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Memorial Consequences of Forced Confabulation: Age Differences in Susceptibility to False Memories

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Numerous studies have demonstrated that exposure to misinformation about a witnessed event can lead to false memories in both children and adults. The present study extends this finding by identifying forced confabulation as another potent suggestive influence. Participants from 3 age groups (1st grade, 3rd/4th grade, and college age) viewed a clip from a movie and were "forced" to answer questions about events that clearly never happened in the video they had seen. Despite evidence that participants would not have answered these questions had they not been coerced into doing so, 1 week later participants in all age groups came to have false memories for the details they had knowingly fabricated earlier. The results also showed that children were more prone to this memory error than were adults.

The present study investigated the memorial consequences of forcing children to knowingly confabulate information about a witnessed event. There are many situations in which children may find themselves pressured to produce responses to questions about witnessed or experienced events, even if they have no memory for the requested information. For example, child witnesses may find themselves pushed beyond their actual memory in producing answers to investigators' questions about what they saw. In such cases, they may confabulate, or make up, answers. Although this may occur unwittingly—as in the case of spontaneous inference—this study is concerned with cases in which children are pressed to confabulate information they would not have provided had they not been forced to do so. Of particular interest is the possibility that as a consequence of pressuring children to provide made-up accounts of fictitious events, they might later come to have a false memory for the events they fabricated. In other words, we were interested in determining whether children might eventually come to remember their forced confabulations as real.

Interestingly, in spite of a large scientific literature on the suggestibility of children's eyewitness memory (see Ceci & Bruck, 1993, for a review), no studies have examined the cognitive sequelae of forcing children to confabulate answers to an interviewer's questions. Rather, the vast majority of these studies have focused on a single type of suggestive interviewing situation, namely, instances where the misleading (or false) information is explicitly provided by the interviewer. In the typical study, participants are simply told some false piece of information by the interviewer (that the thief had a mustache when he didn't, that somebody touched them when he or she didn't), and suggestibility is measured as the extent to which the child will then (or later) claim to remember witnessing the misinformation provided by the interviewer (e.g., Cassel, Roebers, & Bjorklund, 1996; Ceci, Ross, & Toglia, 1987a, 1987b; Goodman & Reed, 1986; Memon, Holley, Wark, Bull, & Koehnken, 1996; Ornstein, Gordon, & Larus, 1992; Pezdek & Roe, 1994; Rudy & Goodman, 1991; Saywitz, Goodman, Nicholas, & Moan, 1991; Zaragoza, Dahlgren, & Muench, 1992). A few recent studies have moved somewhat closer to the situation of interest in the present study by encouraging children to provide details of fictitious events suggested by the experimenter (e.g., Ceci, Crotteau-Huffman, Smith, & Loftus, 1994; Ceci, Loftus, Leichtman, & Bruck, 1994). But even these latter studies did not require that the children confabulate details about the suggested events; the children were simply encouraged to produce them to the extent that they felt comfortable doing so. Hence, Ceci, Crotteau-Huffman, et al.'s (1994) and Ceci, Loftus, et al.'s (1994) findings that children claimed to remember details they had freely made up do not necessarily imply that they would misremember details if they had been forced to confabulate them.

In summary, although there is an extensive literature documenting that children, like adults, can be led to develop false memories for suggested events, the study of eyewitness suggestibility has focused almost exclusively on situations where participants are passively exposed to misinformation by an inter-

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viewer. However, in many of the real-world investigative or therapeutic contexts where suggestive interviewing is of concern, the nature of the suggestive questioning is to pressure the child to provide details of events they do not remember or never experienced. An illustration of this can be found in the highly publicized Wenatchee, Washington child sex ring case, where the conviction of 19 adults was recently called into question because one of the key witnesses (a 13-year-old) recanted her testimony, claiming that the leading police investigator in the case had forced her to fabricate allegations of abuse[1]:

> I had to make it all up. Bob Perez was there, and he pressured me to say it. [He] got some information and told us to use it and, like, he told us to use our own words. . . . First I said it didn't happen, and . . . then he forced me to make up a lie. (Claiborne, 1996, p. 31)

Although the memories of the children in the Wenatchee case were apparently not tainted by the suggestive interviewing they claim to have experienced, it remains an open question whether forcing children to provide confabulated accounts might lead to distortions of memory under less extreme situations (e.g., when the questioning is not as overtly manipulative and the events children are forced to confabulate are not as serious or unusual). Because the potential repercussions of this type of questioning have not yet been systematically investigated, we do not know what effects—if any—forced confabulation might have on children's memories. The primary goal of the present study was to begin to address this gap in the literature.

At an intuitive level, one might be tempted to argue that if children make up a response to a question under pressure, they will remember that they themselves fabricated the response. One might suspect that they would then later remember what information they actually experienced and what information they made up. Yet, if we look to the broader literature on memory illusions, there is ample evidence that people are prone to confusing the sources of information in memory and that, in many cases, children are more susceptible to these source misattribution errors (Foley & Johnson, 1985; Foley, Johnson, & Raye, 1983; Foley, Santini, & Sopasakis, 1989; Lindsay, Johnson, & Kwon, 1991; Markham, 1991; Parker, 1995). For example, there is evidence that people will sometimes confuse imagination with reality, which of two people said what, somebody else's ideas for their own, and what they thought about doing with what they actually did (Johnson, Hashtroudi, & Lindsay, 1993). Indeed, the finding that eyewitnesses are susceptible to misleading postevent suggestions provides a potent illustration of source-monitoring failures—participants of all ages are prone to confusing events that were merely suggested to them for events they actually witnessed (Ackil & Zaragoza, 1995; Belli, Lindsay, Gales, & McCarthy, 1994; Lindsay, 1990; Poole & Lindsay, 1995; Zaragoza & Lane, 1994; Zaragoza & Mitchell, 1996).

Research and theory on source monitoring have shown that source confusions arise when the information that is retrieved from memory about an item's source is ambiguous or incomplete, and/or when less than optimal judgment processes are used to evaluate an item's source (see Johnson et al., 1993, for a review). Thus, to the extent that people forget or simply fail to retrieve information that identifies a fabricated account as something they made up, they may be prone to confusing it for their real memory of what actually transpired. In the absence of cues indicating that some information was confabulated (or that it could not be true on the basis of other information in memory), fictitious events that are self-generated may in fact be especially confusable with reality. Because a self-generated fictitious event will be constructed within the constraints of an individual's idiosyncratic knowledge and beliefs, the content of the made-up account may later be perceived by the rememberer as especially plausible and real. This may be especially true for children, given that there is some evidence that they are more likely than adults to spontaneously elaborate on their imaginations by activating personalized and idiosyncratic details during encoding (Foley et al., 1989).

The expectation that forced confabulations may produce later source misattributions is supported by Roediger, Challis, and Wheeler (1993, as described in Roediger, Wheeler, & Rajaram, 1993), who found that adult participants forced to make up responses on a memory test later had difficulty discriminating between confabulated and actually presented items. Roediger, Challis, and Wheeler had participants study 60 pictures of individual objects and 1 week later forced the participants to free recall all 60 items. An important aspect of Roediger, Challis, and Wheeler's design was the inclusion of a control group that was simply told to recall as many items as they could without being forced. Because participants in the control group freely recalled only one third of the original 60 items, Roediger, Challis, and Wheeler were able to verify that a large proportion of the items provided by participants in the forced group were indeed forced guesses. Nevertheless, participants in the forced-recall group misidentified many of their forced guesses (28%) as items they had actually experienced, thus showing that forcing participants to make up a response does not necessarily protect them from confusing the source of these confabulations later on.

