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The Effect of Intellectual Disability on Children's Recall of an Event Across Different Question Types

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This research examined the performance of 80 children aged 9–12 years with either a mild and moderate intellectual disability when recalling an innocuous event that was staged in their school. The children actively participated in a 30-min magic show, which included 21 specific target items. The first interview (held 3 days after the magic show) provided false and true biasing information about these 21 items. The second interview (held the following day) was designed to elicit the children's recall of the target details using the least number of specific prompts possible. The children's performance was compared with that of 2 control groups; a group of mainstream children matched for mental age and a group of mainstream children matched for chronological age. Overall, this study showed that children with either a mild or moderate intellectual disability can *provide accurate and highly specific event-related information. However, their recall is less complete and less clear in response to free-narrative prompts and less accurate in response to specific questions when compared to both the mainstream age-matched groups. The implications of the findings for legal professionals and researchers are discussed.*

KEY WORDS: children; intellectual disability; eyewitness; testimony; investigative interviewing.

The current study examined the ability of children with intellectual disabilities to recall an event across a variety of different question types commonly used by investigative interviewers. The aim of this investigation was to better understand the abilities of these children in order to make recommendations about how their evidence can be improved. Children with intellectual disabilities constitute a high proportion of all child victims of abuse when considering the base rate of intellectual disability in the general population (Conway, 1994; Goldman, 1994; Morse, Sahler, & Friedman, 1970), however offenders who commit these crimes are rarely successfully prosecuted (Williams, 1995). Even in countries which enforce the mandatory reporting of child abuse, an estimated three out of every four cases of sexual abuse involving children

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with intellectual disabilities are never reported to authorities (Sobsey & Varnhagen, 1989). Of those cases that are reported to police, most informants complain that the allegation had not been taken seriously (Clare, 2001), and of those alleged cases of abuse that finally reach the courts, a guilty verdict is rarely reached. Williams (1995) suggested that of every 100 offences committed, only three actually result in a court conviction due to insufficient evidence or lack of credibility of the child witness. On the basis of these statistics, one could confidently argue that children with intellectual disabilities are being denied adequate access to the criminal justice system.

The importance of the current study is heightened by the scarcity of prior research conducted in this area. An extensive search of the literature elicited only eight studies that examined the performance of children with intellectual disabilities when recalling events that they had witnessed or experienced (Dent, 1986, 1992; Gordon, Jens, Hollings, & Watson 1994; Henry & Gudjonsson, 1999; Jens, Gordon, & Shaddock, 1990; Michel, Gordon, Ornstein, & Simpson, 2000; Milne & Bull, 1998; Pear & Wyatt, 1914). Overall, these studies revealed that children with intellectual disabilities typically provide less complete and less accurate accounts compared to *chronological* age-matched groups. However, the findings are mixed with regards to whether and in relation to what questions, children with intellectual disabilities perform lower than *mental* age-matched groups. Although theories predict that deficits in performance would be expected when using chronological but not mental age-matched peers, this has not always been the case. Of the four previous studies that included mental age-matched control groups, two reported deficits among children with intellectual disabilities in the amount of accurate information recalled in response to specific questions (Gordon et al., 1994; Jens et al., 1990). However, the other studies found no deficits in the amount of accurate information reported in response to these questions (Henry & Gudjonsson, 1999; Michel et al., 2000).

Given the variability in the procedures of past research designs, it is difficult to speculate about the precise conditions under which differences between the participant groups occur. Although some would argue (based on research with mainstream children) that differences between the participant groups would be minimized when children are active participants, rather than mere observers of an event, this does not appear to be supported. Among the three studies that involved children's active participation in the event, two (i.e., Gordon et al., 1994; Jens et al., 1990) reported that children with intellectual disabilities provide fewer correct responses to specific questions than both mental and chronological age-matched control groups. Further, no obvious pattern has been revealed with regards to the relationship between participant group and question type. Some studies revealed differences between the intellectual disability versus control groups in the amount of correct information recalled in free narrative (Michel et al., 2000; Pear & Wyatt, 1914) as well as the number of accurate responses to closed questions (Dent, 1992; Gordon et al., 1994; Pear & Wyatt, 1914). Other studies, however, reported no differences between the participant groups for open questions (Dent, 1992) or specific questions (Henry & Gudjonsson, 1999; Michel et al., 2000). The only consistent pattern is found in relation to children's suggestibility. Of the six studies that included misleading yes/no questions, the children with intellectual disabilities were always more likely to acquiesce to misleading questions than children matched for chronological

age (Henry & Gudjonsson, 1999; Michel et al., 2000; Milne & Bull, 1998; Pear & Wyatt, 1914). However, no differences in performance were found between the intellectual disability and mental age-matched groups (Gordon et al., 1994; Henry & Gudjonsson, 1999; Jens et al., 1990; Michel et al., 2000).

Speculation about the conditions in which deficits in performance occur among children with intellectual disabilities is hindered not only by variability in the previous research designs, but limitations in (and lack of detail regarding) the events, samples, and questions adopted in studies. First, all except one of the studies required the children to recall a demonstration (involving the presentation of a series of discrete objects) that was staged in their classroom, or a conversation between an adult and the teacher. Events that are observed rather than participated in are less easily encoded (Rudy & Goodman, 1991), and are more likely to disadvantage children with intellectual disabilities who are more distractible than mainstream children. Second, the diagnosis of intellectual disability has not always been contingent on the outcome of standardized measures of intellectual functioning. Some studies based their diagnosis of intellectual disability on recommendations from teachers (Dent, 1992) or labels provided in mainstream schools (Milne & Bull, 1998). Without the use of standardized measures for labeling intellectual disability and without clear specification of the number of participants who have physical deficits as well, the degree to which the experimental groups are affected by intellectual disability is unknown. In only one of the studies (i.e., Henry & Gudjonsson, 1999) did the authors include children with moderate as well as mild intellectual disabilities, although this study did not actually differentiate between the results of children with varying levels of disability.

