

Event Frequency and Children's Suggestibility: A Study of Cued Recall Responses

HEATHER L. PRICE* and DEBORAH A. CONNOLLY

Simon Fraser University, Canada

SUMMARY

Research examining the effect of repeated experience on children's suggestibility for particular kinds of information has produced differing results. In one study, responses to recognition questions revealed heightened suggestibility for variable details in children who repeatedly experienced an event compared to children who experienced an event once. In other studies, no such effect was found with cued recall. In this study, 4–5-year old children engaged in one or four play sessions. Children were later given a biasing interview wherein half of the details were incorrectly represented. Children were then given a final memory test using free and cued recall prompts that was preceded by one of three instruction types: no special instructions, moderate instructions, or opposition instructions. Children in the repeated-event condition were more suggestible than those in the single-event condition, regardless of instructions. No significant differences in suggestibility were found across instructions conditions. Copyright © 2004 John Wiley & Sons, Ltd.

Research examining children's suggestibility has focused largely on events that occurred only once. However, children's suggestibility for repeated experiences is an important legal issue because many children who testify in court, testify about offences that occurred more than once (e.g. Ceci, Powell, & Crossman, 1999). Published research of children's suggestibility for an instance of a repeated event reports conflicting results and there is evidence that the type of memory test may help explain the discrepancy. Specifically, when researchers used a cued recall test, children who experienced an event repeatedly were no more suggestible about details that varied across instances (variable details) than children who experienced only the target instance (Powell & Roberts, 2002; Powell, Roberts, Ceci, & Hembrooke, 1999; Powell, Roberts, & Thomson, 2000). Conversely, when researchers have used a yes/no recognition test, children who experienced the event repeatedly were more suggestible about variable details than children who experienced only the target instance (Connolly & Lindsay, 2001; Powell & Roberts, 2002).

There is a substantial body of literature that indicates that children remember repeated events differently than they remember unique events (e.g. Farrar & Boyer-Pennington, 1999; Fivush & Hudson, 1990; Hudson, 1990; Nelson, 1986). It is reasonable to expect

*Correspondence to: Heather L. Price, Department of Psychology, Simon Fraser University, 8888 University Drive, Burnaby, BC, V5A 1S6, Canada. E-mail: hlprice@sfu.ca

Contract/grant sponsors: Natural Sciences and Engineering Research Council PGS-A; Social Sciences and Humanities Research Council.

that event frequency will also affect suggestibility. Using a recognition test, Connolly and Lindsay (2001) reported that children who repeatedly experienced an event were more suggestible for variable details than children who did not have prior similar experiences. In contrast, with a cued recall test, Powell et al. (1999) found that children who experienced a repeated event were not more suggestible than children who experienced a single event (Experiment 2: one-week delay between target instance and biasing interview), and in some circumstances, they were less suggestible (Experiment 1: three-week delay between target instance and biasing interview). Using a similar design, Powell and Roberts (2002) compared suggestibility with yes/no recognition and cued recall. Children who experienced a repeated event were more suggestible than those who experienced a unique event when children were questioned with yes/no recognition questions (biasing interview conducted three weeks after the target play session). A cued recall test resulted in no differences in suggestibility between children in the single- and repeated-event conditions. Powell and Roberts conducted a source-monitoring test three months after the memory test and found that repeated-event children had more difficulty than single-event children distinguishing between target and suggested details than between target and novel details. The authors determined that this finding precluded a conclusion that increased compliance by children who repeatedly experienced an event was solely responsible for the discrepancies in the Powell et al. (1999) and Connolly and Lindsay (2001) studies.

As Powell and Roberts argued, for children who experience several similar versions of an event, the task of identifying which variable option was presented during a particular occurrence is cognitively challenging. It may involve retrieving memory for experienced options and attributing each to its source. When a child's memory is tested with recognition questions, relatively little cognitive effort is required to answer the questions (Waterman, Blades, & Spencer, 2001). Thus, children could acquiesce to plausible suggestions contained in the questions rather than engage in the cognitively difficult task of retrieving experienced options. On the other hand, when memory is tested with cued recall, a plausible suggestion is not contained in the question and so children are more likely to retrieve memory for experienced options.

There are at least two ways that acquiescence could be reduced. First, as discussed above, reliance on cued recall rather than recognition. In the present study, we used a cued recall test similar to that used by Powell and Roberts. Second, interviewing strategies may enhance children's reliance on memory, and reduce the possibility that they will respond based on what they perceive as the interviewer's desired responses (i.e. demand characteristics).

