’) the interviewer should use witness-compatible questions, interrupt as little as possible and make use of pauses to allow the witness to collect their thoughts. Phase 6 entails the interviewer summarising the account back to the witness in their own words in order to check its completeness and accuracy. In Phase 7 - closing the interview - the witness is thanked for their efforts and they are informed what will happen next. The other crucial task of this phase is for the interviewer to ensure the witness does not leave distressed. This step of closing the interview on a positive note is not only ethical practice, but increases the likelihood that the witness would contact the interviewer in the event that more information is recalled.

2.4 Evaluating the Revisions of the Protocol

Only one study has compared the enhanced CI to the original version (Fisher et al., 1987). Undergraduates viewed a short video depicting a crime and then were interviewed two days later using either the original CI or the enhanced CI. The results showed that the enhanced CI elicited a remarkable 45% more correct event details than the original version, without increasing the number of incorrect or confabulated details reported. This revised CI has since become the official version of the protocol and soon after the publication of the CI manual (1992), it was incorporated into a national interviewer training program adopted by police in England and Wales. Other
countries (e.g., New Zealand, Australia, Canada, and Norway) and agencies (e.g., the US Federal Bureau of Investigation and National Transportation Safety Board) have also since adopted the CI in their interview practice.

However, the evolution of the CI has not been finalised - many CI researchers continue to create and test modified versions of the protocol (see Memon, Meissner et al., 2010 for a summary). While the proliferation of versions of the protocol has led to a complex research picture, there have been sound reasons for these efforts. For instance, some researchers have been interested in augmenting the cost-benefit ratio of the protocol by reducing redundant information (Brunel, Py, & Launay, 2012), or in testing the efficacy of a new mnemonic (Colomb & Ginet, 2012). Others have concentrated their efforts on reducing the time the interview protocol takes to implement and increasing the ease of administering the interview (Dando et al., 2009b; Dando, Wilcock, Behnkle, & Milne, 2011; Davis et al., 2005; Shiraishi, Naka, & Ebihara, 2006) or on tailoring the CI to the needs of a particular population, such as children (Geiselman & Padilla, 1988; Holliday & Albon, 2004; Verkampt & Ginet, 2010), the elderly (Wright & Holliday, 2007) or the intellectually disabled (Isaacs, 2005; Milne, Clare, & Bull, 1999). As outlined in the previous chapter, the desire to improve the practical applicability and suitability of the CI for child witnesses motivates the original study that will be presented in chapter 4.

2.5 Summary

To sum, in the first of its kind, Fisher and colleagues developed the CI for the purpose of improving investigative interviewers’ ability to elicit full and accurate eyewitness accounts. Theories of memory and cognition from the laboratory were married with input and insights from police in the field, ultimately resulting in a phased interview protocol incorporating strategies to optimise memory retrieval and
communication of information. Disseminated in a how-to manual for practitioners in the early 1990’s, the CI has now been included in the training of police and other investigative bodies in several countries. The sustained effort by researchers to test and refine the protocol has ensured the CI’s on-going relevance in the field of investigative interviewing.
CHAPTER 3 - REVIEW OF THE COGNITIVE INTERVIEW RESEARCH

Over the last 30 years, a large number of studies have examined the effect of the cognitive interview (CI) on eyewitness memory. The aim of the current chapter is to provide an up-to-date review of the literature. The scope of this review will include studies that have investigated: the effectiveness of the CI protocol as a whole; the effectiveness of the mnemonics in isolation and; the effectiveness of modified versions of the protocol. Moreover, within this scope, this review endeavours to (briefly) outline the extent of the variables and conditions under which the CI has been examined, and to more closely review the CI’s effectiveness in several key areas, such as witness confidence, misinformation/suggestibility and eyewitness identification.

While a range of witness populations will be included in the current review (to adequately canvas the breadth of the CI literature), due to the focus on this thesis, special attention will be given to studies concerning child witnesses.

3.1 The Effectiveness of the CI Protocol

To date, over 70 experiments have been published that have tested the efficacy of the CI on eyewitness memory, with all but two of the experiments conducted in the laboratory. Typically, investigations into the effectiveness of the CI protocol have utilised comparison groups of either a standard interview (i.e., a typical interview to that particular organisation, with no training in the CI) or a structured interview (i.e., identical to the CI protocol but without the mnemonic components). Over recent years, the trend of comparison group used to test the effectiveness of the CI favours the structured interview (Memon, Meissner et al., 2010), likely due to the high level of experimental control it affords compared to the standard interview.

The CI has been examined under multiple conditions and variables that are thought to be analogous with experiences in the real world. For instance, the CI
(compared to a comparison interview), successfully enhances the memory of witnesses interviewed after a delay (of witnessing the event) of 2 days (Geiselman et al., 1984), 1 week (Larsson, Granhag, & Spjut, 2003), 2 weeks (Brock, Fisher, & Cutler, 1999), 6 months (Larsson et al., 2003) and 35 years (Fisher, Falkner, Trevisan, & McCauley 2000) (but see Memon, Cronin, Eaves, & Bull, 1993). The CI has also shown to elicit 70% more information than a standard interview (of the US National Transportation Safety Board), both when participants are interviewed 5 minutes after viewing the event and two weeks later, in a second interview (Brock et al., 1999). Furthermore, the protocol is superior to a comparison interview for recalling: familiar and unfamiliar events (Mantwill, Köhnken, & Aschermann, 1995), events that took place in a familiar environment (Campos & Alonso-Quecuty, 1998), staged crimes (Fisher, Geiselman, Raymond, Jurkevich et al., 1987), and filmed road accidents (Brock et al., 1999; Chapman & Perry, 1995; Roos, 2007). The CI is effective with low and high emotionally-aroused witnesses (Ginet & Verkampt, 2007) and for recalling conversations with adult witness (Campos & Alonso-Quecuty, 2008; Öhman, Eriksson, & Granhag, 2012) and older adults witnesses (Prescott, Milne, & Clarke, 2011). Thus, the CI appears to be a versatile protocol.

In terms of geographical generalisability, the CI has been tested and found to be effective across several countries, including: England (e.g., Milne & Bull, 2002; Memon et al., 1996; Chapman & Perry, 1995), the USA (e.g., Fisher, Geiselman, & Amador, 1989; Geiselman et al., 1985), France (e.g., Ginet, & Verkampt, 2007; Verkampt, & Ginet, 2010), Germany (e.g., Köhnken, Schimossek, Aschermann, & Höfer, 1995), Sweden (e.g., Allwood, Ask, & Granhag, 2005; Granhag, Jonsson, & Allwood, 2004), and Australia (e.g., Davis et al., 2005; Roos, 2007). In addition, recent research has shown that the CI enhances the memory of witnesses in the developing country of Brazil (Stein & Memon, 2006).
The results of the two meta-analyses conducted in this area provide a more comprehensive picture of the CI’s effectiveness (compared to a structured or standard interview). The earlier analysis includes 42 published and unpublished studies (Köhnken, Milne, Memon, & Bull, 1999) and the later, 46 published studies (Memon, Meissner et al., 2010), (N.B., 26 studies are included in both studies). Importantly, both meta-analyses found a strong effect size for the number of correctly recalled event details with witnesses interviewed by the CI ($d = 0.87$ and $d = 1.20$, respectively). Köhnken et al. (1999) further reported that, overall, witnesses recalled 42% more correct information when interviewed by the CI, compared to a comparison interview. While it was also found that witnesses reported 25% more incorrect information, the accuracy rate (calculated by: correct details/correct + incorrect + confabulated details) was very similar to the comparison groups (CI = 85%, comparison interviews = 82%). The higher rate of incorrect information elicited in the CI and the similarity in the accuracy rate between the CI and a comparison interview was replicated in the more recent meta-analysis (Memon, Meissner et al., 2010). The significance of a comparable accuracy rate between interview protocols is that it shows that while the CI increases the quantity of correct and incorrect event details it is not at the expense of the quality of the account. Nevertheless, the prudent investigator should keep in mind that the absolute number of incorrect event details can be increased with the CI protocol (Memon & Stevenage, 1996b). The consequence of more correct information reported at the cost of more incorrect information may have different implications depending on the stage of the legal process, and the availability of corroborating evidence. A salient point is that all CI studies should include an accuracy rate and, unfortunately, this is still not always the case (e.g., Hammond, Wagstaff, & Cole, 2006).
Changing the focus from the laboratory to the field, in the only two studies carried out to date, police interviewers successfully enhanced memory retrieval of real witnesses using the CI. Fisher et al. (1989) and George and Clifford (1996) enlisted the service of 16 experienced US detectives and 28 experienced English officers, respectively. Though there were some differences in design across studies, on common ground the experiments compared the tape-recorded interviews of officers trained in the CI to (1) their own interviews conducted before training, and to (2) a control condition of untrained officers. George and Clifford (1996) and Fisher et al. (1989) found that compared to their own interviews before training, police officers were able to elicit 55% and 47% more details, respectively, and that trained officers elicited significantly more information than the untrained officers. Of note is that these findings fit comfortably within the range of memorial scores presented in the meta-analyses of laboratory studies conducted by Köhnken et al. (1999) and Memon, Meissner et al. (2010).

George and Clifford (1996) made additional valuable analyses which shed light on how well police were able to apply the CI protocol. Interestingly, it was revealed that police did not use all four memory strategies consistently. That is, while ‘mental context reinstatement’ (MCR) was reliably used, ‘report everything’, ‘change perspective’ and ‘change order’ were rarely utilised. The failure to use the whole CI protocol has since been replicated in later work (Brown et al., 2008; Clarke & Milne, 2001; Dando et al., 2008; Kebbell et al., 1999), though there are differences in which memory strategies are favoured across the studies. Moreover, not only do analyses show police are inconsistent in their delivery of the CI components, they do not do it particularly well (Memon, Holley, Milne, Köhnken, & Bull, 1994). Work into modifying the protocol to be more user-friendly will be briefly reviewed in the last section of this review (N.B., it is the motivation for Study 1 presented in Chapter 4).
Before moving on, the limitations of the field studies need be discussed. First, the samples of both field studies were small and only experienced officers were included, which restricts the generalisability of results. Second, in the Fisher et al. (1989) study, the officers were selected to participate by the researchers, though it is unclear on what grounds this was done. And thirdly, the designs of both studies did not include a ‘follow-up’ condition, where the ability of police to maintain the interview skills gained in the CI training was assessed. This later limitation is especially problematic given the well-established finding that training in ‘best interview practices’ fail to translate into lasting change in everyday police practices (Fisher & Schreiber, 2007; Lamb et al., 2008; Lamb et al., 2009; Powell, 2002; Powell et al., 2005; Sternberg, Lamb, Davies, & Westcott, 2001). Discouragingly, the CI protocol is no exception to this, despite its being formally adopted by various police forces nationally (Fisher & Schreiber, 2007; Kebbell et al., 1999). In fact, the development of training programs that are capable of producing lasting change is a vested goal for investigative interviewing researchers (Lamb et al., 2008; Lamb et al., 2009; Powell, 2002), and it is considered a complex and challenging task.

The effectiveness of the CI with children and other vulnerable witnesses

Researchers have turned their attention to investigating whether the effectiveness of the CI protocol can be generalised to vulnerable populations – that is, groups of people who are traditionally viewed as less competent than the average citizen. Though more work is required, the CI shows promise in facilitating memory retrieval in elderly adults (Mello & Fisher, 1996; Prescott et al., 2011; Wright & Holliday, 2007; but see McMahon, 2000), cognitively impaired elderly adults (Wright & Holliday, 2007) and adults with intellectual disability, (but see Maras & Bowler, 2010). Undoubtedly, the population that has received the most attention is children.
Considering children typically produce a less complete witness account than adults (Hershkowitz, Orbach, Lamb, Sternberg, & Horowitz, 2001; Larsson & Lamb, 2009; Wilson & Powell, 2001), it is promising that, in general, research shows that the CI enhances the memory of children (Akehurst, Milne, & Köhnken, 2003; Chapman & Perry, 1995; Geiselman & Padilla, 1988; Larsson et al., 2003; Larsson & Lamb, 2009; McCauley & Fisher, 1995; Milne & Bull, 2003; Saywitz, Geiselman, & Bornstein, 1992; Verkampt & Ginet, 2010), with only a few exceptions (Geiselman & Saywitz, 1991; Memon, Cronin, Eaves, Bull, & Kupper, 1992; Memon, Wark, Holley, Bull, & Köhnken, 1997). Recently, a series of studies has shown that the CI has a beneficial effect with children as young as 4 years (Holliday, 2003a, 2003b; Holliday & Albon, 2004).

While the CI is, overall, less effective with children than adults (i.e., the effect size for children is $d = 0.91$, compared to young adults, $d = 1.21$, Memon, Meissner et al., 2010), theoretically it would be expected that age effects be in the opposite direction - with children showing greater benefit of the CI than adults. This is based on the expectation that the CI’s memory retrieval strategies would become less crucial as developmental proficiency in the self-utilisation of memory retrieval strategies increases over childhood into adulthood (see Ackerman, 1985; Bruck, Melnyk, & Ceci, 2000). Surprisingly, however, research that has included two age groups of children to test this, have found no effect of age (Akehurst et al., 2003; Dietze, Powell, & Thomson, 2010; Dietze, Powell, & Thomson, 2012; Holliday, 2003; Verkampt & Ginet, 2010). In contrast to these findings, Hayes and Delamothe (1997) found older children (e.g., 9-11 years old) benefitted more from the CI than younger children (e.g., 5-7 years old). It was speculated that the older children’s superior metamemory skills may have fostered a greater appreciation of the possible benefits of utilising the strategies (Hayes & Delamothe, 1997). More work is needed to fully understand the
beneficial effect of the CI over the developmental span. To address this, Study 1 of the current thesis included two age groups of children to investigate whether a drawing context reinstatement better enhances memory than a mental context reinstatement.

Concerning children with intellectual disabilities (ID), only one published (Robinson & McGuire, 2006) and two unpublished studies (Milne & Bull, 1996; Price, 1997) have investigated the potential benefits of the CI on memory, and results have indicated that the CI’s beneficial effect is generalised to this population also. For instance, 7-9 year old children with ID were interviewed by a structured interview or a CI after viewing a three minute video (Robinson & McGuire, 2006). Results show that children interviewed by the CI were able to recall twice the amount of correct details than children in the SI. In line with the findings of the meta-analyses, children in the CI condition gave more incorrect details than those in the standard interview condition, and the accuracy rate was similar between conditions. However, it may be that the rise in incorrect information in this particular study resulted from the surprising inclusion of the ‘change perspective’ mnemonic in the interview protocol - this mnemonic is considered the least child-appropriate (the appropriateness of individual CI components for children and the subsequent modification to the protocol will be discussed in the following two sections). Unfortunately, Robinson and McGuire (2006) did not make any anecdotal observations on how children fared on this particular mnemonic, nor did they include any analyses that may shed light on this. A larger concern with the study, however, is the omission of ‘MCR’ in the CI condition due to an unavoidable problem in executing the research. Considering that ‘MCR’ has much potential value on memory retrieval, it makes the results all the more impressive - but it begs for another study to be conducted with the inclusion of more appropriate mnemonics. Given that children with ID are more vulnerable to maltreatment than their non-ID peers (Sullivan & Knutson, 2000), and are under-
represented in the criminal justice system due to being perceived as less reliable than the mainstream population (Gudjonsson et al., 2000; Henry, Ridley, Perry, & Crane, 2011), more work is warranted. As mentioned previously, addressing the under-representation of children with ID in the criminal justice system was the motivation for the study presented in the Chapter 5.

**Witness confidence and the CI**

Research has shown that the more confident the witness is in their account, the more accurate others judge it (Brewer & Wells, 2006; Cutler, Penrod, & Stuve, 1988; Lindsay, Wells, & Rumpel, 1981). In contrast to this, it has been found that the relationship between accuracy and eyewitness confidence is weak (Bothwell, Deffenbacher, & Brigham, 1987; Wells & Murray, 1984). Further, eyewitness confidence is malleable, meaning it may be inflated or deflated depending on factors such as repeated questioning (Shaw & McClure, 1996), briefing prior to testifying (Wells, Ferguson, & Lindsay, 1981), or feedback on what other witness have reported (Luus & Wells, 1994).

Given these findings, CI researchers have raised the concern that the CI may unduly influence the confidence of interviewees. One line of argument is that the CI could unrealistically reduce witness confidence as the witness attempts to be more liberal in reporting information they feel less certain about (Roberts & Higham, 2002). Alternatively, it has been speculated that the CI may inflate witness confidence because the superior amount of information recalled may, in itself, falsely inspire confidence (Gwyer & Clifford, 1997). Similarly, as the ‘MCR’ instruction facilitates memory rich in detail, it may give rise to a sense of confidence in those memories (Granhag et al., 2004).
Overall, results support the conclusion that the CI does not unduly affect witness confidence (Allwood et al., 2005; Granhag et al., 2004; McMahon, 2000; Mello & Fisher, 1996; but see Gwyer & Clifford, 1997).

For instance, Mello and Fisher (1996) interviewed young and older adults with a CI or a SI and then asked participants to rate how confident they were in the accuracy of their accounts. Results indicated that confidence was not affected by interview or age. This finding has been generalised to children. McCauley and Fisher (1995) interviewed second-graders after participating in a Simon Says game with either the CI or a SI, twice – the first within 3 hours of the game, the second, two weeks later. In line with previous research, they found that the CI had a significant beneficial effect on the children’s memory, and the advantage of the CI carried over when the children were interviewed for a second time. When the confidence ratings (anchored to a 5-point scale) obtained at the end of each interview were compared across interview type for Time 1 and for Time 2, McCauley and Fisher found that the level of confidence was not affected by interview type. However, it should be noted that this study separately analysed Time 1 and Time 2, so an interaction cannot be ruled out. Specifically, it is possible that there may be an additive effect of confidence over Time 1 and Time 2 depending on interview type.

Nevertheless, there is convergent research that supports the finding that the CI does not unduly influence confidence in children. Fisher, Mello and McCauley (1999) used a mock jury design, where accounts of 7-year-old children derived from either a CI or a SI were rated on witness variables (including sincerity, accuracy, forcefulness, intelligence, trustworthiness, credibility and confidence) and on the interviewer variable of manipulativeness. They found that not only were the witness variables (including confidence) non-significant between interviews, but that the interviewer
using the CI was perceived to be less manipulative compared to the interviewer using
the structured interview.

More current studies investigating the relationship between confidence and
accuracy have abandoned the point-biserial correlation approach and have instead
utilised calibration methodology for a more sophisticated and powerful analysis of the
relationship. Simply, the calibration method assesses how realistic the judgment of
confidence is by computing a calibration score, in part by taking into account the
relationship with correct details at a particular class interval of confidence ratings (for
a full description see Brewer & Wells, 2006). Using this methodology, Allwood et al.
(2005) found no difference between the confidence judgments on the accuracy of free
recall accounts given by undergraduates that were elicited by a CI or a SI on a brief
filmed crime scenario.

Overall, it appears that the CI enhances the quantity and quality of eyewitness
accounts, without unduly influencing witnesses’ associated confidence. It may be that
the confidence generated by good memory performance is offset by the knowledge
that some of the details reported are of a dubious nature.

**Misinformation effect/suggestibility and the CI**

Witnesses are vulnerable to multiple sources of misinformation that may
potentially contaminate memory, including: inappropriate leading questioning, media
coverage, and exposure to alternate versions of the event from other witnesses. The
focus of concern has been on children, and not without some justification. It is well-
established that children are at higher risk than adults for memory distortions caused
by the introduction of misinformation, with younger children more suggestible than
older children (Ceci & Bruck, 1993; Wilson & Powell, 2001). In response to this
phenomenon, investigative interview researchers have been interested in interview
techniques that minimise the intrusion of misinformation in accounts, and there is
growing evidence to suggest that with appropriate interview techniques, children can
provide accurate eyewitness accounts (Lamb et al., 2008; Wilson & Powell, 2001).

Evidence that the CI can reduce misinformation in children is mixed, with the
protective effect of the CI complicated by when and how the misinformation is
presented. Specifically, misleading (and control) information can be presented to the
children before or after they experience a CI or a SI. Studies that have introduced
misinformation to the children before they were interviewed found that the CI was
unable to retroactively protect against the incursion of misinformation into their
subsequent accounts (Hayes & Delamothe, 1997; Memon et al., 1996; Milne & Bull,
2003). More recently, work by Holliday (2003b) has challenged this finding. Briefly,
Holliday introduced a ‘self-generated’ misinformation condition, where the child was
prompted to orally self-supply the erroneous information, and this was compared to a
misinformation condition where the experimenter read out misleading or neutral
summaries (similar to the previous studies). Under the self-generated condition, but
not the latter, the CI was helpful in minimising misinformation when it was introduced
prior to the child being interviewed.

Results are mixed on whether the CI protects children’s eyewitness account
against the effects of misinformation when it is introduced after a CI. Some
researchers have found that the CI does protect against the intrusion of false
information (Memon et al., 1996; Milne & Bull, 2003), but others have not (Holliday,
2003a; Holliday & Albon, 2004). The conflicting results are likely to be the result of
different measurements, procedures and designs across studies. Considering the real
world implications of eliciting false information in an eyewitness account, more work
is needed in this area to concisely map the beneficial effect of the CI. The present
thesis intends to expand this line of inquiry in Study 1 (Chapter 5) by testing whether
‘drawing context reinstatement’ better protects against the adverse effects of misleading questions than a ‘mental context reinstatement’ interview.

