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Does the Cognitive Interview Promote the Coherence of Narrative Accounts in Children With and Without an Intellectual Disability?

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We examined whether the cognitive interview (CI) procedure enhanced the coherence of narrative accounts provided by children with and without intellectual disabilities (ID), matched on chronological age. Children watched a videotaped magic show; one day later, they were interviewed using the CI or a structured interview (SI). Children interviewed using the CI reported more correct details than those interviewed using the SI. Additionally, children interviewed using the CI reported more contextual background details, more logically ordered sequences, more temporal markers, and fewer inconsistencies in their stories than those interviewed using the SI. However, the CI did not increase the number of story grammar elements compared with 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.

Keywords: child witness; cognitive interview; coherency; intellectual disability; investigative interviewing; narrative account; story grammar; structured interview

Introduction

Children with intellectual disabilities (ID) are more likely to be abused or neglected than children without ID (Crosse, Kayne, & Ratnofsky, 1993; Sullivan & Knutson, 2000). However, few complaints are made to police, and when they are offenders are rarely prosecuted successfully (Petersilia, 2001). Lower rates of prosecution typically occur because witnesses with ID are perceived to give less reliable accounts to police and less credible testimony in court (Gudjonsson, Murphy, & Clare, 2000; Henry, Ridley, Perry, & Crane, 2011; Peled, Iarocci, & Connolly, 2004). This negative perception is especially damaging to child abuse cases in which there may be no corroborating physical evidence (Berliner & Barbieri, 1984; Lamb, Hershkowitz, Orbach, & Esplin, 2008). Moreover, even with physical evidence, it is children's ability to "tell their stories" that juries consider essential in decisions to convict (De Jong & Rose, 1991). This is because a clear, coherent account allows for the jury to evaluate the credibility of a child's story (Leippe, Romanczyk, & Manion, 1992; Raskin & Esplin, 1991) and for establishing the precise nature of the criminal acts (Guadagno, Powell, & Wright, 2006). As such, a high-quality account not only provides detailed, accurate and reliable information, but is communicated by a child to the listener in a clear, coherent, and logical manner (Davis, Hoyano, Keenan, Maitland, & Morgan, 1999).

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Compared with children without ID, children with ID have poorer memory and language skills, and are less confident in their ability to express themselves verbally (Agnew & Powell, 2004; Henry & Gudjonsson, 2003; Milne & Bull, 2001). Based on this, it would be expected that children with ID would have difficulty relating their stories compared with children without ID. To date, only one study has examined how well children with and without ID are able to tell their stories in a forensic setting (Murfett, Powell, & Snow, 2008). Children aged 9–12 years participated in a magic show and were interviewed about it four days later using best-practice techniques (i.e., best practice refers to the elicitation of a narrative account using open-ended prompts; Lamb et al., 2008; Powell, Fisher, & Wright, 2005; Wilson & Powell, 2001). To measure the extent to which children provided a coherent and well-formed account, children's responses were coded for the presence of story grammar elements. This coding was based on Stein and Glenn's (1979) story grammar framework, where a coherent and meaningful account requires the presence of sufficient story grammar elements (the setting, initiating event, internal responses, planning, actions, direct consequences, and resolution), provided in a clear and logical manner such that the listener can make sense of the event (see Stein & Glenn, 1979; Westcott & Kynan, 2004). As in other story grammar studies (Snow, Powell, & Murfett, 2009; Westcott & Kynan, 2004), it was observed that, overall, children produced a very low proportion of story grammar elements in their accounts. Further, children with ID provided fewer story grammar elements than the two control groups of children without ID who were matched for mental age or chronological age. This led Murfett et al. (2008) to conclude that even with "best-practice" techniques, children with ID provide a more impoverished and less coherent account compared with their non-ID counterparts.

Notwithstanding the valuable contribution of Murfett et al.'s (2008) study, obtaining a clear picture of children's story-telling 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 provides an adequately structured (coherent) behavioural sequence. The importance of including this as a measure is supported by research which has found that the child'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, and the amount of *dis*ordered sequences (i.e., behavioural sequences out of logical order), is necessary if we want to more fully capture the experience of the listener (i.e., police, the prosecution, and juries) to stories told by children with ID. As children without ID pepper their accounts with ambiguities and inconsistencies, and have levels of disorder that negatively impact on story coherency and, therefore, their credibility (Davis et al., 1999; Westcott & Kynan, 2004), it would be expected that children with ID would be more disadvantaged in this regard because of deficits in their memory and communication.