Third, many of the studies used questioning techniques that would have underestimated the performance of the children with intellectual disabilities. Problems included the absence of appropriate verbal prompts (including minimal encouragers) to elicit elaborate responses from the child (see Sternberg et al., 1997, regarding the importance of verbal prompts) and lengthy testing procedures sometimes including large numbers of direct questions that were asked irrespective of whether the child had recalled the event detail during an earlier phase of the interview. For example, Dent (1992) required one group of participants with intellectual disabilities to answer 72 specific questions in a single interview. Gordon et al. (1994) and Michel et al. (2000) administered the event, the tests of intelligence and the interview, during a single session. Although conducting multiple sessions with individual children is time consuming, it is particularly important when attempting to obtain genuine measures of the abilities of children with intellectual disabilities. These children have limited concentration spans and require more time and encouragement to provide their responses (Iarocci & Burack, 1998).

In summary, while it is established that children with intellectual disabilities typically perform more poorly than their chronological age-matched controls, and on some occasions perform more poorly than their mental age-matched controls, the conditions under which this occurs have not been clearly established. This will depend on careful selection of the type of event, samples, questions, and retention intervals used. In order to produce findings that are more generalizable to forensic interviewing situations, the conditions should be sensitive to the attention limitations of children with intellectual disabilities and should aim to equate as closely as possible

the recommended interview guidelines. Further, in order to cross-validate research findings, clear specification of the procedures and labels is required.

The aim of the current study was to examine further the memory performance of children with intellectual disabilities. Eighty children aged 9–12 years with an intellectual disability participated in a 30-min magic show that was conducted at their school and involved 21 target items. This show was staged by a research assistant whose role was to perform a number of tricks, which required the assistance of the child participants. Three days after the show, the children received a biasing interview that provided seven false and seven true details about the show. The day after the biasing interview, the researcher conducted a second interview, which was designed to elicit as many of the 21 target details as possible. Initially, minimal encouragers and open-ended questions were used. If these were not successful in eliciting the target details, more specific questions were asked, although (consistent with "best-practice" guidelines) open-ended questioning was exhausted before moving on to more specific questions. The performance of children with intellectual disabilities was compared to that of two control groups; one matched for mental age and the other matched for chronological age.

The design employed in this study differed from the designs of most previous studies in several ways that might enhance the generalizability and usefulness of the findings. First, the event engaged all participant groups and involved a wide array of items (actions, objects, and verbalizations) that centered around a single theme (performing tricks). Second, the study included a relatively large sample of children with mild and moderate disabilities who were assigned according to standardized criteria. Further, the control and experimental groups were matched for both group mean age and variation of age. Third, a suggestibility paradigm was used that included a separate biasing interview and predominantly cued-recall rather than leading yes/no questions in the main interview. This was considered to enhance the generalizability of the findings because interviews that contain a large number of leading yes/no questions are generally not admissible in court. Further, while suggestibility is usually lower for cued-recall questions compared to yes/no questions, cued-recall questions permit the examination of a wide range of errors (i.e., false information previously offered by the interviewer as well as false details generated by the child).

Finally, the children's responses were coded in accordance with several distinct qualities that are used to judge the usefulness and reliability of evidential interviews. Witnesses need to recall specific event details and the relevant points or contextual details that need to be elicited are usually dictated by the requirements of the interviewer rather than the child (see Wilson & Powell, 2001). Without this requirement (referred to as particularization), the accused person's capacity to respond to the allegations would be seriously eroded (see *S v. R*, 1989). In addition to being complete and reliable, evidence needs to be accurate, clear, and elicited using minimal cues or prompts from the interviewer. Most eyewitness memory studies to date have merely measured the number and accuracy of specific details reported in response to different question types. A consideration of the clarity and specificity of the questioning required to elicit the reports is also an important consideration for researchers. Clear reports that are elicited with minimal prompting from the interviewer (irrespective of accuracy) are more likely to be credible and admissible in court.

Overall, it was expected that the children with either a mild and moderate intellectual disability would recall less detailed (i.e., contextual) information compared to their chronological age-matched peers, and the interviewer would require more specific prompts to elicit the target details from these children. Further, it was expected that children with intellectual disabilities would be less accurate compared to their chronological age-matched peers except for information provided during free-narrative. Research has already established that information provided in free-narrative is usually highly accurate (irrespective of mental or chronological age) and this finding has been supported in several previous studies involving children with intellectual disabilities (i.e., Dent, 1992; Gordon et al., 1994; Henry & Gudjonsson, 1999; Jens et al., 1990; Michel et al., 2000; Pear & Wyatt, 1914). When comparing the performance of children with intellectual disabilities to their mental age-matched peers, no deficits in performance were expected. This was because theories of memory and language suggest that children with intellectual disabilities perform at their mental age (Fowler, 1998; Iarocci & Burack, 1998) and prior research (involving a range of cognitive tasks) has typically found few differences in performance between children with intellectual disabilities and those matched for mental age. Further, the interactive nature of the event would ensure that *all* children had good opportunity to encode the event information.

METHOD

Design

Participants included 80 children aged 9–12 years with a mild or moderate intellectual disability, 53 mainstream children matched for mental age, and 62 mainstream children matched for chronological age. All children participated in a 30-min magic show, which was staged at their school and included 21 specific target items. The first interview (held 3 days after the magic show) was designed to provide false and true biasing information about these 21 items. The second interview, held the following day, was designed to elicit the 21 target details using the least number of specific prompts possible. That is, the interviewer attempted to elicit as much of the information as possible in the child's own words followed by the use of specific cued and forced-choice questions (where needed) to elicit target details that had not been provided by the child earlier. The design employed was a 3 (participant group; intellectual disability, mental age-matched, chronological age-matched) × 2 (level of disability; mild, moderate) with both factors measured between subjects.

Participants

"Intellectual Disability" Groups

Children with intellectual disabilities were recruited through letters to parents distributed at special schools.[3] All children with parental consent were invited to participate and none of the participants had any major visual or auditory impairment.

[3]The term "special school" is a school specifically designed to cater for the needs of children with intellectual disabilities.