There are, however, several reasons to suspect that Roediger, Challis, and Wheeler's (1993) results may not generalize to the situation of interest here, where the target memory is a rich, cohesive witnessed event (rather than a list of object pictures). First, participants may be much more reluctant to fabricate details about a meaningful witnessed event, thereby increasing the likelihood that participants will accurately remember the confabulated details as such. Second, whether or not participants specifically remember confabulating a response, it may be easier for them to identify fabrications about meaningful experienced events as false solely on the basis of their content. One might expect that, relative to an actually experienced event, a confabulated event is less likely to be accompanied by supporting memories (i.e., such as antecedents and consequences), and the absence of such information might serve as a cue that the confabulation is false. In contrast, a list-learning paradigm such as that used by Roediger, Challis, and Wheeler is likely to result in a much less intricate network of mutually supporting memories, thus resulting in fewer bases for rejecting a confabulation as false. Finally, the procedure used by Roediger, Challis, and

[1] To our knowledge, this child's claims that she was forced to fabricate her allegations of abuse have not been verified. However, it has been reported that other child witnesses in this case have recanted and complained of coercion (Claiborne, 1996).

Wheeler may have been especially conducive to source confusion given the very large number of forced guesses (approximately 40 of the 60 responses) that participants were required to produce. Whether similar results would be obtained under circumstances where participants generate substantially fewer forced confabulations is an empirical question we addressed in the present study.

The purpose of this study was twofold: (a) to assess whether forcing children to knowingly confabulate information about a witnessed event might lead them to confuse the confabulated details for events they actually witnessed and (b) to assess whether young children might be more susceptible to this source confusion error than older children and adults. Participants from three age groups participated: first graders, third/fourth graders, and college students. We chose these age groups because a previous study involving similar materials revealed age differences in source monitoring and suggestibility among these three age groups (Ackil & Zaragoza, 1995).

The present study involved a substantially modified version of the three-phase procedure typically used in laboratory studies of eyewitness suggestibility. All participants first viewed a clip from a movie depicting a day in the life of two brothers attending a summer camp where the older brother was a camp counselor. Immediately thereafter, participants were asked a series of questions. Some of these questions (hereafter referred to as true-event questions) concerned fairly salient events that did occur in the video. Other questions (hereafter referred to as false-event questions) asked for information that was not in the video. In other words, to answer these questions participants would have to make up an answer. For example, in going over a scene from the video the experimenter said, "It (the chair) broke, and Delaney fell on the floor. Where was Delaney bleeding?" The latter question requires a confabulated response, because, although Delaney did fall off a chair in the video, he clearly did not bleed (nor in fact was there any indication that he hurt himself in any way). Participants in the forced condition were instructed that they must provide an answer to each question, even if they had to guess.

One week later, a different experimenter gave participants a source memory test designed to assess whether they misremembered witnessing the items they had in fact confabulated (e.g., whether participants who provided the forced guess that Delaney's elbow was bleeding would later misremember having seen Delaney's elbow bleeding in the video). One concern was that participants might say they remembered witnessing the details they had confabulated earlier, not because they had a genuine false memory for these events, but because it was socially desirable to behave consistently across test situations. In other words, participants might be reluctant to admit they never saw the events they had described earlier because they may find it unflattering to concede that they could be pressured into making things up. In order to minimize any such reluctance on participants' part, we told participants prior to taking the test that the experimenter who had asked them questions about the video had made some mistakes and had asked them about some things that never happened in the video. We further informed them that their task was to help us figure out which things really happened in the video and which things did not. Note that in setting up the task demands in this way, any perceived social desirability associated with claiming that the confabulated items were in the video should have been largely eliminated.

Because our primary interest was determining whether forced confabulation leads to false memory, it was also important to take into consideration participants' base rate of assenting to these confabulated events. To this end, each participant was yoked to a partner from the same age group and gender who had answered a different set of false-event questions. At the time of test, both members of each yoked pair were asked to judge the source of the new items their partner had confabulated (hereafter referred to as yoked control items). The measure of base-rate error was participants' tendency to claim they remembered witnessing these novel control items in the video. Because there was no way of predicting in advance what sorts of confabulations participants would generate, this yoking procedure provided a way of getting an estimate of base-rate error that took into account the various types of confabulations participants actually generated. A second reason for including measures of base-rate error is that it allows one to control for potential age differences in response biases that might contaminate measures of memory performance.

Finally, we note that in addition to the forced condition described above, one third of the participants in each age group were assigned to a free condition. Whereas participants in the forced condition were required to provide an answer to every question, participants in the free condition were explicitly instructed to respond to only those questions they could answer without guessing. The inclusion of a free condition served two purposes. First, the group was necessary to establish that participants in the forced condition were truly forced. Although the false-event questions were about events that clearly did not occur in the video, it was important to verify that participants perceived this to be so by showing that they would refrain from answering these questions if given the option of doing so. Because a large number of participants were not required to show this, only a third of the participants in each age group were assigned to the free condition. A second reason for including the free condition was to assess potential age differences in the tendency to confabulate responses.

Method

Participants

A total of 297 participants from three age groups participated. Of these participants, 14 first graders and 12 college participants were eliminated for any one of the following reasons: they had seen the video previously, they did not return for the final memory test, or they were yoked to a participant who did not return for the final memory test. In addition, 1 first-grade participant in the forced condition was eliminated because she could not be persuaded to answer a single false-event question. Thus, only the data of 270 participants were included in the final analyses. Ninety-six first-grade children (M = 7 years 2 months; range = 6 years 4 months to 8 years 4 months) and 72 third- and fourth-grade children (M = 9 years 6 months; range = 8 years 5 months to 11 years 10 months) were volunteers recruited from three area parochial schools. College participants were 102 Kent State University undergraduates (M = 21 years 1 month; range = 17 years 11 months to 41 years 5 months) who participated to fulfill a course requirement in General Psychology. Approximately one third of the participants in each age group were assigned to the free condition (first grade, n = 28; third/fourth grade,

n = 22; college, n = 30), whereas the remaining participants in each group were assigned to the forced condition (first grade, n = 68; third/fourth grade, n = 50; college, n = 72).

Materials and Procedure

Phase 1: The "eyewitness event." All participants first watched a video that was a 9-min excerpt from the Walt Disney movie "Looking for Miracles." This movie depicts a young boy's experience at a summer camp where his older brother is a camp counselor (see also Ackil & Zaragoza, 1995). The video segment contained three distinct events—a birthday celebration in the camp dining hall, a boat trip where the passengers were surprised by the appearance of a snake, and a quarrel among three of the campers. Participants watched the video with another participant and with two experimenters present. Immediately following the video, participants were told that the experimenters wanted to review the events of the video with them. Participants were separated at this point and tested individually for the remainder of the experiment.

Phase 2: Postevent questioning. Immediately following the video, all participants were instructed that they would be asked some questions about the events they had seen in the video. Those assigned to the forced condition were told to provide an answer to every question and to guess if they did not know the answer. Participants assigned to the free condition were told to answer only those questions for which they were certain of the response and were instructed not to guess. Otherwise, participants in the free and forced conditions were treated identically. All participants were audiotaped during the questioning phase to insure that there was a complete and accurate record of their responses.