To address the problem of demand characteristics, Lindsay (1990) adapted the 'logic of opposition' paradigm from Jacoby and colleagues (e.g. Jacoby, 1991; Jacoby, Woloshyn, & Kelley, 1989) for use in suggestibility studies. When an interviewer utilizes opposition instructions, s/he explicitly instructs the interviewee that information from a previous biasing interview was inaccurate and should not be included in his/her report. Lindsay, Gonzales, and Eso (1995) found that children (aged 4 to 9 years) who received the opposition instructions reported fewer suggested details than children who were simply instructed to answer questions based on what they remembered about the target event. The instructions did not, however, eliminate the suggestibility effect, which indicates that either the opposition instructions were not strong enough to completely control demand characteristics, or that mechanisms other than demand characteristics contributed to suggestibility.

Holliday and Hayes (2000, 2001, 2002) have extended Lindsay et al.'s work on opposition instructions. Holliday and Hayes have consistently found a reduced (and, at times, absent) suggestibility effect with the use of opposition-like instructions when compared to instructions that request that children simply report their experiences. Importantly, although opposition instructions have been shown to reduce the impact of demand characteristics in studies involving unique events (e.g. Holliday & Hayes, 2000, 2001, 2002; Lindsay, 1990; Lindsay et al., 1995), they have not been used in studies of children's suggestibility for instances of repeated events.

In the present study children engaged in either one (single-event or SE condition) or four play session(s) (repeated-event or RE condition) and were then questioned in a biasing interview that involved suggesting non-experienced details. This was followed by a final free and cued recall test that was conducted using one of three instruction types: no special instructions (NI), moderate instructions (MI), or opposition instructions (OI). Given the well-established influence of demand characteristics on children's suggestibility, and given that in the NI condition no effort was made to moderate this influence, we predicted that children in the NI condition would be most suggestible. The MI condition replicated the instructions used by Connolly and Lindsay (2001) and was expected to reduce the influence of demand characteristics. Opposition instructions were expected to further minimize demand characteristics that may be operative in the NI and MI conditions.

METHOD

Participants

Ninety children (aged 4–5 years, $M = 4.88$ years, $SD = 0.63$ years) were recruited from day cares and preschools. Half of the children were assigned to the SE condition and half to the RE condition (approximately half from each day care or preschool). Within each event frequency condition, an equal number of children were randomly assigned to each instructions condition. Three children were replaced due to interview interference by a third party. Ages and gender distribution were equal in all conditions ($F_s < 1$), except by chance males were underrepresented in the SE, OI condition.

Design and procedure

The study was a 3 (instruction: NI, MI, OI) \times 2 (sessions: single, repeated) \times 2 (details: suggested, control) mixed factorial design. Instruction type and event frequency were between-subjects factors and details was a within-subjects factor. Because multiple children in each class participated in the study, there may have been some discussion of the experience between peers. Of course, this is a concern whenever multiple children from the same class participate in a study. In the present study, children in all conditions were equally likely to have been recruited from each class and so any influence of spontaneous discussions among peers should be equally distributed across conditions.

Play sessions

All sessions were conducted at the child's day care or preschool. Groups of two to four children participated in each play session. The play session leader was always the same

male experimenter. In the RE condition, the four events took place on consecutive days. All play sessions involved six activities, each with two critical details, for a total of 12 critical details. A different option for each critical detail was presented during each of the four play sessions. The experimenter brought each day's options to the attention of the children through repeatedly naming each option. The critical details were partially counterbalanced (two random orders of options were created and half of the children received each order) and assignment of details to the suggested/ control conditions was fully counterbalanced. The final instance (for RE children) and the only instance (for SE children) were identical and served as the target play session which was 'tagged' by having the play session leader wear a special cape. The target instance was repeatedly called 'Cape Day' to help the children identify the target instance during the interviews.

The order of the six activities was the same each day. In the warm-up exercise (jumping jacks, jogging, kicking, stretching, or marching), the children performed an exercise while listening to music that featured a special instrument (drums, piano, violin, guitar, or harp). For the circle game (cross the floor, name game, 'Child' in the middle, freeze game, or scarf game), children stood in a circle to play a game while wearing a coloured hat (blue, black, yellow, orange, or red). During the paper folding game, children folded paper into a shape (book, kite, sailboat, house, or envelope) and wrote their name on it with a special writing instrument (pen, pencil, crayon, marker, or pastels). Following the paper folding, children constructed a puzzle (horse, bunny, dog, cat, or bird) on a mat that was cut into a particular shape (heart, square, circle, triangle, or star). Next, children assisted the experimenter in performing a magic trick (disappearing ball, magic cube, pencil through frame, nickel-to-penny, or falling vase) and said magic words (abracadabra, alakazam, hocus pocus, sim sala bim, or purple puppy paws) before the finale of the trick. Finally, children built a project (wall, table, ship, road, or blanket) with special building materials (cotton balls, Lego, dominos, sponges, or Popsicle sticks).