**Recognition memory and the CI**

One area that the CI has been unsuccessful in enhancing memory is related to recognition tests. For example, in one study 16 to 18 years olds were randomly allocated to a CI or a SI and were interviewed at 48 hours or 96 hours after witnessing a staged event (Gwyer & Clifford, 1997). After the participants were interviewed they were presented with a ‘perpetrator-absent’ photo line-up, then a ‘perpetrator-present’ photo line-up. Results suggest that while the CI, compared to the SI, was able to enhance the description of the person at both times, it was unable to improve the student’s memories in identifying the perpetrator when he was present in the photo array, though it did aid in correctly rejecting the perpetrator-absent line-up. Gwyer and Clifford (1997) hypothesised that the CI may not have been effective because of the outshining hypothesis. Simply, the retrieval cues used to guide memory are dominated by the physical presence of the features of the to-be-remember stimulus, thereby ‘outshining’ efforts to mentally recreate it. It may be that information concerning persons derived from the CI should be limited to using the descriptions to inform the contents of the photo-line-up. Recently, the inability of the CI to improve recognition memory was extended to the area of earwitnessing in adults and children (Öhman et al., 2012).

### 3.2 The Effectiveness of the Isolated Components of the CI Protocol

The evaluation of the individual contribution of the CI components arose soon after the CI protocol (as a whole) started to show promise in enhancing eyewitness memory. This interest was motivated by both the theoretical concern to better
understand how the CI works to enhance memory, and the practical concern of
ascertaining the necessity of including all the techniques for its beneficial effect.
Tables 3.1 and 3.2 summarise the studies that have examined the effectiveness of the
individual components of the CI. As can be seen, they differ across age groups, control
groups and included mnemonics.

Overall, findings are mixed regarding the effectiveness of the mnemonics on
their own. Specifically, some studies have found that each of the isolated mnemonics
are equally effective in enhancing memory as the others, but is no more effective than a
control condition (e.g. a retrieval attempt with a ‘try hard’ encouragement: Memon et
al., 1996; Milne & Bull, 2002). In contrast, others demonstrate that some mnemonics
are significantly better at increasing the amount of recall compared to the control
condition (Boon & Noon, 1994; Dietze & Thomson, 1993; Hammond et al., 2006;
Geiselman et al., 1986). To further complicate the picture, some of the mnemonics
have been found to be less efficacious than others. The following section will unpack
this complex research area, but with the caveat that differences across studies in
‘choice of control interview’, ‘delay between the event and interview’, ‘memorability
of the memory stimulus’, and ‘interviewer instructions’, as well as design, places
limits on any conclusions that can be drawn.

In the two most comprehensive studies to date, it was unexpectedly found that
the isolated mnemonics were no better than the control interview in enhancing
memory (Memon et al., 1996; Milne & Bull, 2002). There are three possible
explanations for the results. First, Milne and Bull (2002) speculate that their null
finding resulted from a design issue that attenuated the possible effect of the
mnemonics on memory. Specifically, witnesses were directed to supply a free
narrative before they recalled the event with the mnemonic to which they had been
Table 3.1  
Mean Correct Event Details as a Function of Instruction

<table>
<thead>
<tr>
<th>Study</th>
<th>Population</th>
<th>N</th>
<th>FI</th>
<th>MCR</th>
<th>RE</th>
<th>CP</th>
<th>CO</th>
<th>MCR+RE</th>
<th>TH</th>
<th>C</th>
<th>FR</th>
</tr>
</thead>
<tbody>
<tr>
<td>Geiselman et al. (1986)</td>
<td>Undergraduates</td>
<td>60</td>
<td>28</td>
<td>23</td>
<td>24</td>
<td></td>
<td></td>
<td></td>
<td>18</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dietze &amp; Thomson (1993)a</td>
<td>6 year olds</td>
<td>36</td>
<td>5</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>2</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>11 year olds</td>
<td>36</td>
<td>13</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>8</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Adults</td>
<td>36</td>
<td>34</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>29</td>
</tr>
<tr>
<td>Boon &amp; Noon (1994)</td>
<td>Undergraduates</td>
<td>93</td>
<td>5.6</td>
<td>5.6</td>
<td>1.7</td>
<td>4.4</td>
<td></td>
<td></td>
<td>2.2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Memon et al. (1996)</td>
<td>5-9 year olds</td>
<td>68</td>
<td>16</td>
<td>15</td>
<td>13</td>
<td>19</td>
<td>19</td>
<td>19</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>17-18 year olds</td>
<td>68</td>
<td>26</td>
<td>31</td>
<td>31</td>
<td>31</td>
<td>31</td>
<td>31</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Milne &amp; Bull (2002)</td>
<td>5-6 year olds</td>
<td>47</td>
<td>15</td>
<td>11</td>
<td>14</td>
<td>18</td>
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<td>7</td>
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<td></td>
<td>8-9 year olds</td>
<td>44</td>
<td>24</td>
<td>16</td>
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<td>17</td>
<td>32</td>
<td>32</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Undergraduates</td>
<td>34</td>
<td>25</td>
<td>22</td>
<td>15</td>
<td>22</td>
<td>27</td>
<td>32</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hammond et al. (2006)a</td>
<td>11-12 year olds</td>
<td>64</td>
<td>16</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>6</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Adults</td>
<td>62</td>
<td>20</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>10</td>
</tr>
<tr>
<td>Dando et al. (2001)b</td>
<td>Undergraduates</td>
<td>54</td>
<td>38.4</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>34.5</td>
</tr>
</tbody>
</table>

FI = Full Interview, MCR = Context Reinstatement, RE = Report Everything, CP = Change Perspective, CO = Change Order, TH = Try Harder, C = Controls, FR = Free Recall  
*a One other condition was not represented because it was not comparable to the other studies;  
*b Experiment 2  
*c Experiment 1
### Table 3.2

**Mean Incorrect Event Details as a Function of Instruction**

<table>
<thead>
<tr>
<th>Study</th>
<th>Population</th>
<th>N</th>
<th>FI</th>
<th>MCR</th>
<th>RE</th>
<th>CP</th>
<th>CO</th>
<th>MCR+RE</th>
<th>TH</th>
<th>C</th>
<th>FR</th>
</tr>
</thead>
<tbody>
<tr>
<td>Geiselman et al. (1986)</td>
<td>Undergraduates</td>
<td>60</td>
<td>1.1</td>
<td>1.5</td>
<td>1.0</td>
<td></td>
<td></td>
<td></td>
<td>2.2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dietze, &amp; Thomson (1993)</td>
<td>6 year olds</td>
<td>36</td>
<td></td>
<td></td>
<td>0.5</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>0.5</td>
<td></td>
</tr>
<tr>
<td></td>
<td>11 year olds</td>
<td>36</td>
<td></td>
<td></td>
<td></td>
<td>2.0</td>
<td></td>
<td></td>
<td></td>
<td>2.0</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Adults</td>
<td>36</td>
<td></td>
<td></td>
<td></td>
<td>2.5</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>2.0</td>
</tr>
<tr>
<td>Boon, &amp; Noon (1994)</td>
<td>Undergraduates</td>
<td>93</td>
<td>0.7</td>
<td>1.4</td>
<td>0.6</td>
<td>0.7</td>
<td></td>
<td>1.3</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Memon et al. (1996)</td>
<td>5-9 year olds</td>
<td>68</td>
<td>4.3</td>
<td></td>
<td>3.4</td>
<td>6.8</td>
<td></td>
<td>5.3</td>
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<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>17-18 year olds</td>
<td>68</td>
<td></td>
<td>2.2</td>
<td></td>
<td>2.6</td>
<td>2.1</td>
<td>2.9</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Milne, &amp; Bull (2002)</td>
<td>5-6 year olds</td>
<td>47</td>
<td>0.9</td>
<td>0.4</td>
<td>1.0</td>
<td>0.8</td>
<td>1.7</td>
<td>0.4</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>8-9 year olds</td>
<td>44</td>
<td>1.5</td>
<td>1.8</td>
<td>0.3</td>
<td>1.9</td>
<td>1.9</td>
<td>0.9</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Adults</td>
<td>34</td>
<td></td>
<td>2.5</td>
<td>0.4</td>
<td>0.7</td>
<td>2.4</td>
<td>2.0</td>
<td>2.0</td>
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<td>2.0</td>
</tr>
<tr>
<td>Hammond et al. (2006)</td>
<td>11-12 year olds</td>
<td>64</td>
<td>4.8</td>
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<td></td>
<td></td>
<td></td>
<td>5.2</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Adults</td>
<td>62</td>
<td>5.2</td>
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<td></td>
<td></td>
<td></td>
<td>5.1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dando et al. (2011)</td>
<td>Undergraduates</td>
<td>54</td>
<td>0.7</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>1.0</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Notes:**
- FI = Full Interview, MCR = Context Reinstatement, RE = Report Everything, CP = Change Perspective, CO = Change Order, TH = Try Harder, C = Controls, FR = Free Recall
- One other condition was not represented because it was not comparable to the other studies
- Experiment 2
- Experiment 1
assigned. This may also explain the null finding in Memon et al.’s (1996) study, as they employed the same design as Milne and Bull.

Second, it is possible that the null is the true state of affairs (i.e., that there is no difference between the mnemonics and the control condition to enhance memory). Specifically, Memon et al. (1996) speculate that the effectiveness of the CI (found in previous studies) was merely the result of additional retrieval attempts - otherwise known as the reminiscence effect (i.e., where new information is recalled upon subsequent retrieval attempts). However, there are two lines of findings that argue against this explanation. One - there is evidence to suggest that a combination of mnemonics is superior to the control condition (Geiselman et al., 1986; Milne & Bull, 2002), indicating that the mnemonics contribute incrementally to a beneficial effect of memory (over and above a reminiscence effect). And two, Campos and Alonso-Quecuty (1999) explicitly tested the hypothesis that the beneficial effect of the CI is the result of a reminiscence effect, comparing it to an interview matched on number of retrieval attempts. Results indicated that the CI was still found to better enhance witness memory. This result has been replicated and extended by others who have statistically tested for differences between the CI and the control interviews in: number of retrieval attempts (Davis et al., 2005); number of questions asked (Holliday, 2003) and; duration of the interview (Centofanti & Reece, 2006; Dando et al. 2009b; Holliday, 2003).

Third, it is speculated that another possible reason for the null finding between the mnemonics and the control condition on memory performance for Memon et al. (1996) and Milne and Bull (2002) studies is that there may have been a lack of power to detect an effect (in other words a Type II error may have been made). As seen in Table 3.1 and Table 3.2, the number of participants per cell in the two studies is low. It may be that with sufficient numbers the promising trend of ‘MCR’ and ‘change order’ would have reached significance for Milne and Bull.
So what might explain why the other studies (see Boon & Noon, 1994; Dietze & Thomson, 1993; Hammond et al., 2006; Geiselman et al., 1986) found that the isolated mnemonics are significantly better at increasing the recall of correct event details compared to the control condition? While the conflicting findings are likely, in part, an artefact of the research design (mentioned previously), it may also be a function of differences in the delivery of the mnemonic instructions. Unfortunately, Memon et al. (1996) and Milne and Bull (2002) do not include a full description of the way the interviewer delivered the instructions, which circumvents a closer analysis. However, that there are differences in memory performance depending on the way the mnemonics are delivered might explain the differences in the means of particular mnemonics across studies. To give an example, referring to Table 3.1, it appears that Hammond et al.’s (2006) ‘MCR’ instruction, delivered by a three minute pre-recorded spiel, is more effective at enhancing memory than Dietze and Thomson’s (1993) ‘MCR’ instruction, delivered by five standardised directions. It may be that in comparison to the later study, the former study supplied more contextual cues, thereby optimising ‘feature overlap’ (recall the ‘encoding specificity hypothesis’ outlined in Chapter 1). Clearly, the versatility in the way that the mnemonic instructions can be delivered differs across the four memory strategies. For instance, the ‘report everything’ instruction intrinsically does not lend itself for many variations in the way it is delivered, compared to the ‘MCR’. The issue of mnemonic instructions will be visited further in Chapter 4.

As mentioned previously, some mnemonics found less empirical support for their efficacy in memory enhancement than others. Undoubtedly, the less supported mnemonic is the ‘change perspective’. In an oft-cited study, Boon and Noon (1994) raised questions regarding its utility in memory enhancement because it was the only one out of the four memory strategies that failed to elicit further information after

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2 Unfortunately, none of the studies included effect sizes.
participants ‘reported everything’. Further, Memon et al. made the anecdotal observation that the children in her study had difficulty in understanding the mnemonic. However, again the issue of exactly how the instructions are communicated to the interviewee arise. Specifically, Memon et al. noted that children better understood this instruction when asked to adopt a change of location rather than a change of person.

Still, even here the results are not straight-forward. That is, Geiselman et al. (1986) did not include ‘change perspective’ (or ‘change order’) in his study because he concluded from his experience in interviewing that the memory strategies had obvious value. Moreover, examining the mean correct details in Table 3.1, it illustrates that the adults in Memon et al.’s study performed as well using the ‘change perspective’ as the other mnemonics, though this is in contrast to Milne and Bull’s (2002) results. To speculate, the difference in findings may partly be due to the possibility that the mnemonic may only be effective following a free recall, though this does not explain Milne and Bull’s (2002) result. The upshot of these mixed results is that the ‘change perspective’ mnemonic has an uncertain status in the CI literature.

There are also now conflicting findings regarding the efficacy of the ‘change order’ mnemonic. Specifically, in contrast to Boon and Noon (1994) who found that recall was superior with a ‘change order’ instruction than a ‘try again’ instruction, more recent work by Dando, Ormerod, Wilcock and Milne (2011) found that witness recall was not enhanced by this mnemonic. The later study speculated that this mnemonic may disrupt the role of temporal clustering in retrieval - thereby impacting negatively on recall. To that end, they tested participants over one of three interview conditions that included two retrieval attempts: ‘free recall – free recall’; ‘change order – free recall’; ‘free recall – change order’. The authors argued that the findings support the above theory, as it was found that both interview conditions containing the ‘change order’
instruction resulted in *less* correct information recalled than the condition containing the two retrieval attempts via free recall.

When considering why the results varied between the two studies, it is likely that differences in the control condition and the recall instructions are in part responsible. For instance, while Dando et al.’s participants responded to the memory retrieval strategies verbally, Noon and Boon’s. participants responded in writing. It may be that writing the responses reduced the cognitive load required for this memory strategy, thus offsetting the negative effect of disrupting the function of temporal clustering in retrieval. A study comparing the two methodologies would be useful in explicating this. It is also worth noting that, due to the design of Dando’s et al. study, it cannot be ruled out that the ‘change order’ mnemonic may have incremental value to the overall beneficial effect of the CI, as proposed by Milne and Bull (2002).

Regarding errors of commission pertaining to the ‘change order’ mnemonic, Dando, Ormerod et al. (2011) reported that participants had a higher number of confabulations in their account when the event was *initially* recalled in a reversed temporal order (i.e., change order – free recall). However, as in other studies (Boon & Noon, 1994; Memon et al., 1996; Milne & Bull, 1996), no difference was found in the number of confabulations or incorrect details between the ‘free recall – free recall’ and the ‘free recall – change order’ conditions. It is this latter finding that shows the mnemonic does not increase errors of commission that is pertinent to practice, as the ‘change order’ is always utilised after an exhaustive narrative account is given (as seen in Table 2.1). Overall, Dando, Ormerod’s et al. (2011) results cast some doubt on the ability of the ‘change order’ to increase the amount of information a witness can recall, though more work is needed to draw firmer conclusions.

Another interesting finding emerging from this line of research is that, because many of the above studies (i.e., Boon & Noon, 1994; Hammond et al., 2006; Geiselman
et al., 1986) did not include rapport in their designs, the beneficial effect of the CI protocol may not exclusively be a function of the social and communicative strategies, there may also be an effect of the mnemonics. This partially addresses Memon, Wark, Holley, Bull and Köhnken’s (1997) speculation that the beneficial effect of the CI is due to these relationship and communication enhancing strategies. Nevertheless, since a study isolating the beneficial effects of the social and communicative strategies (broken down by techniques such as rapport and transfer control) has not been done, it circumvents an analysis of their individual contribution to the whole protocol.

**The effectiveness of the isolated mnemonics with child witnesses**

The effectiveness of the CI’s mnemonics for children has been of some concern to CI researchers, given the developmental considerations. As noted above, Memon et al. (1996) anecdotally reported that some young children had trouble in implementing ‘change perspective’. Saywitz et al. (1992) and Geiselman, Saywitz and Bornstein (1993) made similar observations and they also reported that ‘change order’ was somewhat difficult for the children. Further, there has been debate in the literature regarding the possibility that ‘change perspective’ and ‘change order’ may encourage children to confabulate (e.g., Ceci, Bruck, & Battin, 2000; Saywitz et al., 1992). How do these qualitative observations compare to results of Milne and Bull’s (2002) componential analyses? Findings show no effect of age; the mnemonics were similarly beneficial for adults as for children. Further, there was no evidence in the presented studies that children had difficulty with the ‘change order’ mnemonic. Nevertheless, the consequence of these conflicting findings/observations is that there are reservations about the utility the ‘change order’ and ‘change perspective’ mnemonics with child witnesses. In contrast to these two mnemonics, the encouragement to ‘report everything’ is uncontroversial and is now embedded in best practice guidelines in the
investigative interviewing area at large (e.g., Powell & Wilson, 2001; Lamb et al., 2008).

Evidence regarding the unique beneficial effect of MCR for children is promising but inconsistent. That is, while most studies have found MCR to be of benefit (e.g., Dietze & Thomson, 1993; Hammond et al., 2006; McCauley & Fisher, 1995), others have not (Memon et al., 1997; Milne & Bull, 2002). Also, results were equivocal in the only field study investigating the effect of MCR on memory (Hershkowitz et al., 2001). Specifically, while a MCR instruction did not increase the overall amount of information children reported when interviewed in regards to sexual abuse allegations, it did significantly increase the amount of information children reported in the open-ended phase of the interview. The value of this finding is that the quality of information obtained from open-ended prompts is more accurate than information obtained from more specific questions (Lamb et al., 2008; Powell et al., 2005; Powell & Snow, 2007). Given the potential of MCR, more work is required to understand the inconsistency of its effectiveness. This will be examined further in Study 1 of the current thesis.

To summarise, there is some evidence to suggest that ‘change perspective’ and ‘change order’ can be difficult for children to utilise. In practice the majority of investigators who decide to examine the effectiveness of the CI in children usually opt to take the prophylactic approach and modify their design, most often by omitting ‘change perspective’. In an effort to develop interview protocols that better cater to their particular needs, this practice now extends to other vulnerable groups, such as the elderly and individuals with intellectual disability. Despite some inconsistent findings with ‘MCR’ this mnemonic, along with ‘report everything’, are considered the most useful, and feature consistently in CI studies that have found a positive effect on memory.
3.3 The Effectiveness of Modified Versions of the CI Protocol

There is growing interest in improving the applicability of the CI for practitioners, and results are promising. For instance, a recent Australian study (Davis et al., 2005) examined whether the CI protocol may be shortened in length whilst retaining the effectiveness of the full CI protocol. Memory performance for a full CI, a SI and a modified version of the CI (minus ‘change order’ and ‘change perspective’) was compared. Concerned with experimental control, the conditions were carefully designed so there was an equal number of recall attempts; consequently the modified version had two additional retrieval attempts (instead of the omitted mnemonics). Three hours after viewing a 30 second film depicting an armed robbery, undergraduates were randomly assigned to one of the interview conditions. It was found that witnesses interviewed with the full CI and the modified CI recalled a similar amount of correct event details, and both versions of the CI were significantly superior to the SI condition. In addition, no differences in incorrect details or confabulations across interview protocols were found. Further analyses were then conducted to determine whether the modified version was as efficacious as the full version when the additional free narrative prompts and interview time were subtracted. Davis et al. (2005) found that the shortened CI was able to maintain 87% of correct details in 77% of the time. The added bonus of this modification is that it excludes the mnemonics unpopular with the police (according to Brown et al., 2008; Kebbell et al., 1999) and is viewed as less effective by some researchers (see Boon & Noon, 1994; Dando, Ormerod et al., 2011; Saywitz et al., 1992).

The aforementioned study is useful, not only because it has the practical goal of refining the CI to be more usable in the field, but because it formally tests a shortened version for adults that has been lurking in the literature in a semi-unofficial capacity.

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3 N.B., the ‘change order’ and ‘change perspective’ instruction.
For instance, Robert and Higham (2002) conducted a post-hoc sub-analysis of their results and found that the majority (86%) of correct details was elicited in Phase 1 (consisting of ‘report everything’, ‘MCR’ then a free narrative) of the CI, which is nearly identical to Davis et al.’s (2005) results. In addition, as alluded to earlier, several studies with children have omitted ‘change order’ and ‘change perspective’ in the interests of meeting children’s developmental needs (e.g., Hayes & Delamothe, 1997; Larsson et al., 2003; Larsson & Granhag, 2005), and the shortened version has also been used in studies of adults because of theoretical reasons pertaining to the variable under examination (Allwood et al., 2005; Finger & Pezdek, 1999). The Davis et al. study is able to provide some convergent validity for the results of these studies. Finally, Davis et al.’s modifications to the protocol were based on results of qualitative research that identified police preferences and usage of mnemonics, thereby testing a protocol intrinsically more appealing (and more likely to be utilised) by police.

Using a different approach to improve the applicability of the CI in the field, Dando et al. (2009), tested a user-friendly modification in the MCR instruction (i.e., a drawing context reinstatement) using adult witnesses, and found promising results. This will be extended on using child witnesses in the Study 1 presented in Chapter 4.

**Modifying the cognitive interview for use with child witnesses**

Testing for the most developmentally appropriate CI protocol, Holliday and Albon (2004) compared several variations of the CI with 4-5 year olds. This included a: 1) ‘full CI’, 2) ‘full CI’, minus ‘change perspective’, 3) ‘full CI’, plus enhanced rapport, minus ‘change perspective’, 4) ‘report everything’ plus ‘MCR’, 5) ‘report everything’ plus ‘change order’ and , 6) control interview. Results indicate that all variations of the CI, excluding the ‘full CI’, enhanced children’s memory compared to the control interview. Notably, the ‘full CI’ was the only protocol to include the ‘change perspective’ mnemonic. This provides evidence that this memory strategy does not contribute
(incrementally) to the beneficial effect of the CI in children and that a modified version is more effective for children.

