

## Developmental Differences in Eyewitness Suggestibility and Memory for Source

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To what extent do children who report suggested information believe they actually remember *seeing* the suggested details they report? Asking whether children misremember seeing suggested items is in essence a question about children's ability to monitor the source of their memories. The current study reports the results of two experiments designed to assess potential age-related changes in subjects' ability to accurately monitor the source of suggested information either immediately or following a 1-week delay. The results of both experiments revealed that although all subjects claimed to remember seeing suggested items, the magnitude of this effect varied with age such that first-graders made more source confusions than third- and fifth-graders, who in turn made more confusions than college subjects. Our findings suggest that these age differences are not simply a function of more general age-related memory or performance deficits, but instead reflect developmental differences in the tendency to confuse suggested information for actually witnessed events. © 1995 Academic Press, Inc.

I believe that the children believed what they were saying was true when they testified, Mrs. Williams said. But I couldn't tell whether the children were saying what happened to them or whether they were repeating what they had been told and what they heard their parents telling other people.

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With the recent increase in the number of attempts to prosecute criminal acts against children, and in light of the fact that children are likely to be asked more leading questions than adults, there has been a dramatic increase in the number of studies dealing with children's suggestibility (see Ceci & Bruck, 1993, for a recent review). Many studies have documented that children (like adults) are suggestible in the sense that they can be led to report events that are different from those they witnessed. In spite of the fact that children's suggestibility is well documented, no published studies have examined the extent to which children might come to believe they actually remember *seeing* the suggested details they report. Nevertheless, as illustrated in the above quote by a juror in the McMartin child molestation case, an answer to this question is central to our understanding of children's suggestibility. In this paper we apply a new approach to the study of age differences in suggestibility that focuses on subjects' ability to monitor the source of their memories (see also, Lindsay & Johnson, 1987). Of particular interest is the question: Are young children especially likely to confuse memories of suggested information for their real memories of actually experienced events?

The majority of studies on age differences in eyewitness suggestibility come from laboratory studies of the "misinformation effect." In this experimental paradigm, first developed by E. Loftus for use in studies with adults (e.g., Loftus, Miller, & Burns, 1978), children view an event and are later exposed to leading or misleading information that contradicts selected aspects of the event. For example, in Zaragoza (1987), subjects who had seen a slide show depicting a construction worker holding a hammer were later told that the man had been holding a screwdriver. In the last phase of the experiment, subjects are tested on their memory for the events they saw. Typically, children are given a forced choice between the originally seen item (e.g., hammer) and the suggested item (e.g., screwdriver). The consistent finding is that children in the misled group perform more poorly than children in the control group (who have not been misled), because misled subjects are more likely to select the misleading item on the test.

It is now well established that misinformation effects occur in subjects of all ages, from children three years of age to older adults (e.g., Ceci, Ross, & Toglia, 1987a, 1987b; Cohen & Faulkner, 1989; Cohen & Harnick, 1980; Duncan, Whitney, & Kunen, 1982; Goodman & Reed, 1986; Marin, Holmes, Guth, & Kovac, 1979; Warren, Hulse-Trotter, & Tubbs, 1991; Zaragoza, 1987; Zaragoza, 1991). Nevertheless, these studies have not consistently documented a simple relationship between suggestibility and age (see Ceci & Bruck, 1993, for a review). More recently, researchers have turned to studying the mechanisms that underlie misinformation effects in an attempt to better understand potential age differences in susceptibility to suggestion.

A review of the developmental and adult literatures on eyewitness sug-

gestibility reveals that research and theorizing about misinformation effects has been dominated by a concern with the "fate" of the original memory following exposure to suggestion. In other words, because subjects fail to report the originally seen item on tests of their memory for the originally seen event, it has been assumed that misinformation causes forgetting of the originally seen details. According to the *memory impairment hypothesis* (Loftus et al., 1978; Loftus & Loftus, 1980) misleading postevent information impairs the original memory by altering or overwriting the original information (Loftus, 1979; Loftus & Loftus, 1980) or by making the original information inaccessible (Bekerian & Bowers, 1983; Christiaansen & Ochalek, 1983; Lindsay, 1990). An alternative to the memory impairment hypothesis is that the misinformation serves to fill in gaps caused by forgotten original information (McCloskey & Zaragoza, 1985); and there is considerable evidence that the latter also plays a role in misinformation effects (Belli, Windschitl, McCarthy, & Winfrey, 1992 (Expt. 1); Bowman & Zaragoza, 1989; McCloskey & Zaragoza, 1985; Zaragoza, McCloskey, & Jamis, 1987; Zaragoza & McCloskey, 1989).

Unfortunately, attempts to assess whether young children's memories are more susceptible to impairment (i.e., forgetting caused by suggestion) have produced mixed results (Ceci et al., 1987; Togli, Ross, Ceci, & Hembrooke, 1992; Zaragoza, 1987; Zaragoza, Dahlgren, & Muench, 1992). For example, Ceci et al. (1987) found clear evidence that preschool children are susceptible to memory impairment, but in six experiments with preschool children we (Zaragoza, 1987; Zaragoza et al., 1992) have failed to find evidence of memory impairment in this age group, even when Ceci et al.'s materials and procedures were used (Zaragoza et al., 1992). Moreover, the Ceci et al. (1987) study that obtained evidence of memory impairment in preschool children included only an adult comparison group (e.g., Ceci et al., 1987), so it is unclear whether older children would be less susceptible to such impairment effects.

Clearly, young children's relative susceptibility to memory impairment is an important issue that is deserving of further study. However, in this paper we argue that memory impairment is at best only part of the suggestibility story. Whether or not subjects' ability to remember original details is impaired by the misleading suggestions, the fact remains that subjects are likely to report the suggested information on the test. Yet, questions about the nature of children's memory for the suggested details they report have received almost no empirical attention. One question of particular relevance to children's suggestibility is: To what extent do children come to believe they actually remember *seeing* items that were merely suggested to them?

It has often been taken for granted that subjects who report suggested items do so because they believe they remember seeing them at the witnessed event. However, it is also possible that subjects report everything

they believe to be true of the event, without regard to whether they have a specific memory of having seen it. Because misleading suggestions are typically presented as accurate descriptions of the original event by a source presumed to be both knowledgeable and credible, subjects may be likely to accept them as true. When tested on their memory for the original event, subjects' desire to perform well is likely to lead them to report everything they believe happened at the original event without regard to whether they can specifically recollect it or whether they learned it from a postevent source. Alternatively, subjects may incorporate a suggestion into their testimony simply because they feel pressure to go along with the person who made the suggestion. Consistent with this idea, Ceci et al., (1987a, 1987b) found that children were more likely to report misleading suggestions when they were provided by an adult than when they were provided by a 7-year-old child, suggesting that children's tendency to report misinformation is influenced by the authority of the person making the suggestion. Thus, the finding that subjects report suggested information cannot be taken as evidence that subjects believe they actually remember seeing the suggested information at the original event.