Upon recruitment, the participants were then assigned to either a "mild" or "moderate" intellectual disability category based on their Intelligence Quotient (IQ) score which was obtained from the Wechsler Abbreviated Scales of Intelligence (WASI; The Psychological Corporation, 1999) and the criteria for mental retardation outlined in the *Diagnostic and statistical manual—IV* (American Psychiatric Association, 1994, p. 40).[4]

Children with a mild level of intellectual disability consisted of 58 children (40 males, 18 females) who were aged from 9 to 12 years (M age = 132.57 months; SD = 13.85 months; range = 108–155 months) and had an IQ score between 56 and 75 (M_{IQ} = 62.88; SD = 4.76; range = 56–75).[5] Children with moderate intellectual disability consisted of 12 males and 10 females aged 9–12 years (M = 144.45 months; SD = 8.69 months; range = 127–155 months). These children had a WASI-IQ score "no" greater than 55. Unfortunately, the precise IQ scores for this group could not be determined because the WASI does not provide scores below 55. However, the benefits of using the WASI (i.e., it is a reliable, valid and brief test designed to prevent problems associated with re-retesting; Sattler, 2001) were considered to outweigh the disadvantages of not being able to measure the precise degree of disability among members of the group.

Control Groups

Participants in both the mild and moderate intellectual disability groups were assigned two control groups. The children for the control groups were recruited through letters to parents distributed at four mainstream schools. All children with parental consent were placed in a pool of "potential participants" (N = 138) provided their performance on the WASI (which was administered specifically for this research) revealed an IQ score in the average or higher range. Control groups were matched using a method recommended by Kantowtiz, Roediger, and Elmes (2001) that involved equating each participant group on both mean age and standard deviation (in months). Initially, participants' ages in months were matched on a case-by-case basis. When no more control children of precisely the same age in months were available, then participants were randomly added to the control groups until the means and standards deviations of the controls groups matched that of the intellectual disability group.

The mental age of the participants in the intellectual disability group was based on test age-equivalent scores of their raw scores (before standardization by age) on

[4]The *DSM-IV* specifies that children with an IQ level between 50 and 70 have mild mental retardation, and children with an IQ level between 35 and 55 have moderate mental retardation. As there is an overlap between mild and moderate levels of mental retardation, children with an IQ score of 56 or above have been classified as having a mild intellectual disability, and children with an IQ score of 55 and below have been classified as having a moderate intellectual disability (as per Henry & Gudjonsson, 1999).

[5]Twelve of the participants had a WASI- IQ score between 71 and 75, which placed them in the borderline range. However, as they were attending a special school (and thereby would have previously been assessed as performing in the mild intellectual disability range), they were included in the study. Note that all analyses reported in this paper were initially conducted with these 12 children removed which revealed no difference in the pattern of results. In addition, a series of independent t tests (one for each of the major dependent variables) revealed no significant differences in performance between children who had a WASI-IQ score in the mild intellectual disability or 71–75 range.

the WASI. As a test age equivalent score is given for each of the two subtests on the WASI, these scores were averaged to determine the participant's mental age. The mean mental age of participants in the mild intellectual disability group was 82.78 months (SD = 9.92 months; range = 75–112 months). As indicated earlier, the variance and range in mental age for the moderate intellectual disability group could not be determined using the WASI because the minimum level of mental age determined using this test is 74 months. For the participants with a mild intellectual disability, their chronological age-matched control group consisted of 27 males and 21 females (M = 128.94 months; SD = 12.71 months; range = 108–151 months) and their mental age-matched group consisted of 16 males and 18 females (M = 82.54 months; SD = 10.20 months; range = 69–112 months). For the participants with moderate intellectual disability, their chronological age-matched control group consisted of 6 males and 8 females (M = 139.00 months; SD = 11.03 months; range = 118–160 months) and their mental age-matched group consisted of 6 males and 13 females (M = 73.50 months; SD = 1.38 months; range = 72–76 months). A series of independent sample t tests were conducted to ascertain that the control groups were in fact an equivalent age-match to the intellectual disability groups. Separate t tests were conducted for each of the two disability groups. In all four analyses, mean age was not found to significantly differ across the groups (ts = 0.11–1.70).

MATERIALS

The event consisted of 21 target items that were administered in the same temporal order for each class. These items were divided into three groups (seven items in each group), whereby each group included an equal number of actions, objects, or verbalizations. Seven of the items were correctly biased (referred to as true-biased items) in the initial biasing interview. Seven of the items were falsely described (referred to as false-biased items) in the biasing interview, and the remaining seven items were not mentioned at all (referred to as not-biased items) in the biasing interview. However, to control for item effects, the precise group of items that were assigned to these categories varied among the children such that each item in the event served equally often as a true-biased, false-biased, and not-biased item. In addition, the precise instantiation or exemplar that represented the item and/or the suggestion was counterbalanced such that there were two versions of the show (Version A and Version B). Half of the children in each participant group experienced Version A items, while half of the children experienced Version B items. When suggesting false details about the event, Version A exemplars were chosen for those participants who experienced Version B details in the event and Version B exemplars were chosen for those participants who experienced Version A details in the event. The full set of items and exemplars is presented in Table 1.