### 3.4 Summary and Conclusions

To conclude, there is a considerable body of work substantiating the CI’s efficacy in enhancing the quantity and quality in memory retrieval for forensic purposes. The procedure has demonstrated versatility over different conditions, been found to be equally effective in field studies compared to experimental studies, and the efforts to modify the protocol to better meet the needs of non-standard witnesses and the needs of practitioners show some positive results. However, while the beneficial effect of the CI does not unduly influence the confidence of witnesses, there are conflicting results of its ability to offset misinformation effects in children, though research here does show promise. One area in which the potential of the CI has not lived up to expectations is in its inability to enhance witness identification memory.

What is evident from the above review is that the potential of the CI has yet to be fully realised. The current chapter has drawn attention to the fact that the measures used in CI studies have largely been confined to assessing the CI’s beneficial effects on the quality and quantity of recalled events details, generally overlooking the possibility that the CI protocol may be forensically useful in other capacities. As mentioned previously, novel investigative interview research outside of the CI area has started to investigate factors that optimise the coherence of child witness accounts (cf. Feltis et al., 2010; Murfett et al., 2008; Snow et al., 2009; Westcott & Kynan, 2004). Furthermore, this review showed that further work is needed to develop and test a more user-friendly and child appropriate interview protocol. The following two studies, presented in Chapter 4 and 5, hope to go some way to addressing these issues.
In interview situations, young children typically provide a sparse free-narrative account compared to older children and adults due, in part, to their limited ability to spontaneously utilise their own internal retrieval cues (Lamb, Hershkowitz, Orbach, & Esplin, 2008; Roediger & Gallo, 2002). Nevertheless, children’s free-narrative accounts elicited via open-ended prompts (e.g., ‘Tell me what happened’) are more accurate than their responses to specific questions (e.g., ‘Did you see a red car?’; Bruck et al., 2000; Lamb et al., 2008). The brevity of children’s free recall has led investigative interview researchers to explore techniques that facilitate more complete and detailed accounts, while retaining a high level of accuracy. To contribute to this, the study presented in the current chapter examined the effectiveness of a drawing context reinstatement (DCR), compared to a mental context reinstatement (MCR), in enhancing children’s event recall and reducing errors in response to suggestive questions. The specific aim of this study was to assess a modification in the delivery of MCR that optimises its efficacy with younger and older children.4

Mental Context Reinstatement

To recap, MCR involves encouraging the witness to bring to mind the environmental features and their thoughts and feelings that were present when they experienced the to-be-remembered event. The interviewer does this through a series of verbal prompts and this instruction is provided directly before the witness is asked to recount what happened. Theoretically, reinstating the contextual features that were present at encoding facilitates memory retrieval because associated components of the

4 A version of this study is currently under review in Australian Journal of Psychology
memory representation are then activated and available to report (Tulving & Thomson, 1973). The greater the similarity between features that were present at encoding and the memory cues given at retrieval, the better the memory for the event.

Research examining the utility of MCR component in enhancing children’s memories - in isolation from the CI as a whole - is mixed. The majority of studies have found a beneficial effect on children’s memory, compared to a control group (Bowen & Howie, 2002; Dietze, Powell, & Thomson, 2010; Dietze, Powell, & Thomson, 2012; Dietze & Thomson, 1993; Hammond et al., 2006; McCauley & Fisher, 1995). For example, one study demonstrated that children’s recall in response to specific questions about an event was enhanced when they reinstated the context—either mentally or ‘out loud’—than when they did not (Dietze et al., 2010). However, other studies have not found a beneficial effect on witness memory (Hershkowitz et al., 2001; Memon, Wark, Holley et al., 1997; Milne & Bull, 2002). For example, it was found that a MCR instruction was no more effective in enhancing children’s recall of an event than a simple instruction to ‘try harder’ (Milne & Bull, 2002). One possible explanation for the aforementioned mixed results is that the effectiveness of MCR is moderated by variations in interviewer instructions.

One difference across instructions may be the varying level of child-appropriate verbal prompts chosen to reinstate the context. Supplying non-suggestive and personally relevant MCR verbal prompts to witnesses is a noted difficulty (Dando et al., 2009). One of the reasons for this is that contextual cues are idiosyncratic - what may prove a powerful cue to one witness, may have no such effect with another (Salmon & Salmon, 2001). Another reason that makes it difficult to choose appropriate prompts is that interviewing multiple witnesses for the one crime opens up the possibility for the inadvertent cross-pollination of (unsubstantiated and suggestive) information gleaned in one interview, into the MCR verbal prompts in another (Dando et al., 2009). Further,
particular to interviewing young children, investigators face the additional challenge of keeping in mind that the salience of particular contextual cues are different for young children, compared to adults (see Ackerman, 1981; Nelson, 1990). Theoretically, the implication is that memory retrieval is not optimal because the provided verbal cues do not maximise the activation of the representation of the event in memory.

Another concern, of a more pragmatic nature, is that in the course of their duties, police officers (in England and Wales) generally do not implement the MCR well (Clarke & Milne, 2001; Dando et al., 2008; Kebbell et al., 1999) nor consistently (Clarke & Milne, 2001; George & Clifford, 1996). For instance, one recent study examined how well novice police who had recently been trained in the national Initial Police Learning and Development Programme were able to utilise the CI (Dando et al., 2009a). Police conducted mock interviews and were then rated on their application of each of the CI components. Pertinent to the current discussion, results indicated that no officer conducted the CI in its entirety, and only 6% of officers utilised MCR (with 20% attempting to use it). One of the suggested reasons for the failure of police to apply the MCR is because it is time-consuming and difficult to deliver (Dando et al., 2008; Kebbell et al., 1999).

As the above concerns arise in relation to the delivery of the MCR cues (as verbal prompts supplied by the interviewer), a reasonable strategy, then, is to bypass the interviewer and find a way for the witness to self-generate their own context reinstatement cues. Directing the witness to drawing what they can remember about the event prior to eliciting a free-narrative account (i.e., a drawing context reinstatement; DCR) may be the means to do this.

**Drawing Context Reinstatement**
It is now well established that the use of drawing enhances children’s event recall when they are directed to *simultaneously* ‘draw and tell’, compared to a ‘tell only’ comparison group. One of the reasons proposed for why drawing enhances memory is that it encourages people to generate their own retrieval cues about the to-be-remembered event (Butler, Gross, & Hayne, 1995, Gross & Hayne, 1998; Wesson & Salmon, 2001). In a seminal study by Butler et al. (1995), 5-6 year old children were interviewed on what they could remember about a fire-station tour they experienced 24-hours or 1 month earlier. Half the children were asked ‘Tell me anything you can remember about when you got the medal’, and the other half ‘Draw me anything you can remember about when you got the medal’ (Butler et al., pp. 599). Children who were able to draw during the interview reported *double* the amount of information compared to their counterparts, without a reduction in accuracy at both retention times.

Subsequent research found that ‘drawing while telling’ enhances children’s memory performance when interviewed after a delay of 1 month (Butler et al., 1995), 6 months and when re-interviewed 1 year later (Gross & Hayne, 1999); and for various types of memory events, such as an emotional experience (Gross & Hayne, 1998; Salmon, Roncoloto, & Gleitzman, 2003; Wesson & Salmon, 2001), negative family experiences (Lev-Wiesel & Liraz, 2007), a staged magic show (Bruck et al., 2000), a tour of a chocolate factory (Gross & Hayne, 1999) and a trip to the museum (Gross, Hayne, & Drury, 2009). However, one possible limitation with the use of drawing in a forensic setting is that it might be differentially effective depending on drawing ability. Specifically, some researchers have found a positive correlation between drawing ability and the amount of information recalled was found for children in the ‘draw and tell’ condition (Butler et al., 1995; Gross & Hayne, 1998) - though others have not found a correlation (Wesson & Salmon, 2001). Regardless, a recent study found a
beneficial effect of drawing for children extending from ages 5 through to 12 years (Patterson & Hayne, 2011).

Two recent studies - one tested in the laboratory with adult witnesses (Dando et al., 2009), and the other tested in the field with children who alleged sexual abuse (Katz & Hershkowitz, 2010) – provide some evidence that drawing prior to the elicitation of a free-narrative account may enhance witness memory. Motivated by the need to develop a more user-friendly MCR, Dando et al. (2009) compared adults who reinstated the event by sketching the to-be-remembered to adults who were given the traditional verbal MCR instructions. Witnesses in both interview conditions recalled a similar amount of correct information; both types of context reinstatement interviews were superior to a no context reinstatement interview (NCR) (Dando et al., 2009). Further, those in the drawing condition made fewer confabulations in the free-narrative and questioning phases compared to the MCR and NCR conditions. Dando et al. suggested that the comparatively higher number of confabulations made by witnesses in the MRC occurred due to interviewer interference arising from less effective or inappropriate verbal prompts.

In the second study, children aged 4-14 years who were alleged victims of sexual abuse were interviewed by experienced youth investigative interviewers about their experience (Katz & Hershkowitz, 2010). Children were randomly assigned to a drawing or no drawing condition and were interviewed using a highly structured protocol. Because the researchers were obliged to ensure children’s accounts were not compromised by drawing - which would adversely affect the investigative process - children’s memories were exhausted during a free narrative prior to the experimental manipulation. Children in the drawing condition provided richer accounts than the children in the no-drawing control group. Overall, this research suggests that drawing before providing an account may increase children’s recall. Unfortunately, this study
did not include a MCR condition in their design, so it remains unclear whether drawing prior to recall is superior to verbally provided contextual cues. Further, while it is valuable to test memory retrieval techniques when used by actual practitioners in the field, only the total amount of information that is recalled can be measured; crucially it remains unknown whether the amount of correct information is increased and amount of incorrect or confabulated information is decreased. The current study will extend Katz and Hershkowitz’s (2010) study by experimentally investigating whether drawing increases the quantity and quality of children’s accounts, and whether drawing is better able to do this than a MCR.

**Suggestibility**

Although drawing increases the number and accuracy of details that witnesses report with open-ended prompts, it is not clear whether it protects child witnesses against suggestive questioning. To date, studies that have examined drawing and suggested information have utilised a paradigm where children were instructed to draw event details that did not occur (Bruck et al. 2000; Gross, Hayne, & Poole, 2006; Strange & Sutherland, 2003). These studies have demonstrated that children generate more false memories for these details when they draw them than when they do not. However, it has not yet been investigated whether simply asking children to draw everything they can remember about the event—without directing them to draw suggested details—also increases the reporting of incorrect information when they are later asked suggestive questions.

Turning attention briefly back to MCR, no study has examined whether MCR alone protects against later exposure to suggestive information. However, witnesses interviewed by the CI protocol (with MCR as a key element) were less likely to accept suggestive information into their account when it was presented after the interview,
compared to a control interview (Memon, Zaragoza et al., 2010; Milne & Bull, 1993). 

Explaining the beneficial effect of the CI, Memon, Zaragoza et al. (2010) proposed that the stronger and more complete memory of the event elicited by the CI led witnesses to be more confident about their account. Consequently, witnesses viewed the suggested information with suspicion and were better able to resist it than those in the control interview condition. It is possible that drawing should protect children’s memories against suggested information in a similar way; that is, through enhancing recall of the original event. Further, given that a drawing is an external and physically available reference of what is originally recalled, it is feasible that drawing may better able protect children against suggestive questions compared to MCR.

**Summary of Aims and Hypotheses**

The aim of the current study was to compare two memory techniques in younger and older children—DCR and MCR—to determine their impact on children’s recall and ability to resist suggestive questions. It was hypothesised that both the DCR and MCR should enhance children’s recall more than NCR. It was further predicted that DCR should enhance recall more than MCR due to the self-generation of more personally relevant retrieval cues. Also, it was hypothesised that DCR should better protect children against suggestive questions compared to MCR, which in turn would be more protective than NCR. Given the possible limitation that drawing ability may affect the effectiveness of a DCR on event recall, children’s drawing ability will be measured but no directional hypotheses will be made.

**Method**

**Design**
Children were individually interviewed once regarding what they could remember about a magic show in which they participated 7-10 days earlier. The design used was a 3 (interview: Cognitive vs. Modified Cognitive vs. Structured) × 2 (age: 5-6 years vs. 8-9 years) × 2 (question type: True-biased vs. False-biased), with the first two factors manipulated between-subjects and the last factor manipulated within subjects. Children were pseudo-randomly allocated to an interview condition to ensure that age and gender were represented roughly equal across cells, and they were all presented with the True/False-biased questions at the end of the interview. The dependent variables were correct, incorrect and confabulated event details elicited about the magic show. An accuracy (correct details/correct, incorrect and confabulated details) and completeness (correct details/total number of possible correct details) percentage was also calculated.

**Participants**

A total of 154 children from varied ethnic backgrounds were recruited from two public and two private primary schools in the Melbourne metropolitan area via letters to parents (that were distributed by teachers). However, thirteen children with consent to participate were not included in the final sample. Out of the 5-6 year-old age group, one child declined to be interviewed, four children could not remember the magic show when asked at the outset of the interview and thus could not be interviewed, one child recounted details from a completely different magic show, one child’s account was too confused and one was absent for the interview. Four 8-9 year olds were also absent for the interview, and a further three were absent for the ‘magic show’.

The final sample included a total of 141 children. There were 70 children aged 5-6 years ($M = 5.7$, $SD = 0.4$) (35 females, 37 males) and 71 children aged 8-9 years ($M = 8.7$, $SD = 0.3$) (41 females, 30 males). Children could participate in this study only if they had parental consent and had no significant cognitive or learning difficulties.
(determined by their regular teacher). No child with parental consent was deemed to have insufficient language or cognitive abilities.

A prior power analysis was calculated to determine an adequate sample size using the statistical program G*Power (Faul, Erdfelder, Lang, & Buchner, 2007). Following Howell’s (2002) recommendation of the use of prior research as a rough approximation of the expected population effect size, Katz & Hershkowitz’s (2010) reported effect size for ‘interview condition’ ($\eta^2_p$ effect size = .11) was entered into the program, along with the significance criterion of .05 and the desired power coefficient set to .80. The output indicated that a total sample size of 82 yielded power at a respectable 80.5% to detect an effect of similar size. Thus, a sample of 141 children was deemed more than adequate.

**Interviewer and Interviewer Training**

All interviews were conducted by one female graduate student (40 years-old), who was previously unknown to the children. The use of a single interviewer eliminated the potential problem of individual difference across interviewers (see Geiselman et al., 1985; Mantwill et al., 1995). In addition, the interview protocols were highly structured to limit potential interviewer bias between interview conditions.

Training consisted of the interviewer becoming familiar with the CI protocol, as described by Fisher and Geiselman (1992) and Saywitz et al. (1992), and investigative interviewing best practices (Powell, 2002; Powell et al., 2005). On a practical level, multiple opportunities were provided to practice interviewing (in the form of mock interviews) and extensive feed-back was provided by an expert in the field. This accumulated to approximately 25 hours of training.

**Interview Conditions**
All three interview conditions have five common phases (as detailed in Figure 4.1). The structure was based on a funnel approach, where the elicitation of a child’s response progresses from the broad to the specific. This approach is widely considered as best practice (Sternberg, Lamb, Esplin, Orbach, & Hershkowitz, 2002) and underpins the phased approach recommended for police in England, Wales (Home Office and Department of Health, 1992) and Australia (Snow & Powell, 2007). The social and communicative elements included age appropriate language, interviewer prompts congruent with the children’s mental operations and the avoidance of interruptions. Apart from escorting the child from the classroom to the interview room, no specific rapport time was allotted because it was thought children would be intrinsically interested in talking about the magic show. Each phase of the interview protocol will now be described. Please refer to Figure 4.1 as needed.

In Phase 1, children were prepared for the following interview; they were informed that the interviewer was ignorant about the content of the magic show, and the format and aims of the interview were explained to them. Children were also instructed to concentrate and not make up anything. In Phase 2, a free-narrative account was elicited. The three prompts detailed in Figure 4.1 were given the once. In accordance with best practices only minimal encouragers were given (e.g., ‘uh huh’, ‘mmm’ and head nodding) (Powell & Thomson, 1994). In Phase 3, the children were probed for further details on three events they mentioned previously during their free-narrative. Each of the three events was probed by three open-ended prompts, with the first open-ended prompt (listed at the top of the box in Phase 3) posed to every child. The interviewer then chose two other open-ended prompts from a carefully developed
Figure 4.1. Structure of interview protocol (common for all interview conditions).
set list, composed of two breadth and two depth open-ended prompts (see Powell & Snow, 2007). This was to afford the interviewer some flexibility in the selection of the most appropriate prompt depending on the flow of the child’s account, whilst maintaining a level of experimental control. Again, minimal encouragers were used and the exhaustion of an account was signalled verbally by the children or a continued silence of 10-15 seconds. (N.B.: longer pauses at appropriate intervals were allowed for children in the 5-6 year old age group to accommodate for developmental considerations). In Phase 4, children were told they were going to be asked just a few more questions. As in the Hayes and Delamothe (1997) study, children were warned that they may be asked for information they have already volunteered “but not to worry about it”. This was done to address the possibility of children changing their answer as a function of being asked twice. Children were then asked the pre-set list of eight true/false biased specific questions. Finally, in Phase 5, children were thanked for their time and praised for their effort, and invited to ask any questions they may have. Children were then escorted back to their classroom.

**Mental context reinstatement interview.** Immediately prior to obtaining a free-narrative report (Phase 2), children assigned to the MCR interview were advised that they were going to do something to help them to remember, and were asked to close their eyes or put their hands over their eyes (if it made them feel more comfortable). The MCR instruction was then read slowly and deliberately, with 10-15 seconds pauses between statements. ‘*I want you to think back and picture the magician and the magic show as if you were there right now* (pause). *Think about what it was like there on that day* (pause). *Think about what you can see there* (pause). *Think about what you can smell there* (pause). *Think about what you can hear there* (pause). *Think about what you were you feeling that day* (pause). *Think about what you were thinking during the*
magic show (pause). Picture any other people there (pause) (adapted from Geiselman et al., 1993; Saywitz et al., 1992). The word ‘think’ was emphasised to encourage the child to think but not verbalise their response to each context reinstatement instruction [recall a recent study found no difference in the effectiveness of the MCR mnemonic with children whether they reinstated out loud or reinstated silently (Dietze et al., 2010)]. Also note, in line with previous CI research, the words ‘pretend’ or ‘imagine’ were avoided to reduce fantasising (Geiselman et al., 1993).

This study introduced an additional measure to maximise the potential benefit of the mnemonic. Prior to the free narrative, the extended open-ended prompted phase and the specific question phase, children were explicitly told to think back to the things they pictured in their head at the start of the interview to help them to remember.

**Drawing context reinstatement interview.** Immediately prior to obtaining a free-narrative report (Phase 2), children assigned to the DCR interview were also advised that they were going to do something to help them to remember. Children were then given a sheet of A4 white plain and a 2B lead pencil and told: ‘I want you to think back and picture the magician and the magic show as if you were there right now (pause). Now I want you to draw as many things that you can about the magician and the magic show. You have only 5 minutes to do it, so don’t worry about being too neat’. In the interests of keeping it straightforward for the children, the DCR of this study was simplified, compared to Dando et al. (2009), but was similar to the instruction given in the study by Butler et al. (1995). The time limit was established to approximate a comparable time frame to the MCR interview. As with the MCR condition, children were not required to reinstate out loud while they were drawing and, similarly, were instructed prior to the free narrative, the open-ended prompted phase and the specific question phase to refer back to their drawing to help them to remember.
No context reinstatement interview (NCR). The NCR interview serves as the control and it is essentially identical to the interview format detailed in Figure 4.1. However, it is possible that merely telling children that the mnemonic (in the MCR and DCR conditions) will help them to remember may be, in itself, beneficial to memory. Therefore, children in the NCR interview were told prior to the free narrative, the open-ended prompt phase and the specific question phase that they will be asked some questions that will help them to remember.