Asking whether children misremember seeing suggested items is in essence a question about children's ability to monitor the *source* of their memories. To what extent are children likely to take memories from one source (e.g., leading questions provided by an experimenter) and misattribute them to another source (e.g., the witnessed event)? In order to assess whether children confuse misleading suggestions for their "real memories" of a witnessed event, it is necessary to employ test procedures that more directly assess subjects' memories for the source of the items they report.

Although no published studies have directly assessed the extent to which children come to believe they remember seeing suggested items (but see Poole & Lindsay, 1994), this issue has begun to receive some attention in the adult literature. Recent evidence has clearly established that adults do, under some conditions, come to believe they actually remember seeing suggested items (Zaragoza & Lane, 1994; see also Lindsay, 1990, for evidence consistent with this conclusion). Nevertheless, it is also the case that the magnitude of these effects vary (Zaragoza & Lane, 1994), and that belief in having seen the misinformation is not an inevitable consequence of exposure to suggestion (Lindsay & Johnson, 1989; Zaragoza & Koshmider, 1989). The purpose of the present study is to assess whether there are age-related changes in susceptibility to this memory error.

Although there is no published research on children's ability to monitor the source of suggested information in an eyewitness sort of situation, there is a body of literature on children's source monitoring in other domains. An examination of this literature suggests that young children may be more susceptible to misattributing the source of suggested information.

Most developmental studies of source monitoring have examined reality monitoring, or the processes by which people discriminate between perceived and imagined events. These studies have documented a number of instances where young children are as accurate as older children and adults in monitoring the source of their memories (Foley, Aman, & Gutch, 1987; Foley, Durso, Wilder, & Friedman, 1991; Foley & Johnson, 1985; Foley, Johnson, & Raye, 1983; Johnson, Raye, Hasher & Chromiak, 1979). For example, Johnson et al. (1979) found that children (8-, 10-, and 12-year-olds) and adults made a similar number of confusions when discriminating between memories of real and imagined pictures. Other studies have found that children as young as six years of age perform as well as older children and adults when discriminating between memories of words and memories of pictures (Foley et al., 1991), and when distinguishing what they said and did from what they heard someone else say or do (Foley et al., 1983; Foley & Johnson, 1985).

On the other hand, the reality monitoring literature has also documented circumstances under which children make more source monitoring errors than adults. By and large, age differences have been observed when children are asked to make discriminations between memories derived from similar sources. For example, Foley and Johnson (1985) found that children (6- and 9-year-olds) made more errors than adults when discriminating between actions they performed and actions they merely imagined themselves performing, and Lindsay, Johnson, and Kwon (1991) found that children (7 to 10 years old) made more source confusions than adults when they were asked to distinguish between what another person did and what they merely imagined that same person doing. Similarly, Foley et al. (1983) found that 6-year-olds were worse than 9-year-olds and adults at discriminating between words that they said and words they only imagined themselves saying. Finally, Lindsay et al. (1991) found that when subjects were asked to remember which of two people said what, young children (4- and 6-year-olds) had a more difficult time than adults if the two people shared similar physical characteristics such as voice, gender, and appearance.

The typical eyewitness suggestibility situation also requires that subjects discriminate between memories derived from similar sources because the witnessed information and the suggested information both refer to the same set of objective events and they often occur close together in time. Thus, it seems reasonable to hypothesize that young children may be more likely than older children and adults to confuse memories of suggested information for their memories of actually witnessed events.

The current study reports the results of two experiments that were designed to assess potential age-related changes in subjects' ability to accurately monitor the source of suggested information. The two studies were identical except that subjects in the first experiment were tested immedi-

ately after being exposed to suggested information, and subjects in the second experiment were tested 1 week after hearing the suggestions. For this reason, we report both experiments together. The question of primary interest in both studies was: Are young children more likely than older children and adults misremember seeing details which have in fact only been suggested to them?

To answer this question, the present experiments employed the three-phase procedure typically used in laboratory studies of suggestibility, with the exception that in the final phase subjects were asked to make overt judgments about their memory for the source of the test items. First, all subjects viewed an 8-min segment of a movie about two brothers attending summer camp. Immediately after the video tape, an experimenter read a summary of the video to the subjects. For each subject, the summary contained five pieces of misleading or suggested information that were not in the video they had seen. The misleading suggestions employed in the present study were items or events that supplemented, rather than contradicted, selected aspects of the originally seen event. We chose supplemental misinformation in order to disentangle source misattribution effects from possible memory impairment effects. Although source misattribution and memory impairment are separate processes (e.g., a misleading suggestion might impair memory for an originally seen item yet not lead subjects to misremember seeing the misleading item), it is possible that source misattribution and memory impairment interact.

In the last phase of the experiment, which occurred either immediately or one week after the second phase, subjects were given a surprise test on their memory for the source of various details. The source memory test was modeled after that used by Zaragoza and Lane (Expt.5, 1994). Specifically, subjects were asked two yes/no questions about each of the test items: (1) whether they remembered seeing the item in the video, and (2) whether they remembered hearing the test item mentioned by the experimenter who read the summary. Of primary interest was the extent to which subjects would claim they remembered seeing the suggested details.

## METHOD

### *Subjects*

A total of 517 subjects from four different age groups participated. However of these subjects, 16 first-graders, 16 third-graders, 4 fifth-graders and 7 college subjects were eliminated from the study either because they did not attend to the video (i.e., they looked away) or because they had seen the video previously. Thus, only the data of 474 subjects were included in the analyses. The mean ages of subjects in the first experiment were first grade ( $n = 66$ ), 7.0 years, with a range of 5.8 to 7.9 years; third grade ( $n = 72$ ), 9.1 years with a range of 8.4 to 10.3 years; and fifth grade ( $n = 66$ ),

11.0 years with a range of 10.4 to 11.9 years; and college age ( $n = 78$ ). The mean ages for subjects in experiment two were first grade ( $n = 54$ ), 7.8 years, with a range of 7.2 to 8.3 years; third grade ( $n = 42$ ), 9.9 years, with a range of 8.9 to 11.0 years; fifth grade ( $n = 42$ ), 11.7 years, with a range of 10.8 to 12.6 years; and college ( $n = 54$ ), 20.1 years, with a range of 18.0 to 44.2 years. The children were volunteers from one of two area parochial schools. The college age group consisted of Kent State University undergraduate students enrolled in Introductory Psychology who participated in the study to fulfill a course requirement.