A transcript of the questioning phase appears in Appendix A. All participants were first asked two sets of warm-up questions regarding how much they liked the video and whether they had seen it before, and the names of the two main characters. Then the experimenter reviewed 12 of the main events of the video in chronological order, pausing occasionally to ask the participants a question. Each participant was asked five true-event questions and three false-event questions. The true-event questions were straightforward questions about highly salient events from the video and all participants answered the same five questions. The false-event questions were questions about events that clearly never transpired in the video but were somewhat plausible given the story line of the video. For example, the false-event question "What did the boy say Sullivan had stolen?" was posed after discussing an actual scene where several young boys were yelling and fighting with the main character, Sullivan. Although the video did not depict Sullivan stealing anything, nor did any of the characters ever accuse Sullivan of stealing, this false event was nevertheless plausible given that a heated argument between the boys had in fact occurred. There were two sets of three false-event questions, and for each pair of yoked participants, one member was asked one set of three false-event questions and the yoked partner was always asked the alternate three (see Appendix A). Across the experiment an equal number of participants were exposed to each of the six false-event questions.

The elementary school-age children were asked an additional false-event question at the very end of the interview session, "What color was the bear that Sullivan bumped into at the top of the hill?" This question concerned a highly implausible event and was designed to alert the child participants that some of the things they were asked about clearly did not occur in the video they saw. College participants were not asked this question so as not to reduce the credibility of the experimenter.

Phase 3: Source memory test. One week later participants returned for the source memory test. The experimenter who administered the source test was different from the experimenter who questioned the participants previously. This was done so that participants would not have to point out inaccuracies to the person who had posed the false-event questions.

Prior to the final source test, all elementary school-age participants were given a 5-min sorting task. This task has been used previously (Ackil & Zaragoza, 1995) and served several purposes. First, the format of the task was designed to familiarize the young participants with the format of the source test. Second, because all of the participants were successful in performing this task accurately, we established that the children who participated in this study were capable of understanding that individual items can come from one, both, or neither of two source categories. Such an understanding is a prerequisite for meaningful performance on the source test.

During the filler task, children were presented with four pairs of objects (e.g., two apples, two toy fire trucks, two oranges, two green blocks), and for each object in the pair, they were asked whether it belonged in each of two category bags (e.g., "Does an apple belong in the red-things bag? Does an apple belong in the fruit bag?"). Note that the four pairs of objects corresponded to the four possible types of responses to the source test items (i.e., yes–yes, yes–no, no–yes, no–no). Each child participant performed this task twice with different categories and objects each time.

Following the sorting task, participants were first asked whether they remembered watching a video the week before and whether they remembered talking to the other experimenter about the video afterward. Participants were then told that the experimenter who had asked them questions about the video a week ago had made some mistakes and had asked about some things that never happened in the video. They were told that their job was to help figure out which things had really happened in the video and which things had not by answering some questions. The experimenter then asked two yes–no questions regarding the source of each test item: (a) "When you talked to (experimenter's name), did you talk about ____?" (e.g., Delaney's elbow bleeding) and (b) "When you watched the video, did you see ____?" (e.g., Delaney's elbow bleeding). All participants were tested on the source of 16 items queried in chronological order. In addition, before beginning the source test proper, the first-grade and third/fourth-grade participants were also tested on their memory for the source of the "bear" item. Because it was obvious to the vast majority of the first and third/fourth graders that there was no bear in the video, we assumed that having the children answer this question first would help reinforce our claim that some of the events they had discussed with the experimenter were false.

Participants in the forced condition were tested on the source of items from four source categories. Specifically, for each participant the test was comprised of (a) the three confabulated items that the participant had generated in response to the three false-event questions (talked about only), (b) the three control items that the participant's yoked partner had confabulated in response to the alternate set of three false-event questions (neither talked about nor in video), (c) the five items that the participant had provided in response to the five true-event questions (talked about and in video), and (d) five items that were in the video but were not mentioned during the questioning phase (video only).

For participants in the free condition, the items that constituted the source test were somewhat different. Recall that participants in the free condition were not required to answer the true- or false-event questions, and, consequently, all participants in this condition refrained from answering at least some of the questions. In those cases where participants failed to provide an overt response to a question, the source test contained an item that was judged to be a likely response to that question (hereafter referred to as experimenter-generated items). These experimenter-generated items were the same for all participants (see Appendix A). In this way, the free participants' source test was similar to that of forced participants, in that it was made up of four types of items: (a) three items that corresponded to the three false-event questions (these included any items the participants freely confabulated as well as experimenter-generated items for false-event questions not answered), (b) three experimenter-generated control (new) items that corresponded to the three false-event questions the participant was not asked, (c) five items that corresponded to true-event questions (participant-generated responses to the five true-event questions as well as experimenter-provided true items for true-event questions not answered), and (d) five items seen only in the video.

Results

Preliminary analyses revealed that there were no gender differences on any of the dependent measures. For this reason, we report the results collapsed across gender.

Would Participants Have Fabricated Responses Had They Not Been Forced to Do So?

The purpose of the present study was to assess the cognitive consequences of forcing participants to knowingly confabulate information about a witnessed event. For this reason, it was necessary to first establish that participants in the forced condition were fabricating responses they would not have created had they not been "forced" to do so. Although the false-event questions could not be answered without confabulating, it was nevertheless important to establish that participants realized they did not know the answers to these questions.

To this end, we examined the proportion of times participants in the free condition answered the false-event questions that were posed to them. Because participants in the free condition were not required to answer these questions, their response rate provides an estimate of participants' willingness to answer these questions. Overall, participants in the free condition provided answers to the false-event questions only 15% of the time. (In contrast, they answered the true-event questions 99% of the time.) Interestingly, there were no significant age differences in the frequency with which participants freely responded to the false-event questions (mean proportions of freely confabulated responses were .17, .18, and .09 for the first graders, third/fourth graders, and college participants, respectively, $F(2, 77) = 2.119$, $MSE = 0.290$, $p > .10$. Thus, the finding that participants in the free condition refrained from answering the vast majority of the false-event questions lends support to our assumption that, in requiring forced-condition participants to answer these questions, we had in most cases forced them to knowingly make things up.

Did Children Come to Misremember Witnessing Details They Knowingly Confabulated Earlier?

The question of primary concern in this study was whether participants would come to misremember witnessing the details they knowingly confabulated earlier.[2] To answer this question, we assessed the mean proportion of times forced-condition participants in each age group incorrectly claimed to remember witnessing the items they had confabulated previously, as measured by their "yes" responses to the "saw in the video" question (see Figure 1). As a control comparison, the figure also depicts the mean proportion of times participants in each age group misattributed these same items when they were new (i.e., yoked control items). Inspection of the figure reveals clear evidence of false memory for the confabulated details in each age group, in that participants were more likely to claim they remembered witnessing the confabulated items than the control items. This observation was confirmed by an analysis of variance (ANOVA), which revealed a significant main effect of item type (Ms = .35 and .17 for the confabulated and control items, respectively), $F(2, 187) = 69.499$, $MSE = 0.420$, $p < .0001$. Moreover, the magnitude of this confabulation effect varied with age, as evidenced by a highly significant Age × Item Type interaction, $F(2, 187) = 8.338$, $MSE = 0.420$, $p < .001$. Planned comparisons confirmed that there was a significant forced confabulation effect in each age group (all ps $< .03$). Thus, although there were age differences in the magnitude of this effect, no age group was immune to these errors.