Pre-determined list of true/false biased questions. The pre-determined list of true and false-biased questions presented to each child at the end of the interview consisted of eight target items which included a roughly equal number of objects, actions and verbalisations. There were four possible instantiations of each target item consisting of two true-biased and two false-biased versions, with each version broken down further into a broad and a specific variant of the target item, as seen in Table 4.1. The target items were presented in four specific question formats and in the sequence shown in Table 4.2. This sequence of questions was repeated twice, once with a true-biased version of the target item and once with a false-biased version of the target item, thus making up eight questions. (N.B., the order of the true and false-biased target items was inter-mixed and not presented in blocks). Holding the temporal order of the question format and the True/False presentation constant, each of the eight target instantiations was cycled through, generating a total of eight counterbalanced sets of pre-determined question lists.
Table 4.1

*True-Broad, True-Specific, False-Broad and False-Specific Representations of the Target Items*

<table>
<thead>
<tr>
<th>Item</th>
<th>True Broad</th>
<th>True Specific</th>
<th>False Broad</th>
<th>False Specific</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Brown hair</td>
<td>Long brown, straight hair</td>
<td>Red hair</td>
<td>Short, curly red hair</td>
</tr>
<tr>
<td>2</td>
<td>Koala puppet</td>
<td>Koala puppet with soft grey fur</td>
<td>Crocodile puppet</td>
<td>Crocodile puppet with green scales and long tail</td>
</tr>
<tr>
<td>3</td>
<td>Clap</td>
<td>Clap like this… (Interviewer demonstrates)</td>
<td>Jump</td>
<td>Star-Jumps like this…(Interviewer demonstrates)</td>
</tr>
<tr>
<td>4</td>
<td>Favourite lollipop</td>
<td>Favourite lollipop that she put in her pocket</td>
<td>Favourite ribbon</td>
<td>Favourite colourful long flowing ribbon</td>
</tr>
<tr>
<td>5</td>
<td>Magic words</td>
<td>Magic words that helped make the tricks work</td>
<td>Sing a song</td>
<td>Sing a song about going to magic school</td>
</tr>
<tr>
<td>6</td>
<td>Stand up</td>
<td>Standing up behind a table</td>
<td>Fell over</td>
<td>Fell over and hurt her knee</td>
</tr>
<tr>
<td>7</td>
<td>Drink orange juice</td>
<td>Drink orange juice from a wineglass</td>
<td>Eat a cupcake</td>
<td>Eat a delicious cupcake with pink icing on top</td>
</tr>
<tr>
<td>8</td>
<td>Poster</td>
<td>Poster with writing on it</td>
<td>Yellow ball</td>
<td>Yellow bouncy ball with polka dots</td>
</tr>
</tbody>
</table>
Table 4.2

Specific Question Format for the Presentation of the Target Items

<table>
<thead>
<tr>
<th>Format</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Did the magician have/use (specific instantiation)…?</td>
</tr>
<tr>
<td>2 Tell me everything you can remember about (broad instantiation)…?</td>
</tr>
<tr>
<td>3 The magician had/used (broad instantiation)..., didn’t she?</td>
</tr>
<tr>
<td>4 Did the magician have/use (broad instantiation)…?</td>
</tr>
</tbody>
</table>

Materials

**Draw-a-Person Test—Quantitative Scoring System (DAP) (Naglieri, 1988).**

Given the inclusion of a drawing element in the present study, the DAP was used to measure children’s drawing ability. The DAP is a 15-minute assessment that requires children to carefully draw a man, a woman and the self. Each drawing is coded on a 64-point scale made up of 14 criteria areas: arms, ears, eyes, feet, fingers, hair, head, legs, mouth, neck, nose, trunk, clothing and attachment of body parts. Within these criteria, points can be awarded for presence, extra details and proportion (where relevant). If the maximum points are awarded for a criterion, then a bonus point is given. The three drawings are then summed to generate a total DAP score. The DAP System includes age and gender norms (based on a US sample).

Procedure

Prior to the commencement of this study, ethics was obtained from Deakin University Research Ethics Committee, the Department of Education and Early Childhood Development, and the Catholic Education Office (Melbourne). See Appendix A-2 for the approval documents.
The event. The children participated in a 20-minute scripted magic show that was performed by a research assistant at the children’s school; each grade-level participated in the magic show separately. To ensure that the content of the magic show was appropriate for children over both the younger and the older age groups, the ‘magician’ stated at the outset that she had only been performing magic for a short time and that she needed feedback (which they presented by clapping after each trick) on whether her tricks would be suitable for an audience of kindergarten children. This also served the purpose of encouraging active participation by the children. Briefly, the magic show consisted of the magician: introducing herself, conducting a short puppet skit, involving the children in a warm-up activity and choosing an assistant, ‘disappearing’ a lollipop, making a drink ‘magically’ appear, and making lip-gloss ‘magically’ appear. The lip-gloss was then passed around on ear-buds for children to put on their lips or smell and, last, children were given a sticker (see Appendix B for the Magic Show script). Teachers were asked to refrain from talking about the magic show with the children prior to the magic show and were reminded again directly after the show was concluded.

Briefings and interviews. Seven to ten days after the magic show was staged and prior to the interviews, the interviewer came to the children’s classrooms and introduced herself, and informed the children that she will be taking some children out of the classroom and talking to them about the magic show. This was done - 1) to let the children get used to the idea that they will be individually removed from their classroom by the interviewer who was an unknown woman, at some point over the day; 2) to give the opportunity for children to decline to be interviewed and; 3) to begin the process of rapport. As noted above, one child declined to participate, however the majority of children were clearly eager to be interviewed.
Each child was then individually escorted to a quiet room that was different from where the magic show was staged (to avoid spontaneous context reinstatement) and interviewed according to the interview condition to which they were assigned. To avoid compromising the motivation of the children, care was taken to ensure the interviews did not take place when highly valued class activities were scheduled to run. At both the conclusion of each interview and during the class de-brief, children were given the opportunity to ask any questions they may have. No child became upset during the interview, nor requested a halt to the interview.

**Draw-A-Person test administration.** The DAP was administered to all children during class, at a time that was convenient for the teachers. Because the DAP is easy to administer, and in the interests of minimising the intrusion of the researchers in the classroom, the children’s regular teacher was given the task of administering the test. To that end, teachers were briefed on the DAP and given the Response Forms and the Group Administration Instructions (Naglieri, 1988), which they were directed to deliver verbatim. See Appendix C for the Group Administration Instructions.

Two coders independently scored 28 (20%) randomly chosen DAPs to determine inter-rater reliability. Using the appropriate intraclass correlation coefficient (Armstrong, 1981; Shrout & Fleiss, 1979) a very high level of agreement (.98) between raters was established.

**Coding.** All interviews were audio-taped and transcribed verbatim by two researchers and two research assistants. To code the transcripts, a scoring template was developed based on pre-existing techniques (Gross & Hayne, 1998; Memon et al., 1996) that was refined for the present study. The procedure entailed one coder generating a comprehensive list of the key concepts from the script of the magic show (parsed as meaningful simple sentences or clauses) that if recalled, were afforded one point each.
Extra relevant details that were intrinsically embedded in the key concepts were also identified which made it possible to score at a greater level of specificity, over and above the key concept [e.g., ‘Puts up the poster (1) on the whiteboard’ (1) ‘Chose/had a helper (1) name’ (1)]. Next, the scoring template was trialled on fifteen randomly selected transcripts with a second coder, who was familiar with the magic show but uninvolved in the present study, for the purpose of progressively fine-tuning the template. Any discrepancies were discussed and resolved. The final coding system comprised 119 key concepts and 81 associated extra details, totalling 200 event details. See Appendix D for the Coding Manual/SHEET.

Each interview phase (free recall, extended open-ended prompts) was coded separately. Every piece of information recalled by the children was coded as correct, incorrect (e.g., “The magician’s favourite lollipop was strawberry” – where it was actually banana) or confabulated (reporting a detail that did not appear or occur (e.g. “The magician made baby butterflies appear”). Errors of distortions (i.e., incorrectly recalled information) and confabulations\(^5\) were coded separately as there is some evidence that they arise from different underlying psychological mechanisms (Gudjonsson & Clare, 1995). Additionally, Milne and Bull (2003) reported out that each type of error has different implications in a forensic investigation. Information that was repeated, subjective (e.g., ‘I really enjoyed the magic show’) or unrelated to the magic show (e.g., ‘My dad can do a magic card trick’) was not coded.

Children’s responses to the true/false-biased specific questions were coded as one of the following: correct, incorrect, ‘don’t know’. The response ‘don’t know’ was recorded separately as it is not clear whether the child was ‘resisting’ the suggestive

\(^5\) The unconscious filling in gaps of memory by fabrication
questions (Milne & Bull, 2003) or whether it was a matter of encoding or retrieval failure.\(^6\)

Inter-rater reliability was obtained by two coders independently marking 20% of the same transcripts (that were chosen at random). Agreement was then calculated by intraclass correlation for each of the dependent variables in the free recall and the open-ended question phase of the interview. Table 4.3 shows that inter-rater reliability was very good to excellent.

Table 4.3

<table>
<thead>
<tr>
<th>Interview Phase</th>
<th>Correct</th>
<th>Incorrect</th>
<th>Confabulated</th>
</tr>
</thead>
<tbody>
<tr>
<td>Free recall</td>
<td>.99</td>
<td>.87</td>
<td>.86</td>
</tr>
<tr>
<td>Open-ended questions</td>
<td>.94</td>
<td>.95</td>
<td>.94</td>
</tr>
</tbody>
</table>

Results

Preliminary Analyses

Context reinstatement and interview duration. The DCR instruction took about twice as long as the MCR instruction (\(M = 4.3\) minutes, \(SD = 1.03\) vs. \(M = 2.02\) minutes; \(SD = .29\)). Only 60% of children in the DCR condition went for the fully allotted 5 minutes and just two children said that they would have liked more time. This gives some indication that a 5-minute time limit was sufficient for the children.

\(^6\) Note this coding system was the second to be developed for the reason outlined on pp. 79
Interview duration was measured from when the free narrative account was elicited, till the end of the interview. The results of a 2 (age group) × 3 (interview condition) between-groups ANOVA revealed a significant effect for interview condition, $F(2, 135) = 4.68, \ p = .011, \ \eta^2 = .06$. Follow-up post hoc comparisons using the Tukey HSD test indicated that the MCR interview and the DCR interview were significantly longer ($M = 12.60$ minutes and $M = 12.55$ minutes, respectively), than the NCR interview ($M = 10.88$ minutes). There was no main effect for age, $F(1, 135) = 1.60, \ p = .208, \ \eta^2 = .011$, or significant interaction.

While the design of the current study ensures a high level of control across interview conditions by having an identical amount of open-ended prompts in Phase 3, it is possible that interview duration may have unduly influenced the effect of interview or age on each of the dependent variables. Therefore a series of ANCOVA’s were performed, with interview duration as the covariate. A main effect for interview duration was found for correct details, $F(1, 134) = 31.56, \ p = .001, \ \eta^2 = .10$, incorrect details, $F(1, 134) = 17.25, \ p = .001, \ \eta^2 = .09$, and for completeness, $F(1, 134) = 31.56, \ p = .001, \ \eta^2 = .10$, but not for confabulated details, $F(1, 134) = 3.72, \ p = .056, \ \eta^2 = .03$, or accuracy rate, $F(1, 134) = 1.90, \ p = .170, \ \eta^2 = .01$. As a consequence, interview duration was included as a covariate in the subsequent analyses for the dependent variables of correct and incorrect details, and completeness of account, with the means adjusted accordingly.

**Drawings.** The total DAP scores were submitted to a 2 (age) × 3 (interview condition) between-groups ANOVA. As expected, children across interview conditions had similar drawing ability, $F(2, 132) = .59, \ p = .587, \ \eta^2 = .003$, and the older children had significantly higher drawing scores ($M = 122.79, \ SD = 23.79$) than the younger children ($M = 66.89, \ SD = 18.71$), $F(1, 132) = 230.47, \ p < .001, \ \eta^2 = .63$. Examination of the standardised drawing scores for the children show that 59% of 5-6 year old scores
and 76% of the 8-9 year old scores fell between +/- 1 standard deviation of the standardised mean (i.e., 100). Please note that the drawings made by the children in the DCR condition were used only in the interview as a vehicle for context reinstatement, and were not subject to formal analysis.

The Effect of DCR and MCR on Event Recall

The mean number of correct, incorrect and confabulated event details recalled for each age group summed over the free-narrative and extended open-ended prompt phase, in addition to the accuracy and completeness rate, are displayed in Table 4.4. A series of 2 (age group) × 3 (interview condition) between-groups ANOVA’s was conducted for each of the dependant variables.

Interview condition. Contrary to what was hypothesised, no significant differences between DCR, MCR and NCR were found for correct details, $F(2, 134) = .61, p = .542$, $\eta^2 = .004$; incorrect detail, $F(2, 134) = .28, p = .754$, $\eta^2 = .030$; confabulated details, $F(2, 135) = .16, p = .849$, $\eta^2 = .002$; accuracy rate, $F(2, 135) = .87, p = .42$, $\eta^2 = .012$ or; completeness, $F(2, 134) = .61, p = .542$, $\eta^2 = .004$.

Age. A main effect for age was found, with older children, compared to younger children, producing more correct details ($M = 53.72$ vs. $M = 30.11$ respectively), $F(1, 134) = 135.97, p < .001$, $\eta^2 = .447$, and more incorrect details ($M = 6.82$ vs. $M = 3.60$, respectively), $F(1, 134) = 37.92, p < .001$, $\eta^2 = .198$. Further, the older children, compared to the younger children, provided a more complete account ($M = 27%$ vs. $M = 15%$ respectively), $F(1, 134) = 135.97, p < .001$, $\eta^2 = .504$, however, the amount of possible reported information is strikingly low for both age groups. It is also evident from Table 4.4 that children in the current study reported a very small number of confabulations and there was no difference between older children and younger children on this variable ($M = 1.91$ vs. $M = 1.37$ respectively), $F(1, 135) = 2.89, p > .09$, $\eta^2 =$
Last, the accuracy rate between the older and younger children was not significantly different ($M = 88.7\%$ vs. $M = 89.3\%$ respectively), $F(1, 135) = .33, p > .569, \eta^2 = .003$.

Table 4.4

*MMeans for Correct, Incorrect, Confabulated Event Details, and Accuracy and Completeness Percentage as a Function of Age and Interview Condition*

<table>
<thead>
<tr>
<th>Interview Condition</th>
<th>5-6 year olds ($n=70$)</th>
<th>8-9 year olds ($n=71$)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Variable</td>
<td>NCR (SD)</td>
<td>MCR (SD)</td>
</tr>
<tr>
<td>Correct</td>
<td>27.77 (11.45)</td>
<td>30.88 (11.42)</td>
</tr>
<tr>
<td>Incorrect</td>
<td>2.68 (2.06)</td>
<td>3.73 (3.31)</td>
</tr>
<tr>
<td>Confabulated</td>
<td>1.05 (1.53)</td>
<td>1.57 (2.04)</td>
</tr>
<tr>
<td>Accuracy</td>
<td>0.91 (0.08)</td>
<td>0.89 (0.09)</td>
</tr>
<tr>
<td>Completeness</td>
<td>0.14 (0.06)</td>
<td>0.15 (0.06)</td>
</tr>
</tbody>
</table>

Note: Standard deviations appear in parentheses.
To sum, as expected, the older children’s event recall was found to be superior to the younger children, in that they recalled more correct event detail and gave a more complete account. The similar accuracy rate between the age groups suggests that, despite the older children also reporting more incorrect details, their accounts did not suffer in terms of quality, compared to the younger children. However, no effect of interview condition on any of the dependent variables was found for either the older or the younger children. Despite the a priori power of the current study indicating that there were sufficient numbers, a power issue is nevertheless suspected because of the very high standard deviations around the means of interest, among other reasons. Therefore, to fully interpret these non-significant findings, additional data and analysis will be presented at the end of this section.

**Drawing Ability and Memory Performance**

To investigate the relationship between drawing ability and event recall, more specifically, whether drawing ability limits the beneficial effect of DCR, six Pearson product-moment correlations (two-tailed) were calculated for the total DAP score and total correct details for each of interview over each age group. No relationship between drawing and each interview condition was found for the older children (NCR: \( r = -.11, p = .612 \); MCR: \( r = .11, p = .626 \); DCR: \( r = .17, p = .428 \)). For the younger children, an unexpected significant relationship was found between drawing ability and correct details for all interview conditions (NCR: \( r = .58, p = .001 \); MCR, \( r = .61, p = .001 \); DCR, \( r = .63, p = .001 \)). As the relationship between drawing ability and event recall was found across all interview conditions and not in DCR alone, it suggests that drawing ability does not limit the effect of DCR on event recall, as found by Butler et al. (1995). Rather, younger children’s (but not older children’s), scores on the DAP may
represent some general ability at a particular developmental stage, and not drawing ability alone.

Further Analysis of the Null Results: A Power Analysis

Despite the establishment of sufficient a priori power, high \( p \) values, high variance in the data, and small effect sizes suggest that further analyses are required to better interpret the data. Further, the consideration of power when a non-significant finding occurs is recommended as good statistical practice (American Psychological Association, 2001; Cohen, 1994; Cumming & Finch, 2001; Onwuegbuzie & Leech, 2004; Trout, Kaufmann, & Kallmes, 2007). This consideration is important because a non-significant finding can mean one of two things. First, it is possible that the null hypothesis is the actual state of affairs – in this case it makes no difference to children’s event memory if they are interviewed with a DCR, MCR or NCR. Second, it is possible that the current study lacks the statistical power to detect a difference between groups, leading to a failure to correctly reject the null hypothesis; specifically the failure to reject the null hypothesis that there is no difference between interview conditions.

To determine which of these possible explanations is more likely to be true, we need to consider the three variables that relate to power: the significance criterion, sample size and variance, and effect size. These variables are related in such a way that when the values of three of these variables are set, the fourth is determined (Cohen, 1994). Because the significance criterion and the desired power level are a matter of convention (that is, they are typically set at .05 and .80 respectively), the following discussion will focus on the effect size and sample size/variance.

Effect size. A confidence interval around an effect size gives an indication of how confident we can be that the detectable effect size is zero (when the finding is null) (Colegrave & Ruxton, 2003; Cumming & Finch, 2001). In other words, how confident
we can be that there is no real effect rather than merely a lack of power to detect it. Two sets of confidence intervals were calculated (see Wuensch, 2009); one for reinstatement vs. no reinstatement (MCR and DCR vs. NCR) and one for mental reinstatement vs. drawing reinstatement (MCR vs. DCR). The effect size for the difference between reinstatement and no reinstatement was small, Cohen’s (1988) \( d = .04 \); the 95% CI was -.31 to .40. The effect size for the difference between MCR and the DCR was medium, \( d = .15 \), 95% CI was -.25 to .55. The widths of these confidence intervals are very broad, indicating a lack of certainty that the effect size is actually zero. Importantly, the estimated population effect size [extrapolated from the Katz and Hershkowitz (2010) study for the establishment of a priori power], is within the upper limits of the confidence intervals, meaning a Type II error cannot be ruled out.

**Sample size/variance.** While the a priori power analysis suggested the sample size was more than adequate to provide power, the large standard deviations around the means of interest indicate great variability within the sample. (Indeed, this variability in children’s accounts within age groups, regardless of interview condition, was striking even when interviewing the children). In essence, the data set is ‘noisy’, making it difficult to detect an effect. A number of possible sources were examined to investigate this noise. First, the difference in children’s performance between the four schools that children were recruited was considered. A one-way between-group ANOVA for each age group, with school as the independent factor and number of correct details recalled as the dependent variable, did not reveal any significant effects,[5-6 year olds: \( F(3, 66) = 1.58, p = .203, \eta^2 = .067 \); 8 to 9 year olds: \( F(2, 68) = 1.09, p = .341, \eta^2 = .031 \].

The second factor investigated to determine its contribution to noise was measurement. The present coding system is actually the second coding measure developed, and represents a more clearly delimited set of codable details. That is, the first coding system did not delineate the universe of possible correct responses by a pre-
determined list of meaningful key phrases, but instead coded any part of the sentence that denoted meaning, and was further coded into subject, action, object and descriptors. Because information such as ‘The magician pretended to make the koala talk with a squeaky voice’ would attract 7 correct points in the first coding system, but none in the second, the possible range of children’s recalled event details coded by the first system was obviously more broad. However, the variability in the children’s memorial performance was a robust phenomenon and recoding did not reduce this in any meaningful way. (See Appendix D for the ‘elaborate’ coding manual). The upshot is that individual differences in event recall have likely reduced the power to detect an effect for interview condition. This issue will be more fully discussed later.

To conclude, the broad confidence intervals and the unexpectedly large individual difference in memorial performance means that a Type 2 error for the non-significant finding of interview condition cannot rule out.

**Children’s Suggestibility**

**Responses to the true/false-biased specific questions.** Mean responses of correct, incorrect, and ‘don’t know’ to the specific questions, summed over the four true-biased and four false-biased versions, as a function of interview condition and age group are shown in Table 4.5. To determine the effect of DCR, compared to MCR, on responses to suggestive questions presented after the elicitation of an eye-witness account, two 2 (age) × 3 (interview condition) between groups ANOVA’s were conducted for each of the dependent variables of correct responses and ‘don’t know’ responses.

**Correct responses.** As expected, a significant main effect of age on correct responses was found, \( F(1, 135) = 5.32, \ p = .023, \ \eta^2 = .036 \). Older children had a higher number of correct responses (\( M = 6.95, \ SD = 1.28 \)) than the younger children (\( M = 6.48, \ SD = 1.14 \)). Older children answered 93.9% of the true-biased and 82.2% of the false-
biased correctly, compared to younger children who responded correctly to 87.9% of the true-biased and 74.0% of the false-biased questions answered correctly. A significant main effect was also found for interview condition, $F(2, 135) = 3.16, p = .045$.

Table 4.5

*Responses of Correct, Incorrect and Don’t Know as a Function of Age and Interview Condition*

<table>
<thead>
<tr>
<th>Interview Condition</th>
<th>5-6 year olds ($n=70$)</th>
<th>8-9 year olds ($n=71$)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Variable</td>
<td>NCR</td>
<td>MCR</td>
</tr>
<tr>
<td>Correct</td>
<td>6.36 (1.14)</td>
<td>6.35 (1.29)</td>
</tr>
<tr>
<td>Incorrect</td>
<td>1.23 (0.97)</td>
<td>1.35 (1.16)</td>
</tr>
<tr>
<td>Don’t know</td>
<td>0.36 (0.73)</td>
<td>0.27 (0.67)</td>
</tr>
</tbody>
</table>

Note: Standard deviations appear in parentheses.