### *Materials*

The video tape segment was an 8-min excerpt from the Walt Disney movie entitled "Looking for Miracles." This movie depicts a young boy's experience at a summer camp where his older brother is a camp counselor. The segment contained three distinct events—a birthday party in the camp dining hall, a boat trip where the characters are surprised by the appearance of a snake, and a quarrel among three of the young campers.

The summary of the video segment was approximately 17 sentences in length. Across subjects six versions of the summary were used, and within each age group an equal number of subjects received each version. The summary versions varied in two ways. First, the versions varied with regard to which aspects of the video segment were described. Although the main events of the video were described in all summary versions, some salient scenes from the video were omitted from each summary. In this way, the omitted scenes provided items for the final test that the children should have easily been able to identify as having occurred in the video they saw but not in the summary they heard. The rationale behind this manipulation was to ensure that there were some fairly conspicuous differences between the information contained in the video and the summary, so as to make it obvious to subjects that these two sources of information did not overlap perfectly.

Second, and more important, the six summary versions varied with regard to which items were assigned to the role of suggested and control items (see Table 1). As shown in Table 1, across summary versions a total of 14 items served as suggested items, and these same 14 items served equally often in the role of control items. The suggested items employed in this study were objects or events that, although plausible, did not occur in the video subjects had seen. In all cases the items used as suggested information *supplemented*, but did not directly contradict, the events subjects had seen. For example, some subjects heard the sentence, "After the snake bit one of the ladies in the leg, Delaney killed the snake with the boat paddle. . . .", when in fact the snake did not bite anyone. For each suggested item, a corresponding control version was prepared by deleting the suggested information from the text. For example, subjects for whom *snake bit*

TABLE 1  
Assignment of Critical Items to the Role of Suggested Item (S), Control Item (C), or  
neither (—) for Each of the Six Versions of the Post-event Summary

Items	Summary version					
	1	2	3	4	5	6
Balloons	S	C	S	C	S	C
Candles on the cake	C	S	C	S	C	S
Piano was played by a lady	C	S	C	S	C	S
Presents	S	C	S	C	S	C
Delaney blew a whistle	C	S	—	—	—	—
Ryan's knee was bleeding	S	C	—	—	—	—
Ladies rode in a car	C	S	C	S	C	S
A man was fishing	S	C	S	C	S	C
The snake bit a lady	—	—	S	C	—	—
Picnic basket in the boat	—	—	C	S	—	—
Sullivan punched a boy	S	C	S	C	S	C
Dog followed Delaney	—	—	—	—	S	C
Ryan spanked a boy	—	—	—	—	C	S
Sullivan put on a coat	C	S	C	S	C	S

*one of the ladies* served as a control item heard only, "Delaney killed the snake with the boat paddle. . ." in the summary, but then received *snake bit one of the ladies* as an item on the final source test. In sum, a piece of misinformation was defined as a suggested item in those cases where it was presented in the summary and as an item on the source test, and as a control item in those cases where it was *not* presented in the summary but did appear as an item on the test. Across the six summary versions each of the 14 pieces of misinformation served equally often in the role of suggested and control item.

As shown in Table 1, for each summary version there was a subset of 4 items that were not used at all (i.e., they did not appear in the summary or on the test). This is because for each version there were 4 items that referred to events that had been omitted from that particular summary version. For example, the suggestion that *Ryan's knee bled* when he fell off the chair could not be used in summary versions 3–6, because the scene where Ryan fell off the chair was completely omitted from these summaries. Consequently, for each summary version, only 10 of the 14 items were used, and half of these were assigned to the role of suggested and control item, respectively.

The summaries were the same for all age groups with one exception. For the first- and third-grade subjects the final sentence in each summary contained an additional suggestion (a big brown bear). This suggestion was designed to be highly implausible in the context of the video and was used to ensure that the younger children understood that some of the things that



were in the summary were not in the video they saw. The "bear" suggestion was not included in the summaries read to the fifth-grade and college subjects so as not to reduce the credibility of the experimenter.

The source memory test was made up of 23 items. For each subject, the source test contained the five suggested and five control items that corresponded to the version of the summary he/she had heard. The remaining 13 items were filler items. Of these filler items, six were items that the subject had seen in the video only, six were items that the subject had both seen in the video and heard about in the summary, and one was a new item. The latter item was chosen to be a very obvious example of an item that had not occurred in the context of the experiment at all (e.g., that there was a clown). The first- and third-grade subjects had an additional filler item on their source test, the "bear" item. The test items (with the exception of the first four items, which were especially easy filler items) were presented in chronological order.

#### *Procedure*

Elementary school-age subjects were told that we were interested in their opinion of the video. They watched the video in groups of two with two experimenters present. Immediately following the video, each subject was told that the experimenter wanted to review the events of the video. Subjects were separated and tested individually from that point forward. Subjects then listened as one of the experimenters read the summary containing the suggested information. After listening to the summary, subjects in Experiment 2 were dismissed and returned to complete the experiment one week later. Subjects in Experiment 1 immediately proceeded to the next phase of the experiment. This was the only difference in procedure between the two experiments.

After presentation of the summary, the experimenters switched places such that the experimenter who administered the filler task (and later the source test) was different from the experimenter who had read the summary. In this way the children were not put in the position of having to point out inaccuracies in the summary to the person who had actually presented the inaccurate information. All first- and third-grade subjects were then given a five minute filler task. We constructed the filler task in such a way that it could serve the additional purpose of establishing that children this age are capable of making the relatively complex judgments required by the source test. Specifically, we wanted to establish that the young subjects were capable of judging whether individual items were members of each of two separate categories, when the items could come from one, both, or neither category. A second purpose of the filler task was to familiarize the younger subjects with the format of the source test. In the filler task, each subject was shown four objects presented individually (e.g., an apple, an orange, a toy fire truck, a sea shell) and, for each object, was asked whether it be-

longed in each of two "category" bags (e.g., "Does \_\_\_\_\_ belong in the fruit bag? Does \_\_\_\_\_ belong in the red things bag?"). The four objects were chosen so that the correct response for each corresponded to each of the four possible types of responses on the source test (i.e., yes–yes, yes–no, no–yes, no–no). Each first- and third-grade subject performed this sorting task three times, with different categories and objects each time. All children mastered the filler task by the second trial. While the first-grade subjects took the entire 5 min to perform this task, the third-grade subjects did not, and they worked on a maze for the remainder of their 5 min.

Upon expiration of the time allotted for the filler task, subjects were told that the experimenter who had read the summary had made some mistakes and that not everything that she had mentioned was actually in the video. They were further instructed that their job was to help us decide which things were in the video and which things were not, by answering some questions. They were then given the surprise source memory test. For each of the 23 test items, the experimenter asked two consecutive questions aloud, "Did you see \_\_\_\_\_ in the video?," and "Did (experimenter's name) talk about \_\_\_\_\_?," and recorded each response.