One technique that may enhance the coherence of narratives provided by children with and without ID is the cognitive interview (CI; Fisher & Geiselman, 1992). The CI contains instructions to enhance the retrieval of information from memory and to enhance the relationship between the witness and the interviewer. To increase memory, the CI instructs witnesses to: report everything that comes to mind no matter how small the details may seem; mentally recreate the context of the witnessed event; recall the event in a different order; and recall the event from a different perspective. To improve the relationship between the witness and the interviewer, the CI interviewer utilises several strategies, including: establish rapport with the witness, transfer control of the inter-

view to the witness, ensure questions are in line with the witness's current thoughts, use focused retrieval of information, and use witness-compatible questioning (for more detailed descriptions see Fisher & Geiselman, 1992; Milne, Clare, & Bull, 1999). Research to date indicates that the CI successfully increases children's recall of witnessed events compared with a structured interview (SI) (for example, Holliday, 2003a, 2003b; Larsson & Lamb, 2009; McCauley & Fisher, 1995; Milne & Bull, 2003; Saywitz, Geiselman, & Bornstein, 1992), although there are exceptions with much younger children (for example, Memon, Cronin, Eaves, Bull, & Kupper, 1992; Memon, Holley, Wark, Bull, & Kohnken, 1996).

There is a dearth of studies on the effect of the CI with children with ID, but early results are promising (Price, 1997; Robinson & McGuire, 2006). For instance, in one study, seven-year-old to nine-year-old children with ID were interviewed using a SI or CI after viewing a three-minute video (Robinson & McGuire, 2006). Those interviewed with the CI recalled twice the number of correct details than those interviewed with the SI in their free recall. Although the CI also gave rise to significantly more incorrect details than the SI, the overall accuracy rates were similar. It is possible that the increase in incorrect information reported by children interviewed with the CI in this study was the result of the inclusion of the less child-friendly "change perspective" instruction. One caveat to these promising results is that the CI may be differentially effective within the ID population, as adults with autism (with no developmental delays) showed no benefit when interviewed by the CI (Maras & Bowler, 2010).

Nevertheless, 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 the confidence of children with ID 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.

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 being interviewed about it using the CI or the SI. We examined differences in children's story-telling abilities by measuring their production of story grammar elements, contextual and background information, logically ordered behavioural sequences, the temporal markers that they used, and the inconsistencies and ambiguities in their stories.

Method

Participants

A total of 150 children 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 seven and 10 years (mean = 117.03 months, standard deviation [*SD*] = 10.24, range = 96–133 months) were recruited from a special school for children with mild to moderate ID. Owing to data protection issues, we were unable to access children's records; nor were we able to

carry out cognitive testing to determine precise mental age. 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 that meant 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), we expect the sample to 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 eight and nine years (mean = 113.43 months, *SD* = 4.46, range = 107–126 months) were recruited from a mainstream school. The study used a two (ID: with, without) by two (interview: CI, SI) between-subjects design. An analysis of variance (ANOVA) comparing the mean age of the two groups of children revealed a small but significant difference, $F(1,139) = 7.29$, $p = 0.008$, $\eta^2 = 0.06$. Children with ID were on average 3.6 months older than children without ID.

Materials and Procedure

Deakin University Research Ethics Committee granted approval to conduct this study. Participants watched a nine-minute video of a magic show in their usual classes (see Milne & Bull, 1996, 2003, for more details about the method). The video depicted a magician performing six magic tricks. One day later, participants were interviewed about the magic show. After random assignment to the CI or SI condition, children were interviewed individually in a different room from where they had watched the video. Table 1 shows the common phases between the CI and SI and the extra techniques included in the CI. Because the *change perspective* instruction can be difficult for children (Saywitz et al., 1992), it was not included. Interviewers were trained to administer the CI by the second author, who is an international expert in CI techniques.

Table 1. Phases of the structured interview and the cognitive interview.