Procedure

The Event

All children participated in a 30-min magic show that was performed by a visiting magician in a room at the child's school (not the regular classroom). Teachers were

Table 1. The Target Items and the Two Versions of Exemplars That Made Up the Magic Show

No.	Item	Version A	Version B
1	Magician's name	Trina	Katie
2	Child's response to tricks	Clapping hands	Stomping feet
3	Method of dressing in cape	Step into	Over head
4	Reason for becoming a magician	Father was a magician	Received magic set forbirthday
5	Koala's name	Boo	Pop
6	What the friend did to keep the koala awake	Sneezing	Coughing
7	Warm-up activity	Wiggle fingers	Touching toes
8	Utensil to choose helper	Crayon	Texta
9	Helper's name	Child A	Child B
10	Magic words	Abracadabra	Hey presto
11	Magician's favourite lollipop	Banana	Strawberry
12	What magician got from shop/bag	Rock	Sock
13	What magician had to do to make the wand work	Tap wand × 3	Tap wand × 1
14	Type of drink that appeared	Orange juice	Coke
15	What magician used to protect the floor during the drink trick	Raincoat	Garbage bag
16	Why the magician's box needed cleaning	Under bed	Left in car
17	What the magician gave to the children	Lip gloss	Face spray
18	Type of stickers the magician gave the children	Dinosaurs	Balls
19	Where the children put the stickers	Chest	Hand
20	Action required to turn power off	Hop on spot	Turn twice
21	Consequence of not turning the power off	Teacher might turn into a frog	Teacher might turn into a mouse

asked not to talk with the children about the event or to inform them that they would later be interviewed about the event. No person other than the child's teacher, the magician, and the children were present in the room during the show. At the beginning of the event the magician explained that she was learning to do magic tricks and that she wanted to conduct a magic show for younger children, but wanted to seek the participants' advice as to whether her tricks were suitable. She explained that she needed the participants to show her (either by clapping their hands or stomping their feet), whether the magic tricks she was using would be appropriate for kindergarten children (4–5 year olds). The purpose of providing this rationale is that it encouraged active participation and ensured that the event was developmentally appropriate for all the children in the study. If this rationale had not been provided, there was a risk that the older mainstream children would have criticized the script and tricks as being too obvious for their age range. Although debriefing was offered to all participants after the event, all classroom teachers indicated that this was not necessary. Indeed, all of the children seemed to enjoy the show and were pleased to offer their opinion about the quality of the tricks.

Interviews

All children individually attended two interviews, which were held in an isolated room at the child's school (not the room where the activities took place). One female

interviewer (aged 25 years) who was previously unknown to the children conducted all the interviews and used a standard list of questions/prompts for each child (see below) to ensure that the interview procedure was as similar as possible across the participant groups. The first interview took approximately 5 min to complete and was held 3 days after the magic show. The second interview took approximately 15 min to complete and was held the day after the first interview.

The Biasing Interview

The purpose of this interview was to suggest details that may have occurred in the event. After an initial rapport-building period, the interviewer said, "I heard that a magician came to your school and did a magic show. I wasn't there that day and I don't know what happened. So I need to ask you some questions about what the magician did when she came to your school."

A series of 14 questions were then asked, each referring to a different item presented in Table 1. For seven of the questions, a false detail was presupposed to have occurred in the event in accordance with the counterbalancing procedure outlined earlier. These items are referred to as false-biased items. For the remaining questions (true-biased items), a true suggestion was provided. For example, if the magician made orange juice appear during the magic show, a corresponding false suggestion would be "I heard the magician did a trick where she made a glass of coke appear. Where did the drink of coke come from?" A corresponding true suggestion would be "I heard the magician did a trick where she made a drink of orange juice appear. Where did the drink of orange juice come from?" Questions of this nature have successfully been used in other research to show reliable suggestibility effects with young children (e.g., Powell, Roberts, Ceci, & Hembrooke, 1999).

Memory Interview

The second interview took place the day after the biasing interview and was conducted by the same person who administered the biasing interview. The interviewer began by saying; "Do you remember that my name is Sarah and I spoke to you yesterday about the magic show. Well I really messed up because I accidentally taped over all of your answers. So I need to ask you again about the magic show. This time the questions might be a bit different, so just do your best to tell me what you can remember." The aim of this interview was to elicit as many of the 21 items (i.e., the specific exemplars listed in Table 2) using the broadest or least specific questions possible.

Each interview commenced with a free-narrative phase in which participants were encouraged to report everything they could remember about the magic show in their own words. Part 1 of the free-narrative phase involved minimal encouragers (e.g.,"uh huh," "mmm," pauses, headnodding) as well as broad open-ended questions (e.g., "What happened next?;" "What happened then?") to elicit as many of the activities that occurred in the event as possible. Once it was clear that the child could not recall more, the interviewer moved onto Part 2. This included a series of broad open-ended questions that were designed to elicit more depth of information about

aspects of the event previously mentioned by the child (e.g., "Tell me everything you can remember about the magician"). To provide consistency across children, no more than eight possible open-ended questions were used in this phase, which related to central details of the event (i.e., the magician, the Koala, what the children and magician had to do to help the magician and the tricks that were performed). These latter open-ended questions were followed up with further minimal encouragers as described above.

For each target item that was not recalled during the free-narrative phase of the interview, the interviewer asked one specific cued-recall question (e.g., "You said the magician came to your school to do a magic show. What was the magician's name?"; "I heard the magician made a drink appear in a box. What type of drink did the magician make?"). Consistent with best-practice guidelines (Home Office, 2000), these questions were asked only after the free-narrative phase was exhausted. However, it is important to note that for a small proportion of the items, the questions would be considered leading because the information being requested had not been established earlier in the interview. For example, the question "What type of drink did the magician make in the box?" was leading in the small proportion of cases where the child had not previously mentioned that the magician made a drink. For the purpose of this investigation, specific questions were asked irrespective of whether the child had mentioned the broader category of information (e.g., drink) as this had to be assumed to elicit the more specific category of information (e.g., the type of drink). From an experimental perspective, however, the data could easily be analyzed with the leading questions removed. Therefore, qualifications in interpretation (where necessary) could be made in relation to analyses that revealed different patterns of results depending on whether the leading questions were included.

If in response to each specific cued-recall question, the child did not recall the required information, a forced-choice question was immediately asked which contained three possible alternatives (e.g., "Was the magician's favourite lollipop banana, orange or raspberry?"). For the seven items that had been falsely biased, the options included the correct detail, the false-biased detail and a new-false detail. For the remaining items, the options included a correct response and two new-false responses. If a feasible verbal response was still not provided, then participants were immediately provided with the opportunity to provide a nonverbal response by pointing or head-nodding in response to actions demonstrated or various symbolic representations of the items that were displayed on cards (e.g., three colored cards represented different flavored lollipops, various actions performed by the interviewer represented various responses to tricks). For both sets of forced-choice questions, the order in which the correct, false, and new options were presented was fully counterbalanced. If a feasible answer was not provided following the nonverbal forced-choice question, no further questions were asked.