$\eta^2 = .043$ (see Figure 4.3). Results of post hoc Tukey’s HSD test indicated that more of the suggestive questions were answered correctly by children in the DCR interview ($M = 7.06, SD = .90$) than the NCR interview ($M = 6.47, SD = 1.46$). There was no significant difference between MCR ($M = 6.59, SD = 1.22$) with either the DCR or the NCR condition. Further, the interaction between age and interview was non-significant $F(2, 135) = .46, p = .631, \eta^2 = .006$. 
‘Don’t know’ responses. The main effect for age on ‘don’t know’ responses failed to reach significance, $F(1, 134) = 3.22, p = .075, \eta^2 = .023$. The trend of the means suggest

![Figure 4.3. Mean correct responses to suggestive questions as a function of interview condition (out of a total possible score out of 8).](image)

that younger children make more ‘don’t know’ responses ($M = 0.33, SD = .70$) than older children ($M = 0.16, SD = .40$). Younger children replied ‘don’t know’ to 2.5% of the true-biased and 5.8% of the false-biased questions, compared to the older children who replied 0.75% to the true-biased and 4.3% to the false-biased question. The main effect of interview was also non-significant, $F(2, 134) = .06, p = .940, \eta^2 = .001$, and there was no significant interaction, $F(2, 134) = .18, p = .839$. 
These results suggest that, overall, children responded less accurately to false-biased questions than true-biased questions. Similar to their responses to free recall questions and open-ended prompts—older children were more accurate than younger children in their responses to biased questions. However, in contrast to the above findings, children interviewed with the DCR had more accurate responses to biased questions than children interviewed with the NCR.

**Discussion**

The results of the current study showed that the two memory retrieval techniques—MCR and DCR—did not affect children’s responses to free recall or open-ended prompts, yet interview condition impacted their accuracy when they answered suggestive questions. Those in the DCR condition who drew the event prior to recall gave more accurate answers to true- and false-biased questions than those in the NCR interview condition. However, unexpectedly, no difference in the accuracy of children’s responses to suggestive questions was found between the DCR and MCR conditions, or between the NCR and MCR conditions. Neither older or younger children’s drawing ability was positively associated with event recall in only the DCR condition, indicating drawing ability would not place a limit on recall. The pattern of results is consistent with what is expected developmentally. Older children reported more details and were more accurate than younger children; older children were less misled by the suggestive questions than younger children.

Surprisingly, neither context reinstatement interview had a beneficial effect on the completeness and accuracy of younger and older children’s responses to free recall and open-ended prompts. Regardless of whether they were interviewed using NCR, MCR, or DCR, children had similar levels of completeness and accuracy. Prior research with adults demonstrated the DCR to be as effective as MCR, with both more effective than a
NCR instruction (Dando et al., 2009). Further, in their field study, Katz and Hershkowitz (2010) found that a DCR, compared to NCR, significantly increased the number of details reported by alleged child sexual abuse victims. However, contrary to what was predicted, the present study did not show a beneficial effect of DCR (or a MCR) on recall compared to a control condition of no context reinstatement. There are two interpretations of the unexpected null finding involving the context reinstatement conditions on children’s event recall. The first is that the null finding is the actual state of affairs – DCR and MCR delivered prior to the elicitation of a free account of the event offers no special advantages in enhancing memory of child witnesses. The second possibility for this non-significant result is that, despite having a priori power, the present study lacked the power to detect an effect. Each interpretation will now be discussed in turn.

In relation to the interpretation that there was (really) no effect of MCR and DCR on children’s free recall and responses to open-ended prompts – there are a number of possible explanations. First, it is possible that children in the current study mentally reinstated the context of the event regardless of whether they were specifically instructed to do so. In other words, merely interviewing them about the event might have been enough for them to naturally think back to the context of the event. Thus, further instructions to reinstate the context might not have had a significant impact (see also Dietze, Sharman, Powell, & Thomson, in press, for a discussion of this point).

Second, children were not asked specific questions about the event, which is where some other studies have demonstrated the impact of context reinstatement. For example, Dietze et al. (2010) found that mental context reinstatement instructions affected children’s responses to specific cued-recall questions but not their responses during free recall. They suggested that this difference between free- and cued-recall might have occurred because mental context reinstatement enhances recall through
establishing the boundaries of a search set (see also Dalton, 1993; Smith, Glenberg, & Bjork, 1978). These boundaries may enhance the activation of the memory items within the set. If the activation is low, then cued recall questions should be more effective in probing the set than less specific free recall. Thus, in this situation, cued-recall questions will demonstrate more of a benefit from mental reinstatement instructions than open-ended prompts. Similarly, in the current experiment, it is possible that free recall and open-ended prompts did not effectively probe the search set due to low activation of the memory items. As a result, no significant effect of mental or drawing context reinstatement was found.

Third, while it was theorised that drawing would assist children generate personally relevant, and thus more effective retrieval cues, than MCR, it is possible that drawing did not provide enough of a scaffold to overcome deficits in the internal generation of retrieval cues. Children’s limited ability to self-generate retrieval cues, compared to adults, may explain the difference between our study and that of Dando et al. (2009), where it was found that the completeness of accounts was improved when the adult witness was able to draw prior to recalling the event.

The alternative explanation of the null result of interview condition on event recall is that the current study lacked adequate power to detect an effect; specifically, additional power analyses indicate that a Type II error cannot be ruled out. Not only are the confidence intervals around the current study’s effect sizes very broad - indicating a lack of certainty that the effect size is truly zero – Katz & Hershkowitz’s (2010) effect size of interview condition used in the a priori power calculation was within the current study’s confidence intervals. The unexpected high variability found in children’s recall scores was identified as the likely cause of the lack of power, after examining the potential contribution of measurement error and sampling variance arising from collecting data from four schools.
Large variability in children’s event recall (of the same age) was also found in other Australian studies (Dietze et al., 2010; Wesson & Salmon, 2001). Wesson and Salmon argued that the variability found in interview performance should not be viewed as error variance, but as potentially meaningful. That is, understanding individual differences in cognitive, social and emotional factors that potentially moderate children’s ability to recall event details may help future interviewers predict whether an individual child would benefit from a particular interview method. To date, only a handful of studies have examined individual differences that moderate children’s event recall. Factors that have been found to influence event recall include attachment and prior knowledge of the event (Goodman, Quas, Batterman-Faunce, Riddlesberger, & Kuhn, 1997) intelligence (Elischberger & Roebers, 2001; Roebers & Schneider, 2001), language ability (Salmon et al., 2003), and various aspects of temperament (Gordon et al, 1993; Roebers & Schneider, 2001; Salmon et al., 2003). There is also evidence to suggest that culture can influence the recall of memories (Rubin, Schrauf, Gulgoz, & Naka, 2007). Considering the current sample can be characterised as multicultural, with a high number of children of an Asian background (from several countries), in retrospect collecting additional demographic information, such as ‘ethnic background’, ‘length of time family has been in Australia’ and ‘English as a second language’ may have been useful in explaining the variability of the current sample, (however, please note that all children in the sample were fluent in English). Further, considering knowledge of the event can also influence recall, including a question designed to assess the familiarity with a magic show may also have been useful.

The main implication from the current experiment is that asking younger and older child witnesses to draw an event prior to freely recalling it increases their accuracy when answering questions that are true- or false-biased. The fact that no positive correlation was found between drawing ability and the amount of information recalled
for only those in the drawing condition, indicates that the protective function of drawing prior to recall is not limited to those who can draw well. Because the current study did not find that event recall was improved, compared to the control interview, it is unlikely that Memon, Zaragoza et al.’s explanation that resistance to suggestive questioning lies only in improving memory and thus confidence for the witness to question suspicious information supplied by the interviewer. Rather, once children have drawn the event, they have a record of the details that they can refer to during questioning, perhaps protecting against source monitoring failure. Alternatively, an external reference to the memory of the event may reduce children’s uncertainty of their recall possibly invoked by the biased information, thereby reducing interviewer compliance. In a similar line of inquiry, Naka (2000b, as cited in Naka, 2006) found that writing prior to the presentation of true and false information increased the accuracy of children’s responses. It would be interesting to investigate whether writing better protects against the effects of suggestive questioning than drawing.

The protective properties of the DCR—compared to the NCR—are promising as a first step. It is possible that asking children to self-generate retrieval cues through drawing at the beginning of the investigative process might be used to protect the child from changing their testimony in the face of repeated questions if they were allowed to refer to their drawing. Future research is needed to clarify the extent of the usefulness of this easily-implemented, potentially protective exercise.
CHAPTER 5 - DOES THE COGNITIVE INTERVIEW PROMOTE STORY GRAMMAR IN CHILDREN WITH AND WITHOUT AN INTELLECTUAL DISABILITY? (STUDY 2)

This chapter presents the second study of the thesis, which investigates the beneficial effect of the cognitive interview (CI) in eliciting a coherent story in children with and without intellectual disability (ID). The current study contributes to the literature by being the first to investigate whether the CI not only enhances memory but improves the way children tell their stories (using Stein and Glenn’s 1979 story grammar framework). Indeed, this is the first study to experimentally investigate a way of improving children’s storytelling within the investigative interviewing area.

The rationale for conducting this study is that research shows it is the quality of an eye-witness account that is key in decisions to proceed with prosecution, given that most child abuse cases lack corroborating physical evidence (Berliner & Barbieri, 1984; Lamb et al, 2008). Even with the presence of physical evidence, it is the ability of the child to ‘tell their story’ that juries consider more essential in decisions to convict (De Jong & Rose, 1991). This is because a clear, logically ordered and coherent account allows for the jury to evaluate the credibility of the child’s story (Leippe, Romanczyk, & Manion, 1992; Raskin & Esplin, 1991) and for establishing the precise nature of the criminal acts (Guadagno, Powell, & Wright, 2006). Unfortunately, individuals with ID are perceived to give less reliable accounts to police and less credible testimony in court (Gudjonsson et al., 2000; Henry et al., 2011), resulting in an under-representation of ID witnesses in the criminal justice system. Considering children with ID are more likely to be abused and/or neglected than children without ID (Crosse et al., 1993; Sullivan &

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7 A version of this study is currently in press in the International Journal of Development, Disability and Education.
Knutson, 2000), research aimed at improving children’s storytelling abilities (and therefore access to justice) is timely.

Given children’s eyewitness accounts are elicited in the investigative interview and may be used in court, it is particularly important to examine ways the interviewer can maximise children’s ‘story telling’ abilities, possibly with the utilisation of the CI. As detailed in earlier chapters, research to date indicates that the CI successfully enhances children’s recall of witnessed events compared to the Structured Interview (SI) (e.g., Holliday, 2003a, 2003b; Larsson et al., 2003; Larsson & Lamb, 2009; McCauley & Fisher, 1995; Milne & Bull, 2003; Saywitz et al., 1992). This beneficial effect on memory has been generalised to children with ID (Milne & Bull, 1996; Price, 1997; Robinson & McGuire, 2006).

Recently researchers in the investigative interviewing area have turned their attention to examining how well children are able to communicate their accounts/stories, though with only five studies completed in this area (c.f. Feltis, Powell, & Roberts, 2011; Feltis et al., 2010; Murfett et al., 2008; Snow et al., 2009; Westcott & Kynan, 2004), research is still in its infancy. Related research has shown that producing a narrative is a complex skill that calls for the recruitment and integration of social, communicative, cognitive (Norbury & Bishop, 2003) and mega-cognitive abilities (Montague, Maddux, & Dereshiwsky, 2001). Further, the specific skill of storytelling requires the acquisition and use of a cognitive schema or template that provides a set of culturally shared rules of the common elements and structure of a story (Montague et al., 2001), and how to relate it in a way that is logical and meaningful to the listener (Paul, 2001). To measure this, linguistic researchers developed the \textit{story grammar framework}.

According to the widely utilised and influential story grammar framework designed by Stein and Glenn (1979; Nicolopoulou, 2008), a well-formed, coherent story
comprises the following seven logically sequenced elements, including: 1) *Setting*, which introduces the main protagonist and/or describes the physical location and the time in which the event took place; 2) *Initiating event*, which refers to the event or action that begins the behavioural sequence of events; 3) *Internal response*, which refers to the emotions and cognitions of the character (in case of a first-person account) or the inferred emotions and cognitions (in the case of a second-person account) evoked by the initiating event; 4) *Plan*, which refers to a set of intentions formed in the mind of the character in response to the initiating event to obtain change in the situation; 5) *Action*, which refers to what the character did in his or her effort to execute the plan; 6) *Direct consequence*, which refers to the outcome of the attempt/action; and 7) *Resolution*, which refers to the child’s reaction to the consequence or to the outcome of the story. At the structural level, a story consists of a *setting* and one or more ‘episode systems’, also known as the behavioural sequence. The composition of a behavioural sequence consists of at least an *initiating event*, an *action* or a *consequence* and a *resolution* (Stein & Glenn, 1979), though there are minor differences in this composition across researchers. To illustrate a behavioural sequence, recall Goldilocks and the Three Bears; this story includes three behavioural sequences: the episode concerning the porridge, the episode concerning the chairs, and the episode concerning the beds.

Westcott and Kynan (2004) were the first to apply a story-grammar framework to the investigative interviewing research area. They were interested in determining the degree in which children’s eye-witness accounts of alleged sexual abuse adhered to a story grammar framework, measuring for the presence and clarity of story grammar elements, the degree to which the narrative was logically ordered or disordered, and the presence of ambiguities and inconsistencies. Video-taped interviews with children (73% females, aged 12 years and younger) involving a range of sexual abuse allegations were coded for 5 of the 7 Stein and Glenn’s (1979) story grammar elements (direct
consequences and resolution were not included). Problematically, only a small amount of children’s accounts consisted of story grammar elements and, overall, they were incomplete, ambiguous and incoherent to an extent that would impede the understanding of a listener. Age effects were also reported, with children under 7 years providing less clear setting, initiating events and abuse activities, and they were more disordered in relating their accounts than older children. The very low levels of story grammar elements produced in children’s field interviews were replicated by Snow et al. (2009).

So, how well are children with ID able to tell their story? Based on research on memory and communication, children with ID would be expected to provide a more impoverished and less coherent story than children without ID. For instance, past research has established that individuals with ID are poor at encoding, storing and retrieving information (Kebbell, Hatton, & Johnson, 2004; Milne & Bull, 2001). One would expect this would lead to less information reported in an interview (and hence a reduced opportunity to provide story grammar) – and this is what has been found (Agnew & Powell, 2004; Henry & Gudjonsson, 2003; Michel, Gordon, Ornstein, & Simpson, 2000). Interestingly, while children with ID provide less complete eyewitness accounts than age-matched children without ID, their accounts are just as accurate.

Further, children with ID have noted deficits in language production (Paul, 2001). The type of difficulties arising from poor language production include producing narratives with less words and less complex sentences (Feagans & Short, 1984), poor fluency of expression (Montague et al., 2001), articulation errors (Shriberg & Widden, 1990), and dependence on concrete words (Owens, 1999). These deficits would likely impact on their ability to provide a coherent and understandable story.

Only one study has examined the ability of children with ID to adhere to a storytelling framework in the provision of an eye-witness account (Murfett et al., 2008). Children with ID (aged 9-12 years), matched with chronological and mental age peers,
participated in a ‘magic show’ at their school then were interviewed four days later according to ‘best interview practices’. To measure the quality of children’s accounts, responses were coded for story grammar, contextual/background information, and unrelated content, in addition to length of the narrative. Results showed that children with ID provided proportionally less story grammar elements than both control groups, with 13% unable to provide a narrative account at all. Children with ID also provided shorter narratives compared to the chronologically matched control group. Murfett et al. (2008) concluded that even under optimal conditions of ‘best interview practices’, children with ID have difficulty in telling their story in a coherent manner compared to children without ID.

Notwithstanding the valuable contribution of this study, to obtain a clearer picture of children’s storytelling abilities requires going beyond measuring for the presence of story grammar elements, to including a measure of how well the story grammar elements are logically ordered. That is, how well a child can provide an adequately structured (coherent) ‘episode’ or behavioural sequence, similar to the Westcott and Kynan’s (2004) study. The importance of including this as a measure is supported by research that has found that children’s ability to provide a clear sequence of events is crucial in decisions by the prosecution to proceed with a case (Davis et al., 1999). Further, gauging the amount of ambiguous and inconsistent information that can clutter an account, as well as the number of disordered sequences (i.e. behavioural sequences out of logical order) is crucial to the ability to more fully capture the experience of the listener (i.e. police, the prosecution, and juries). Children without ID pepper their accounts with ambiguities and inconsistences that negatively impact on story coherency and therefore their credibility (Davis et al., 1999; Westcott & Kynan, 2004). Thus, it would be expected that children with ID would be more disadvantaged in this regard, because of deficits in their recall and communication.
The CI might enhance the coherence of narratives provided by children with ID in two different ways: through enhancing their memories of the witnessed events and through enhancing the relationship between the interviewer and the witness. Given that children remember more about the event when interviewed with the CI, it follows that they should have more information to report in their stories than those interviewed with the SI. The more supportive relationship between the interviewer and the witness may increase children with ID’s confidence about their ability to describe the event, which—coupled with their better memory for details—should encourage them to relate a more comprehensive and, thus, more coherent narrative compared with children interviewed with the SI. Further, directing the witness to recount the event from a different starting point (i.e. backwards), may sensitise the child to the temporal and logical ordering required for a meaningful and coherent narrative. Indeed, past research by Memon, Cronin, Eaves and Bull (1992) found more temporal information in children’s accounts in response to the ‘reverse order’ instruction than the other three memory strategies.

The aim of the current experiment was to investigate whether the CI promoted the coherence of narrative accounts in children with and without ID. Children watched a magic show before they were interviewed about it using the CI or the SI. The differences in children’s storytelling abilities were examined by measuring their production of story grammar, contextual and background information, logically-ordered behavioural sequences, the temporal markers that they used, and any inconsistencies and ambiguities in their stories. Based on the reasoning stated above, it was expected that children with and without ID would produce more story grammar elements and more contextual/background information in the CI, compared to the SI. It was also expected that the CI would increase the use of temporal markers and the adequacy of behavioural sequences in the transfer of a meaningful account, and decrease the
presence of story violations (ambiguities and inconsistencies) in children with and without ID.

**Method**

**Design**

The current study involved the re-coding and analysis of two existing data sets using Stein and Glenn’s (1979) story grammar framework. The data sets were collected at the same time by the same researchers; one sample comprised 84 children without ID (Milne & Bull, 2003), and the other, 84 children with ID (Milne & Bull, 1996). Briefly, children from each sample were pseudo-randomly allocated to a CI or SI condition to ensure age and gender were represented as equal as possible across cells, then individually interviewed regarding what they could recall about a ‘magic show’ video they viewed 24 hours earlier. A pre-set list of suggestive questions was also asked, either before or after the interview. Further information on participants, interview condition and memory stimulus are provided below, but for a full account refer to publications.

Upon transcription (verbatim) of the audio-tapes for the current study’s use, 14 interviews from the non-ID sample and 4 from the ID sample were excluded because the tape recordings were damaged. The design of the current study was a 2 (intellectual status: ID, Mainstream) x 2 (Interview: CI, SI) between subjects design.

**Participants**

A total of 150 children who were recruited from an English metropolitan area participated in this study. Informed written consent was obtained via letters to parents/guardians sent out by their homeroom teacher.

Eighty children with ID (52 males, 28 females) aged between 7 and 10 years ($M = 117.03$ months, $SD = 10.24$, range = 96-133 months) were recruited from a special
school for children with mild to moderate ID. Due to data protection issues, children’s records were not available to the original researchers, nor were they able to carry out cognitive testing to confirm mental age in schools. However, as part of their admission into the special school, children were identified as having a significantly greater difficulty in learning than the majority of pupils of their age, or having a disability which meant that they could not make full use of the general educational facilities provided for pupils of their age. Their ID status was independently verified by educational psychologists and all children had received a statement of special education needs. Based on Mittler (2002), it was expected that the sample would be heterogeneous, including children with physical and sensory impairments, mild to moderate specific learning disabilities, emotional and behavioural difficulties, autism, and Down syndrome.

Seventy children without ID (34 males, 36 females) aged between 8 and 9 years ($M = 113.43$ months, $SD = 4.46$, range = 107-126 months) were recruited from a mainstream school.

A priori power analysis was calculated using the statistical program G*Power (Faul et al., 2007) to ensure the available sample was adequate to detect an effect. Because no previous research exists that would provide a reasonable approximate of $d$, the present study followed Howell’s (2002) recommendation and utilised effect size parameters proposed by Cohen (1988). Further recommended by Howell (200), a medium effect size was chosen. This effect size, a significance criterion of .05 and the desired power coefficient of .80 were entered into the program. Results indicated that a total sample size of 128 was the minimum required number. Thus, a sample of 150 children was deemed adequate to detect a medium effect.
Materials and Procedure

Deakin University Research Ethics Committee granted approval to conduct this study. Participants watched a 9-minute ‘magic show’ video in their usual classes. The video depicted a magician performing six magic tricks to an audience of preparatory children. One day later, children were individually interviewed at their school (but in a different room from where they viewed the video). For a description of the interviews beyond what was offered earlier, see Table 5.1. As can be seen, the SI and CI conditions consist of 6 common phases, with the CI memory and communication enhancement techniques in italics. Because the change perspective mnemonic is difficult for children (Memon et al., 1996), it was not included in the study.

Interviewers in Milne and Bull’s (1996) ID study consisted of five graduates (4 female, 1 male), $M$ age = 29 years, who conducted both the CI and SI (controlling for interviewer individual differences). Interviewers in Milne and Bull’s (2003) non-ID study consisted of five undergraduates and three graduates (4 female, 4 male), $M$ age = 21 years who conducted either the CI or SI (controlling for the purity of the interview techniques between interview conditions). The identical training and similar quality assurance tests were included to minimise potential differences between studies.