	Structured interview	Cognitive interview
Phase 1	Greet and establish rapport	Greet and establish rapport
Phase 2	Explain the aims of the interview	Explain the aims of the interview
		Report everything
	Transfer control	Transfer control
	No fabrication or guessing	No fabrication or guessing
		Concentrate hard
		Mental context reinstatement
	Initiate free report	Initiate free report
Phase 3	"Remember more" prompt	"Remember more" prompt
Phase 4	Questioning	Questioning
		Activate and probe an image
		Witness-compatible questioning
		Report everything
	Open and closed questions	Open and closed questions
	No fabrication or guessing	No fabrication or guessing
	OK to say "don't know"	OK to say "don't know"
Phase 5	Motivated second retrieval	*Reverse-order recall*
Phase 6	Closure	Closure

Children were asked a pre-determined list of leading and misleading questions; however, as the current study examined children's free recall and answers to the specific questions, these questions will not be discussed further.

Coding

Interviews were audiotaped and transcribed verbatim. To code the transcripts, a scoring template was developed from past research (Murfett et al., 2008; 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 15 randomly selected transcripts with a second coder who was familiar with the magic show but uninvolved in the present study. This was done for the purpose of reliably assigning narrative to story grammar categories and any discrepancies were discussed and resolved. Inter-rater reliability was obtained by two coders independently marking 20% of the same transcripts 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 (0.89–0.99) for each of the dependent variables.

Children's accounts were coded for three content areas: story grammar elements; 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"); and 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 that they "did not know"). We coded all children's responses regardless of whether they were correct or not, as we were more interested in 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., the setting and the descriptions of the magician) but was part of or related to the story. Similar to previous research, if a child provided an account of a trick with the presence of 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 (Snow et al., 2009; Stein & Glenn, 1979). An account of a trick with only two of these story grammar elements reported in logical order was coded a partial ordered behavioural sequence. Note that as we were interested in examining the minimal amount of information that was 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 (i.e., the inclusion of two or more of each of these story grammar elements). An account of a magic trick that included only one story grammar element was ignored (but still captured in the measure of story grammar elements).

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 the last thing that happened"). Here, temporal markers are not information that contributes to the setting of the story (i.e., when the event took place), but they 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

Eight children with ID did not provide a narrative account and one additional child with ID did not remember the magic show; therefore, the results presented below are based on 71 children with ID and 70 children without ID.

Visual inspection of the histograms for each dependent variable for the two groups suggested that several of the variables were not normally distributed. However, skewness and kurtosis were satisfactory and below three in all instances. In the interests of interpretability, transformations were not conducted. As each of the cells of the variables held over 20 participants (i.e., a minimum of 33) and there were 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.[1]

Correct Recall

Before examining the effects of ID and interview type on children's story grammar, we first determined whether the CI increased children's recall of accurate details compared with the SI in the current sample.[2] The results are displayed in the top section of Table 2. A two (ID) by two (interview) ANOVA on the mean number of correct details

Table 2. Mean (standard deviation) number of grammar details, ordered episodes, and violations by condition.

	Children with ID		Children without ID	
	SI	CI	SI	CI
Memory				
Correct event details	60.83 (34.5)	85.36 (36.5)	107.19 (40.3)	125.73 (38.1)
Grammar				
Story grammar details	13.37 (8.36)	16.67 (9.79)	24.73 (9.28)	25.87 (10.08)
Contextual/background details	18.80 (9.79)	27.81 (11.47)	25.11 (9.79)	36.15 (16.01)
Temporal markers	0.70 (1.0)	2.72 (2.1)	2.12 (1.9)	5.21 (1.8)
Unrelated content	9.77 (8.13)	7.72 (5.84)	7.41 (3.22)	10.87 (5.89)
Episodes				
Adequately ordered	1.03 (0.92)	1.67 (1.39)	2.46 (1.50)	2.70 (1.13)
Partially ordered	0.83 (0.86)	0.94 (0.98)	1.03 (0.96)	0.97 (0.85)
Violations				
Inconsistencies	0.94 (1.26)	0.33 (0.63)	0.54 (0.70)	0.42 (0.70)
Ambiguities	5.06 (4.66)	4.11 (3.39)	2.95 (2.97)	1.82 (1.69)
Disordered episodes	0.29 (0.62)	0.28 (0.57)	0.16 (0.37)	0.21 (0.42)

revealed a significant main effect for ID: children with ID produced fewer correct details (mean = 73.27, *SD* = 37.86) than children without ID (mean = 115.82, *SD* = 40.06), $F(1, 137) = 47.20$, $p = 0.001$, $\eta^2 = 0.24$. There was a significant main effect for interview: children interviewed using the CI reported more correct details (mean = 104.67, *SD* = 38.13) than those interviewed using the SI (mean = 84.65, *SD* = 40.26), $F(1,137) = 11.64$, $p = 0.001$, $\eta^2 = 0.06$. The interaction was not significant, $F(1, 137) = 0.225$, $p = 0.636$. This finding replicates the results in previous research showing that the CI enhances the recall of children with and without ID compared with the SI (Price, 1997; Robinson & McGuire, 2006). We now turn to the focus of our experiment to determine whether ID and interview type affected children's story grammar.