Test of Intellectual Functioning

Between 1 and 2 weeks following the second interview, all of the participants with an intellectual disability and 83% of participants in the control groups were

administered the Wechsler Abbreviated Scales of Intelligence (WASI; The Psychological Corporation, 1999).[6] The assessment was conducted by the interviewer and took between 10 and 15 min to complete.

CODING

The interviews were audiotaped and transcribed verbatim for coding. Responses to the first interview were not coded as the purpose of this interview was merely to present biasing information to the child. For the main interview, the responses during the free-narrative phase and to the specific cued-recall and forced-choice questions were coded separately. Only information related to the event was coded, and only the first time it was reported.

Responses to each question during the free-narrative phase and in response to the specific cued-recall and forced-choice questions were coded as correct or incorrect. Incorrect responses during the free-narrative phase and in response to the specific cued-recall questions were divided into one of the following three categories; (i) *False suggestions*, when the false item that was suggested by the interviewer in the biasing interview was reported by the child; (ii) *external intrusion errors*, when an entirely new false item that had not occurred and had not been suggested was reported (e.g., "The magician made a drink of cordial appear"); and (iii) *confusions*, when a detail regarding another part of the activities was reported (e.g., "We had to touch our toes to turn the magic powers off"). For the forced-choice questions, there was one additional response category that included *new responses* (i.e., when the response given by the child was a new option provided by the interviewer in the forced-choice question). Responses during the free-narrative phase were also coded according to whether a specific item was described in context or not. The contextual detail associated with each item is presented in the far left column of Table 1. For example, in relation to Item 12 (Version A), if the child merely referred to a "rock" being in the show, this was not credited as being in context unless the child specifically mentioned that the magician made the rock appear in the bag, or made it come from the shop.

Finally, for each of the 21 target items recalled (irrespective of whether they were described accurately), a "distance score" was calculated which represented where in the sequence of questions the detail was provided (i.e., free-narrative part 1, free-narrative part 2, specific cued-recall questions, verbal forced-choice questions, or nonverbal forced-choice questions). For instance, if the child recalled the detail during the free-narrative phase (part 1), (s)he was given a score of 1. If the child recalled the detail in response to the nonverbal forced-choice questions, (s)he was given a score of 5. All the transcripts were coded by the first author. A person, who was not otherwise involved in the study, then coded 15% of the transcripts (representing a cross-section from all the conditions). Intercoder agreement was at least 96% for all categories.

[6]Time constraints did not permit all children in the control groups to be tested.

RESULTS

An alpha level of .01 was used for all the main statistical tests. All analyses were initially performed with types of item bias (false-biased, true-biased, and not-biased) included as a within-subjects factor. Only a few significant effects were found involving item bias, all of which were not germane to the main analyses. Therefore, all results (excluding error responses) are reported collapsed over this factor.

Completeness of Recall

Completeness of recall was coded in several different ways. The first column of Table 2 represents the mean number of target items referred to by the children irrespective of whether the item was correctly described. For example, Item 14 refers to the drink that appeared in the magician's box. To be awarded a score for this item, the child needed to refer to the type of drink that appeared irrespective of whether it was correct. As shown in this table, the interview was effective in eliciting these target details. Even in the moderate disability group, there was a ceiling effect such that the mean number of items recalled was 20 out of a possible 21.

The second way in which completeness of recall was measured was the mean number of target items *correctly* reported. These scores are represented in the second column of Table 2. Note that they do not specify where in the interview a target item was reported. A 3 (Participant group: intellectual disability, mental age-matched, chronological age-matched) × 2 (Level of disability: mild, moderate) analysis of variance (ANOVA) was performed on these scores with both factors measured between-subjects. The results revealed one finding; a main effect for participant group, $F(2, 189) = 39.69$, $p < .01$; $\eta^2 = .30$. Post hoc analyses (Tukey) showed that children in the intellectual disability group reported a smaller number of correct responses than children in the two control groups (M difference compared to mental age $= -4.29$, $p < .01$; M difference compared to chronological age $= -4.56$, $p < .01$). The number of correct responses reported by the mental and chronological age-matched groups were not significantly different (M difference $= 0.27$, $p = .90$).

Table 2. Completeness of Children's Recall

	N	Mean number of target items recalled/21	Mean number of items correctly recalled	Mean mode of where children responded in interview
Mild				
ID	58	20.98 (0.13)	14.40 (4.53)	3.05 (0.69)
MA	34	20.97 (0.17)	18.71 (1.70)	2.71 (0.72)
CA	48	21.00 (0.00)	18.58 (1.85)	2.00 (1.01)
Moderate				
ID	22	20.36 (2.56)	12.86 (4.05)	3.50 (0.96)
MA	19	20.95 (0.23)	17.47 (2.27)	2.95 (0.23)
CA	14	21.00 (0.00)	18.36 (2.41)	1.71 (0.99)

Note. Standard deviations are in parentheses. ID, intellectual disability group; MA, mental age-matched participants; CA, chronological age-matched participants.

The third way in which completeness of recall was measured was in relation to the type of question required to elicit the target details. A distance score was awarded for each target item recalled, which indicated where in the interview the specific target item was reported by the child (i.e., free-narrative part 1 = 1; cued-recall = 3; nonverbal forced choice = 5). For each child, a modal score was determined such that a higher modal score indicated a less complete account of the event during the earlier phases of the interview. The third column of Table 2 presents the mean of these modes "distance scores," which were subjected to a 3 (Participant group) × 2 (Level of intellectual disability) ANOVA (with both factors measured between subjects). Results revealed one finding; a main effect of participant group, $F(2, 189) = 39.61$, $p < .01$, $\eta^2 = .30$. Post hoc analyses (Tukey) showed that children in the intellectual disability group required greater specificity of questioning than children in the mental (M difference = 0.38, $p = .22$) and chronological (M difference = 1.24, $p < .01$) age-matched control groups. Also, the mental age-matched control group required greater specificity of questioning than the chronological age-matched group (M difference = 0.86, $p = .01$). Although no significant effect was found between participants in the mild and moderate intellectual disability groups, the size of the mean difference between these groups (M difference = −0.45, $p = .06$) suggests that the null finding may be due to the small sample size in the moderate disability group.