The experimental procedure was the same for adult subjects with a few minor exceptions. First, the cover story given to college subjects asked that they watch the video and listen to the summary in order to judge the appropriateness of both for children. Second, college-age subjects viewed the video and listened to the summary in groups of three, with the same two experimenters present during the entire session. In addition, fifth-grade and college subjects were given word search puzzles as the filler task and allotted 5 and 10 min respectively, instead of performing the filler task given to the first- and third-grade subjects. Finally, like elementary school-age subjects, college-age subjects were told that the summary they heard had contained some items that were not in the video they had seen. In addition, they were told that the test contained items from each of four source categories (i.e., video only, summary only, video and summary both, and neither video nor summary) and that their task was to identify the source of each test item. The procedure for the source test was the same for all age groups with the exception that the college age subjects were given an answer sheet numbered from 1 to 23 that had two columns labeled (1) "saw in the video" and (2) "heard about." College-age subjects were instructed to record their answers for each test item by writing "yes" or "no" under each of the two columns. Subjects did not have an opportunity to revise their answers once they had responded.

## RESULTS

The question of primary concern in this article was whether there were age differences in subjects' tendency to believe that they remembered seeing suggested items at the original event. We refer to situations in which

subjects claim to remember seeing something they did not in fact see as *source misattribution errors*, and we restrict the use of the term to this particular case. Although other sorts of source confusions are possible (e.g., subjects believing that they remember hearing something that they in fact only saw), we focus on this error because it is especially relevant to eye-witness suggestibility.

#### *Misattribution Scores*

In order to assess the extent to which subjects claimed to remember seeing the suggested items, for each subject a misattribution score was computed by taking the number of suggested items the subject claimed to remember seeing in the video (i.e., by responding "yes" to the 'saw in slides question') and dividing by the total number of suggested items the subject claimed to recognize as "old" (i.e., the total number of suggested items for which the subject responded "yes" to the 'saw in the video' question and/or the 'heard in summary' question). Mean misattribution scores for each age group and experiment are displayed in Table 2. The question of primary interest was whether there were age-related changes in subjects' tendency to claim they remembered seeing items that had only been suggested to them.

The data for each experiment were submitted to separate analyses of variance. The effect of age group was highly significant in both experiments ( $F(3,278) = 8.0, p < .0001, MS_e = .093$ , and  $F(3,188) = 40.5, p < .0001, MS_e = .086$ ) for Experiments 1 and 2, respectively. Planned comparisons revealed that in both experiments (1) first-graders had higher misattribution scores than subjects in all other age groups (all  $p$ 's  $\leq .02$ ), (2) college-age subjects had lower misattribution scores than the elementary school age groups (all  $p$ 's  $< .05$  with the exception of the comparison with third-graders in Expt. 1, which was only  $p = .08$ ), and (3) third- and fifth-graders did not differ from each other (both  $F$ 's  $< 1$ ).

To assess the effects of retention interval on misattribution scores, the data from both experiments were submitted to a single ANOVA with reten-

TABLE 2  
Mean Proportion of Suggested Items Recognized as Old That Subjects Incorrectly Claimed to Have Seen in the Video as a Function of Age Group and Experiment

Age group	Experiment	
	1	2
First grade	.38	.91
Third grade	.25	.77
Fifth grade	.26	.70
College	.16	.30

*Note.* Subjects in Experiment 1 were tested immediately and subjects in Experiment 2 were tested after a 1 week retention interval.

tion interval (immediate vs. one week delay) and age group as between subjects factors. As is obvious from Table 2, misattribution scores increased significantly with delayed testing ( $F(1,466) = 189.2, p < .0001, MS_e = .090$ ), although college age subjects evidenced a smaller effect of delay than all of the other age groups ( $F(3,466) = 10.0, p < .001, MS_e = .090$ ). Subsequent analyses confirmed that the first-, third-, and fifth-grade subjects showed comparable increases in misattribution scores as a function of delay ( $F(2,336) = .70, p > .5, MS_e = .093$ ).

#### *Old/New Recognition of Suggested Items*

In order to determine whether the aforementioned developmental differences in misattribution scores simply reflect a more general age-related memory or performance deficit, we also assessed potential age differences in old/new recognition of suggested items. Old/new recognition of suggested items refers to subjects' ability to both (1) recognize that the suggested items were presented in the context of the experiment (by claiming that they saw and/or heard it) and (2) recognize that the control items were never presented. From these data a  $d'$  score was computed for each subject as an overall index of recognition. Mean  $d'$  scores for each age group and experiment are shown in Table 3. As discussed below, in both experiments, the pattern of recognition performance did not match the pattern of misattribution scores.

An analysis of  $d'$  scores for subjects in Experiment 1 showed a main effect of age ( $F(3,278) = 5.7, p < .01, MS_e = .634$ ) such that first-graders performed more poorly than all of the other age groups (all  $p$ 's  $< .05$ ), and none of the latter groups differed from each other (all  $p$ 's  $> .1$ ). Subsequent analyses conducted on hits and false alarms separately revealed significant age differences in false alarms ( $F(3,278) = 5.2, p < .01, MS_e = .972$ ). The

TABLE 3  
Indices of Recognition Performance on Suggested Items as a Function  
of Age and Experiment

	Hits	False alarms	$d'$
Experiment 1			
First grade	.75	.23	1.34
Third grade	.81	.17	1.64
Fifth grade	.83	.13	1.85
College	.81	.11	1.80
Experiment 2			
First grade	.70	.39	.77
Third grade	.68	.35	.82
Fifth grade	.71	.34	.91
College	.65	.16	1.25

apparent age differences in hits did not reach statistical significance ( $F(3,278) = 1.8, p > .05, MS_e = 1.2$ ).

Analysis of  $d'$  scores for subjects in Experiment 2 also revealed a main effect of age ( $F(3,188) = 4.3, p < .01, MS_e = .579$ ), but in this case the college-age subjects performed better than all of the other age groups (all  $p$ 's  $< .05$ ), and none of the elementary school-age groups differed from each other (all  $p$ 's  $> .3$ ). Interestingly, the reason for the recognition advantage among the college-age subjects is due entirely to a lower incidence of false alarms to the control items ( $F(3,188) = 9.9, p < .0001, MS_e = 1.433$ ). There were no age differences in hits made to suggested items ( $p > .5$ ).

In sum, both experiments provided evidence of situations where source misattribution errors varied as a function of age and old/new recognition did not. Specifically, in Experiment 2 first-graders made more source misattribution errors than the third- and fifth-grade subjects, even though their recognition of critical items was not poorer than that of the older children. Similarly, in Experiment 1 college-age subjects made fewer source misattributions than fifth-grade subjects, even though their recognition of critical items was not better than that of the fifth-grade subjects.