Story Grammar

The mean total number of story grammar elements (i.e., the sum of all elements), contextual and background information and unrelated content—representing the total output of the children—are displayed in the top section of Table 2. (Note, 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.) To examine the effects of ID and interview type on children's story grammar, a two (ID) by two (interview) ANOVA was conducted on their mean number of story grammar details. There was a significant main effect for ID: children with ID produced fewer story grammar elements (mean = 15.04, *SD* = 9.19) than children without ID (mean = 25.04, *SD* = 9.19), $F(1, 137) = 42.21$, $p = 0.001$, $\eta^2 = 0.23$. There was no main effect for interview, $F(1,137) = 1.97$, $p = 0.163$, and no significant interaction, $F(1, 137) = 0.46$, $p = 0.499$.

To examine the effects of ID and interview type on the amount of contextual and background information that children produced, a two (ID) by two (interview) ANOVA was conducted on their mean number of contextual and background details. There was a significant main effect for ID: children with ID provided less contextual information (mean = 23.37, *SD* = 11.53) than children without ID (mean = 30.31, *SD* = 14.14), $F(1,137) = 13.25$, $p = 0.001$, $\eta^2 = 0.08$. There was also a significant main effect for interview: children interviewed with the CI provided more details (mean = 31.80, *SD* = 14.36) than those interviewed with the SI (mean = 22.04, *SD* = 10.23), $F(1,137) = 24.81$, $p = 0.001$, $\eta^2 = 0.14$. The interaction between ID and interview was not significant, $F(1,137) = 0.26$, $p = 0.613$.

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 with the SI.

Temporal Markers

We examined the mean number of temporal markers that children included in their accounts using a two (ID) by two (interview) ANOVA. There was a significant main effect for ID: children with ID provided fewer temporal markers (mean = 1.72, *SD* = 1.97) than children without ID (mean = 3.57, *SD* = 2.50), $F(1, 137) = 41.37$, $p = 0.001$, $\eta^2 = 0.16$. There was also a significant main effect for interview: children interviewed using the CI provided more temporal markers (mean = 3.91, *SD* = 2.34) than those interviewed using the SI (mean = 1.41, *SD* = 1.74), $F(1, 137) = 71.43$, $p = 0.001$, $\eta^2 = 0.28$. The interaction was not significant, $F(1, 137) = 3.08$, $p = 0.081$.

Logical Order of Information

For each child, the mean number of adequately ordered and partially ordered episodes was calculated. As there were six different magic tricks (episodes of behavioural sequences) in the video, children's maximum score for these episodes was six. The middle section of Table 2 presents the mean number of episodes displayed by condition.

Overall, children provided a low number of adequately ordered episodes. To determine whether ID and interview affected their mean number of adequately ordered episodes, a two (ID) by two (interview) ANOVA was conducted. There was a significant main effect for ID: children with ID reported fewer completely ordered episodes (mean = 1.35, SD = 1.22) than children without ID (mean = 2.57, SD = 1.34), $F(1, 137) = 33.31$, $p = 0.001$, $\eta^2 = 0.19$. There was also a significant main effect for interview: children interviewed with the CI provided more adequately ordered episodes (mean = 2.16, SD = 1.37) than children interviewed with the SI (mean = 1.76, SD = 1.44), $F(1, 137) = 4.67$, $p = 0.032$, $\eta^2 = 0.02$. The interaction was not significant, $F(1, 137) = 0.883$, $p = 0.349$.

For the partially ordered episodes, there was no main effect for ID, $F(1, 137) = 0.53$, $p = 0.470$, and no main effect for interview, $F(1, 137) = 0.04$, $p = 0.850$. There was also no interaction, $F(1,137) = 0.32$, $p = 0.576$.