Coding

Interviews were audiotaped and transcribed verbatim. To code the transcripts, a scoring template was developed from past research (Murfett et al., 2008; Stein & Nezworski, 1978; Westcott & Kynan, 2004). A narrative expert (not otherwise involved in the present study) was consulted to ensure a valid and reliable coding system. The scoring template was then trialled on fifteen randomly selected transcripts with a second coder, who was familiar with the magic show but uninvolved in the present study for the purpose of reliably assigning narrative to story grammar categories. Any discrepancies
Table 5.1

<table>
<thead>
<tr>
<th>Phase 1</th>
<th>Structured Interview</th>
<th>Cognitive Interview</th>
</tr>
</thead>
<tbody>
<tr>
<td>Phase 1</td>
<td>Greet and establish rapport</td>
<td>Greet and establish rapport</td>
</tr>
<tr>
<td>Phase 2</td>
<td>Explain the aims of the Interview</td>
<td>Explain the aims of the interview</td>
</tr>
<tr>
<td></td>
<td>Transfer control</td>
<td>Report everything</td>
</tr>
<tr>
<td></td>
<td>No fabrication or guessing</td>
<td>Transfer control</td>
</tr>
<tr>
<td></td>
<td>Concentrate hard</td>
<td>No fabrication or guessing</td>
</tr>
<tr>
<td></td>
<td>Initiate free report</td>
<td>Concentrate hard</td>
</tr>
<tr>
<td>Phase 3</td>
<td>‘Remember more’ prompt</td>
<td>‘Remember more’ prompt</td>
</tr>
<tr>
<td>Phase 4</td>
<td>Questioning</td>
<td>Questioning</td>
</tr>
<tr>
<td></td>
<td>Open and closed questions</td>
<td>Activate and probe an image</td>
</tr>
<tr>
<td></td>
<td>No fabrication or guessing</td>
<td>Witness compatible questioning</td>
</tr>
<tr>
<td></td>
<td>OK to say ‘don’t know’</td>
<td>Report everything</td>
</tr>
<tr>
<td>Phase 5</td>
<td>Motivated second retrieval</td>
<td>Reverse order recall</td>
</tr>
<tr>
<td>Phase 6</td>
<td>Closure</td>
<td>Closure</td>
</tr>
</tbody>
</table>

were discussed and resolved. Inter-rater reliability was obtained by two coders independently marking 20% of the same transcripts (that were chosen at random). The computations of intraclass correlation (i.e., absolute agreement), the most appropriate reliability measure for this type of data (Armstrong, 1981), indicated that reliability was very good to excellent (.89 - .99) for each of the dependent variables.
Children’s responses were coded for three content areas: 1) *story grammar elements*, 2) *contextual background information* (i.e. content that did not add to the storyline, but provided rich extra information – e.g. ‘the rabbit that appeared was white’; ‘the magician was wearing a purple suit’), 3) *unrelated content* (i.e. when a child made an off-topic remark, asked questions of the interviewer, or stated that they ‘could not remember any more’ or they ‘did not know’). All children’s responses were coded regardless of whether they were correct or not, as the focus of the current study was more on how well the accounts were communicated to the listener, rather than their accuracy.

Each of the six tricks (or episodes of behavioural sequences) was coded separately to assess how well children were able to logically structure and communicate these in a meaningful and coherent way. In addition, another category was created to cater for confabulated narrative, and another for overall information that did not pertain to the magic tricks (e.g., setting and descriptions of the magician), but were part of or related to the story. If a child provided an account of a trick including at least three of the four following story grammar elements (initiating event, action, direct consequence and resolution) recalled in logical order, then it was coded as an *adequate ordered behavioural sequence*. An account of a trick with only two of these story grammar element reported in logical order was coded a *partial ordered behavioural sequence*. An account of a magic trick that included only one story grammar element was ignored (but still captured in the measure of number of *story grammar elements*). Note that as the current study was concerned with measuring for what is minimally sufficient for the listener to comprehend ‘what happened’, this measure does not reflect the *total number* of story grammar elements a child used to recount a behavioural sequence (that is, the inclusion of two or more of a particular story grammar element). The above definition of a *behavioural sequence* is a slightly different conceptualisation to Westcott and
Kynan’s (2004) study. These authors omitted direct consequence and resolution. However, other story grammar field studies (Feltis et al., 2010; Snow et al., 2009) have meaningfully coded these from the perspective of the child, to better capture the story. Based on this and the experience of developing the coding manual for the current study, it was considered important to have at least one of these story grammar elements in the sequence, especially in situations where there are multiple episodes in a story system (i.e., an experienced event). This is because they also contribute to delimiting one behavioural sequence from the next.

Children’s narratives were also coded for temporal markers (e.g., ‘after that’, ‘the last trick was…’ or a response in relation to questions such as ‘tell me what the last thing that happened was’). Here, temporal markers were not information that contribute to the setting of the story (i.e., when the event took place), but were cohesive reference devices employed to provide a temporal relationship between clauses. Information that was repeated or redundant (e.g., the rabbit had two ears) was not coded. Responses to the suggestive questions were also not coded as they were not relevant to the current study.

Finally, story violations were coded for each of the episodes of behavioural sequences. Ambiguities referred to details that were not understandable or open to more than one interpretation. Inconsistencies referred to details or statements that differed at two or more points across the interview. Disordered behavioural sequences referred to an account of a trick with the presence of three or more particular story grammar elements (initiating event, action, direct consequence, and resolution) that were not recalled in logical order.

Results

Visual inspection of the histograms for each dependant variable for the two groups suggested that several variables were not normally distributed. However, skewness and
kurtosis were satisfactory and below 3 in all instances. In the interests of interpretability, transformations were not done. As each of the cells of the variables held over 20 (i.e., a minimum of 33) participants and there was over 20 degrees of freedom for error (i.e., 137 degrees of freedom), the data were considered robust against violations of normality (Tabachnick & Fidell, 2007). Accordingly, ANOVAs were conducted.

Seven children with ID did not provide a narrative account, and two others did not remember the magic show; therefore the results presented below are based on 71 children with ID and 70 children without ID.

**Correct Recall**

Before examining the effect of interview type on children’s story grammar, it was first determined whether the CI increased children’s recall of accurate details compared to the SI in the current sample. The results are displayed at the top section of Table 5.2. A 2 (intellectual status: ID vs. Mainstream) x 2 (Interview: CI vs. SI) ANOVA on mean number of correct details revealed a significant main effect for ID: children with ID produced fewer correct details ($M = 73.27, SD = 37.86$) than children without ID ($M = 115.82, SD = 40.06$), $F(1, 137) = 47.20, p = .001, \eta^2 = .24$. There was a significant main effect for interview: children interviewed using the CI reported more correct details ($M = 115.82, SD = 40.06$) than those interviewed using the SI ($M = 73.27, SD = 37.86$), $F(1, 137) = 47.20, p = .001, \eta^2 = .24$.

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8 Note that non-parametric analyses were performed to confirm results of the parametric analyses. They showed exactly the same pattern of results. Therefore, for ease of interpretation, the results of the parametric analyses are presented.

9 To code for correct event details an exhaustive list of available details of the magic show was catalogued, with the final coding scheme including 771 units of information. Each piece of information was coded as correct, incorrect, or confabulated. Only correct information was analysed as we were primarily interested in showing that the CI improved children’s recall in the current sample. To introduce an appropriate level of sensitivity in the measure, a weighted system was utilised to capture the specificity of the event detail. An example of the coding system is that the phrase ‘the magician pulled a dove from a scarf’ was coded as ‘magician’ = 1 point, ‘pulled’ = 1 point, ‘dove’ = 2 points (‘bird’ = 1 point), ‘scarf’ = 1 point). As a matter of interest this example would be coded as 1 ‘direct consequence’ within the story grammar framework.
The mean total number of story grammar elements (i.e. the sum of all elements), contextual/background elements and unrelated content, representing the total output of the children’s content, are displayed in the top section of Table 5.2. Two separate 2 (intellectual status) × 2 (interview) between-groups ANOVAs were conducted to investigate the possible beneficial effect of the CI on the production of story grammar elements and contextual/background content in children with and without an ID. No further analyses were performed for the variable unrelated content as it was only included to provide the reader with an overview of the total output of children’s responses.

Concerning the number of story grammar elements, there was non-significant trend for interview condition favouring the CI (M = 21.17, SD = 10.91) over the SI (M = 19.31, SD = 10.47), F(1,137) = 1.94, p = .166, η² = .01. There was a significant effect for participant group: children with ID were found to produce fewer story grammar elements (M = 15.18, SD = 9.25) than children without ID (M = 25.34, SD = 9.61), F(1, 137) = 41.41, p = .001, η² = .23. The interaction was not significant, F(1, 137) = .46, p = .499.

There was a significant difference in event-related contextual background information across interview condition, F(1,137) = 24.27, p = .001, η² = .14. Children
with and without ID provided significantly more contextual/background information in the CI ($M = 31.56$, $SD = 14.22$) than the SI ($M = 22.03$, $SD = 10.18$). However, children with ID provided fewer contextual/background information ($M = 23.18$, $SD = 11.20$) than children without ID ($M = 30.26$, $SD = 14.14$), $F(1,137) = 13.99$, $p = .001$, $\eta^2 = .08$.

The interaction between participant group and interview condition was non-significant $F(1,137) = .26$, $p = .613$.

Table 5.2

Mean Number of Content Details, Ordered Sentences, and Violations by Condition

<table>
<thead>
<tr>
<th></th>
<th>Children with ID</th>
<th>Children without ID</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>SI</td>
<td>CI</td>
</tr>
<tr>
<td><strong>Memory</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Correct event details</td>
<td>60.83 (34.5)</td>
<td>85.36 (36.5)</td>
</tr>
<tr>
<td><strong>Content details</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Story grammar</td>
<td>13.37 (8.36)</td>
<td>16.67 (9.79)</td>
</tr>
<tr>
<td>Contextual/background</td>
<td>18.80 (9.79)</td>
<td>27.81 (11.47)</td>
</tr>
<tr>
<td>Unrelated</td>
<td>9.77 (8.13)</td>
<td>7.72 (5.84)</td>
</tr>
<tr>
<td>Temporal markers</td>
<td>0.70 (1.0)</td>
<td>2.72 (2.1)</td>
</tr>
<tr>
<td><strong>Order</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Adequately ordered</td>
<td>1.03 (0.92)</td>
<td>1.67 (1.39)</td>
</tr>
<tr>
<td>Partially ordered</td>
<td>0.83 (0.86)</td>
<td>0.94 (0.98)</td>
</tr>
<tr>
<td><strong>Violations</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Inconsistencies</td>
<td>0.94 (1.26)</td>
<td>0.33 (0.63)</td>
</tr>
<tr>
<td>Ambiguities</td>
<td>5.06 (4.66)</td>
<td>4.11 (3.39)</td>
</tr>
<tr>
<td>Disordered</td>
<td>0.29 (0.62)</td>
<td>0.28 (0.57)</td>
</tr>
</tbody>
</table>

*Note: ID = Intellectual Disability; SI = Structured Interview; CI = Cognitive Interview. Standard deviations are in parentheses.*
Taken together, these results suggest that the CI encouraged children to produce more event-related contextual information than children interviewed with the SI. However, the CI did not significantly improve story grammar compared to the SI.

**Logical Order of Information**

The mean number of *adequately ordered* and *partially ordered* was calculated. As there were six different magic tricks (episodes) in the video, children’s maximum score was six. The middle section of Table 5.2 presents the mean number of reported episodes displayed by order condition. Overall, children provided a low number of adequately ordered episodes. A series of 2 (intellectual status) × 2 (interview) between-groups ANOVAs for each of the order variable was conducted.

There was a significant difference in the number of *adequately ordered episodes* across interview, $F(1, 137) = 4.67, p = .032, \eta^2 = .03$. Children with and without ID provided significantly more adequately ordered episodes in the CI ($M = 2.16, SD = 1.37$) than the SI, ($M = 1.76, SD = 1.44$). The was also a main effect for participant group, $F(1, 137) = 33.31, p = .001, \eta^2 = .19$, indicating that children with ID recounted fewer adequately ordered episodes ($M = 1.35, SD = 1.22$) than children without ID ($M = 2.57, SD = 1.34$). The interaction was non-significant, $F(1, 137) = .883, p = .349$.

For the *partially ordered episodes*, there was no main effect for interview condition, $F(1, 137) = .04, p = .85$, and no main effect for intellectual status, $F(1, 137) = .53, p = .470$. There was also no interaction, $F(1, 137) = .32, p = .576$.

**Temporal Markers**

The mean number of temporal markers that children included in their accounts was examined using a 2 (intellectual status) x 2 (interview) ANOVA. Results revealed a significant main effect for interview condition, $F(1, 137) = 71.43, p = .001, \eta^2 = .28$. 
Children provided more temporal markers in the CI ($M = 3.91$, $SD = 2.34$) than those interviewed using the SI ($M = 1.41$, $SD = 1.74$). However, children with ID provided fewer temporal markers ($M = 1.72$, $SD = 1.97$) than children without ID ($M = 3.57$, $SD = 2.50$), $F(1, 137) = 134.64$, $p = .001$, $\eta^2 = .16$. The interaction was not significant, $F(1, 137) = 3.08$, $p = .081$.

**Story Violations**

The means number of inconsistencies, ambiguities and disordered accounts present in children’s accounts were calculated and are presented in the lower part of Table 5.2. Two 2 (intellectual status) × 2 (interview) between-group ANOVAs were then performed for each variable. For the number of inconsistencies, there was a main effect of interview, $F(1, 137) = 6.28$, $p = .013$, $\eta^2 = .04$. Children included significantly fewer inconsistencies in their accounts in the CI condition ($M = .38$, $SD = .67$) than the SI condition ($M = .74$, $SD = 1.02$). Interestingly, an inspection of the means showed that children with ID who were interviewed by the CI had a lower number of inconsistencies than children without ID (in both interview conditions), though the interaction was non-significant, $F(1, 137) = 2.90$, $p = .091$. No difference in number of inconsistencies was found between children with ID and without ID, $F(1, 137) = 1.16$, $p = .284$.

The main effect for interview condition in the number of ambiguities approached significance, $F(1, 137) = 3.34$, $p = .073$, $\eta^2 = .02$. As can be seen, the trend of the means favoured children in the CI condition, who reported fewer ambiguities than children in the SI condition. There was a main effect for participant group, $F(1, 137) = 15.06$, $p = .001$, $\eta^2 = .10$, indicating that children with ID reported more ambiguities ($M = 4.58$, $SD = 4.07$) than children without ID ($M = 2.41$, $SD = 2.50$). The interaction was not significant, $F(1, 137) = .291$, $p = .873$. For disordered episodes, there was no main
effect for interview, \( F(1, 137) = .06, p = .805 \), nor for intellectual status, \( F(1, 137) = 1.24, p = .268 \). There was also no interaction, \( F(1, 137) = .12, p = .734 \).

To sum, the CI, compared to the SI, had a beneficial effect of reducing story violations such as inconsistencies and (to a lesser extent) ambiguities that negatively impacts on the coherency and meaningfulness of children’s accounts.

**Discussion**

Overall, the CI enhanced the children’s correct recall of the witnessed event compared to the SI. This enhancement occurred for children with and without ID, which replicates previous research (Price, 1997; Robinson & McGuire, 2006). The unique contribution of this study is that it demonstrated that the CI not only enhances memory performance, but provides some benefit in the production of a coherent account in children with ID, generalised over children without ID. While it was unexpected that there was no difference between interview groups with respect to the production of story grammar elements, the children interviewed by the CI reported more contextual/background information (which serves to augment the narrative). Moreover, results indicated that the CI improved the ability of the children in both groups to chronologically and logically narrate ordered behavioural sequences with enough story grammar elements to meaningly transfer ‘what happened’ to the listener, compared to the SI. The concomitant increase in temporal markers, devices that act as sequential signposts, strengthens this finding, along with the fewer inconsistencies and (to a lesser extent) ambiguities made by the children. In short, the children interviewed by the CI told better stories than children interviewed by the SI.

It is surprising that the CI only increased the provision of contextual/background information and not the number of story grammar elements in the children’s accounts. Considering that there was sufficient a priori power (to find a medium effect), it
suggests that the null finding may be the true state of affairs - or that the real difference in the number of story grammar elements between interview conditions was too small to detect. The question is raised, then, on what aspects of the child’s account was improved by the CI in the Milne and Bull (1996, 2003) studies, considering the benefit of memory enhancement did not extend to increasing the production of story grammar elements – that is the central story. Examining the type of detailed recalled in the original studies, children recalled more person, action, and surrounding (but not object) details in the CI, compared to the SI. This finding has generally been replicated elsewhere in the CI literature (Holliday, 2003a, 2003b; Memon et al., 1997). On the face of it, one would expect the significant increase in action details to translate into an increase in story grammar elements, as most elements have an ‘action’ quality. However, close examination of the coding protocol show that nearly each word in the children’s accounts was partitioned according to detail type, resulting in the likelihood that such a fine-grained level of analysis was unable to capture the concept of a story grammar element and, following this, how well the CI was able to improve recall of the central issue of ‘what happened’. This underscores the distinct contribution of story grammar analysis to the CI literature.

So why did the beneficial effect of the CI lie in the production of contextual and background information rather than the story grammar elements? One possible reason for this finding is that the mental reinstatement of context instruction encouraged the children to mentally recreate the background setting and contextual information from the event. When paired with the report everything mnemonic, this type of information may then be more likely to be elicited in their subsequent accounts. Nonetheless, the mental reinstatement instruction should have encouraged the retrieval of the entire event—that is, the story of ‘what happened’—as it should have increased the overlap between the encoding and retrieval conditions thereby augmenting memory (Tulving &
Thomson, 1973). A potential explanation for this is a cognitive load effect: the children’s cognitive capacities may already be at maximum load from the effortful task of both attending to interviewer instructions and attempting to recall multiple physical and perceptual details, essentially leaving no or minimal resources to organise the resulting confusion of details in the context of a meaningful story. It is possible, therefore, that the mnemonic decontextualised the contextual and background details from the representation of the story in memory. This novel finding has provocative implications for mental context reinstatement given it is the most distinctive component of the CI.

The finding that the CI increased contextual/background information that is relevant but not central to the storyline has potential value for at least three reasons. One, a quality eyewitness account is one that is as accurate, coherent and complete as possible. While the extent to which these types of details are of investigative or evidentiary value cannot be determined, presumably the more facts available to the investigator, the more likely the chance of corroborating or refuting them. Secondly, contextual/background information may also be useful in particularising one individual offence from another (in the case of repeated abuse). This is an important forensic goal because successful prosecution requires the distinguishing of individual offences with reasonable precision in most jurisdictions (e.g., see S v. R, 1989). Indeed, police often target this information when questioning children about repeat events (Guadagno & Powell, 2009). And third, the ability to provide a richer story may increase the possibility of the child’s case to rightfully proceed through the criminal justice system: fact-finders perceive detailed eye-witness accounts as more credible than less detailed ones (Bell & Loftus, 1989; Henry et al., 2011; Wells & Leippe, 1981).

The CI increased the children’s ability to provide a logically ordered and coherent sequence of behaviour that was understandable to the listener. This may be due to the
enhancement of the children’s memory and their ability to provide a fuller account in their free narrative, which has led to a greater opportunity for the interviewer to use follow-up prompts to flesh out what happened. When providing these prompts in line with the mental operations of the child (i.e., using prompts to encourage the witness to continue or to elaborate on the current flow of the narrative) it should have assisted the children to provide adequate behavioural sequences (as opposed to being interrupted with unrelated questions). This assistance may be particularly relevant to children with ID, as past research has suggested that they lack confidence in the accuracy and helpfulness of their responses and often seek reassurance (Agnew & Powell, 2004; Murfett et al., 2008). Generally speaking, the recognition of the role of social and communicative strategies in the elicitation of an eyewitness account is in line with a large body of research (e.g., Larsson & Lamb, 2009; Milne & Bull, 2001; Powell et al., 2005). As police (Westera, Kebbell, & Milne 2011) and the prosecution (Davis et al., 1999) place value on the quality of a chronological and ordered story in decisions to proceed, a major implication arising from this finding is that investigative interviewers have the responsibility for optimising the coherency of children’s stories.

Comparing the current study’s results with Westcott and Kynan’s (2004) descriptive study is difficult because of differences in design and method. Nonetheless, these results also show that children without ID have difficulty in providing a complete story, and have a similar low level of disorder in their behavioural sequences in the laboratory as in the field. These finding were extended by showing stories of the children with ID included a similar low number of disordered behavioural sequences as children without ID, regardless of interview condition. Based on Westcott and Kynan’s findings that younger children’s accounts have a higher degree of disorder than older children, it would not be unreasonable to expect that children with ID would also show a similar developmental effect. The null finding in the current study is likely due to the
more stringent definition of a disordered (and ordered) behavioural sequence. That is, the children with ID were less likely to meet the criteria of reporting a disordered behavioural sequence due to the poverty of their narrative. Nonetheless, it is important to point out that, as in the Murfett et al.’s. (2008) study, a clear majority of the children were able to provide some elements of a story, with only 10% of children with ID unable to provide any story grammar at all. This highlights the importance of avoiding premature and pessimistic conclusions regarding the ability of a child with ID to tell their story, and consequently foregoing the interview.

It is noteworthy that few behavioural sequences were adequately recounted, even when the children were interviewed under the optimal condition of the CI. That is, out of the six tricks the magician performed, only 1.67 tricks/behavioural sequences were adequately reported by the ID group and 2.70 tricks/behavioural sequences adequately reported by the non-ID group. This low number is especially concerning considering the ‘magic show’ would be an event already familiar with most children: related research shows that repeated events increases gist memory of that event (Powell & Thomson, 1996). This finding has been extended to story grammar production (Feltis et al., 2011). Nevertheless, the limited ability of the children to provide an adequate story for the purpose of a listener’s understanding is consistent with past field research (Davis et al., 1999). Given that children’s poor storytelling abilities impact on the decisions made by police to investigate cases, the prosecution to proceed with the case to court, and by judges to direct the jury to acquit the defendant, the ability of the CI to improve children’s storytelling is especially valuable.