To assess the nature of the Age × Item Type interaction, we conducted simple effects analyses on participants' responses to the confabulated and control items. Considering performance on the confabulated items first, the analysis revealed significant age differences in participants' tendency to claim they remembered seeing confabulated items in the video, $F(2, 187) = 33.353$, $MSE = 0.640$, $p < .001$. Tukey's honestly significant difference post hoc comparisons further revealed that the children were more likely to make this error than college participants, and that the first graders were in turn more likely to make this error than the third/fourth-grade participants (all ps $< .01$). However, there were also significant age differences in participants' misattributions of control items to the video, $F(2, 187) = 9.859$, $MSE = 0.404$, $p < .0001$. Post hoc analyses revealed that first-grade participants made more errors than both the third/fourth graders and the college participants (ps $< .05$), whereas the latter groups did not differ from each other ($p > .3$).

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[2] On examination of the items confabulated by participants in the forced condition, it became apparent that there were several instances where participants seemed to misunderstand the incident referred to in the false-event question. For example, when asked the question "What present did the boy get for his birthday?" several participants (4 first graders, 2 third/fourth graders, and 2 college participants) responded with the item "chair." Given that chairs are generally not thought of as children's birthday gifts, and because the film depicted a chair that was given to the head counselor to stand on immediately after the birthday scene, we assumed that participants had misinterpreted the scene that the question referred to. For this reason, participants' final test responses (and those of their yoked control partners) to this item (i.e., chair) were eliminated from the analyses discussed below. Similarly, when answering this same question, 1 participant (first grader) said that the boy got to go to camp for his birthday and 4 participants (3 first graders and 1 third/fourth grader) said he received a cake. Because both of these responses referred to events that were true of the video (i.e., he did receive a cake and was already at camp), participants' test responses to these items were eliminated from the analyses as well. It should be noted that eliminating these responses meant that these participants had fewer opportunities to make source misattribution errors. Moreover, the proportions of misattributed confabulations reported and displayed in the figures were all calculated as if participants had three opportunities to make an error. Hence, this was a conservative way of remedying the situation. Finally, there were 4 participants in the forced condition (3 first graders and 1 third/fourth grader) who did not provide answers to all three false-event questions. For these participants, experimenter-generated items corresponding to the questions they did not answer were included on their source tests. However, their performance (and that of their yoked control partner) on these items was not included in the error analyses discussed below.

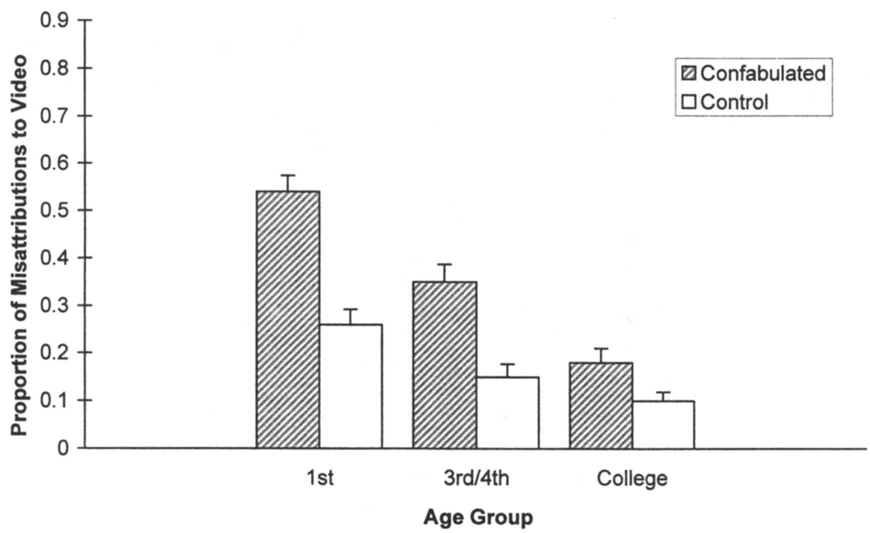

Figure 1. Mean proportion of times forced-condition participants in each age group misattributed confabulated and control items to the video as evidenced by "yes" responses to the "saw in the video" question. Error bars indicate standard error.

The finding that third/fourth-grade participants did not differ from the college participants in their base rate of misattribution errors provides clear evidence that these children's greater tendency to accept the confabulations as real was not due to age differences in response bias. Rather, the results show that, relative to adults, these children were more prone to confuse their confabulations for actually experienced events. However, because the first- and third/fourth-grade groups differed from each other on both confabulated and control items, a separate analysis was conducted on these two groups alone to assess potential age differences among the elementary school-age participants. This analysis failed to reveal a significant Age × Item Type interaction, $F(1, 116) = 2.609$, $MSE = 0.457$, $p > .10$, thereby showing that, although the first-grade participants made more errors overall, the magnitude of the forced confabulation effect was not greater for the first-grade children than the third/fourth-grade group.

Another approach to assessing whether forced confabulation leads to false memory is to examine misattribution errors as a function of false-event questions. In this way, one can assess whether the deleterious effects of forced confabulation were consistent across the various types of confabulations participants were required to produce and whether there were age differences in this regard. Table 1 displays the mean proportion of times forced-condition participants in each age group misattributed the items corresponding to each of the six false-event questions as a function of whether the items were self-generated confabulations or whether the same items were new (control items). Separate ANOVAS conducted for each of the six false-event questions revealed a significant forced confabulation effect for items corresponding to five of the six questions (see Table 1; $ps < .05$). There was no evidence of a forced confabulation effect for items corresponding to the question "What did Delaney give to Sullivan to keep warm?" ($p > .10$), most likely because of the high base rate of misattribution errors to control items. In sum, the forced confabulation effect occurred fairly consistently across the diverse types of items participants were required to fabricate.

Interestingly, there were two cases in which the forced confabulation effect interacted with age. Specifically, this interaction was highly significant for items corresponding to the question

Table 1
Mean Proportion of Times Forced-Condition Participants in Each Age Group Claimed to Remember Seeing the Items That Corresponded to Each of the Six False-Event Questions When the Items Were Self-Generated Confabulations (C) and When the Same Items Served as Yoked Controls (Y)

False-event question	Item type	Age group: 1st grade	3rd/4th grade	College
What present did the boy get for his birthday?	C	.29	.19	.14
	Y	.17	.10	.03
What did the boys throw to help the ladies out of the water?	C	.82	.60	.39
	Y	.27	.08	.33
What animal followed Delaney?	C	.41	.16	.03
	Y	.18	.12	.03
Where was Delaney bleeding?	C	.44	.28	.14
	Y	.09	.00	.03
What did the boys say Sullivan had stolen?	C	.55	.28	.22
	Y	.21	.04	.08
What did Delaney give to Sullivan to keep warm?	C	.85	.60	.14
	Y	.68	.60	.08

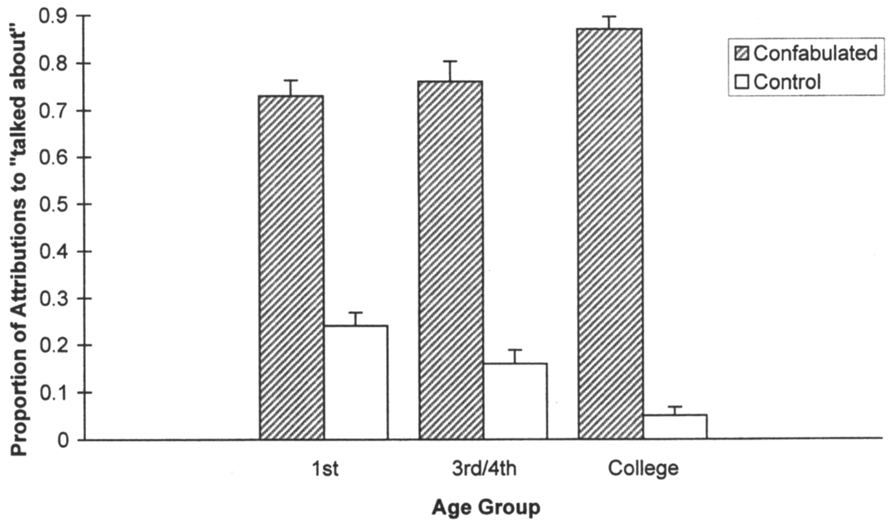

Figure 2. Mean proportion of times forced-condition participants correctly attributed confabulated items to the postevent interview as evidenced by "yes" responses to the "talked about with experimenter" question. Misattributions of control items to "talked about with the experimenter" are included for comparison. Error bars indicate standard error.