Story Violations

The lower part of Table 2 shows the mean number of inconsistencies, ambiguities and disordered episodes in children's accounts. To examine the effect of ID and interview type on children's inconsistencies, a two (ID) by two (interview) ANOVA was conducted. There was no significant main effect for ID, $F(1, 137) = 1.16$, $p = 0.284$; however, there was a significant main effect for interview, $F(1, 137) = 6.28$, $p = 0.013$, $\eta^2 = 0.04$. Children interviewed with the CI had fewer inconsistencies in their accounts (mean = 0.38, SD = 0.67) than those interviewed using the SI (mean = 0.74, SD = 1.02). There was no significant interaction, $F(1, 137) = 2.90$, $p = 0.091$.

A two (ID) by two (interview) ANOVA on children's mean number of ambiguities revealed a main effect for ID, $F(1, 137) = 15.06$, $p = 0.001$, $\eta^2 = 0.10$. Children with ID reported more ambiguities (mean = 4.58, SD = 4.07) than children without ID (mean = 2.41, SD = 2.50). The main effect for interview was not significant, $F(1, 137) = 3.34$, $p = 0.073$, and the interaction was also not significant, $F(1, 137) = 0.291$, $p = 0.873$. For disordered episodes, there was no main effect for ID, $F(1,137) = 1.24$, $p = 0.268$, and no main effect for interview, $F(1,137) = 0.06$, $p = 0.805$. There was also no interaction, $F(1, 137) = 0.12$, $p = 0.734$.

Discussion

Overall, the CI enhanced children's correct recall of the witnessed event compared with the SI. This enhancement occurred for children with and without ID, which replicates previous research (Price, 1997; Robinson & McGuire, 2006). Contrary to predictions, the CI did not increase the amount of story grammar elements provided by children; however, it improved their reporting of background and contextual information, the logical structure of their accounts, the inclusion of temporal references, and it reduced the inconsistencies in their accounts compared with the SI. These improvements occurred to a similar extent for children with and without ID. Overall, these results suggest that

the CI not only enhanced children's memory performance, it also assisted with their generation of a coherent narrative about the witnessed event.

Although we found no difference between children interviewed with the CI and SI in their production of story grammar elements, the CI improved all other aspects of their narrative. Children interviewed with the CI reported more contextual and background information, which supplemented their narratives compared with those interviewed with the SI. The CI also improved children's ability to chronologically and logically order the elements of the event with enough story grammar elements to meaningly transfer what happened to the listener, compared with the SI. The increased number of temporal markers, which act as sequential signposts, also strengthened the overall sense of the stories produced by children interviewed with the CI. These children also gave fewer inconsistencies in their accounts compared with those interviewed with the SI. In short, children interviewed with the CI told better stories than children interviewed with the SI.

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 (Tulving & Thomson, 1973). However, this instruction did not appear to increase retrieval of the story as much as the background and contextual information. It is possible that children's cognitive capacities were already stretched from listening to the interviewer's instructions and attempting to recall all of the details that they could, essentially leaving few 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. Such a process might explain why children reported more contextual information but no more actual story grammar elements. Future research could explore this possible explanation by including older children and adults in a study to examine the developmental impact of cognitive capacity on the beneficial effect of *mental context reinstatement* in the production of story grammar.

The finding that the CI increased the children's reports of contextual and background information, for those with and without ID, is important for at least three reasons. First, high-quality eyewitness accounts are accurate, coherent and as complete as possible. While it cannot be determined, the extent to which these types of details are of investigative or evidentiary value, presumably the more facts that are available to the investigator, the more likely the chance of corroborating or refuting them. Second, contextual and background information may also be useful in particularising one individual offence from another (in the case of repeated abuse). Particularisation is an important forensic goal because successful prosecution requires the distinguishing of individual offences with reasonable precision in most jurisdictions (for example, see S v. R., 1989). Indeed, police often target this information when questioning children about repeated events (Guadagno & Powell, 2009). The third reason is that the ability to provide a richer story may increase the possibility that the cases of children with (and without) ID rightfully proceed through the criminal justice system: fact-finders perceive

detailed eyewitness accounts to be more credible than less detailed ones (Bell & Loftus, 1989; Henry et al., 2011; Wells & Leippe, 1981).