Biasing interview

The biasing interview took place four days after the target instance and was conducted with each child individually. The interviewer was unknown to the children and blind to the condition of each child. The interviewer (one of two trained females) began by establishing rapport with the child and explaining that she was interested in learning more about what happened on Cape Day. Once it appeared that the target instance had been identified (i.e. the child was able to describe accurately the cape worn on the target day), and the child understood that all questions pertained to that instance only, the interviewer continued with a scripted set of questions. The children were asked two questions about each of the six activities (one for each critical detail). The questions were grouped by activity and asked in the order experienced during the play session. One question from each pair was a control question, the other was a suggestive question and order of questions was counterbalanced. Each pair of questions was introduced with a brief reminder of the activity and was followed by two presentations of each suggestion. The suggestions were details the children had not experienced in any play session and were embedded in questions that did not require that the child acquiesce to the suggestion in order to answer. The control question did not present any specific information about the target detail. Following the 12 activity questions, the biasing interviewer also asked one question about an activity the child had not engaged in: The child was 'reminded' that s/he played 'Blammen' (a game not experienced by any child) during Cape Day and asked if s/he had ever played Blammen before.

Final interview

One day following the biasing interview, a new interviewer (blind to the conditions and purpose of the study) conducted the memory test. Children were again interviewed individually. All interviewers (one of five trained females) were trained by the same individual and were instructed on specifically how to phrase and determine the number of prompts (e.g. one general probe was asked each time a child reported a new detail and the first time the child was unable to report any information). To begin, the interviewer established rapport with the child. The interviewer then assisted the child in identifying the target instance and emphasized that all questions should be answered from what they remember about that instance only.

Interviews commenced with one of three scripted instruction conditions: NI, MI, or OI. In the NI condition, the interviewer read a set of instructions on how to properly cross the street. This was done to balance the volume of instructions and time spent with the interviewer in all conditions. No other instructions were presented. In the MI condition, the interviewer began with a shorter set of instructions on how to cross the street. This was followed by a standard set of instructions (Appendix). In the OI condition, the interviewer first gave the standard instructions as in the MI condition (excluding the filler introduction about crossing the street). These instructions were followed by the less stringent OI as described in Lindsay et al. (1995) and presented in Appendix.

Following the instructions, children were reminded that all questions were about Cape Day. The interview then progressed to free recall, cued recall, and ended with recognition questions. Free recall consisted of an open-ended question that requested the child to describe everything s/he remembered about 'Cape Day.' Approximately the same number of non-directive prompts (e.g. 'What else can you remember?') were used to assist each child in recalling more information. Once the child appeared to have exhausted his/her ability to recall more information, the interviewer named each activity (in the order experienced by the child and regardless of previous reporting of such details) and asked the child to describe as much as s/he could about that activity. This was followed by more non-directive prompts, such as 'What else can you tell me about that?' Then, the interviewer progressed to cued recall in which the child was asked a specific question regarding each of the 12 critical details (e.g. 'What exercise did you do to warm-up on Cape Day?'), regardless of their responses in free recall. The last cued recall question was 'What other game did you play on Cape Day?' This was a test of whether the children would report playing 'Blammen.' Next, for each critical detail about which a child had not reported any information in free or cued recall, two recognition questions were asked: one regarding the experienced detail and the other about the suggested detail. Two random orders of correct responses to recognition questions were created and were counterbalanced across participants. Children were then asked if they had played 'Blammen.' Finally, for those children who received the OI, two questions were asked to determine if children were able to apply the OI. First, children were reminded of the instructions given at the beginning of the interview and asked if they understood them. Then, 66 of the children were tested for the ability to apply the OI with two questions (e.g. 'If [biasing interviewer] said that you played baseball on Cape Day, would that be right?'). The final 24 children were asked a recognition question regarding whether or not s/he had played Blammen on Cape Day. This last procedure was added as an alternative measure of children's comprehension of the OI. The purpose of this procedure was to determine if, when reminded of the special instructions they had received at the beginning of the interview, children's responses varied between instructions condition. It was expected that

if children understood the OI, they would be more likely to respond 'no' to the suggested Blammen activity.

CODING

Final interviews were transcribed and critical details were coded (e.g. *red* hat versus hat) as one of four responses:

- i) Correct response: the correct critical detail.
- ii) False suggestion: the suggested detail.
- iii) External intrusion error: a detail that had neither been experienced during any of the play sessions nor suggested in the biasing interview.
- iv) Internal intrusion error: a detail that was experienced, but not during the target session.

This coding protocol was adapted from Powell et al. (1999) with one exception: When children reported multiple details to the same question (e.g. the child said s/he wore a red *and* a black hat on Cape Day), and when probed, insisted s/he experienced both, each was coded individually. This change was made to ensure that we recorded all details children reported as experienced. However, if children initially reported a detail and later changed to another detail, only their final response was coded. Intercoder agreement was 92% based on coding 10% of the transcripts by two trained coders.