To further assess the possibility of a relationship between source monitoring and recognition performance, we computed the correlation between  $d'$  and misattribution scores for subjects in each age group and experiment separately. In no case was the correlation significant (largest correlation  $r(54) = -.18$ , all  $p$ 's  $> .05$ ), thus providing further evidence that the misattribution score is not simply another measure of memory for occurrence (see also Foley & Johnson 1985; and Foley et al., 1983, for similar findings).

### *Suggestibility*

Although misattribution scores provide a useful measure of subjects' tendency to claim they remember seeing suggested items, this measure does not indicate the extent to which these errors were *caused* by exposure to suggestion. In order to assess suggestibility, it is necessary to determine whether subjects claim to remember seeing the suggested items more often than they would have had they not been misled. Consequently, in the following analyses the measure of suggestibility will be the difference between the number of source misattributions committed to suggested and control (i.e., never presented) items. The results are reported in percentages for ease of exposition.

Figure 1 illustrates the percentage of source misattributions subjects made to suggested and control items as a function of age and retention interval. Inspection of the figure reveals that, in both experiments, (1) there is clear evidence of a suggestibility effect in all age groups, and (2) the pattern of age differences in suggestibility closely matched the pattern of age

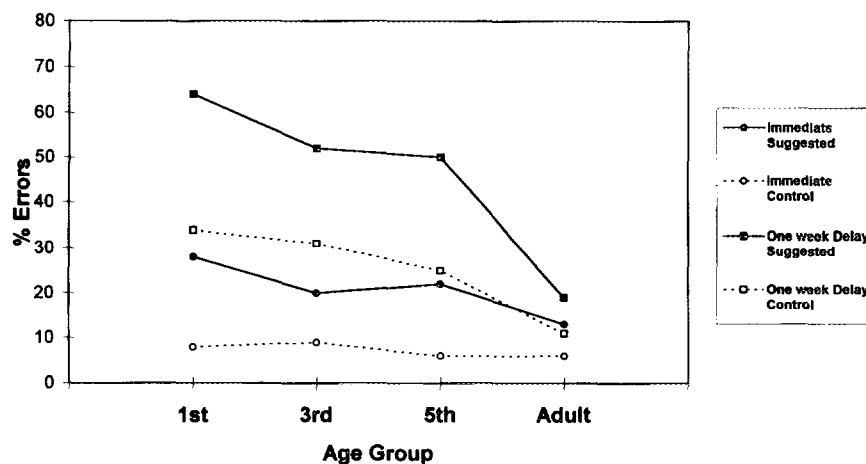


FIG. 1. Mean percentage of source misattribution errors made to suggested and control items as a function of age and retention interval. The immediate test data are from Experiment 1; the 1 week delay test data are from Experiment 2.

differences in misattribution scores. These observations were confirmed by ANOVAs conducted separately for each experiment.

Overall, subjects were more likely to claim they remembered seeing critical items when they had been suggested to them than when the same items were new (i.e., control items), as evidenced by highly significant main effects of item type in both experiments ( $F(1,278) = 86.97, p < .0001, MS_e = .723$ , and  $F(1,188) = 93.4, p < .0001, MS_e = 1.134$  for Experiments 1 and 2, respectively). However, in both experiments, the magnitude of the suggestibility effect varied as a function of age, as evidenced by highly significant age  $\times$  item type interactions at both retention intervals ( $F(3,278) = 4.12, p < .01, MS_e = .723$ , and  $F(3,188) = 5.3, p < .01, MS_e = 1.134$ , for Experiments 1 and 2, respectively). Planned comparisons confirmed that, in both experiments, there was a significant suggestibility effect in every age group (all  $p$ 's  $< .05$ ). Hence, although there were age differences in suggestibility, no age group was immune to these errors.

To more precisely assess the nature of the age differences in suggestibility, for each experiment simple effects analyses were conducted on subjects' responses to the control items and suggested items separately. Considering the results of Experiment 1, the first finding of interest is that there were no age differences in subjects' tendency to claim they remembered seeing the control items,  $p > .05$ , (the aforementioned age differences in false alarm rates were due entirely to a greater incidence of "heard" responses to control items by first-graders). Hence, there was no evidence that younger subjects had a higher base rate of claiming they remembered seeing the critical items if they had not been suggested to them. Nevertheless, there were

clear developmental trends in subjects' tendency to claim they remembered seeing the suggested items ( $F(3,278) = 5.6, p < .01, MS_e = 1.299$ ), with first-graders more likely to claim they remembered seeing the suggested items than third-graders ( $p < .05$ ), third- and fifth-grade subjects equally likely to do so ( $p > .05$ ), and college-age subjects less likely to claim they remembered seeing the suggested items than all of the other age groups (all  $p$ 's  $< .05$ ).

In Experiment 2, where subjects were tested after a 1-week retention interval, the same pattern of age differences in source misattributions to suggested items was obtained, but in more pronounced form ( $F(3,188) = 34.5, p < .0001, MS_e = 1.421$ ). Namely, first-graders were more likely to claim they remembered seeing the suggested items than all of the other age groups (all  $p$ 's  $\leq .01$ ), third- and fifth-graders were equally likely to do so ( $p$ 's  $> .05$ ), and college-age subjects were much less likely than all of the younger age groups to claim they had seen the suggested items (all  $p$ 's  $< .0001$ ). However, unlike Experiment 1, there were age differences in subjects' tendency to claim they remembered seeing the control items ( $F(3,188) = 11.1, p < .01, MS_e = 1.22$ ). Specifically, college-age subjects claimed to remember seeing the control items less often than all of the other age groups, although the first-, third-, and fifth-grade subjects once again did not differ from each other ( $p$ 's  $> .05$ ). Keep in mind, however, that the age  $\times$  item type interaction was significant, thus showing that there were larger age differences in source misattributions to suggested than control items.

Finally, in order to assess the effects of delay on suggestibility, the data from both experiments were submitted to a single analysis with retention interval (immediate vs 1 week) and age group as between-subjects factors, and item type (suggested vs control) as a within-subjects factor. This analysis revealed a significant main effect of retention interval such that subjects tested after 1 week made more source misattribution errors to both suggested and control items than those subjects tested immediately. In addition, there was a significant interaction between retention interval and age such that, the elementary school children showed a greater increase in overall errors (i.e., errors to both suggested and control items) than did adult subjects ( $F(3,466) = 16.32, p < .01, MS_e = 1.181$ ). The effects of retention interval did not vary across elementary school-age groups ( $F(2,366) = 1.17, p > .1, MS_e = 1.354$ ). However, for all age groups there was a greater increase in errors to suggested items than to control items ( $F(1,466) = 9.6, p < .01, MS_e = .889$ ), thus showing an overall increase in suggestibility when subjects were tested after a delay. Of particular importance for present purposes is the fact that this increase in suggestibility did not vary as a function of age (i.e., the three-way interaction among age, retention interval, and item was not significant,  $F < 1$ ).