Accuracy of Recall

Table 3 presents the mean proportion of target items reported accurately. Accuracy measures were obtained by dividing the number of items correctly reported by the total number of items reported (correct and incorrect). These proportion scores were calculated separately for each question type. Separate 3 (Participant group) × 2 (Level of disability) ANOVAs were conducted on each of these three sets of proportion scores. Note that children who did not report any target items in response to a question type were excluded from the analysis involving that question type.

For the free-narrative phase of the interview, the results revealed no effects, Fs = 1.65–3.95. For the specific cued-recall questions, one effect was revealed; a main effect of participant group, $F(2, 188) = 19.48$, $p < .01$, $\eta^2 = .17$. Post hoc analyses (Tukey) revealed that children in the intellectual disability group provided a smaller proportion of accurate responses compared to both the mental age-matched

Table 3. Mean Proportion of Accurate Responses, by Question Type

	N	Free narrative	N	Specific cued-recall	*N*	Forced-choice
Mild						
ID	49	0.88 (0.22)	57	0.64 (0.25)	53	0.69 (0.26)
MA	34	0.94 (0.10)	34	0.86 (0.13)	27	0.79 (0.34)
CA	48	0.95 (0.07)	48	0.82 (0.16)	32	0.84 (0.33)
Moderate						
ID	17	0.83 (0.27)	22	0.61 (0.24)	21	0.58 (0.22)
MA	19	0.85 (0.27)	19	0.80 (0.15)	16	0.80 (0.24)
CA	14	0.90 (0.10)	14	0.82 (0.19)	13	0.92 (0.20)

Note. Standard deviations are in parentheses. ID, intellectual disability group; MA, mental age-matched participants; CA, chronological age-matched participants.

(M difference = −0.21, $p < .01$) and chronological age-matched (M difference = −0.19, $p < .01$) control groups. The proportion of accurate responses reported by the mental and chronological age-matched groups were not significantly different (M difference = 0.02, $p = .86$). These results, however, should be considered cautiously because the effect of participant group was reduced when leading questions (i.e., those where the child had not previously mentioned that part of the event) was removed from the analysis [$F(2, 176) = 3.45$, $p = .03$, $\eta^2 = .04$; Intellectual disability group: $M = 0.67$, $SD = 0.33$; mental age-matched control group: $M = 0.81$, $SD = 0.21$; chronological age-matched control group: $M = 0.79$, $SD = 0.30$].

For the forced-choice questions, a main effect of participant group was found, $F(2, 156) = 9.68$, $p < .01$, $\eta^2 = .11$. Post hoc examination of the main effect (Tukey) revealed that the children in the intellectual disability group were less accurate than both the mental age-matched (M difference = −0.14, $p = 0.03$) and chronological age-matched (M difference = −0.21, $p < .01$) control groups. The proportion of accurate responses to forced-choice questions did not differ for the two control groups (M difference = 0.07, $p = .47$).

Nature of the Errors

Errors were examined only for false-biased items because the number of errors for the other categories was very low (particularly for the chronological age-matched groups) and because the reporting of interviewer suggestions could only be made for these items. In other words, these were the only items for which the full range of errors could be compared. Table 4 presents the proportion of errors made across the participant groups (for free-recall and specific cued-recall questions) in relation to the seven false-biased items. The proportion scores were determined by dividing the number of errors in each category out of the total number of error responses. Separate one-way ANOVAs for participant group were performed on the proportion of all errors that were interviewer false suggestions and external intrusions.

For the interviewer suggestions, the results revealed a main effect of participant group, $F(2, 115) = 8.24$, $p < .01$, $\eta^2 = .13$. Post hoc examination (Tukey) revealed that children in the intellectual disability group reported a smaller proportion of false interviewer suggestions than children in both the mental (M difference = −0.23, $p = .04$) and chronological (M difference = −0.33, $p < .01$) age-matched groups. Interestingly, when the analysis was repeated on the *number* of interviewer suggestions reported, rather than the proportions, there was no significant difference between the groups, $F(2, 189) = 0.181$, $p = .83$, $\eta^2 = .002$ (ID = 0.82, MA = 0.93, CA = 1.10).[7] No difference in performance was found between the chronological and the mental age-matched participant groups (M difference = 0.10, $p < .62$) on the proportion of interviewer suggestions reported by the child in the main interview.

As total errors reported were the sum of suggestion errors and external intrusion errors, an inverse of the main effect for suggestion errors was found for external intrusion errors, $F(2, 115) = 8.68$, $p < .01$, $\eta^2 = .13$. Children in the intellectual disability group reported a larger proportion of these errors than children

[7]It should also be noted that children with intellectual disabilities were less likely to repeat a true interviewer suggestion in response to specific cued-recall and forced choice questions than both children matched for mental age and chronological age.

Table 4. Mean Proportion of Error Responses Across Free-Narrative and Specific Cued-Recall Questions

	N	False interviewer suggestion	External intrusion	Child confusion
Mild				
ID	48	0.45 (0.41)	0.55 (0.41)	0.00 (0.00)
MA	18	0.55 (0.48)	0.45 (0.48)	0.00 (0.00)
CA	23	0.72 (0.39)	0.28 (0.39)	0.00 (0.00)
Moderate				
ID	14	0.34 (0.37)	0.66 (0.37)	0.00 (0.00)
MA	10	0.83 (0.27)	0.13 (0.22)	0.04 (0.11)
CA	8	0.81 (0.37)	0.19 (0.37)	0.00 (0.00)

Note. Standard deviations are in parentheses. ID, intellectual disability group; MA, mental age-matched participants; CA, chronological age-matched participants.

matched for mental age (M difference = 0.24, $p = .03$) and chronological age (M difference = 0.33, $p < .01$). Further, no differences were found between the two control groups (M difference = 0.09, $p = .69$). For the main analyses there was no main effect or interaction involving disability level, Fs = 1.37–2.32.