The CI increased children's ability to provide a logically ordered and coherent sequence of behaviour that was understandable to the listener. It is possible that the CI's enhancement of the relationship between the interviewer and the witness was responsible for this increase. For instance, asking questions that were consistent with children's mental operations (i.e., using prompts to encourage the witness to continue or to elaborate the current flow of the narrative) may have assisted children in describing behavioural sequences compared with when they are interrupted with unrelated questions. Using child-compatible questions should also have assisted children to develop coherent narratives through addressing any possible language deficits and maximising their understanding as well as making children feel more comfortable in an unfamiliar situation. 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).

Despite our finding that the CI increased the logical order of the behavioural sequences reported, it is worth noting that children did not report many behavioural sequences overall. Out of the possible six tricks performed by the magician, children with ID reported an account with sufficient coherency for a listener to infer "what happened" for less than two tricks on average and those without ID reported less than three tricks on average. This low number is particularly concerning given that a magic show should be an event that is engaging and familiar to most children. Yet this finding of children's limited ability 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 story-telling abilities impact on the decisions made by police to investigate cases, on decisions made by the prosecution to proceed with the case to court, and on decisions by judges to direct the jury to acquit the defendant, the ability of the CI to improve children's story-telling is especially valuable.

Finally, compared with the SI, the CI reduced the number of inconsistencies that children reported in their stories. These inconsistencies should have been reduced through the improved memory performance of children interviewed using the CI. This finding has important implications for the 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, indicating that the CI may be particularly beneficial for the ID group in reducing the number of inconsistencies. Considering children with ID 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 marginally significant difference between interviews for number of ambiguities is noteworthy. It is possible that the social and communicative strategies employed by the interviewer provided a scaffold for children's language deficits. As the presence of ambiguities muddies the understanding of the central story for the listener, and encourages the juries to "fill in the gaps" with their own understanding (Westcott & Kynan, 2004), the potential value of this trend also warrants further research.

The use of an innocuous event such as watching a magic show potentially affects the generalisability of our 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 witnesses and

victims who had experienced real criminal events (Fisher, Geiselman, & Amador, 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, & Fraser, 2010), in real life interviews rarely occur this quickly. Last, as previously noted, children's diagnoses and mental ages were unavailable to us, 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. For instance, it is possible that the social and communicative impairments found with individuals with autism spectrum disorder may inhibit the beneficial effect of the CI protocol on storytelling. Further, while we suspect the 10% of children with ID who were unable to provide a narrative at all had a more severe intellectual disability, we are unable to rule out social factors such as shyness or lack of confidence in their ability to recount what they remembered about the magic show. Certainly, future work here would be valuable, although 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 when interviewed with 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, Kebbell, & Milne, 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.

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Notes

1. 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.
2. 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 study. To introduce an appropriate level of sensitivity in our measure, we utilised a weighted system capturing the specificity of the event detail. An example of our 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), and "scarf" = 1 point. As a matter of interest, this example would be coded as one "direct consequence" within the story grammar framework.

References

Agnew, S. E., & Powell, M. B. (2004). The effect of intellectual disability on children's recall of an event across different question types. *Law and Human Behavior, 28*, 273–294.

Armstrong, G. D. (1981). The intraclass correlation as a measure of interrater reliability of subjective judgments. *Nursing Research, 30*, 314–315.

Bell, B. E., & Loftus, E. F. (1989). Trivial persuasion in the courtroom: The power of (a few) minor details. *Journal of Personality and Social Psychology, 56*, 669–679.

Berliner, L., & Barbieri, M. K. (1984). The testimony of the child victim of sexual assault. *Journal of Social Issues, 40*, 125–137.

Crosse, S. B., Kayne, E., & Ratnofsky, A. C. (1993). *A report on the maltreatment of children with disabilities*. Washington, DC: National Centre of Child Abuse and Neglect.

Davis, G., Hoyano, L., Keenan, C., Maitland, L., & Morgan, R. (1999). *An assessment of the admissibility and sufficiency of evidence in child abuse prosecutions: A research report for the Home Office*. London: Home Office.

De Jong, A. R., & Rose, M. (1991). Legal proof of child sexual abuse in the absence of physical evidence. *Paediatrics, 88*, 506–511.

Fisher, R. P., Brewer, N., & Mitchell, G. (2009). The relation between consistency and accuracy of eyewitness testimony: Legal versus cognitive explanations. In R. Bull, T. Valentine, & T. Williamson (Eds.), *Handbook of psychology of investigative interviewing: Current developments and future directions* (pp. 121–136). Chichester: John Wiley & Sons.