RESULTS

Analyses of free and cued recall are reported below. Recognition results are not reported because there were too few responses: Each child was asked an average of only 6.87 recognition questions. Recall that recognition questions were only asked if details were not reported in free or cued recall. Further, for many children, a response set was noted in recognition responses. Overall, children were more likely (1.53 times, $\chi^2(1, N=90)=26.04, p<0.05$) to provide a 'yes' than a 'no' response. This finding is consistent with some previous research that has reported a 'yea-saying' bias in young children to recognition questions (Peterson, Dowden, & Tobin, 1999). Children reported information about an average 64.4% of critical details in free recall (including correct responses, false suggestions, external intrusions, and internal intrusions) and an average 70.8% in cued recall. If a particular detail was reported in both free and cued recall, each was coded separately. Alpha levels were set to 0.05 for all tests and all tests were two-tailed. Although it was not possible for the experimental manipulation to cause children to report a suggested detail in response to a question about a control detail or an internal intrusion in the SE condition, small values may be present in those conditions due to guessing. Consistent with similar previous research, some of these values were analysed to measure whether the odds of reporting a particular detail were better than chance.

Unless otherwise indicated, for each type of response reported below, we ran a 2 (details: suggested, controlled) \times 2 (sessions: single, repeated) \times 3 (instructions: NI, MI, OI) analyses of variance (ANOVA) for free and cued recall responses separately.

Correct responses

In free recall, there was a main effect of sessions, $F(1, 84) = 46.23, \eta^2 = 0.36$; children in the SE condition reported more correct details ($M = 5.78, SD = 3.26$) than those in the RE condition ($M = 2.07, SD = 1.51$).

In cued recall, there was a main effect of sessions, $F(1, 84) = 47.30, \eta^2 = 0.36$; children in the SE condition reported more correct details ($M = 5.64, SD = 2.54$) than children in the RE condition ($M = 2.38, SD = 1.86$). There was also a significant interaction between details and sessions, $F(1, 84) = 6.14, \eta^2 = 0.07$. To explore this interaction, two paired samples *t*-tests were conducted to examine the reporting of suggested and control details in SE and RE conditions separately. Correct responses by children in the RE condition were more often reported to control ($M = 1.47, SD = 1.34$) than suggested details ($M = 0.91, SD = 1.00$), $t(44) = 2.56$. There were no differences in the reporting of suggested ($M = 2.98, SD = 1.73$) and control ($M = 2.67, SD = 1.38$) details in the SE condition $t(44) = 1.15, p = 0.26$.

False suggestions

Overall (in free and cued recall), 24 (26.7%) children reported false suggestions to suggested details (excluding chance reporting). One child reported three suggestions, six children reported two suggestions, and 16 children reported one suggestion.

In free recall, there was a main effect of details, $F(1, 84) = 14.36, \eta^2 = 0.15$: Children reported more false suggestions to suggested ($M = 0.24, SD = 0.59$) than control ($M = 0.01, SD = 0.11$) details.

In cued recall, there was a main effect of sessions, $F(1, 84) = 12.22, \eta^2 = 0.13$; children in the RE condition reported more false suggestions ($M = 0.64, SD = 0.93$) than children in the SE condition ($M = 0.13, SD = 0.34$). The main effect of details, $F(1, 84) = 20.17, \eta^2 = 0.19$, was qualified by a Details \times Sessions interaction, $F(1, 84) = 9.99, \eta^2 = 0.11$ (Figure 1). To explore this interaction, two paired samples *t*-tests were conducted. In the SE condition, there was no difference in the reporting of false suggestions to suggested ($M = 0.11, SD = 0.32$) and control details ($M = 0.02, SD = 0.15$), $t(44) = 1.67, p = 0.10$. Children in the RE condition reported more false suggestions to suggested ($M = 0.58, SD = 0.86$) than control details ($M = 0.07, SD = 0.33$), $t(44) = 4.21$.

External intrusions

In free recall, there was an Instructions \times Sessions interaction, $F(2, 84) = 3.79, \eta^2 = 0.08$. To explore this interaction, we examined the effect of instructions in each sessions condition. In the SE condition, children in the OI condition reported more external intrusions ($M = 2.60, SD = 2.47$) than children in the MI condition ($M = 0.80, SD = 1.21$), $F(1, 45) = 3.66$. The NI condition was not different from the other instructions conditions ($M = 1.33, SD = 1.72$) and there were no differences in the RE condition, $F(1, 45) = 0.85, p = 0.43$ (NI: $M = 1.57, SD = 2.00$; MI: $M = 1.43, SD = 2.16$; and OI: $M = 1.83, SD = 2.09$).