Compared to the SI, the CI was also of benefit in reducing the story violations of inconsistencies, and to a lesser extent, ambiguities in children’s stories. Inconsistencies across children’s accounts may have been reduced through the improved memory performance of children interviewed using the CI. This finding has important
implications for court as inconsistencies in children’s accounts are typically considered
to indicate a lack of credibility (Fisher, Brewer, & Mitchell, 2009). It is interesting that
the interaction between the type of interview and the ID condition approached
significance, which indicated that the CI may be particularly beneficial for the ID group
in reducing the number of inconsistencies. Considering children with ID as witnesses
are perceived particularly negatively by decision-makers in the legal system (Henry et
al., 2011), this trend may be of particular value, and worth pursuing further.

The overall finding that ambiguities featured more prominently in children’s
stories than inconsistencies are in line with Westcott’s and Kynan (2004) results.
However, because the current study used an innocuous event as the memory stimulus, it
suggests that Westcott and Kynan’s explanation that ambiguities arise because of the
child’s sense of shame or reticence may only be part of the picture. Taking into account
that the children with ID had a higher number of ambiguities than children without ID,
as well as the commonality of language deficits in this population (Paul, 2001), it is
likely that language ability contributed to this. The marginally significant difference in
number of ambiguities between interviews is interesting. It is possible that the
social/communicative strategies employed by the interviewer functioned to provide a
’scaffold’ for language deficits. As the presence of ambiguities muddy the
understanding of the central story for the listener, and opens the way for juries to ‘fill in
the gaps’ with their own understanding (Westcott & Kynan, 2004), the potential value of
this trend also warrants further research.

Examination of the presence of individual story grammar elements was not
included in the current study. It is possible that collapsing the story grammar elements
into one overall score has hidden an effect of the CI at the level of the individual story
grammar element (i.e., the profile of individual story grammar elements may differ
between interview conditions). For instance, it is possible that internal response, a story
grammar element found at floor levels in this population (Murfett et al., 2008), may be more likely to be included in the narrative due to the child ‘reinstating’ what they were ‘feeling’ at the time of the event. Similarly, reinstating the context may elicit setting information, at least in terms of describing the physical location. Indeed, this may explain the non-significant trend of number of story grammar elements favouring the CI. What previous field studies have shown (Snow et al., 2009; Westcott & Kynan, 2004) is that setting and attempt are the most popular targets of police questions, as each of these elements are essential in establishing a criminal charge. Thus, research into interview techniques that elicit these types of details would have real-world value.

While conducting this study in the laboratory enabled a high level of control, the use of an innocuous event such as watching a magic show potentially affected the generalisability of the results. Such an event is very different from the experience of being a victim or witness to an actual (possibly traumatic) crime. Nevertheless, the two existing field studies of the CI found it to be effective with adult witness and victims who had experienced real criminal events (Fisher et al., 1989, George & Clifford, 1996). Another potential limitation is that interviews with children took place one day after they witnessed the event. While this retention interval is similar to the interval used in the majority of CI studies (see Memon, Meissner et al., 2010), in real life interviews rarely occur this quickly. Lastly, as previously noted, children’s diagnoses and mental ages were unavailable, which has circumvented a finer analysis of the data. The heterogeneous nature of children’s disabilities that are typically catered for by special schools opens the possibility that the CI may be differentially effective among our sample. Further, while it is suspected the 10% of children with ID who were unable to provide a narrative at all had a more severe intellectual disability, social factors, such as shyness or lack of confidence in their ability to recount what they remembered about the magic show, were unable to be ruled out. Certainly, future work here would be valuable,
though it is recognised that it would be challenging to obtain adequate participant
numbers of different types of disabilities.

In conclusion, the results from the current experiment demonstrated that
interviewing children with and without ID using the CI helps them to tell a better story
than using the SI. Children with and without ID provided more adequately ordered
behavioural sequences, enriched with more contextual detail and temporal signposts to
aid the listener in the causal flow of the story, and their stories were less compromised
by inconsistencies when interviewed with the CI than the SI. Given the importance that
police and prosecution place on having a coherent story in decisions to proceed with
prosecution (Davis et al., 1999; Westera et al., 2011), investigative interviewers should
provide children with an opportunity to tell their stories in a way that maximises the
chances of their case proceeding through the justice system. One way in which this may
be achieved is by interviewing children with the CI.
CHAPTER 6 - CONCLUSIONS AND DIRECTIONS FOR FURTHER RESEARCH

The current thesis contributed to the literature on the effectiveness of the cognitive interview (CI) procedure with child witnesses by conducting two stand-alone studies. Each of the studies had a markedly different focus and was motivated by differing concerns. Responding to both the need to develop a more user-friendly protocol and to fine-tune the protocol for use with child witnesses, Study 1 (Chapter 4) examined a modification to the delivery of the mnemonic ‘mental context reinstatement’ (MCR). Specifically, it examined whether a ‘drawing context reinstatement’ (DCR), compared to a MCR, better enhances children’s event memory and reduces errors in response to suggestive questions. Motivated to extend the usefulness of the CI into a novel area, Study 2 (Chapter 5), investigated whether the CI not only enhances memory but promotes story grammar (i.e., a coherent, meaningful account) in eye-witness accounts provided by children with and without ID.

This final chapter summarises the key findings of each of the two studies and discusses their implications for theory and practice. Directions for future research are also proposed.

6.1 Major Findings, Implications and Possible Future Direction of Studies 1 and 2

In line with existing research (e.g., Dietze et al., 2010; Dietze et al., 2012; Holliday, 2003), the pattern of results of Study 1 indicated that older children, compared to younger children, gave a more complete account, with both age groups similar in accuracy. Older children were also less misled than younger children. Similarly, replicating existing research (e.g., Price, 1997; Robinson & McGuire, 2006), results of Study 2 showed that the CI protocol enhanced the recall of a witnessed event for children with and without ID. Further, children without ID produced more correct
details than children with ID. Studies 1 and 2 also made unique contributions to the CI literature. These, along with the implications and directions for future research for each study will now be discussed in turn.

The unique major findings of Study 1 were that, first, DCR (and MCR) had no effect on younger and older children’s event recall, and second, children in the DCR condition who drew the event prior to recall gave more accurate answers to true- and false-biased questions than those in the no context reinstatement (NCR) interview condition. Concerning the first finding, the unexpected problem with power means that it is difficult to determine whether the null findings of the context reinstatement conditions are due to it being ineffective in enhancing the free recall and responses to open-ended prompts or whether there was not enough power to detect an effect. It further follows that it cannot be determined at this stage which context reinstatement condition is superior (if at all) in enhancing children’s event recall. Theoretically, it was speculated that the verbal cues of MCR may not all be personally relevant to a particular child, and therefore not optimal in facilitating memory retrieval. It was hypothesised that drawing would better facilitate memory because it would provide the opportunity for the child to self-generate their own cues. Explaining the null finding (if it was the actual state of affairs), it may be that drawing did not provide enough of a cognitive scaffold to overcome children’s deficits in self-generating memory retrieval cues. Considering that children were given prompts whilst *simultaneously* ‘drawing and telling’ (e.g., Butler et al., 1995; Gross & Hayne, 1998), it is possible that drawing as an aid to enhance event recall may only be effective when paired with open-ended prompts.

The rigorous follow-up power analyses conducted in Study 1 provided further insights into the null findings. Specifically, these analyses suggest that the ‘noise’ in the data set arose from the inherently large variability in children’s event recall and not
from measurement error or sampling variance (arising from collecting data from four schools). The upshot of the high variability in the children’s event recall within age group is that it indicates there are (at present) poorly understood individual or contextual factors that moderate performance in event recall and, likely, the ability of the child to gain benefit from reinstating the context. In addition, though ethnic demographic data was not collected in this study, anecdotally it was noted that the sample had many children of different ethnic backgrounds. Thus, it is possible that cross-cultural factors may also be contributing to the large difference in children’s event recall. Given that Australia is now considered a multi-cultural nation, future research examining the impact of culture on event memory and context reinstatement is timely.

A practical implication of the null finding for the context reinstatement conditions is that, isolated from the rest of the CI, it has limited utility in enhancing child witnesses accounts. It is possible that, as Milne and Bull (2002) suggests, the value of MCR (as with the other memory strategies) may only be evident in combination with the rest of the CI components. Thus, until the individual differences in children’s event recall is understood better, it is recommended that MCR and DCR should not be utilised in field interviews with child witnesses, outside of use with the CI protocol as a whole.

Concerning the second finding of Study 1, theoretically it was proposed that drawing would protect against subsequent suggestive questions because a stronger and more complete memory of the event would be elicited, leading the child to appraise the misleading/leading information as possibly false (see Memon, Zaragoza et al., 2010). However, given the finding that DCR did not enhance event recall, this theory was not supported. Instead, it is possible that drawing functions to protect against source monitoring failure due to it being an easily accessed and non-taxing record of the memory of the event. Alternatively, an external and physical reference to the memory of the event may reduce children’s uncertainty about their recall prompted by misleading
information, thereby reducing interviewer compliance. These theories would explain why DRC, but not MCR, was better than NCR in protecting against the effect of suggestive questioning.

The practical utility of drawing prior to an interview is that it has the potential to be a tool to decrease children’s suggestibility. Due to the design of Study 1, the evidence suggests that the protective effect of drawing extends over younger and older children. Given there has been a sharp rise in the reporting of child abuse and neglect cases, but a corresponding low rate of conviction for the alleged offenders (Victorian Law Reform Commission, 2004), techniques that can increase the accuracy of eyewitness accounts, which lead to potentially more investigatory leads, are vital. That it is easy for the interviewer to implement also addresses the deficits found in police interviewing skills (e.g., Clarke & Milne, 2001; Dando et al., 2008). However, not only does this finding require replication, future work is needed to map the boundaries of its potential effectiveness. For instance, would the protective effect of a drawing generated prior to free recall in an initial investigative interview remain over subsequent repeated interviews? Would a drawing generated in an investigative interview setting be useful to protect the child from suggestive questioning when testifying in court? Further work is required before a recommendation can be made to include the use of drawing in future police training programs.

Study 2 moved the focus from examining the efficacy of a single component of the CI to the whole protocol. The major finding of Study 2 was that the CI protocol not only enhanced memory performance in children with and without ID, but provided some benefit in the production of a coherent account. Specifically, while it was unexpected that there was no difference between interview groups with respect to the production of story grammar elements, the children interviewed by the CI: reported more contextual/background information; included more logically-ordered behavioural
sequences (with enough story grammar elements to meaningly transfer ‘what happened’ to the listener); had more temporal markers and; had fewer inconsistencies and (to a lesser extent) ambiguities that serve to muddy the understanding of the story.

Explaining the finding that the CI facilitates the provision of logically-ordered and coherent sequences of behaviour, it was speculated that witness-compatible prompts supported the unfolding of the story. The importance of prompts in the elaboration of the current flow of the narrative has been found by others (Feltis et al., 2010; Snow et al., 2009). Specifically, open-ended prompts were found to be more effective than specific questions in eliciting story grammar. As the role of prompts was not examined in the current study, possible useful future CI research could conduct a more fine-grained analysis of this.

While it was theorised that the CI would encourage children to relate a more comprehensive account and, thus, more story grammar elements due to both the memory and communicative strategies, this was not supported. It was hypothesised in the previous chapter that this null finding may have been the result of a cognitive load effect. The children’s cognitive capacities may already be at their limit from the effortful task of both attending to interviewer instructions and attempting to recall multiple physical and perceptual details that were reinstated at the start of the interview - essentially leaving no or minimal resources to organise the resulting confusion of details in the context of a meaningful story. Given the increase in the number of contextual and background information reported with the CI, it is possible, that MCR may have served to remove the contextual and background details from the context of the whole story.

The capacity of the CI to improve the ability of child witnesses (with and without ID) to tell their story has important practical implications at each stage of the criminal justice system - potentially resulting in improved access to justice in this vulnerable and
under-represented population. That is, having a coherent, understandable account is central in decisions by police and the prosecution to proceed with prosecution (Davis et al., 1999; Westera et al., 2011). Indeed, responses of legal professionals to in-depth questioning show that they value obtaining “the child’s experience as a whole” (pp. 257) – or their story – as having the whole story allows for establishing the nature of the alleged criminality (Guadagno et al., 2006). Further, the coherency of an account is one of the ways juries assess witness credibility (Raskin & Esplin, 1991), which is a major factor affecting their decision-making (Davis et al., 1999). Given the finding that, overall, the coherency of children’s accounts can be improved by techniques employed by the interviewer, a major recommendation arising out of Study 2 is to include ‘story grammar’ in police training packages.

In terms of direction for further research, perhaps the most urgent line of investigation is to examine the effect of the CI protocol on the production of a coherent account in children with ID, measuring for mental age and type/severity of the disability. As noted previously, the ID population is heterogeneous, and it is therefore possible that the CI is differentially effective depending on the type and severity of the disability. While recognising the difficulty in obtaining both ethics and participants in this area, nevertheless it is hoped that the current research contributes to building a case for the necessity of further work for future researchers.

6.2 Concluding Comment

In sum, the current thesis provided modest contributions to the CI literature with child witnesses. Specifically, this thesis extended onto the literature by finding preliminary support for drawing prior to an initial free recall providing protection against the effect of suggestive questions - and on a practical level, drawing is child-friendly and easy to implement. In addition, the current thesis demonstrated that
children with and without ID tell a more coherent and meaningful account when interviewed by the CI. As a coherent account is viewed as more credible by players in the criminal justice system, the value of this finding is that it contributes (albeit in a small way) to increasing access to justice with an under-represented population. While the CI (as a whole) continues to garner support for its effectiveness in enhancing witness recall, the same cannot be said for the use of MCR (and DCR) alone. Without a clearer understanding of the individual factors that may moderate its effect, there is no basis to include MCR as way to enhance event recall in investigative interviews (outside the CI) at this time.
References


Appendix A-1
Ethics Approval for Study 1

Research Services
Office of the Deputy Vice-Chancellor (Research) (Melbourne Campus)

MEMORANDUM

TO: Prof Martine Powell
    School of Psychology, Burwood

FROM: Deakin University Human Research Ethics Unit

DATE: 29 July 2009

SUBJECT: EC 125-2009 (please quote this project number in future communication)
          The effect of the Cognitive Interview in promoting story grammar in child witness interviews

Exemption from Ethics Review was granted for this project on 29 July 2009.

Authorisation has been given for Mia Gentle, under the supervision of Prof Martine Powell, School of Psychology, to undertake this project for the life of the project from 29 July 2009.

This Exemption from Ethics Review is given only for the project as stated in this memo. It is your responsibility to contact the Human Research Ethics Unit, immediately regarding any of the following:

- Any adverse events or events which might affect the continuing ethical acceptability of the project
- All modifications to the research relating to the data or records must be submitted to the Human Research Ethics Unit for review prior to being implemented

In addition, you will be required to report on the progress of your project at least once every year and at the conclusion of the project. You are furthermore required to retain auditable records of the project demonstrating compliance with the National Statement on Ethical Conduct in Human Research (2007) (paragraph 5.2.9) and to produce these if required.

Vicky Bates
Human Research Ethics Officer

9251 7123
Appendix A-2
Ethics Approval for Study 2

Memorandum

To:              Prof Martine Powell  
                 School of Psychology

B

From:           Deakin University Human Research Ethics Committee (DU-HREC)

Date:           02 March, 2010

Subject:        2010-014

The effectiveness of the cognitive interview procedure with child witnesses

Please quote this project number in all future communications

The application for this project was considered at the DU-HREC meeting held on 22/02/2010.

Approval has been given for Prof Martine Powell, School of Psychology, to undertake this project from 2/03/2010 to 2/03/2013.

The approval given by the Deakin University Human Research Ethics Committee is given only for the project and for the period as stated in the approval. It is your responsibility to contact the Human Research Ethics Unit immediately should any of the following occur:

• Serious or unexpected adverse effects on the participants
• Any proposed changes in the protocol, including extensions of time.
• Any events which might affect the continuing ethical acceptability of the project.
• The project is discontinued before the expected date of completion.
• Modifications are requested by other HREC’s.

In addition you will be required to report on the progress of your project at least once every year and at the conclusion of the project. Failure to report as required will result in suspension of your approval to proceed with the project.

DU-HREC may need to audit this project as part of the requirements for monitoring set out in the National Statement on Ethical Conduct in Human Research (2007).

Human Research Ethics Unit
research-ethics@deakin.edu.au
Telephone: 03 9251 7123
Memorandum

To: Prof Martine Powell
School of Psychology

B

From: Deakin University Human Research Ethics Committee (DU-HREC)

Date: 26 March, 2010

Subject: 2010-014
The effectiveness of the cognitive interview procedure with child witnesses

Please quote this project number in all future communications

The modification to this project, submitted on 26/03/2010 has been approved by the committee executive on 26/03/2010.

Approval has been given for Prof Martine Powell, School of Psychology, to continue this project as modified to 2/03/2013.

The approval given by the Deakin University Human Research Ethics Committee is given only for the project and for the period as stated in the approval. It is your responsibility to contact the Human Research Ethics Unit immediately should any of the following occur:

- Serious or unexpected adverse effects on the participants
- Any proposed changes in the protocol, including extensions of time.
- Any events which might affect the continuing ethical acceptability of the project.
- The project is discontinued before the expected date of completion.
- Modifications are requested by other HREC's.

In addition you will be required to report on the progress of your project at least once every year and at the conclusion of the project. Failure to report as required will result in suspension of your approval to proceed with the project.

DU-HREC may need to audit this project as part of the requirements for monitoring set out in the National Statement on Ethical Conduct in Human Research (2007).

Human Research Ethics Unit
research-ethics@deakin.edu.au
Telephone: 03 9251 7123
2010_000538

Professor Martine Powell
School of Psychology
Deakin University
221 Burwood Highway
BURWOOD 3125

Dear Professor Powell

Thank you for your application of 16 March 2010 in which you request permission to conduct a research study in government schools titled: The effectiveness of the cognitive interview procedures with child witnesses.

I am pleased to advise that on the basis of the information you have provided your research proposal is approved in principle subject to the conditions detailed below.

1. Should your institution’s ethics committee require changes or you decide to make changes, these changes must be submitted to the Department of Education and Early Childhood Development for its consideration before you proceed.

2. You obtain approval for the research to be conducted in each school directly from the principal. Details of your research, copies of this letter of approval and the letter of approval from the relevant ethics committee are to be provided to the principal. The final decision as to whether or not your research can proceed in a school rests with the principal.

3. No student is to participate in this research study unless they are willing to do so and parental permission is received. Sufficient information must be provided to enable parents to make an informed decision and their consent must be obtained in writing.

4. As a matter of courtesy, you should advise the relevant Regional Director of the schools you intend to approach. An outline of your research and a copy of this letter should be provided to the Regional Director.

5. Any extensions or variations to the research proposal, additional research involving use of the data collected, or publication of the data beyond that normally associated with academic studies will require a further research approval submission.

6. At the conclusion of your study, a copy or summary of the research findings should be forwarded to Education Policy and Research Division, Department of Education and Early Childhood Development, Level 3, 33 St Andrews Place, GPO Box 4367, Melbourne, 3001.
I wish you well with your research study. Should you have further enquiries on this matter, please contact Jonathan Howcroft, Policy and Research Officer, Education Policy and Research, by telephone on (03) 9947 1892 or by email at <howcroft.jonathan.j@edumail.vic.gov.au>.

Yours sincerely

Elizabeth Hartnell-Young
Group Manager
Education Policy and Research

15/04/2010

enc
In reply please quote:
GE10/0009
1580
21 April 2010

Professor M. Powell
School of Psychology
Deakin University
221 Burwood Highway
BURWOOD VIC 3125

Dear Professor Powell

Reissue of Letter of Approval

I am writing with regard to your research application received on 16 March 2010 concerning your forthcoming project titled *The effectiveness of the cognitive interview procedure with child witnesses*. You have asked approval to approach Catholic schools in the Archdiocese of Melbourne, as you wish to involve students in Years Prep and 3.

I am pleased to advise that your research proposal is approved in principle subject to the nine standard conditions outlined below.

1. The decision as to whether or not research can proceed in a school rests with the school’s principal, so you will need to obtain approval directly from the principal of each school that you wish to involve.

2. You should provide each principal with an outline of your research proposal and indicate what will be asked of the school. A copy of this letter of approval, and a copy of notification of approval from the university’s Ethics Committee, should also be provided.

3. A Working with Children (WWC) check – or registration with the Victorian Institute of Teaching (VIT) – is necessary for all researchers visiting schools. Appropriate documentation must be shown to the principal before starting the research in each school.

4. No student is to participate in the research study unless s/he is willing to do so and informed consent is given in writing by a parent/guardian.

5. You should provide the names of schools which agree to participate in the research project to the Knowledge Management Unit of this Office.

1 of 2
Appendix B

Magic Show Script

Hi everyone, my name’s Elli, and I am a magician. Is anyone else’s name Elli? Do you know anyone called Elli?

Today I’m going to do a magic show for you, but first I need to check who is here, so I am going to very quickly call out everyone’s name and see who is here. (Take the roll and then ask) What was my name again?

I haven’t been a magician for very long and I’m still learning how to do magic tricks. Do you want to know how I became a magician? My dad is a magician, but he is getting too old to do magic shows anymore, so he is teaching me how to do the magic tricks. Is anyone else’s dad a magician?

I have been practicing my magic tricks a lot and soon I have to do a magic show for kids in kinder and I need to make sure that the tricks that I use will be okay for them. So I need your help today to tell me whether you think that the tricks are okay or not. What I need you to do is to tell me how much you like the tricks I do, because if you think they’re really good then I’ll use them with the kids in kinder, but if you think they’re not very good then I won’t use them. So after I’ve finished a trick I want you to clap your hands to show me how much you liked the trick. If you think it’s a good trick then clap loudly like this, but if you think it’s only okay then just clap softly like this. Can you practice for me?