Fisher, R. P., & Geiselman, R. E. (1992). *Memory-enhancing techniques for investigative interviewing: The cognitive interview*. Springfield, IL: Charles C Thomas.

Fisher, R. P., Geiselman, R. E., & Amador, M. (1989). Field test of the cognitive interview: Enhancing the recollection of the actual victims and witnesses of crime. *Journal of Applied Psychology, 74*, 722–727.

George, R. C., & Clifford, B. R. (1996). The cognitive interview: Does it work? In S. Lloyd-Bostock & G. Davies (Eds.), *Psychology, law and criminal justice: International developments in research and practice* (pp. 146–154). Oxford: Walter de Gruyter.

Guadagno, B., & Powell, M. B. (2009). A qualitative examination of police officers' questioning of children about repeated abuse. *Police Practice and Research, 10*, 61–73. doi: 10.1080/15614260802128468

Guadagno, B., Powell, M. B., & Wright, R. (2006). Police officers' and legal professionals' perception regarding how children are, and should be questioned about repeated abuse. *Psychiatry, Psychology and Law, 13*, 251–260. doi: 10.1375/pplt.13.2.251

Gudjonsson, G. H., Murphy, G., & Clare, I. (2000). Assessing the capacity of people with intellectual disabilities to be witnesses in court. *Psychological Medicine, 30*, 307–314.

Henry, L. A., & Gudjonsson, G. H. (2003). Eyewitness memory, suggestibility, and repeated recall sessions in children with mild and moderate intellectual disabilities. *Law and Human Behavior, 27*, 481–505.

Henry, L., Ridley, A., Perry, J., & Crane, L. (2011). Perceived credibility and eyewitness testimony of children with intellectual disabilities. *Journal of Intellectual Disability Research, 55*, 385–391. doi: 10.1111/j.1365-2788.2011.01383.x

Holliday, R. E. (2003a). The effect of a prior cognitive interview on children's acceptance of misinformation. *Applied Cognitive Psychology, 17*, 443–457. doi: 10.1002/acp.879

Holliday, R. E. (2003b). Reducing misinformation effects in children with cognitive interviews: Dissociating recollection and familiarity. *Child Development, 74*, 728–751. doi: 10.1111/1467-8624.00565

Lamb, M. E., Hershkowitz, I., Orbach, Y., & Esplin, P. W. (2008). *Tell me what happened: Structured investigative interviews of child victims and witnesses*. Chichester: John Wiley & Sons.

Larsson, A. S., & Lamb, M. E. (2009). Making the most of information-gathering interviews with children. *Infant and Child Development, 18*, 1–16. doi: 10.1002/ICD.573

Leippe, M. R., Romanczyk, A., & Mamion, A. P. (1992). Eyewitness persuasion: How and how well do fact finders judge the accuracy of adults' and children's memory reports? *Attitudes and Social Cognition, 63*, 181–197.

Maras, K. L., & Bowler, D. M. (2010). The cognitive interview for eyewitnesses with autism spectrum disorder. *Journal of Autism and Developmental Disorders, 40*, 1350–1360. doi: 10.1007/s10803-010-0997-8

McCauley, M. R., & Fisher, R. P. (1995). Facilitating children's eyewitness recall with the revised cognitive interview. *Journal of Applied Psychology, 80*, 510–516.

Memon, A., Cronin, O., Eaves, R., Bull, R., & Kupper, B. (1992, May). *The cognitive interview and child witnesses*. Paper presented at the NATO Advanced Study Institute: The Child Witness in Context: Cognitive, Social and Legal Perspectives, Lucca, Italy.

Memon, A., Holley, A., Wark, L., Bull, R., & Kohnken, G. (1996). Reducing susceptibility in child witness interviews. *Applied Cognitive Psychology, 10*, 503–518.

Memon, A., Meissner, C. A., & Fraser, J. (2010). The cognitive interview: A meta-analytic review and study space analysis of the past 25 years. *Psychology, Public Policy, and Law, 16*, 340–372. doi: 10.1037/a0020518

Milne, R., & Bull, R. (1996). Interviewing children with mild learning disability with the cognitive interview. In N. K. Clark & G. M. Stephenson (Eds.), *Investigative and forensic decision making: Selected papers from the Division of Criminological and Legal Psychology Annual Conference 1995* (No. 26, pp. 43–50). Leicester, UK: The British Psychological Society for the Division of Criminological and Legal Psychology.