In cued recall, there was an Instructions \times Sessions interaction, $F(2, 84) = 3.29, \eta^2 = 0.07$. Because an original interest in this study was to examine the impact of instructions within single- and repeated-events, we initially explored this interaction by examining the effect of instructions in each session condition. However, no effects were significant. Therefore, to explain the interaction, we examined the differential effect of

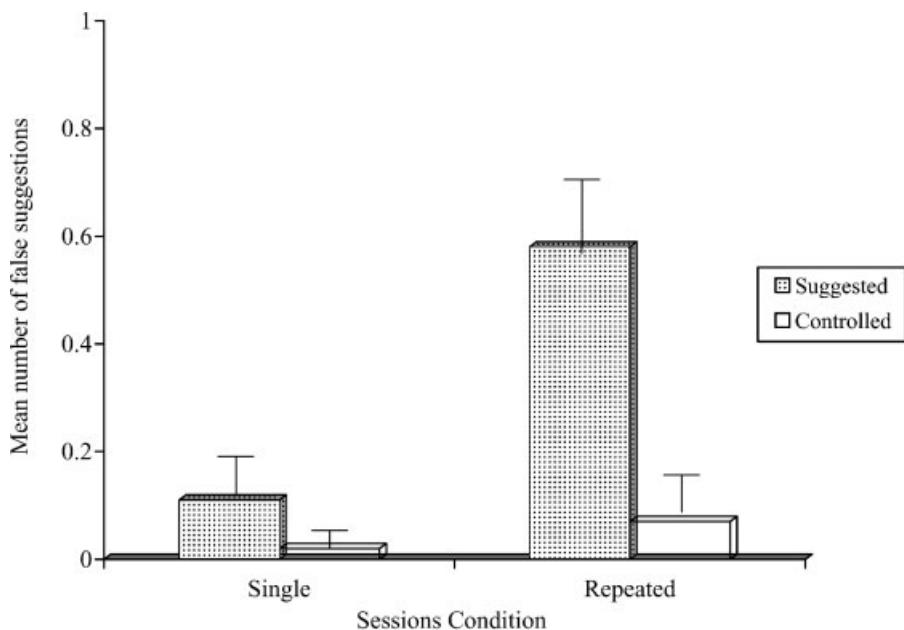


Figure 1. Mean number (and standard errors) of false suggestions reported in cued recall for each session condition from suggested and control details

sessions in each instructions condition. In the OI condition, there was a significant difference between SE and RE children: SE children were more likely to report external intrusions ($M = 3.00, SD = 2.56$) than RE children ($M = 0.93, SD = 2.09$), $F(1, 30) = 5.87$. There were no differences in the reporting of external intrusions as a function of event frequency in the MI (SE: $M = 1.87, SD = 1.13$, RE: $M = 1.53, SD = 1.46$), $F(1, 30) = 0.49$, $p = 0.49$ or NI (SE: $M = 1.80, SD = 1.32$, RE: $M = 2.00, SD = 1.77$) conditions, $F(1, 30) = 0.12$, $p = 0.73$.

Internal intrusions

Reported internal intrusions were analysed in two 2 (details) \times 3 (instructions) ANOVAs, for each of free and cued recall. Due to small (or 0) cell means for reporting of internal intrusions in the SE condition, sessions was not included in this analysis. For obvious reasons, internal intrusions can only be reported by children in the RE condition (although some internal intrusions were reported by chance in the SE condition). Thus, more internal intrusions were reported by children in the RE than SE condition in free recall ($M = 3.87, SD = 2.81$ and $M = 0.02, SD = 0.15$, in the RE and SE conditions, respectively) and cued recall ($M = 4.47, SD = 3.15$ and $M = 0.00, SD = 0.00$, for RE and SE conditions, respectively). There were no differences in the reporting of internal intrusions across instructions conditions in free or cued recall.

Reports of playing 'Blammen'

Almost half (43.3%) of the children reported playing Blammen in at least one of the interview sections. Of those children, 56.4% were in the SE condition, 43.6% were in the

RE condition, and 35.9%, 33.3% and 30.8% were in the NI, OI and MI conditions, respectively. No differences were significant. Of the final 24 participants who were reminded of the instructions given at the beginning of the interview before the Blammen recognition question, 45.5% of correct 'no' responses were reported by children in the OI condition, while children in the NI and MI conditions each provided 27.3% of the correct responses.

DISCUSSION

In their careful analysis of the effect of type of memory test on suggestibility for instances of repeated events, Powell et al. (1999) and Powell and Roberts (2002) suggested that premature acceptance of suggestions may occur when memory is tested with recognition questions. Reporting details of an instance of a repeated event is a complex process: It involves retrieving relevant information acquired through multiple experiences and attributing particular details to the target instance. When memory is tested with recognition, children are able to provide a viable response without engaging in this complex cognitive task (e.g. Waterman et al., 2001). Conversely, when memory is tested with cued recall, a viable response is not contained in the question and children are more likely to evaluate options they remember.