For the forced-choice questions, the number of errors reported by children from the mental and chronological age-matched groups was too low to make any meaningful statistical comparisons (less than one error per child). However, it was observed that the majority (i.e., approximately 60%) of errors for these questions (irrespective of participant group) were the selection of the interviewer false suggestion.

Clarity of the Child's Report

Table 5 presents the mean proportion of all target items that were described in context during the free-narrative phase of the interview, across the participant groups and disability levels. A 3 (Participant group) × 2 (Level of intellectual disability) ANOVA was performed on these scores. The results revealed a main effect of participant group, $F(2, 180) = 37.55$, $p < .01$, $\eta^2 = .29$. Participants in the intellectual disability group reported a smaller proportion of specific information in context than both the mental (M difference = −0.14, $p < .01$) and chronological (M difference = −0.35, $p < .01$) age-matched control groups. In addition, the mental

Table 5. Mean Proportion of Specific Items Reported in Context During Free-Narrative

	N	Specific in full context
Mild		
ID	51	0.33 (0.29)
MA	34	0.50 (0.20)
CA	48	0.63 (0.18)
Moderate		
ID	20	0.23 (0.27)
MA	19	0.34 (0.20)
CA	14	0.72 (0.10)

Note. Standard deviations are in parentheses. ID, intellectual disability group; MA, mental age-matched participants; CA, chronological age-matched participants.

age-matched group provided a smaller proportion of items in context than the chronological age-matched group (M difference = 0.21, $p < .01$).

DISCUSSION

All of the children who took part in this study (even those with moderate intellectual disabilities) were able to provide accurate information about the event; information that in a forensic context could potentially lead to corroborative evidence. Indeed, by the end of the cued-recall question phase of the interview, feasible answers were given about more than half of the target items, irrespective of the participant group. Further, it was rare for the children to confuse various aspects of the event. This is despite the fact that the event had a relatively complex structure, the target (memory) items were all highly specific in nature and the children had received an earlier interview, which had included a relatively large number of misleading details.

Although it is clear from this study that children with intellectual disabilities have the potential to provide reliable evidence for the courts, the elicitation of this evidence using standard "best-practice" questioning procedures is much more challenging than for mainstream children. Deficits in performance associated with intellectual disability were revealed in relation to every major performance measure. Overall, the children with intellectual disabilities (both mild and moderate groups) provided less *complete* and *clear* narrative accounts of the event and less *accurate* responses to specific questions compared to both mental and chronological age-matched peers. Further, they required more specific questioning by the interviewer to elicit the target details. The greater difficulty experienced by children with intellectual disabilities in generating event details in this study is consistent with other research that has demonstrated expressive and receptive language deficits among these children (Fowler, 1998). It is also consistent with research that has revealed deficits in explicit memory processes among persons with intellectual disabilities (e.g., rehearsal, chunking, categorizing of information; Fyffe, 1996; Wyatt & Conners, 1998).

The fact that performance of the children with intellectual disabilities on the above measures was consistently lower than that of the two control groups is interesting in light of the fact that no significant differences were found between the mental age- and chronological age-matched control groups on either the number or proportion of correct items recalled. Further, although the questions focused on highly specific event features, the event was highly engaging for all children (even those with attention difficulties), and the control groups were matched for both mean and variation of age.[8] Hence it could not be argued that the event or method of matching discriminated against the intellectual disability group.

[8]It is possible that the current study did not find adequate mental age-matched controls for the moderate intellectual disability group. This is because mental age for the intellectual disability group was calculated using the WASI, which does not provide standardized scores below 55 and therefore children in the mental age-matched group were matched as closely to the lowest possible age equivalent available on the WASI, 74 months. However, this would not explain why the moderate group performed consistently lower than the mental age-matched group. The pattern of responses across the experimental and control groups was very similar to that of the mild disability groups.

Why then did the children with intellectual disabilities perform lower than their mental age-matched peers when theories of memory and language suggest that mental age would be a relatively good indicator of performance (Fowler, 1998; Fyffe, 1996; Iarocci & Burack, 1998; Weisz, Yeates, & Zigler, 1982; Zigler, 1982)? The findings need to be considered in light of the fact that performance in an investigative style interview (i.e., where the child has to recall accurate and detailed information about an event) is not solely reliant on cognitive factors. Social, motivational, and emotional factors play a large part in determining the rate of children's errors (Ceci & Bruck, 1993; Dattilo, Hoge, & Malley, 1996; Pipe & Salmon, 2002). Such factors include the desire to please an interviewer by cooperating and complying with requests for information, the desire to hide one's limitations, and to appear a competent conversational partner (Brennan & Brennan, 1994; Kernan & Sabsay, 1989; Sigelman, Budd, Spanhel, & Schoenrock, 1981). Further, children's performance in an interview is also dictated by their prior experiences and perceptions of their own ability and the role of the interviewer (Cashmore, 2002; Mahoney, 1988; Saetermoe, Farruggia, & Lopez, 1999; Vrij & Winkel, 1994). For instance, if a child perceives adults to be a credible source of information and believes that adults should speak on behalf of children, there would be little motivation (and perceived need) for the child to relate everything (s)he knows to adults. Further, if a child is used to being asked highly specific questions in everyday life (questions that require only brief answers), then the child will perceive that short answers are usually all that are expected or required by adults (Sternberg et al., 1996).

Social and motivational factors would have been particularly relevant in this study given that the interviewer had a very confident and friendly manner. Further, she appeared to have a great deal of background knowledge about the event (which was displayed in the earlier biasing interview) and she was highly persistent in eliciting specific event-related material. Although it could be argued that social, motivational, and emotional factors would have impacted all children's responses, these factors could explain (at least in part) the poorer performance among the children with intellectual disabilities because the detrimental effect of these factors is heightened when the social status of the interviewer and interviewee is more differentiated (see Ceci, Ross, & Toglia 1987; Leman & Duveen, 1996). Indeed, children with intellectual disabilities have a much lower status in society than mainstream children, and their experiences in the home reinforce the view that they are not competent conversational partners (Mahoney, 1988; Saetermoe et al., 1999). Further, the concentration limitations of children with intellectual disabilities, and the heightened demands of the interview on their language and memory would have increased their desire to mask their limitations and do whatever is needed to get the interview over with as quickly as possible.