In summary, retention interval had two effects on performance, and only one of these varied with age. First, with delayed testing, subjects of all

ages were more likely to claim they remembered seeing the suggested and control items they had not in fact seen, but elementary school-age children evidenced a greater increase in overall errors than college students. Second, for all age groups, delayed testing resulted in greater suggestibility, insofar as the difference in the source misattributions committed to suggested and control items was greater at delayed testing than at immediate testing. This increase in suggestibility did not vary as a function of age. The latter finding is due to the fact that with delayed testing, elementary school-age subjects evidenced a greater increase in source misattribution errors to both the suggested *and* control items. Nevertheless, the magnitude of the source misattribution effect was greater for elementary school children than for subjects in the college-age group.

#### *Memory for Actual Source*

All of the foregoing analyses were conducted on subjects' claims that they remembered seeing the suggested items, as measured by their "yes" responses to the "saw in video" question. In this section, we focus on subjects' memory for the actual source of the suggested items, as measured by their "yes" responses to the 'heard in summary' question. Note that subjects' tendency to incorrectly claim that they remember seeing the suggested items does not imply anything about their memory for the actual source of the suggested items. It is entirely possible for subjects to claim that they both remember seeing the suggested item in the video and hearing about it in the summary, and it so happens that many of our subjects did so (see also Belli, Lindsay, Gales, & McCarthy, 1994; Zaragoza & Lane, 1994).

In order to measure the extent to which subjects accurately remembered hearing about the suggested items in the postevent summary, for each subject the number of suggested items he/she claimed to remember hearing in the summary (i.e., by responding "yes" to the 'heard in summary' question) was divided by the total number of suggested items the subject claimed to recognize as "old" (i.e., the total number of suggested items for which the subject responded "yes" to the 'saw in slides' question and/or the 'heard in summary' question). Mean scores for each age group and experiment are displayed in Table 4. The question of primary interest was whether there were age-related changes in subjects' ability to identify the actual source of the suggested items.

The data from each experiment were submitted to separate ANOVAs. Considering first the results of Experiment 1, inspection of Table 4 reveals that memory for having heard the suggested items was very good in all of the age groups. Nevertheless, the effect of age group was significant ( $F(3,278) = 5.2, p < .01, MS_e = .041$ ). Planned comparisons revealed a rather complex pattern of age differences that is attributable to the unusually high performance of the third grade subjects. Specifically, first-graders performed more poorly than third-graders and college-age subjects ( $p$ 's <



TABLE 4  
 Mean Proportion of Suggested Items Recognized as Old That Subjects Correctly Claimed to Remember Hearing about in the Summary as a Function of Age Group and Experiment

Age group	Experiment	
	1	2
First grade	.84	.31
Third grade	.96	.55
Fifth grade	.88	.63
College	.94	.73

*Note.* Subjects in Experiment 1 were tested immediately and subjects in Experiment 2 were tested after a 1 week retention interval.

.01), but did not differ from fifth-grade subjects ( $p > .15$ ). Fifth-graders performed more poorly than third-graders ( $p < .05$ ), but were not significantly different from college-age subjects ( $p = .10$ ). College-age subjects and third-graders did not differ from each other ( $p > .5$ ). Hence, the pattern of group differences (from lowest to highest performance) was first-grade, fifth-grade, college-age, and third-grade. In Experiment 2, the effect of age group was also significant ( $F(3,188) = 16, p < .0001, MS_e = .107$ ), although the pattern of performance differences showed a more direct relationship between memory and age. Specifically, first-graders performed more poorly than all of the other age groups (all  $p$ 's  $< .001$ ), third-graders performed more poorly than the college-age subjects only ( $p < .01$ ), and fifth-graders and college-age subjects did not differ from each other ( $p > .10$ ).

Clearly, the pattern of age differences in memory for actual source does not neatly correspond to the pattern of age differences in source misattribution errors, as evidenced by a comparison between Tables 2 and 4. For example, in Experiments 1 and 2, fifth-grade subjects consistently made many more source misattributions than college-age subjects, yet in neither experiment did they differ from college-age subjects in their memory for having read the suggested items. Similarly, in Experiment 1, first-graders committed significantly more source misattributions than fifth-graders, yet these groups did not differ significantly in their memory for actual source. There is also evidence that superior memory for actual source does not necessarily lead to a corresponding decrease in source misattributions. In Experiment 1, third-graders outperformed fifth-graders in their memory for actual source, but third-graders did not differ from fifth-graders in their tendency to claim they remembered seeing the suggested items. Finally, in Experiment 1, the magnitude of the age differences in memory for actual source are much smaller than the corresponding age differences in misattribution scores (consider, for example, the relative performance of first-graders vs college-age subjects on both measures). Taken together, these re-

sults suggest that children's greater tendency to claim they remembered seeing suggested items is not simply due to poorer memory for the actual source of the suggested items.

To assess the effects of retention interval on memory for actual source, the data from both experiments were submitted to a single ANOVA with retention interval (immediate vs 1 week delay) and age group as between-subjects factors. As is obvious from Table 4, memory for actual source declined significantly with delayed testing ( $F(1,466) = 209.5, p < .0001, MS_e = .067$ ), although both fifth-grade subjects and college-age subjects evidenced a smaller effect of delay than all of the other age groups ( $F(3,466) = 9.3, p < .001, MS_e = .067$ ). The interaction between age and delay is highly significant even when the analysis is restricted to the elementary school age groups only ( $F(2,336) = 6.9, p < .01, MS_e = .075$ ). Once again, the pattern of age differences in memory for actual source do not correspond with those observed for misattribution scores. Although fifth-graders evidenced a smaller decline in memory for actual source at delayed testing relative to first- and third-graders, they showed an increase in misattribution scores at delayed testing that was comparable in size to that of first- and third-graders.

## DISCUSSION

The results of Experiments 1 and 2 showed that exposure to misleading suggestion led subjects of all ages to come to believe they actually remembered *seeing* events that had in fact only been suggested to them. The present results thus replicate Zaragoza and Lane (1994; see also Lindsay, 1990) who obtained similar findings with adults. The current study extends previous findings, however, by revealing that children are also susceptible to this memory error. Although many studies have shown that children can be led to report events that are different from those they actually witnessed (see Ceci & Bruck, 1993, for a review), the present study provides the first evidence that children may report such suggested information because they have come to believe they remember seeing it as part of the originally witnessed event.