Milne, R., & Bull, R. (2001). Interviewing witnesses with learning disabilities for legal purposes. *British Journal of Learning Disabilities, 29*, 93–97. doi: 10.1046/j.1468-3156.2001.00139.x

Milne, R., & Bull, R. (2003). Does the cognitive interview help children to resist the effects of suggestive questioning? *Legal and Criminological Psychology, 8*, 21–38.

Milne, R., Clare, I. C., & Bull, R. (1999). Using the cognitive interview with adults with mild learning disabilities. *Psychology, Crime and Law, 5*, 81–99. doi: 10.1080/10683169908414995

Mittler, P. (2002). Educating pupils with intellectual disabilities in England: Thirty years on. *International Journal of Disability, Development and Education, 49*, 145–160.

Murfett, R., Powell, M. B., & Snow, P. C. (2008). The effect of intellectual disability on the adherence of child witnesses to a story grammar framework. *Journal of Intellectual and Developmental Disability, 33*, 2–11. doi: 10.1080/13668250701829811

Peled, M., Iarocci, G., & Connolly, D. A. (2004). Eyewitness testimony and perceived credibility of youth with mild intellectual disability. *Journal of Intellectual Disability Research, 48*, 699–703.

Petersilia, J. (2001). Crime victims with developmental disabilities. *Criminal Justice and Behavior, 28*, 655–694. doi: 10.1177/009385480102800601

Powell, M., Fisher, R. P., & Wright, R. (2005). Investigative interviewing. In N. Brewer & K. D. Williams (Eds.), *Psychology and law: An empirical perspective* (pp. 11–42). London: Guildford Press.

Price, E. (1997). *Assessing the cognitive interview: How effective is it for use with children with mild learning disabilities*. University of Portsmouth, UK: Unpublished manuscript.

Raskin, D. C., & Esplin, P. W. (1991). Statement validity assessment: Interviewing procedures and content analysis of children's statements of sexual abuse. *Behavioral Assessment, 13*, 256–291.

Robinson, J., & McGuire, J. (2006). Suggestibility and children with mild learning disabilities: The use of the cognitive interview. *Psychology, Crime & Law, 12*, 537–556. doi: 10.1080/10683160500337550

Saywitz, K. J., Geiselman, R. E., & Bornstein, G. K. (1992). Effects of cognitive interviewing and practice on children's recall performance. *Journal of Applied Psychology, 77*, 744–756.

Snow, P. C., Powell, M. B., & Murfett, R. (2009). Getting the story from child witnesses: Applying a story grammar framework. *Psychology, Crime and Law, 15*, 555–568. doi: 10.1080/10683160802409347

Stein, N. L., & Glenn, C. G. (1979). An analysis of story comprehension in elementary school children. In R.O. Freedle (Ed.), *New directions in discourse processing* (pp. 53–120). Norwood, NJ: Ablex.

Sullivan, P. M., & Knutson, J. F. (2000). Maltreatment and disabilities: A population-based epidemiological study. *Child Abuse and Neglect, 24*, 1257–1273.

S v. R. (1989). 89 A. L. R., 321.

Tabachnick, B. G., & Fidell, L. S. (2007). *Using multivariate statistics* (5th ed.). Boston, MA: Pearson Education.

Tulving, E., & Thomson, D. M. (1973). Encoding specificity and retrieval processes in episodic memory. *Psychological Review, 80*, 352–373.

Wells, G. L., & Leippe, M. R. (1981). How do triers of fact infer the accuracy of eyewitness identification? Using memory for peripheral detail can be misleading *Journal of Applied Psychology, 66*, 682–687.

Westcott, H. L., & Kynan, S. (2004). The application of a 'story-telling' framework to investigative interviews for suspected child sexual abuse. *Legal and Criminological Psychology, 9*, 37–56.

Westera, N. J., Kebbell, M. R., & Milne, R. (2011). Interviewing rape complainants: Police officers' perceptions of interview format and quality of evidence. *Applied Cognitive Psychology, 25*, 917–926. doi: 10.1002/acp.1770.

Wilson, J. C., & Powell, M. B. (2001). *A guide to interviewing children: Essential skills for counsellors, police, lawyers and social workers*. Crows Nest, NSW: Allen & Unwin.