In the current study, the heightened impact of social demand characteristics on the responses of children with intellectual disabilities as opposed to mainstream children was demonstrated in several ways. First, anecdotally, it was noted that the children with intellectual disabilities appeared to be more anxious and self-conscious about their performance in the interview than the mainstream children. Further, they appeared to be more distracted by the new interview environment and were more concerned about its impact on their normal school routine. For example, some of

the children with intellectual disabilities were concerned that the interview might interfere with their ability to eat lunch, even though lunchtime was a long time away and the interviewer made it clear they would be returned to their classroom in time for lunch. Mainstream children, in contrast, appeared to enjoy the fact that the interview provided a break from their normal routine. A heightened anxiety among children with intellectual disabilities in new situations with new people has been reported elsewhere in the literature as well (Westcott & Cross, 1996).

Second, children with intellectual disabilities often deferred to the interviewer as if she was the authority and knew everything. For example, they frequently asked her questions throughout the interview such as "How do you think she made the drink appear in the box?"; "Do you think it was ice-cream flavoured lip gloss?" Although the younger mainstream children also asked the interviewer questions, the incidence was noticeably higher among the children with intellectual disabilities. This might explain why the children with intellectual disabilities were less likely to provide target details in context compared to mainstream children. As previous research with mainstream children has demonstrated, children provide less information to an interviewer they perceive as being knowledgeable about what occurred (Menig-Peterson 1975; Vrij & Winkel, 1994).

Third, the children with intellectual disabilities were less accurate than both control groups in response to specific cued-recall questions. However, the main effect of participant group was reduced when leading questions (i.e., those where the child had not previously mentioned that aspect of the event) were removed from the analysis. Further, for the free-narrative phase of the interview, accuracy was near ceiling for all children. The fact that a decline in accuracy associated with intellectual disability was most evident in relation to leading cued-recall and closed questions is consistent with other research that has shown a heightened suggestibility of children with intellectual disabilities (Henry & Gudjonsson, 1999; Michel et al., 2000; Milne & Bull, 1998; Young, Dudgeon, & Powell, 2003). The more cues the interviewer provides, and/or the greater the demand for highly specific details, the more compelled the child is to provide a (potentially inaccurate) response. Although previous research has demonstrated heightened suggestibility of children with intellectual disabilities using questions that specified the target item in the form of a yes/no question, this study demonstrated increased suggestibility even in response to questions that required the child to generate the desired information.

One other new result was revealed in relation to the children's suggestibility. It was found that the children with intellectual disabilities were significantly *less* likely than the control groups to repeat the false-interviewer suggestions that they had heard the previous day. This is a new finding because no previous research using children with intellectual disabilities had investigated suggestibility effects using a separate biasing interview paradigm. The finding should be interpreted in light of the fact that repeating an interviewer suggestion requires the ability to encode and store the information and then retrieve it verbally at a later date. The poorer memory and receptive and expressive language skills of the children with intellectual disabilities may have reduced the likelihood that the children remembered the interviewer suggestions (Fyffe, 1996). Instead, the majority of errors reported by children with intellectual disabilities tended to be "external intrusion" errors (feasible details that

did not occur in the event and were not suggested by the interviewer). Many of these errors were stereotypical responses (e.g., saying that the magician used a pencil to write the helper's name when it was a texta) although (as with mainstream children) they sometimes reported bizarre, incredible responses as well (e.g., "the magician made all the children disappear").

On the positive side, the finding that children with intellectual disabilities are less susceptible to false-interviewer suggestions implies that they may be less easily "coached" or their memories may be less easily overwritten by previous biasing interviews (Loftus, 1975) than mainstream children. Indeed they suggest that ground rule instructions (which target social, emotional, and motivational factors) may provide greater advantages for children with intellectual disabilities compared to mainstream children. However, the findings also need to be considered in light of the fact that the children with intellectual disabilities reported more errors per se (i.e., the absolute number of interviewer suggestions was the same across the participants). Further, the study provided no clear basis for distinguishing between child- and interviewer-generated errors.

Overall, while caution should be exercised in making generalizations across different forms of events and from designs that merely demonstrate the association between different variables, the findings of this study highlight three important implications for investigative interviewers who interview children about abusive events. First, consistent with "best-practice guidelines," this study supports that a phased questioning approach (including the elicitation of a free-narrative account prior to any specific questioning) should be used (where possible) for all children, including those with mild or moderate intellectual disabilities. The effectiveness of a phased approach was demonstrated by the high level of accuracy among all participants during free-narrative relative to that in response to specific cued-recall and closed questions. Improvements in the quality of evidence of children with intellectual disabilities are therefore dependent on the effectiveness of training programs in implementing current "best-practice" guidelines (see Powell, 2002, for review).

Second, the findings highlight the importance of further research into the role that social, emotional, and motivational factors play in contributing to the poor quality of evidence often obtained from children with intellectual disabilities. In particular, the findings highlight the importance of exploring techniques that may reduce the detrimental impact of these factors. For example, research has shown that extensive ground rule instructions that emphasize the importance of not guessing or making things up can reduce suggestibility in young children due to social desirability effects (i.e., a desire to please; Nesbitt & Markham, 1999). This might also be the case with children with intellectual disabilities. Indeed, programs designed to build self-esteem and confidence have been shown to improve the performance of these children on some academic tasks (Evans, 1998). Finally, the findings highlight the importance of not underestimating the children's performance. The onus is on the interviewer to assess the child's ability to relate information during the investigative process, rather than to rely on the child's mental age as a predictor of performance. Although each of these issues is relevant for all children, this study showed that they are particularly important when interviewing children with intellectual disabilities.

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