I thought that every good magic show needs a poster and I thought that kids in kinder would like a poster, so I brought a one with me today. See the poster says ‘Magic show’ on it.

I brought some special magician’s things for me to wear…. First is my magician’s cape. (Magician has to step into the cape, has some difficulty pulling it over her arms)
I accidentally got a knot in my laces, so I can’t put my cape on the normal way, instead I have to step into it to get it on. But then the laces are too big, so I have to tie another knot to keep the cape on. I hope that I don’t get a knot in it this time, otherwise I won’t be able to get it off. I also brought my white magician gloves and my magician’s hat.

Ooohh! My hat doesn’t seem to be fitting properly. Oh I know why. I’ve got a special friend who lives in my magician’s hat. You know how some magician’s have rabbits that live in their hats. Well I don’t really like rabbits so I have a different animal that lives in my hat, he is a koala and his name is Boo. Do you want me to see if my friend Boo the koala wants to come out and play with us? Let me just ask him. (Whisper to Boo in the hat)

Oh no, Boo says he is too tired to come out and play today because he had a friend come over and stay the night in my hat. I’ll show you a picture of his friend. His friend was a kangaroo and Mrs Kangaroo had a cold and was sneezing all night, right in Boo’s ear, so Boo couldn’t get any sleep. Can you make the sound of sneezing? (ensure they make the sound of sneezing whilst the picture of the kangaroo is being held up).

So Boo won’t come out and play with us today, but perhaps if you are all really quiet, he will come out and say hello. I’ll just ask him if he will come out and say hello to you. (voice of Koala) ‘Hi everyone, my name’s Boo and I’m a koala. I’m really tired, because I didn’t get any sleep last night. Do you know why I didn’t get any sleep? Because I had a friend, Mrs Kangaroo stay at my house and she had a cold, she was sneezing all night long Ahh Choo! I think that maybe I’m getting a cold too, so I had better go back and get some sleep. Bye’

Poor Boo, he must be really tired.

I hope all you guys got enough sleep last night. Nobody was sneezing and keeping you awake? I wouldn’t want anyone to be like Boo and fall asleep in the middle of the
magic show. So just to make sure that everyone is wide awake and ready to do the
tricks, I think we should do a warm-up activity.

The warm-up activity I want everyone to do is wiggle their fingers. You have to stand
up to do this and you have to wait for me, because I’m going to count to ten and you
have to wiggle your fingers ten times, once for every time I count. When we are
finished I want you all to sit down and be ready for the magic tricks. Are you all ready?

(everyone wiggles their fingers ten times)

I think that everyone looks awake now. Are you ready to do some magic tricks?

I need a helper to help me with my magic tricks and to be fair, I’m going to pick
someone’s name from the roll. Now I need something to help me point to a name on the
roll.

Let me see, what’s in my bag that I can use… A crayon, that’s a good thing to pick a
helper with. Do you guys use crayons at school for colouring in or writing? They’re
pretty good for colouring in, I think that younger kids like to use them. What colour
crayon do you think I should use?

Now I will close my eyes and let the crayon pick someone from the roll.

… You can be my helper. I had better write your name down, so that I will remember
who my helper is later on, when I am doing the magic tricks. I’ll use my crayon to write
your name on this piece of paper (Write name down and show it to children so they can
see the crayon)

I think that everything is ready now to do some magic tricks, I just have to turn my
magic powers on. To turn magic powers on I just have to tell the magic what to do.

‘It’s time for the magic show to start, so magic powers do your part’

Okay I think that we are ready to start….

**Lollipop Trick**

Now for my first trick. I am going to make something disappear.
Over here I have my brown paper bag with lollipops in it, and I don’t need all of them. I have lots of different lollipops in my bag and I’ve brought along some fruit for you to guess what the different flavours are and because I didn’t think kinder kids would be very good at telling flavours. There is this flavour lollipop (hold up plastic raspberry), yes that’s right its raspberry flavoured and there is this flavour (hold up fake apple), yes an apple flavoured lollipop. There is this flavour (hold up fake grapes), yes, that’s right, its grape flavoured lollipop. Finally there is my favourite flavoured lollipop that tastes like this (hold up fake banana).

Mmm, Banana flavour, I just love banana flavoured lollipops, but its strange, do you know I don’t actually like bananas? In fact I hate bananas, but I love banana flavoured lollipops, that’s pretty strange isn’t it? Well because I love banana flavoured lollipops so much, I think that I might just keep the banana flavoured lollipop to eat later. I’ll just put it in my pocket, so that I can get it later.

I don’t want the rest of the lollipops, so I’ll make them disappear. Where do you think I should send them to? (Allow children to make suggestions)

Yes, I think that the shop is the best place for them, so other people can buy them later. I need your help to send the lollipops back to the shop. There is a magic word that magician’s say to make magic work. The magic word is ‘Abracadabra’ Now I am going to tell the magic what I want it to do, then I want you to say the magic word afterwards.

Are you ready?

‘Bippety Bop, lollipops won’t you go back to the shop’

Now you all say Abracadabra

Where is my helper, can you come and look in the paper bag, have the lollipops gone back to the shop? Sorry, what’s in the bag? Oh it’s a dirty rock, what’s that doing in there? Can you get the rock out and see if the lollipops are gone?
The magic must have gotten confused, it sent the lollipops away, but it gave me a dirty rock instead.

Well what did you all think of that trick? Do you think kids in kinder will like it?

*(respond to level of clapping)*

Yes, I think that I did do something wrong in that trick? *(magician has a think about what went wrong.)*

Oh, I remember now, I forgot to tap my magic wand. I forgot to tell you that when I do a magic trick, I always have to tap my magic wand three times to make the magic work properly. Can you all show me how to tap three times? Yes, that’s right, so next time I do a trick remind me to tap my wand three times.

**Egyptian water box trick**

In my next trick I am going to use my special magic box that can make things appear. This trick can get a bit messy, so I’ve brought along my raincoat. It’s the raincoat I wore when I was a little, because I didn’t want to get the raincoat I wear now to get messy.

I’ll just put my raincoat on the floor, so any mess lands on it.

I haven’t used my box for a couple of weeks and it’s been sitting under my bed. It gets pretty dusty under my bed. Does it get dusty under your beds? Well I want the trick to work properly this time, so I’m going to quickly clean the box to make sure it’s not dirty or dusty from sitting under my bed.

I am really thirsty and I could really use a drink, I forgot to have a drink at breakfast time, so I really need a drink now. I think that’s what I’ll make appear in the box.

Now I need you to say the magic word that will make a drink appear, remember what it was? ‘Abracadabra’. You say that word after I have said what I want the trick to do and how many times do I have to tap, can you show me? Three times, that’s right. Are you ready?
‘Let’s have a think on making magic make me a drink.’ Now say the magic word *(Abracadabra)* and I’ll tap my wand three times. Let’s look in the box.

Oohh, look a drink!!! *(Pull out the drink)* Mmmm, what type of drink is this? *(Get children to guess)* *(Drink it)*. Oohhh, yes you were right it is yummy orange juice.

Did you think that was a good trick? Remember if you think it was a good trick that kinder kids would like clap your hands loudly. *(respond to the loudness of the clap)* By the way you are clapping it sounds like you thought that was a very good trick.

Well I feel all cool after that trick made the drink appear for me, but you guys didn’t get anything, I think I should do a trick where you all get something refreshing.

I have a special bag that can make things appear, see this colourful bag. It’s empty at the moment, but if we say the right words, and I tap my magic wand, maybe we can make something appear for all of you.

Now can you remember the word you say for the magic ‘Abracadabra’ that’s right and remember to wait for me to tell the trick what to do before you say the magic word.

‘Kalamazoo, I think these guys would like something too’. *(Abracadabra)* and I tap my magic wand three times.

Helper, can you come and look in the bag for me, is there anything in there? Oooh, lip gloss, and its ice-cream flavour. Yumm!

I’ll give all of you a little bit of lip gloss, Mmmm, it tastes great! I have these cotton buds, and I’ll put a little bit on each one for you. Just put the lip gloss on your lips.

Did you think that that was a good trick? Clap and tell me how much you like that trick. It’s almost time for you to go back to class, but before you go back, I have something special for you all because you have been such a big help today.

The surprise is a sticker and I have lots of them in my special sticker purse, but you have to guess what is on the sticker before you get one.
(Give some hints, ask some children to guess). The sticker is of a dinosaur.

I want you all to stay sitting down and I will give you all a sticker, but you have to put the sticker on your jumper, right here (show them), so that I can see it and make sure that everyone has a sticker. (Make sure that everyone puts their sticker on their jumper).

Now everyone show me their sticker on their jumper, I want to make sure you all have one.

Thank you all for coming and watching my magic show today, I think I know now what tricks to use for the kids in kinder.

Before you go back to class I had better turn my magic powers off, because I wouldn’t want to accidentally do something, like turn your teacher into a frog. I don’t think that she would like to be a frog very much, all green and slimy and hopping around all over the place.

Now before I tapped my wand to make the magic work but this time I need to hop on the spot to make the magic stop, but I still need you to say the magic word ‘Abracadabra’.

So I’ll tell the magic what to do and hop, then you say the magic word ‘Tippety top, I think its time for the magic to stop’ (‘Abracadabra’)

Well the magic is turned off now, so your teacher is safe, she won’t be turned into a frog.

Now before you go I’m going to come around and collect all of your rubbish, with my magic bin. I just wave my hand over it and it opens. So everybody have their rubbish ready.

Thank you for all your help today. Goodbye.
Appendix C

Group Administration Instructions for the Draw-A-Person Test

After distributing the Response Forms, give the following directions verbatim to the examinees:

Please write your name on this page (show the front page of the Response Form) where it says ‘name’. On the next line write your sex, age and birth date. (Pause to allow students time to complete this information.) Next, write the name of your school. (Pause.) Now write your grade and name of your teacher on the next line. (Pause). On the next line, write today’s date. (Pause.) Now turn to the next page and fold the booklet so that only the page with the word ‘Man’ at the bottom is showing. (Demonstrate, and point to the page labelled ‘Man’.)

I’d like you to draw some pictures for me. On this page, I’d like you to draw a picture of a man. Make it the very best picture you can. Take your time and work carefully, and I’ll tell you when to stop. Remember, be sure to draw the whole man. Please begin.

Allow 5 minutes for completion of the drawing. Then say to the examinees:

Now turn to the next page and fold back the booklet so that only the page with the word ‘Woman’ at the bottom is showing. (Demonstrate.)

This time I want you to draw a picture of a woman. Make the very best picture you can. Take your time and work very carefully, and I’ll tell you when to stop. Be sure to draw the whole woman. Please begin.

Allow 5 minutes for completion of the drawing. Then say: Now turn to the last page and fold back the booklet so that only the page with the word ‘Self’ at the bottom is showing. (Demonstrate.) Now I’d like you to draw a picture of yourself. Be sure to draw the very best picture you can. Take your time and work very carefully,
and I’ll tell you when to stop. Be sure to draw your whole self. Please begin. (Allow 5 minutes.)

Appendix D
Elaborate Coding Manual Originally Developed for Study 1

*General Coding Rules

- Any part of the sentence that gives meaning should be coded.
- Only code things once, i.e. first mention (except NM-code every time).
  
  If a child mentions extra details code new details but not the old.
  
  e.g. The koala came out of the hat = all coded as correct new information.
  
  The koala came out of the hat and yawned = only code yawned as correct new information
  
- Treat each activity as a separate activity i.e. a mention of a detail in the recall of the lollipop trick can be coded again in the recall of the drink trick.
  
  e.g. We said abracadabra = correct information in both tricks
  
- If a child correctly mentions a detail in one part of their report and then mentions it incorrectly somewhere else, they will be coded for both the correct and incorrect detail.
  
  e.g. The magician made some lollipops disappear = 2 correct details.
  
  The magician made some lollipops disappear back to the magic shop = 1 incorrect detail.

- Only code the first reference to subject and location if mentioned more than once in the same sentence.
  
  e.g. We got some lip gloss, and it put it on our lips = code ‘we’ as 1 correct subject, ignore ‘our’ as subject.

*Coding Accurate and Inaccurate Information in One Sentence

- If accurate and inaccurate information is provided in one sentence it helps to think of the sentence as idea units. Give credit for correct details and incorrect details as appropriate.
e.g. The magician made a drink appear in the blue box, I think it was lemonade = 4 accurate details, 1 inaccurate detail (‘lemonade’)
The koala was coughing and sneezing = 1 accurate detail, 1 inaccurate detail (‘coughing’)

*Self-Correction

- If the child correct themselves the correction stands and previous comments are not coded. Code the correction as a normal response would be coded.
  
e.g. We got a sticker with a dolphin on it. No, a dinosaur on it = Don’t code dolphin.

*Sequence of Activities

- The sequence of activities has to be correct if the children mentions them. The child can also be marked correct or incorrect when reciting an activity in temporal relation to another activity. Activities include anything that the magician did, i.e. one of the tricks, or the koala puppet.
  
eg., The first trick was the lollipop trick= Correct sequence
  
The first thing she did was introduce herself= Correct sequence
  
The first thing she did was make a drink appear= Incorrect sequence

*Relevant Information

- Code any information that was not part of the script but part of the child’s experience of the magic show as relevant information.
  
eg., I sat next to my best friend during the magic show = REL
  
We had to wait for the magic show, and we played eye spy = REL

*Irrelevant Information

- Do not code any information that was not a part of the script and not relevant to the child’s experience of the magic show (i.e. information off topic).
  
eg. We did art after we got back from the magic show
  
My sister and I saw a koala at the zoo last holidays
*Ambiguous Information

- If child mentions information and it’s not clear whether it’s in relation to the magic show and anything that could not be understood, code as ambiguous information.

- Code 'stuff, things, something' as ambiguous information.
  e.g. ‘And then something else happened’ = code as one ambiguous statement.
  e.g. ‘She made some stuff appear for us’ = code ‘something’ as one ambiguous bit of information.

*Coding Words that Correspond to Verbs

- Do not code as a detail words that correspond to the verb.
  e.g. lift up, took off, went back, got out.

- Sat on or sat next to would count as 2 details (sat and on; sat and next to) because the 'on' is informative and the verb 'to sit' is meaningful without a preposition.

- Do not code 'to' separate from the verb.
  e.g., 'going to', 'get to', 'used to', ‘got out’.

*Coding Repeated Information

- When coding for repetition, the details don't have to be exactly the same i.e., they can be words that have the same meaning or in a different tense.
  e.g. found/find (repetition)
  got/get (repetition)
  sleep/sleeping/asleep (repetition)
  had to line up/had to wait in line (repetition)

- BUT they cannot be negative forms of the verb as opposed to positives or words that have a significantly different meaning.
  e.g., could/couldn't (not repetition)
  hurt/broke (not repetition)

- Ignore prepositions associated with the verb you're coding.
e.g. went to/went out (repetition)

**Coding Subject**

- Code the subject as correct or incorrect, as long as another word was used to refer to the subject other than the one the interviewer used in the question.

  e.g. I: Tell me everything that happened in the part with the koala.
  C: He was really tired = 1 correct subject.

- Do not code ‘she, her, lady, girl etc’ as a subject when referring to the magician, as the prompt given at the start of the interview mentions the ‘lady’ who did the magic show (therefore gender provided). But do code name of the magician if mentioned.

  e.g. she was really thirsty = do not code subject
  Elli was really thirsty = code as correct subject

  e.g. The koala said that she invited her friend over, kangaroo, and she stayed over that night = 1 correct subject (‘she’ kangaroo), 1 incorrect subject (‘she’ koala), 1 repeated incorrect (‘her’ koala)

  e.g. And then she said ‘abracadabra’ = 1 incorrect subject (code as incorrect even when referring to magician as the children said abracadabra)

  And then we said ‘abracadabra’ = 1 correct subject

**Coding ‘All’**

- Code ‘all’ when it is used to describe the quantity, not quality

  e.g. The koala was all grey = ignore the ‘all’, do not code

  We all got a sticker = code all as correct (i.e. descriptor)

**Coding ‘One’**

- Only code ‘one’ in terms of quantity.

  e.g. I got one = Don't code

  I got one sticker. = code one as correct (i.e. descriptor)
*Coding Off Topic Responses*

- Any response that is off topic to the questions being asked but still part of the magic show, code as normal and highlight to be tallied as off topic responses.

  e.g. I- Tell me more about the part with the magic box.
  
  C- Well after the juice appeared, she made some lip gloss appear in a bag = code information as normal, and highlight information not relevant to the question as off topic.

*Don't Code*

- Don't code 'an', 'a', 'the' etc

- Don't code phrases of speech.

  e.g. I mean....

  I think…

- Don't code prepositions on their own.

  e.g. with, by, onto, of, about, at, out, over, into, even

- Don't code 'really, very, only' on their own.

*Ignore*

- Stuttering of child.

- Ignore anything child says that has to do with them not paying attention during the interview.

  e.g. Look at that picture over there.

- Ignore anything about the tape recorder.

- Ignore refusal's to answer.

  e.g. I don't want to, I already told you that

- Ignore responses where child repeats of interviewer's question or prompt, when the response does not add any additional information.

  e.g. I- What happened after the juice appeared?
C- After the juice appeared… = do not code child repeating question

- Ignore irrelevant information.
  e.g. We aren’t usually allowed lip gloss in school.
- Ignore repeated responses when it is not correct or incorrect coded information, i.e. ambiguous and relevant responses.
- Ignore child's sentences explaining what they're going to tell you next.
  e.g. I’ll tell you what was on the sticker.

**What to Code in Free Recall and Open Questions**

- **Objects/Nouns** = O
  e.g. tricks, mistake, sleep, sick.
- **Descriptors** = D.
  e.g. colour (blue box), tired, big, dusty. Include adjectives and adverbs.
- **Actions** = A.
  e.g. got, liked, wanted, waved.
- **Subjects/People** = S
  e.g. she, helper, we, our.
- **Location** = L
  eg., on, under, in, inside, library, hall, school, next to, over.
- **Verb** = V
  Transitive verbs coded as action in contrast to the intransitive verb, as they provide more information.
  e.g. had, have, there was, there were, do did, could.
- **Sequence of Events** = SEQ
  Simple temporal markers - all words referring to chronological time. Do not code activity the temporal marker refers to.
e.g. after we got our stickers = code after as sequence, but do not code ‘we got our stickers’.
e.g. after, before, later, first, start, end

- **Broad Statements** = BS
  Any statement that is vague but part of the magic show script.
e.g. and then she did another trick = 1 correct BS

- **Dialogue Content** = DC
  Code as one statement, or break down into meaningful units of dialogue.
e.g. C- She said ‘my dad used to be a magician, but he is too old, so now he is teaching me’

- **Repeated Information** = R
  Detail that has previously been mentioned by the child, exclude information that is mentioned again but in a new context and is given new meaning. BUT repeated verbs coded as a verb (correct or incorrect depending on whether the rest of statement is correct/incorrect) not as repeated information.

  n.b. All of the above categories are coded in terms of whether they are correct or incorrect.

- **Correct** = C (detail that accurately describes the event)
e.g. a drink appeared in the blue box – drink = CO (correct object), appeared = CA (correct action), in = CL (correct location), blue = CD (correct descriptor), box = CO

- **Incorrect** = I (detail that inaccurately describes the event)
e.g. she had a crocodile pet – had = IV (incorrect verb), crocodile = ID (incorrect descriptor), pet = IO (incorrect object).
• **Confabulated Details** = FAB
  Anything that is implausible or outlandish
  e.g. I chased the koala around the room.
  e.g. The koala smashed through the windows.

• **Internal confusion** = IC
  When the child confused aspects of one activity with another activity, or when child
  confuses the order of activities later in the interview, after correctly giving sequence
  earlier.
  e.g. she tapped her wand and the lollipops appeared = ‘tapped’ and ‘wand’ are IC
  e.g. the lip gloss appeared in the magic box = ‘magic box’ is IC

• **Demonstrating Actions** = DEM
  When the child demonstrates something performed in the show.
  e.g. ‘she waved her wand like this’ = 1 correct detail.

• **Emotive/Reflective Content** - ERC
  How the child describes the events or how they were feeling during the events. Can
  also include the child’s judgment, attitude or inferences of their experience of the
  magic show.
  e.g. I liked the koala. It was good/bad.
  I was sad/happy.

• **Ambiguous** = AMB (see general coding rules for explanation)

• **Relevant Information** = REL (see general coding rules for explanation)

• **No More** = NM
  e.g. that's all, that was the end, I don’t know, I forgot the rest.

n.b.. Cannot be coded as correct or incorrect

*Difficult Words to Code*
Back to the shops → back = CL, shops = CO
Turned into a rock → turned = CA, rock = CO
Nothing in the box → nothing = CD, in the = CL, box = CO
Koala was sleeping → koala = CS, was = CV, sleeping = CA
Hole in the bottom → hole = CO, in the = CL, bottom = CD
Instead of = CD
Powers/magic = CO
Magicked/trick = CA

*Words to Accept Variations of*

1. Disappeared, magicked, went away, sent, took away or go back.
2. Lip balm, lip stuff, lip stick or make up.
3. Cotton buds, ear buds, sticks or ear cleaners.
4. Dusted, washed, wiped, cleaned or polished.

**Coding Specific Questions**

- Each response will be coded with an overall mark in one of the following 6 codes:
  - Correct (C)
  - Correct Not Sure (CNS) – e.g. I think it was banana flavour.
  - Incorrect (I)
  - Incorrect Not Sure (INS) – e.g. I’m not sure but I think she had red hair.
  - Off Topic (OT) – e.g. answer not relevant to specific question.
  - Don’t Know (DK) – e.g. I don’t know if there was a crocodile puppet.
- In addition, any extra information will be scored using the same codes for responses in free recall and open questioning (as above)