"What did the boys throw to help the ladies out of the water?" $F(2, 184) = 6.807$, $MSE = 0.195$, $p < .01$, and was marginally significant for items corresponding to the question "What animal followed Delaney?" $F(2, 184) = 2.664$, $MSE = 0.119$, $p = .079$. Post hoc analyses revealed that college participants did not show a forced confabulation effect for items corresponding to the former question, and neither third/fourth-grade participants nor college-age participants evidenced a forced confabulation effect for items corresponding to the latter question. Consistent with these findings, no third/fourth-grade participants assented to the highly implausible bear suggestion, although 4 first-grade participants claimed to remember seeing a bear in the video.[3] In sum, first-grade participants tended to misattribute a wider variety of confabulated events to the video than did either third/fourth-grade or college-age participants.

Were There Age Differences in Participants' Ability to Remember the True Source of Confabulated Items?

We also assessed potential age differences in participants' ability to remember the actual source of the confabulated items, as measured by their "yes" responses to the "talked about with the experimenter" question. Note that the foregoing analyses of misattribution errors are not informative with regard to participants' memory for having talked about the confabulated items with the experimenter. It was possible for participants to respond "yes" to both questions, thereby simultaneously committing an error (misattributing the confabulated item to the video) and a correct response (correctly remember talking about it), and indeed, many participants did so. Hence, Figure 2 illustrates the mean proportion of times forced-condition participants in each age group answered "yes" to the "talked about with experimenter" question for both confabulated and control items. Not surprisingly, participants were more likely to claim they remembered talking about the confabulated items ($M = .79$) than the (novel) control items ($M = .15$), $F(1, 187) = 860.248$, $MSE = 0.393$, $p < .001$. More important, this effect significantly interacted with age, $F(2, 187) = 22.477$, $MSE = 8.824$, $p < .001$. Simple effects analyses revealed age differences in responses to both items, $F(2, 187) = 5.465$, $MSE = 0.619$, $p < .005$; $F(2, 187) = 15.755$, $MSE = 0.361$, $p < .001$, for confabulated and control items, respectively. Post hoc analyses showed that the college group was more accurate than both groups of children on both confabulated and control items ($ps < .05$), whereas the elementary-school-age participants' performance was comparable on both items ($ps > .05$). Thus, college participants demonstrated better memory for having talked about the confabulated items than the children.

In the foregoing analyses we have considered participants' responses to each of the two source test questions separately, considering all misattributions to the video erroneous responses and all attributions to "talked with the experimenter" accurate responses. What cannot be discerned from the foregoing analyses is the extent to which participants were completely accurate (by claiming that they talked about the confabulated items but never saw them) or the extent to which participants' responses were completely erroneous (by claiming that they saw the confabulated items but did not talk about them). The relevant data are presented in Table 2, which reports participants' joint responses to the two source questions when queried about the source of the confabulated items (i.e., the proportion of times

[3] If the data from the 4 first-grade participants who claimed to remember seeing a bear are excluded from the analyses, the results are virtually identical to those of the entire first-grade sample (e.g., misattributions of self-generated confabulations to the video were .54 when excluded and .53 for the entire sample, and misattributions of yoked control items were .25 and .26, respectively).

Table 2
Distribution of Forced-Condition Participants' Joint "Yes" (Y) and "No" (N) Responses to the Two Source Questions for Each Age Group When Queried About the Source of Self-Generated Confabulations

	Source question and response			
	Talk | saw[a]	Talk | saw	Talk | saw	Talk | saw
Age group	Y N	N Y	Y Y	N N
1st grade	.29 (.08)	.09 (.09)	.49 (.18)	.13 (.64)
3rd/4th grade	.49 (.10)	.06 (.08)	.30 (.08)	.16 (.75)
College	.72 (.03)	.03 (.08)	.14 (.02)	.10 (.87)

Note. Base-rate responses to control items are provided for comparison in parentheses. Talk = ''talked about with the experimenter''; saw = ''saw in the video.''
[a] Denotes completely correct response.

participants responded ''yes'' to the ''talked about'' question only, ''yes'' to the ''video'' question only, ''yes'' to both questions, and ''no'' to both questions) as a function of age. The results converge with the foregoing analyses in showing that the children were much less likely than adults to correctly claim that they only talked about the confabulated items, $F(2, 187) = 44.098$, $MSE = 0.418$, $p < .001$. Interestingly, there was no evidence that participants from any age group were prone to completely misattributing the confabulations by claiming they were in the video only. In all age groups the tendency to make this error did not exceed the base-rate level of this response. Finally, even when base-rate differences in performance were considered, children were more likely than adults to erroneously claim that the confabulated items were both in the video and discussed with the experimenter, as evidenced by a significant interaction between age and item type, $F(2, 187) = 6.430$, $MSE = 0.371$, $p < .002$.

Given the age differences in participants' ability to accurately monitor the source of confabulated items, we examined the specific types of confabulations participants produced in response to each question to determine whether there were systematic age differences in the nature of the confabulations generated (see Appendix B for a complete listing of the confabulations generated in each age group to one of the false-event questions). Inspection of participants' responses showed that the items generated by the younger participants were from the same categories as those produced by the college-age participants. Moreover, the high-frequency responses to each question tended to be the same for all age groups, and there was no obvious association between age group and the number of different responses provided to the questions. The high degree of consistency in response type was most likely the consequence of the restrictive nature of many of the false-event questions. For example, the only logical responses to the question ''What did Delaney give to Sullivan to keep warm?'' were a type of clothing, a blanket, or a towel, and these were precisely the items that participants produced. Furthermore, when participants were asked questions that allowed for a wider variety of responses, participants of all ages tended to produce items that were in line with the events depicted in the video. In sum, there was no clear evidence that the types of confabulations participants' produced varied with age.

Did Mere Exposure to False-Event Questions Have Negative Consequences for Memory?

Although of secondary interest, we also assessed whether mere exposure to the false-event questions might have negative consequences for memory, even if participants refrained from producing an overt response. There are several reasons why this might be the case. First, participants who are asked false-event questions are likely to entertain potential answers, even if they eventually refrain from answering the questions. To the extent that the test items correspond to the items participants thought about, they may be prone to confusing these details with those they actually witnessed (cf. Johnson & Raye, 1981). A second possibility is that the partial overlap between the false-event questions and the test probe produces a feeling of familiarity that leads participants to assent to the novel false detail. For example, a participant who was asked where Delaney was bleeding may be more likely than a participant who was not asked this question to assent to the false detail that Delaney's elbow was bleeding, simply because prior exposure to this false question makes the notion that Delaney bled familiar and, hence, seem true (cf. Brainerd & Reyna, 1996). Note that the control data from the forced condition do not address this issue because these participants were never asked the false-event questions that corresponded to the control items. Thus, it remains an open question whether simply being asked the false-event question might predispose participants to misremember witnessing details that, although novel, are consistent with the presupposed false event.