The present study used free and cued recall to compare the suggestibility of children who experienced one or four play sessions across three instructions conditions. Children who experienced a repeated event were more suggestible than children who experienced a single event. Although the purpose of this study was to explore the impact of varying instructions on children's reports of single and repeated events, the most important contribution is in the cued recall results. This is the first study to find that RE children can be more suggestible than SE children in response to cued recall questions.

Opposition instructions were also used in this study to reduce children's acquiescence to suggestions. Given that Lindsay and colleagues (1995) found that children were less likely to acquiesce to a suggested detail with the use of OI, and Holliday and colleagues (Holliday & Hayes, 2000, 2001, 2002) found similar results with comparable instructions, this study tested similarly forceful and scripted instructions. Although the effect of the instructions manipulation was not significant, there is some evidence that children understood the instructions. Of the children who received the OI and were asked the application questions, only one child responded incorrectly to both application questions and only two others responded incorrectly to one of the two questions. Furthermore, of the final 24 participants who were reminded of the instructions prior to the 'Blammen' recognition question, more children who had received the OI were able to correctly answer 'no' to the 'Blammen' question than children in the NI and MI conditions, although this difference was not significant.

What could account for the null effect of instructions on children's suggestibility? In this study, the purpose of the OI was to reduce acquiescence to suggestions. Accordingly, we should consider the possibility that other mechanisms reduced the influence of demand characteristics below some threshold level needed to observe an effect of instructions. This possibility is consistent with the finding of no differences in suggestibility between any of the instructions conditions. Our MI were ones that many scholars have found to be effective in reducing errors (and, in particular, demand characteristics) and are recommended in most interviewing protocols (see Saywitz & Campano, 1998 for a discussion of interviewing strategies). It is possible that with the use of free and cued recall rather than

recognition questions, our interviewers' emphasis on her lack of knowledge about the experienced event, and using different interviewers for the biasing and the final memory test, reduced demand characteristics to a level that could not be influenced by our instructions manipulation.

Of course, it is also possible that the OI were simply ineffective. Some research has shown that young children have difficulty focusing on the source of information (e.g. Poole & Lindsay, 2002), a skill that is required to apply OI. Poole and Lindsay (2002) found that source monitoring training benefited 7–8 year olds, but had no impact on the reports of 3–6 year olds. Given that the participants in this study were preschoolers, it may be the case that the children were simply too young to understand the OI. However, similar age groups participated in the Lindsay et al. (1995) study and Holliday and Hayes research (2000, 2001, 2002) and effects of OI were found.

Although the central finding in this study differed from that of Powell et al., there were also consistencies between the studies. For example, children who experienced a single event reported more correct information than children who experienced repeated events. This pattern of results is supported by previous findings that details of a single, unfamiliar event are better recalled than an instance of a repeated event (Farrar & Goodman, 1992; Fivush, Hudson, & Nelson, 1984; Hudson, 1990; Pearse, Powell, & Thomson, 2003). Further, more of the errors made by children in the RE condition were internal intrusions than either external intrusions or false suggestions. This demonstrates that the most substantial accuracy problem faced by children who repeatedly experience similar instances is interference between the instances. According to schema confirmation-deployment hypothesis (Farrar & Goodman, 1990), in the early stages of script formation, children have difficulty attributing particular details to specific instances. Conversely, once a script is formed, it can be used to anticipate invariant details, leaving more cognitive resources available to attend to variable details. This supports independent memory for instances of the routine that deviate from the norm. In the present study, all children would have been in the early stages of script formation. Accordingly, confusion between episodes is expected (Farrar & Boyer-Pennington, 1999; Farrar & Goodman, 1992). This confusion, we argue, provides fertile ground for the introduction and acceptance of plausible, yet erroneous suggestions.

In the current study, children in the SE condition reported more correct information to suggested than control details in cued recall while the reverse was true for RE children. It is conceivable that the biasing interview may have activated memory of experienced details (Brainerd & Reyna, 1988), acting as a rehearsal for children in the SE condition while it resulted in increased confusion or integration of suggestions for children in the RE condition.

What could account for children's heightened suggestibility for instances of repeated events compared to unique events reported in Connolly and Lindsay (2001) as well as the current study, but not in Powell et al. (1999) or Powell and Roberts (2002; cued recall)? There are a number of methodological differences that may help to explain the discrepant findings.

First, we used a slight variation of the Powell et al. coding. As reported in the methods section, multiple responses in this study were coded individually rather than as 'other responses' (as in Powell et al.). However, when we coded the cued recall responses using the Powell et al. coding protocol, the conclusions did not change.