Of greater interest, however, is the consistent finding in both experiments of age-related changes in subjects' tendency to confuse misleading suggestions for their memories of actually witnessed events. Whether tested immediately (Experiment 1) or after a 1-week delay (Experiment 2), first-grade children were more likely than older children and adults to incorrectly claim they had seen items that had only been suggested to them, and the older children (i.e., third- and fifth-grade) were in turn more likely to make this error than college-age subjects. The present study clearly established that these developmental trends reflect an increased susceptibility to suggestion and are not due to a "saw" bias among the younger children. An examination of subjects' responses to control (i.e., new) items revealed that

first-graders were not more likely to claim they remembered seeing control items than the older children, thus showing that first-graders did not have a higher base rate of responding "yes" to the 'saw in video' question. Finally, our results demonstrate that these age differences in source misattributions do not simply reflect more general age-related memory or performance deficits. This is because both experiments document circumstances where there were no corresponding age differences in old/new recognition of the suggested items. Particularly noteworthy in this regard was the finding in Experiment 2 that first-graders were as accurate as the older children in recognizing the suggested items as old, in spite of the fact that they were much more prone to incorrectly claim that they remembered seeing these same items in the video.

A second finding of interest is that, for all age groups tested in these experiments, immediate testing resulted in smaller suggestibility effects than did testing at a 1 week delay. Although conclusions based on cross-experimental comparisons must be drawn with caution, the effects of retention interval were sufficiently robust to warrant some confidence. An analysis of the data combined across experiments revealed that age differences in suggestibility did not interact reliably with delay, so the present study provided no evidence that age differences in suggestibility become more pronounced over time (although younger subjects did show a greater increase in overall errors with delayed testing). However, this conclusion is qualified by the fact that we may have observed ceiling effects in the absolute levels of suggestibility evidenced by the first-grade subjects in Experiment 2 (see Fig. 1). As Table 2 shows, first-graders tested at the 1 week delay misattributed .91 of the suggested items they could still recognize as old.

Documenting the time course of source misattribution errors, and their interaction with age, remains an important question for future research. If, as this study suggests, source misattributions increase over time, parallel increases in source misattribution errors should be observed when the same individuals are tested at increasing delays. We suspect that the interaction of age differences in suggestibility with delay will also depend heavily on the extent to which there are age differences in subjects' memory for the content of the suggestions—subjects cannot be influenced by misleading suggestions that they have forgotten altogether. To the extent that child witnesses in real world eyewitness situations may be exposed to repeated suggestions that are likely to persist in memory over long periods of time, it will be important to assess the influence of such repeated questioning on the incidence of source misattribution errors (cf., Ceci, Crotteau, Smith, & Loftus, in press).

An important question raised by the present findings is: Why are there age-related changes in subjects' tendency to believe they remember seeing suggested information? In attempting to answer this question it is important to first consider what is known about source monitoring processes.

Johnson, Hashtroudi, and Lindsay (1993; see also Johnson & Raye, 1981) have proposed a framework for understanding when source monitoring processes are likely to be accurate and when they are likely to fail. According to the source monitoring model, memory for source is an attribution that is the product of decision making processes. The source monitoring model also assumes that memory representations contain characteristics that reflect the specific conditions under which they were acquired (e.g., the mode and medium of presentation, contextual information, emotional reactions) and that judgments about source are made by evaluating the quantity and nature of these characteristics. Johnson et al. (1993) further propose that most source judgments are made quickly and without reflective deliberation. For example, recollections that are rich in visual and spatio-temporal detail are likely to be identified as memories of witnessed events. However, in some cases more extended reasoning processes are performed, and source judgments may be influenced by other information the subject has such as supporting memories, general knowledge, and the subjects' beliefs about how memory works. Thus the accuracy of source monitoring judgments is influenced by circumstances at the time of retrieval (i.e., the amount and nature of information retrieved, the reasoning processes and biases brought to bear on the judgment, the rememberer's current goals and agendas) as well as the characteristics of the underlying memory representations.

The developmental differences in source misattributions observed in the present study could be due to age differences in any or all of the processes relevant to accurate source monitoring. For example, one possibility is that young children's memory representations may be impoverished relative to those of older children and adults. The finding that memory for the actual source of the suggested items tended to improve with age is consistent with the possibility that younger children encoded less source relevant information. Given that failure to remember the actual source of suggested items is likely to result in greater susceptibility to source misattributions (as a comparison of Experiments 1 and 2 would seem to suggest), age differences in the encoding of source relevant information may well have contributed to these effects. However, it should be noted that poor memory for actual source is not a prerequisite for source misattributions, and as such the age differences we have observed cannot be ascribed entirely to poor memory for actual source. This is especially true for the results of Experiment 1, where the vast majority of subjects in all age groups accurately remembered that they had heard the suggestions in the summary provided by the experimenter. Hence, in the majority of cases where subjects in Experiment 1 claimed to remember seeing the suggested items, they also indicated that they remembered hearing about the suggestions (cf. Zaragoza & Lane, 1994, for similar findings); in each age group about 60% of the

source misattributions were to items subjects claimed both to have seen and heard.

Another encoding variable that could have contributed to developmental differences in source misattributions is age differences in the use of visual imagery. Specifically, it is possible (if not likely) that when listening to the postevent summary subjects formed an implicit image of the events being described in the summary. The source monitoring framework predicts that memories of suggested items will be confused with perceived details to the extent that they include visual information (albeit imagined) about what the suggested details look like (see Carris, Zaragoza, & Lane, 1992, for results consistent with this prediction). If young children are more likely than older subjects to generate especially realistic images of the suggested events/items (cf., Foley, Harris, & Hermann, 1994), they should be more prone to source misattributions as well.

Another possibility is that children perform differently than adults because they lack the relevant metamemory skills. Young children are known to be overly optimistic in judgments of their memory capabilities, unaware of the fact that their memories may be deficient or erroneous (Flavell, Friedrichs, & Hoyt, 1970; Yussen & Levy, 1975). Thus it is possible that young children might be less aware of the fact that different sources of information in memory are easily confused. This limited knowledge that children have of the workings of their memories might then result in limited attempts to remember. If young children perceive their memory as infallible they may exert less effort than older children and adults and hence be more susceptible to making source misattribution errors.

That young children are generally less skilled than older children and adults in the employment of retrieval strategies is another factor that may contribute to age differences in source monitoring accuracy. For example, there is a substantial literature documenting that young children are less likely than older children and adults to spontaneously use retrieval strategies, even though they are capable of learning to do so (see Schneider & Pressley, 1989, for a review). In line with this idea is the finding that young children often ignore explicit cues that could potentially aid memory retrieval (e.g., Kobasigawa, 1974). Given that young children often fail to use explicit memory cues, it is likely that they have similar difficulties making use of less explicit source cues (e.g., memory characteristics) as aids for distinguishing between observed and suggested information. In addition, young children who do display strategic retrieval do not necessarily search their memories as extensively as older children and adults (e.g., Ackerman, 1988; Kobasigawa, 1974) and hence may be less likely to retrieve the specific feature or features that might discriminate between originally perceived and suggested information.