To address this possibility, we examined free-condition participants' tendency to misattribute the false test items to the video, as a function of whether they had been exposed to the related question (note that this analysis was restricted to those cases where participants refrained from answering the false-event question). Recall that, for free-condition participants, the source test always included novel experimenter-generated items that corresponded to the false-event questions the free-condition participant had refrained from answering, and three items corresponding to the false-event questions the participant had never been asked. The results showed that participants were more likely to misremember witnessing a false detail if they had been asked the corresponding false-event question ($M = .20$) than if they had not ($M = .13$), $F(1, 77) = 3.883$, $MSE = 0.043$, $p = .05$. Interestingly, although there was a main effect of age, $F(2, 77) = 4.966$, $MSE = 0.506$, $p < .01$, the magnitude of the exposure effect did not vary significantly with age ($p > .05$). Thus, whereas the forced confabulation manipulation had a greater effect on the elementary school participants relative to the college participants, mere exposure to the false-event questions affected participants of all ages to the same extent.

The above findings raise an interesting question. Does forcing children to answer questions about nonevents render them more or less prone to memory distortions than simply asking such questions and not pressuring them to respond? On the one hand, one might reason that children who were forced to confabulate responses might remember that these items are false because of the discomfort they presumably experienced at the time they fabricated them. On the other hand, there is evidence to suggest that overt commitment to an incorrect response can have detrimental consequences on later memory performance (see, e.g., Hastie, Landsman, & Loftus, 1978; Roediger, Jacoby, & McDermott, 1996; Schooler, Foster, & Loftus, 1988, for relevant studies with adults). These latter studies are consistent with the possibility that overt production of an incorrect response might increase confusion later on.

Although this question is beyond the scope of the present study, a direct comparison of performance in the free and forced conditions can provide preliminary evidence that bears on this issue. Because participants in both the free and forced conditions were asked the same false-event questions, any differences in their tendency to misattribute false-event items to the video can be ascribed to the forced manipulation. (Note that misattributions to novel control items did not vary as a function of condition [free vs. forced; $p > .20$]). Before reporting the results of this comparison, we emphasize that because this study was not designed to address this specific issue, there are several uncontrolled differences between the groups that compromise our ability to draw strong conclusions. First, there were more than twice as many participants in the forced group than in the free group. Second, the false-event test items were not matched across conditions. Whereas forced-condition participants were always tested on the items they themselves had confabulated, in most cases free-condition participants did not answer the false-event questions, and hence were tested on a standard set of experimenter-generated items (see Appendix A). With these caveats in mind, we analyzed the mean proportion of times participants in each condition misattributed the false-event test items to the video. Note that in this analysis free-condition performance included participants' responses to all the items that corresponded to the false-event questions, without regard to whether they had freely responded to the false-event question. This was done under the assumption that a roughly equal proportion of forced participants' responses were also freely generated. The analysis revealed that forced-condition participants made more misattribution errors than free-condition participants (Ms $= .36$ and $.28$, respectively), $F(1, 264) = 4.812$, $MSE = 0.612$, $p < .05$. The interaction with age was not statistically reliable, $F(2, 264) = 2.0$, $MSE = 0.612$, $p = .133$. Thus although preliminary, the results are consistent with the hypothesis that forcing participants to answer the false-event questions increases their susceptibility to memory distortions.

Developmental Differences in Memory for the Source of Other Items

Although of ancillary interest, we also assessed potential age differences in participants' memory for the source of the remaining test items. This included true-event items (i.e., items seen in the video that participants were asked about in the true-event questions) and those test items that were seen in the video but not mentioned during the questioning phase (video only). Performance on these items was analyzed separately. Because there was no case in which free- and forced-condition participants differed in their performance on these types of items (all ps $> .05$), the analyses reported below were collapsed across condition (cf. Howe, Courage, & Peterson, 1995, for other evidence that exposure to incorrect information does not necessarily lead to differences in the amount of correct information recalled).

True-event items. Prior to reporting performance on the source test, we first note that all participants, regardless of age, readily provided accurate responses to the true-event questions, and in fact performance was nearly perfect for all age groups (means collapsed across condition: .98, 1.00, and .99 for first graders, third/fourth graders, and college participants, respectively). The top panel of Table 3 depicts participants' responses to the two source questions, as a function of age, when asked about true-event items. Interestingly, an analysis of age differences in participants' correct source performance (in this case responding "yes" to both source questions) revealed that college participants were less likely to respond correctly than the child participants, $F(2, 267) = 6.352$, $MSE = 0.816$, $p < .01$, because they were more likely to attribute these items to the video only, $F(2, 267) = 7.969$, $MSE = 0.794$, $p < .001$ (both post hoc ps $< .01$). Perhaps providing answers to the true-event questions was so easy for the adult participants that they were less likely to remember discussing these items with the experimenter. Alternatively, this finding may reflect more conservative source judgments on the part of the college participants.

Video-only items. Participants' responses to the video-only items are shown in the lower panel of Table 3. Analysis of participants' correct performance on video-only items (in this case responding "yes" to the "saw in the video" question and "no" to the "talked about" question) revealed a significant main effect of age, $F(2, 267) = 105.305$, $MSE = 1.629$, $p < .001$, such that first graders were less accurate than both the third/fourth-grade and college groups (both ps $< .001$) and the third/fourth graders were in turn less accurate than the college-age participants. It should be noted that the reason for this age difference was that the elementary school participants were more likely to incorrectly claim that they both saw and talked about the video-only items than the college participants, $F(2, 267) = 137.861$, $MSE = 1.508$, $p < .001$. So, it was not the case that the younger participants had trouble identifying

Table 3
Distribution of Participants' Joint "Yes" (Y) and "No" (N) Responses to Source Test Questions for Each Age Group When Asked About True-Event and Video-Only Items

	Source question and response			
	Talk | saw	Talk | saw	Talk | saw[a]	Talk | saw
True-event items	Y N	N Y	Y Y	N N
Age group				
1st grade	.004	.07	.92	.004
3rd/4th grade	.01	.09	.90	.000
College	.002	.17	.83	.002

	Source question and response			
	Talk | saw	Talk | saw[a]	Talk | saw	Talk | saw
Video-only items	Y N	N Y	Y Y	N N
Age group				
1st grade	.05	.19	.65	.11
3rd/4th grade	.02	.34	.58	.06
College	.01	.70	.11	.18

Note. Proportions are collapsed across conditions. Talk = ''talked about with the experimenter''; saw = ''saw in the video.''
[a] Denotes completely correct response.

the video as the source of these items. Rather, their error was in misattributing these items to the questioning phase as well.

In sum, the assessment of performance on ''filler'' test items shows that children's source-monitoring difficulties were not limited to the confabulated items. Rather, the children were in general less capable than adults at distinguishing the contents of the video from the contents of their interview with the experimenter.

Discussion

Previous studies have amply demonstrated that exposing children to misinformation about an event they have witnessed can lead to false memory for suggested details (see Bruck, Ceci, & Hembrooke, 1998; Ceci & Bruck, 1993; and Qin, Quas, Redlich, & Goodman, 1997, for reviews). The present study extends these earlier findings by identifying forced confabulation as another potent suggestive influence. In this study, participants who were forced to answer questions about events they had never witnessed later came to misremember as real some of the details they had knowingly confabulated. Moreover, there were age-related changes in participants' tendency to confuse confabulated information for actually perceived events. The resultant age differences were such that both groups of children were more likely to misremember witnessing confabulated details than the college participants, and the first- and third/fourth-grade participants did not differ from each other. However, the adults were not immune to these errors, and as such the age differences were relative ones.