Another methodological difference between the studies was the frequency of suggestion presentation. Each suggestion was presented three times by Connolly and Lindsay (2001), twice in the present study, and once by Powell et al. Although there is no empirical guidance for predicting a differential impact of the number of times suggestions are

presented on reports of single and repeated events, inferences may be drawn from research on suggestibility for single events. Repeated presentation of suggestions has been shown to increase suggestibility in children who experience a single event (e.g. Gobbo, 2000). It may be that the repetition of suggestions added further confusion to the already detail-laden RE children. This added confusion may have resulted in an enhanced suggestibility effect for children who experienced a repeated event compared to SE children.

Another possible explanation for the discrepant finding has to do with the relationship between variable options. In the Connolly and Lindsay study as well as in the current study, several variable details had options that were linked categorically (e.g. all puzzles were of animals). This was less apparent in Powell et al. (1999) and Powell and Roberts (2002). Suggestions that are members of the category from which experienced options were drawn may seem more plausible than suggestions that are not categorically linked to experienced details and this can lead to heightened suggestibility (e.g. Mazzoni, Loftus, & Kirsch, 2001; Pezdek & Hodge, 1999). To support this possibility, Connolly and Price (D. A. Connolly & H. L. Price, paper presented at the meeting of the American Psychology-Law Society, Scottsdale, Arizona, USA, 2004) found that when experienced options and suggestions were members of the same category, school-aged children were more likely to accept the suggestions than when experienced options were not categorically related.

It is important to emphasize that in the current study, children who experienced repeated events were more likely to err by reporting experienced details (correct details and internal intrusions) than non-experienced details (false suggestions and external intrusions). Indeed, RE children were over three times more likely to report a correct detail ($M = 6.84$) than an incorrect detail ($M = 2.13$). Unfortunately, the high prevalence of internal intrusions may discredit a child's report of a target instance. The very important work to develop interviewing strategies to minimize these and other errors when children report instances of repeated events is underway (Pearse et al., 2003; Powell, et al., 2000).

The findings from this study are consistent with theories that provide an expectation of increased suggestibility for variable details of a repeated event (e.g. script theory, trace theories, source monitoring theory) compared to details of a unique event. However, given the findings of Powell et al. (1999) and Powell and Roberts (2002) it is clear that children are not always more suggestible about variable details of an instance of a repeated event compared to children who experience the event once. Studying factors such as type of memory test, frequency of suggestion presentation, and the degree of similarity between experienced options and suggestions may help to explain when and why RE children are more and less suggestible than SE children.

ACKNOWLEDGEMENTS

This research was supported by a Natural Sciences and Engineering Research Council PGS-A grant to the first author and a Social Sciences and Humanities Research Council operating grant to the second author. Thank you to research assistants Scott Currie, Rachel Richards, and Jocelyn Conway and to the children, parents, and teachers who participated in this research.

REFERENCES

- Brainerd, C. J., & Reyna, V. F. (1988). Memory loci of suggestibility development: comment on Ceci, Ross, and Toglia (1987). *Journal of Experimental Psychology: General*, 117, 197–200.