Still another possibility is that older subjects were simply less likely to

accept some of the suggestions than were the younger subjects. Recall that in these experiments we used a large set of misleading suggestions that varied in their centrality and potential importance. Because of the older subjects' greater sophistication and general knowledge, they may have been more sensitive to differences in the plausibility of the suggestions, and hence have been more likely to explicitly reject some of the suggestions as untrue at encoding. Unfortunately, our ability to perform an item analysis is complicated by the fact that we do not have equal numbers of observations on all of the items (see Table 1). Specifically, although 8 of the 14 critical items employed in these experiments served as either suggested or control items for all subjects, the remaining 6 critical items served as suggested or control items for only one third of the subjects in each age group. In addition, the group of items with relatively few observations also contained some of the items that were most consequential (e.g., Ryan's knee was bleeding, the snake bit a lady, and Ryan spanked a boy), thus making it all the more difficult to compare different types of suggestions in a meaningful way. Nevertheless, informal examination of the item data does provide some useful information bearing on the issue of potential age by item interactions. First, the data clearly rule out the possibility that the age differences in suggestibility were simply due to the fact that older subjects went along with fewer of the suggested items than did younger subjects. By and large, there was evidence of suggestibility to all of the critical items, and this was true for all of the age groups in both experiments. However, there was one critical item—the snake bit a lady—that no college-age subjects in either experiment (out of a total of 22) claimed to remember seeing, although at least a few children in all of the other groups did succumb to this suggestion. That subjects would be likely to reject this suggestion is understandable in light of the fact that a snake bite has serious consequences (medical treatment, potential illness and even death) and the absence of supporting memories about those consequences might be expected to serve as additional evidence that the event never happened. It is interesting, therefore, that some subjects from each of the elementary school-age groups did claim to remember seeing this rather serious nonevent. These results raise the interesting possibility that children may be less likely to engage in extended reasoning about the plausibility of misleading suggestions, thus rendering them susceptible to a wider range of suggestions than adults. Of course, the validity of this hypothesis cannot be established without additional research.

In summary, an explanation of age differences in source monitoring is made difficult by the fact that source monitoring is not a unitary skill or ability. There are a number of processes that contribute to source monitoring judgments, all of which may develop with age. In all likelihood, the age differences observed in these experiments resulted from a combination of some or most of the factors discussed above. Hence, a critically important issue for future research is to identify the mechanisms responsible for age-

related changes in the tendency to commit source misattributions to suggested items.

### *Summary and Implications*

Although several studies have found that young children are more suggestible than older children and adults, the present study is the first to provide evidence that young children are more susceptible to a serious memory error, namely, the tendency to believe they remember seeing details that were only suggested to them. Nevertheless, we believe that the incidence and magnitude of these age differences will vary from situation to situation, depending on the relative discriminability of the original and misleading episodes. We know from the reality monitoring literature that developmental differences in source monitoring appear and disappear as a function of the difficulty of the discrimination subjects have to make. For this reason, it will be important to extend this work to situations involving live events that have greater personal relevance to the child (e.g., Rudy & Goodman, 1991; Baker-Ward, Gordon, Ornstein, Larus, & Clubb, 1993) and where misleading suggestions are provided in a context that better resembles an actual interview situation. To the extent that more naturalistic sorts of situations are likely to result in memories of original and postevent episodes that have more distinctive cues to source (both because there should be less overlap between the episodes when they are not two phases of a single experimental session, and because the more naturalistic context is likely to result in a richer array of contextual cues due to its higher interactional content) developmental differences may very well be minimized under such situations, at least in the short run. On the other hand, it will also be important to assess the effects of repeated questioning over very protracted retention intervals, factors that may magnify developmental differences (cf. Poole & White, 1991; in press).

Although we have highlighted the finding of developmental differences, it is important to emphasize that no age group was immune to source misattribution errors and as such the difference is a relative one. Moreover, although college-age subjects in the current experiments were quite resistant to source misattribution errors, the adult subjects we have tested in other experiments with nearly identical procedures (but different materials) were at least as suggestible as the first-graders tested in this study (see, for example, Zaragoza & Lane, 1994; Chambers & Zaragoza, 1993). In Chambers and Zaragoza (1993), for example, college-age subjects viewed a police training film of a home burglary and an ensuing car chase, and were subsequently exposed to six misleading suggestions. The misleading suggestions included a variety of objects and actions, including the suggestion that the thief had a gun (even though he did not). As in the current study, one group of subjects was tested immediately and the other was tested after a 1 week delay. The results were strikingly similar to those obtained here

with first-grade subjects: subjects tested immediately misattributed .48 of the suggested items they recognized as old, whereas those tested after one week claimed they remembered seeing .87 of the suggestions they recognized (see Table 2). Clearly, then, adults are just as capable as young children of extremely high levels of suggestibility, even under conditions that closely mimic those studied in these experiments.

In sum, the results of the present study document that there are age-related changes in the tendency to confuse suggested items for actually perceived events, with younger children showing increased susceptibility to this error. Although there is still much to be learned about the mechanisms responsible for these age differences, continued research along these lines promises to illuminate our understanding of suggestibility in both children and adults. In addition to documenting a new phenomenon, the present research illustrates the advantages of the source monitoring approach as a framework for studying children's suggestibility. Most of the theorizing about age differences in suggestibility phenomena has focused on their implications for theories of forgetting (e.g., Are young children more susceptible to forgetting caused by misinformation than older children and adults?). Although it is certainly important to understand forgetting that results from exposure to suggestion, it is equally important to understand the inaccuracies in memory that exposure to suggestion may cause. The study of source misattributions provides one means of satisfying the need for theory development along these lines.

A problem that has often plagued attempts to assess developmental differences in the suggestibility of memory is the fact that young children are more likely to conform to suggestions simply because of the perceived pressure to go along with an adult authority figure. Consequently, age differences in the tendency to report suggested information become very difficult to interpret. A clear advantage of the source test procedure is that it eliminates any demand to conform with the suggestion—if anything it creates demand in the opposite direction. As we have shown, the source test procedure provides a relatively unambiguous assessment of the extent to which children confuse misleading suggestions for events that they have actually witnessed. Moreover, this same approach has been successful in advancing our understanding of the development of other source monitoring skills, such as reality monitoring. For this reason we believe that the source monitoring approach is an especially fruitful one that promises to provide a much clearer understanding of possible age-related changes in the suggestibility of memory.

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