In some ways these findings are surprising. One might reasonably expect that forcing children to fabricate details about fictitious events should protect them from misremembering the source of their confabulations later on. This is because their memories of the confabulated details should preserve information about the context in which they were generated, a context that should have made it salient that the confabulations were made up. Specifically, one might expect participants' memories of the confabulated details to be associated with memories of having resisted the experimenter's requests, feelings of discomfort at having to make things up, as well as memories of the cognitive operations that went into generating plausible responses to the experimenter's questions (e.g., considering alternative responses). Although it is probably the case that all situations involving exposure to misinformation produce some degree of uneasiness, we assume that interview situations where participants are forced to confabulate responses are likely to produce much greater levels of discomfort. The following transcript from an interview with a third-grade participant is useful in illustrating the sort of resistance the children in this study exhibited when forced to answer the false-event questions:

> Experimenter: What did the boy say Sullivan had stolen?
> Participant: Ahh, I forget what that was.
> Experimenter: Oh, can you just take a guess then?
> Participant: Mmm, no, I don't think so.
> Experimenter: Well, what do you think would make him really mad if Sullivan had stolen it?
> Participant: Ahh, maybe like a radio or something?
> Experimenter: O.K.

Interestingly, in spite of the resistance documented here, 1 week later this participant misattributed the confabulated incident regarding the stolen radio to the video. Although not all of the participants expressed their resistance as explicitly as this child did, the vast majority of participants resisted responding to the false-event questions initially (e.g., by remaining quiet) and had to be encouraged to guess. In fact, 92% of the first graders, 96% of the third graders, and 69% of the college participants had to be probed twice or more by the experimenter on at least one of the false-event questions in order to elicit a response.

The above example notwithstanding, it is also true that participants in the free condition did not always refrain from answering the false-event questions. Overall, free-condition participants freely responded to the false-event questions 15% of the time. It might therefore be argued that participants in the forced condition were not always forced to fabricate responses to these questions, and hence that some of these items were not knowingly confabulated. We note in this regard that the extent to which participants freely responded to the false-event questions varied somewhat as a function of question. Hence, participants apparently felt more forced by some of these questions than others. Fortunately, however, there were two false-event questions that free participants uniformly resisted answering. Specifically, no participant in the free condition freely answered the question "What did the boys say Sullivan had stolen?" and only 1 participant in the free condition (a first grader) freely answered the question "What present did the boy get for his birthday?" If one restricts the analysis to the items corresponding to these two questions, the conclusion is the same as when all the data are considered. Inspection of Table 1 clearly shows that, for both the "present" and "stolen" false-event questions, participants from all three age groups showed a clear tendency to misattribute their confabulated responses to the video. Thus, one contribution of the present study is that it provides evidence of false memories for details that participants would not have confabulated had they not been forced to do so.

We interpret these results as evidence of genuine false memories for the following reasons. First, we have established that participants' misattribution errors, and the age trends we have documented, are not simply the result of careless responding or a bias to acquiesce on the test. In all age groups, the tendency to misattribute confabulated details to the video far exceeded the base rate of false alarms, although the increase was larger for children than for the adults. Second, our procedure should have eliminated any perceived demand to report that the confabulated details were real. Specifically, we warned participants at the time of test that they had been asked questions about some things that never happened in the video, and we told them that their task was to help us figure out which things really happened in the video and which things did not. Moreover, prior to the source test proper, we queried the children about their memory for the highly improbable bear item. The finding that the vast majority of child participants correctly indicated that they had talked about a brown bear, but had not seen a brown bear in the video, supports our contention that the children understood the warning and were able to identify some of the confabulations as such. Hence, it is highly unlikely that participants' erroneous claims about having witnessed the confabulated incidents were the product of demand. Studies have shown that suggestibility effects are sometimes eliminated (or drastically reduced) when participants are made aware that they may have been exposed to misinformation (Ceci, Loftus, et al., 1994; Lindsay, 1990; Lindsay, Gonzales, & Eso, 1995; Newcombe & Siegal, 1996), or when they are explicitly instructed to discriminate what they've seen with their own eyes from information acquired elsewhere (Leichtman & Ceci, 1995). Thus, we suspect that the level of suggestibility reported here is an underestimate of the rate of false reporting that is likely to be observed when participants are pressured to conform and/or are encouraged to use looser response criteria.

Developmental Differences

This study identified several ways in which children's memories for the events they experienced differed from those of the adults, all of which likely contributed to the children's higher error rate. First, given that the children were more prone to misattributing their confabulations to the video, it seems reasonable to conclude that the children were less likely to remember that they had fabricated these items. Presumably, participants who knew that the test item was something they had made up would not claim that it was part of the witnessed event. Second, the children were also less likely to remember that these items had been discussed during the interview at all. It is striking that in spite of their bias to respond "yes" to the source test questions, both groups of children were nevertheless more likely than adults to say "no" when asked whether they remembered talking about the confabulated incident with the experimenter. In contrast, the children were not more likely than adults to claim that they never experienced the confabulated incident (by responding "no" to both source test probes; see Table 2). Hence, it is not simply the case that the children remembered nothing about the confabulated items. Rather, they evidenced a relatively selective deficit in their memory for the origin of the confabulated information. Although poor source memory is not a prerequisite for source misattribution errors in situations like this one, where the two sources are not mutually exclusive (cf. Ackil & Zaragoza, 1995), it is well documented that paucity of information regarding a memory's true source renders it more vulnerable to misattribution.

However, "source amnesia" is not the whole story regarding the developmental differences observed here. It is also true that the children were more likely than adults to erroneously claim that they both talked about and witnessed the confabulated items (see Table 2). Relative to the adults, the children appeared to have greater difficulty differentiating between what they actually saw and what they discussed in the postevent interview, leading them to attribute information gleaned from only one of these sources to both. This latter finding is consistent with the finding in the source-monitoring literature that developmental differences in source monitoring are most likely to be observed when children attempt to discriminate between sources containing a great deal of overlap. For example, it is well documented that children make more source misattribution errors than adults in discriminating between imagined and perceived events, if the same person is the participant of both memories (e.g., Foley & Johnson, 1985; Foley et al., 1983; Lindsay et al., 1991). Similarly, Lindsay et al. (1991) found that young children (ages 4 and 6) made more errors than adults when they were asked to discriminate between two speakers who discussed similar aspects of the same story. Participants in the present study were also required to discriminate between sources containing substantial overlap. For example, the postevent questions were about the very same characters and events the participants had witnessed in the video. Moreover, because participants were asked to answer questions about the witnessed event, attempts to answer these questions (whether participants knew the answer or not) were probably accompanied by active rehearsal and mental reconstruction of the witnessed event. Reflecting on the events of the video while attempting to answer the questions probably served to increase the overlap between the two sources even further.

Although we have emphasized children's greater tendency to err on the source test, there were other ways in which their performance was comparable to that of adults. For example, in the free condition, the children did not differ reliably from adults in their ability to withhold responses to the false-event questions (i.e., to say "I don't know"), thus showing that the children were quite accurate at assessing their knowledge state. In the forced condition, the children generated responses to the false-event questions that were highly appropriate and virtually indistinguishable from those generated by the adults. Finally, in both conditions, children were just as likely as adults to provide correct responses to the true-event questions.