- Ceci, S. J., Powell, M. B., & Crossman, A. M. (1999). Critical issues in children's memory and testimony. In D. L. Faigman, D. H. Kaye, M. J. Saks, & J. Sanders (Eds.), *Modern scientific evidence: The law and science of expert testimony* (pp. 40–60). St Paul, MN: Westgroup.
- Connolly, D. A., & Lindsay, D. S. (2001). The influence of suggestions on children's reports of a unique experience versus an instance of a repeated experience. *Applied Cognitive Psychology*, 15, 205–223.
- Farrar, M. J., & Boyer-Pennington, M. E. (1999). Remembering specific episodes of a scripted event. *Journal of Experimental Child Psychology*, 73, 266–288.
- Farrar, M. J., & Goodman, G. S. (1990). Developmental differences in the relation between scripts and episodic memory: do they exist? In R. Fivush, & J. A. Hudson (Eds.), *Knowing and remembering in young children* (pp. 30–64). New York: Cambridge University Press.
- Farrar, M. J., & Goodman, G. S. (1992). Development changes in event memory. *Child Development*, 63, 173–187.
- Fivush, R., & Hudson, J. A. (1990). *Knowing and remembering in young children*. New York: Cambridge University Press.
- Fivush, R., Hudson, J., & Nelson, K. (1984). Children's long-term memory for a novel event: an exploratory study. *Merrill-Palmer Quarterly*, 30, 303–316.
- Gobbo, C. (2000). Assessing the effects of misinformation on children's recall: how and when makes a difference. *Applied Cognitive Psychology*, 14, 163–182.
- Holliday, R. E., & Hayes, B. K. (2000). Dissociating automatic and intentional processes in children's eyewitness memory. *Journal of Experimental Child Psychology*, 75, 1–42.
- Holliday, R. E., & Hayes, B. K. (2001). Automatic and intentional processes in children's eyewitness suggestibility. *Cognitive Development*, 16, 617–636.
- Holliday, R. E., & Hayes, B. K. (2002). Automatic and intentional processes in children's recognition memory: the reversed misinformation effect. *Applied Cognitive Psychology*, 16, 1–16.
- Hudson, J. A. (1990). Constructive processes in children's event memory. *Developmental Psychology*, 26, 180–187.
- Jacoby, L. L. (1991). A process dissociation framework: separating automatic from intentional uses of memory. *Journal of Memory and Language*, 30, 513–541.
- Jacoby, L. L., Woloshyn, V., & Kelley, C. (1989). Becoming famous without being recognized: unconscious influences of memory produced by dividing attention. *Journal of Experimental Psychology: General*, 118, 115–125.
- Lindsay, D. S. (1990). Misleading suggestions can impair eyewitnesses' ability to remember event details. *Journal of Experimental Psychology: Learning, Memory, and Cognition*, 16, 1077–1083.
- Lindsay, D. S., Gonzales, V., & Eso, K. (1995). Aware and unaware uses of memories of postevent suggestions. In M. S. Zaragoza, J. R. Graham, G. C. N. Hall, R. Hirschman, & Y. S. Ben-Porath (Eds.), *Memory and testimony in the child witness* (pp. 86–108). Thousand Oaks, CA: Sage.
- Mazzoni, G. A. L., Loftus, E. F., & Kirsch, I. (2001). Changing beliefs about implausible autobiographical events: a little plausibility goes a long way. *Journal of Experimental Psychology: Applied*, 7, 51–59.
- Nelson, K. (1986). *Event knowledge: Structure and function in development*. Hillsdale, NJ: Erlbaum.
- Pearse, S. L., Powell, M. B., & Thomson, D. M. (2003). The effect of contextual cues on children's ability to remember an occurrence of a repeated event. *Legal and Criminological Psychology*, 8, 39–50.
- Peterson, C., Dowden, C., & Tobin, J. (1999). Interviewing preschoolers: comparisons of yes/no and wh- questions. *Law and Human Behavior*, 23, 539–555.
- Pezdek, K., & Hodge, D. (1999). Planting false childhood memories in children: the role of event plausibility. *Child Development*, 70, 887–895.
- Poole, D. A., & Lindsay, D. S. (2002). Reducing child witnesses' false reports of misinformation from parents. *Journal of Experimental Child Psychology*, 81, 117–140.
- Powell, M. B., & Roberts, K. P. (2002). The effect of repeated experience on children's suggestibility across two question types. *Applied Cognitive Psychology*, 16, 367–386.
- Powell, M. B., Roberts, K. P., Ceci, S. J., & Hembroke, H. (1999). The effects of repeated experience on children's suggestibility. *Developmental Psychology*, 35, 1462–1477.

- Powell, M. B., Roberts, K. P., & Thomson, D. M. (2000). The effect of a suggestive interview on children's memory of a repeated event: does it matter whether suggestions are linked to a particular instance. *Psychiatry, Psychology, and Law*, 7, 182–191.
- Saywitz, K., & Camparo, L. (1998). Interviewing child witnesses: a developmental perspective. *Child Abuse and Neglect*, 22, 825–843.
- Waterman, A. H., Blades, M., & Spencer, C. (2001). Interviewing children and adults: the effect of question format on the tendency to speculate. *Applied Cognitive Psychology*, 15, 521–531.

APPENDIX

Moderate instructions. Sometimes you may not remember the answer to a question and that's okay. If you ever cannot remember, or you just don't know the answer, it's okay to say 'I don't know.' Also, sometimes the right answer is 'no' and sometimes the right answer is 'yes.' Just do your best to think really hard about the questions I'm asking and answer as best you can. Sometimes I might ask you the same thing twice. If I do that, it does not mean that you were wrong the first time, it's just that I have all these questions written on my piece of paper and I have to ask them all.

Opposition instructions. I heard that [interviewer] was here to talk to you yesterday. Is that right? It is really important that you know that she was confused about what happened the day [play session leader] wore the special cape, so [interviewer] accidentally said some things that were wrong when she talked to you. It is important that you tell me about things from Cape Day and not from yesterday when you talked to [interviewer] because she got some things wrong. So when you answer the questions, you should not answer them based on anything that [interviewer] said, only on what you remember from Cape Day. Do you understand?

Copyright of Applied Cognitive Psychology is the property of John Wiley & Sons Inc. and its content may not be copied or emailed to multiple sites or posted to a listserv without the copyright holder's express written permission. However, users may print, download, or email articles for individual use.