More informative, however, was the finding that children's source-monitoring performance was not always worse than adults. For instance, merely asking free-condition participants the false-event questions (relative to situations where the participants were never exposed to the questions) increased misattribution errors in all age groups to the same extent. This finding stands in contrast to the effect of the forced confabulation manipulation, which led to a disproportionate increase in errors among the children. This divergence in the pattern of results suggests that the age differences we observed centered on participants' memory for the confabulated incidents they had generated specifically and were not merely a reflection of a more global source-monitoring deficit.

Why, then, were the children more prone to confusing their confabulations for actually perceived events? According to the source-monitoring framework (Johnson et al., 1993; Johnson & Hirst, 1993), source monitoring is not a single ability but involves a variety of interrelated cognitive processes including encoding, retrieval, and decision-making/reasoning processes. By this account, identification of source does not involve the recollection of a "tag" that specifies the source of a memory. Rather, the attribution of a memory to a source is a complex judgment that typically involves assessing the characteristics of a memory in light of a current task or agenda. From this view, developmental differences in source monitoring arise either because children are less able to encode or activate the memory characteristics necessary to support accurate source monitoring or because they fail to engage in the extensive and complex decision-making processes that accurate source monitoring sometimes requires (cf. Lindsay et al., 1991; Parker, 1995).

The developmental differences observed in the present study may have been due to age differences in any or all of the processes relevant to accurate source monitoring. Young children are known to be overly optimistic about their memory capabilities (Flavell, Friedrichs, & Hoyt, 1970; Kreutzer, Leonard, & Flavell, 1975; Yussen & Levy, 1975) and do not search their memories as extensively as older children and adults (Ackerman, 1988; Hall, Murphy, Humphreys, & Wilson, 1979; Kobasigawa, 1974). Thus, the children may have performed more poorly because they were less likely to retrieve information that would support accurate source identification. It is also possible that children were less skilled in reasoning about the source of their memories. For example, we suspect that many participants rejected the confabulated incidents as false on the basis of the absence of supporting memories (i.e., the absence of expected antecedents or consequences). For example, participants could have rejected the idea that they witnessed Delaney's elbow bleeding because they could not remember any other details that would have supported this incident (blood on clothing, treatment of the injury). It is possible that the children were less likely to engage in this sort of critical reasoning and hence were more prone to misattribution.

However, there is another factor, specific to the present study, that likely contributed to the age differences in source monitoring observed here. It seems that the children found it much more difficult to generate responses to the false-event questions than the adults did (the above finding that children required more prompting than adults supports this contention), probably as a function of the children's less sophisticated general knowledge base. It is well-established that the encoding of source-relevant information is an effortful process that is easily disrupted by lack of attentional resources (e.g., Begg, Anas, & Farinacci, 1992; Jacoby, Woloshyn, & Kelley, 1989; Zaragoza & Lane, in press), whereas familiarity is a relatively automatic consequence of exposure to an item. To the extent that generating the confabulated items was more taxing for the children than for the adults, one would expect to see poorer encoding of the confabulation's source among the children, without necessarily observing a deficit in their memory for its content. One prediction that follows from the foregoing account is that self-generated confabulations should be more susceptible to misattribution than false information acquired from external sources (i.e., simply being told some false piece of information), and the magnitude of this difference should be greater for children than adults. Evaluation of this hypothesis remains an important issue for future research.

Conclusions

The results of the present study are the first to show that pressing children to fabricate information they would not have otherwise provided can lead to false memories for the confabulated incidents. Although much research remains to be done before the boundary conditions of this effect are clearly established, the results certainly suggest that the surest way to preserve the integrity of children's memories is to avoid pressuring them to discuss incidents that may not have transpired.

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Appendix A

Questions Asked in the Second Phase of the Experiment

Note that *F* and *T* are used to denote false- and true-event questions, respectively. In addition, note that all six false-event questions are included here although each participant was asked only three of these. Specifically, half of the participants in each age group were asked False-Event Questions 1, 6, and 10, whereas their yoked partners were asked 2, 8, and 11. In the cases where participants were not asked a false-event question (marked in italics), it alone was deleted while the context preceding the question remained. Furthermore, the experimenter-generated items that were provided when free-condition participants did not confabulate responses to false-event questions are provided in parentheses next to each false-event question. Finally, note that only the child participants were exposed to the last question in this series.

1. Remember in the beginning of the video when all the ladies and the boys were in the dining hall having lunch? Remember when the cook brought out a cake? He did that because it was one of the boys' birthday. *What present did the boy get for his birthday?* (F) (toy)

2. Then remember how it got really noisy in the dining hall? So to make the boys be quiet Delaney stood on a chair at the front of the room. But then what happened to the chair? It broke, and Delaney fell on the floor. *Where was Delaney bleeding?* (F) (arm)

3. In the next part everyone was outside. Remember, all the boys and the ladies were walking down a path. Remember how some of the ladies had a hard time walking? *Where was everyone going?* (T)

4. Remember how Delaney was talking and pointing out interesting things to the ladies when they were riding in the boats? But then the ladies screamed because they noticed something in their boat that scared them. Remember that? *What was it that scared the ladies?* (T)

5. *What did the ladies do when they saw the snake in their boat?* (T)

6. Remember when the ladies were in the water in their clothes, and they were swimming toward the other boat? *What did the boys in the other boat throw to the ladies to help them get out of the water?* (F) (rope)

7. *Who was the only person who stayed in the boat with the snake in it?* (T)

8. Then in the next part, Sullivan and some other boys were by the water fighting, remember? And remember how they were yelling at each other and one of the boys was really mad at Sullivan? *What did the boy say Sullivan had stolen?* (F) (money)

9. Then remember how the boys did something very mean to Sullivan? *What did they do to Sullivan?* (T)

10. But then Delaney came running down to the lake to break up the fight. Remember? *What animal followed Delaney when he came running down to the lake?* (F) (dog)

11. Remember how Delaney yelled at the boys to scram, and how he helped Sullivan get out of the water? Sullivan was very cold and wet when he got out of the water. *What did Delaney give to Sullivan to keep warm?* (F) (towel)

12. Then Sullivan ran away up the hill. *What color was the bear he bumped into at the top of the hill?* (F)

(*Appendixes continue*)

Appendix B

Items Produced by Forced-Condition Participants in Response to the False-Event Question "What Present Did the Boy Get for His Birthday?"

First grade	Third/fourth grade	College
Bike (.09)	Action figure	Apple
Boat ride (.09)	Ball	Ball (.11)
Car	Baseball	Baseball
Clothes	Bicycle	Basketball
Got to go camping	Bike	Bat (.06)
Paddle ball	Boating trip	Bike (.17)
Pet (.06)	Clothes	Boat
Robot	Football	Coat
Shoes	Friend	Football
Snake (.06)	Hat	Hat (.06)
Super Soaker	New friend	Money
Truck	Pet snake	Oar
Toy (.06)	Pocket knife	Paddle
Toy boat	Snake	Pair of shoes
Toy car	Symbol of the camp	Radio
Toy soldier	Toy (.24)	Reading book
Wrestler	Toy car	Shirt (.08)
	Toy figure	Toy
		Toy stool
		Truck (.08)

Note. The proportion of participants in each age group who generated each response is provided in parentheses. (The absence of parentheses indicates that only 1 participant in that age group produced the item.) Information regarding responses to other false-event questions is available from the authors.

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