False Recognition Effects in Young and Older Adults’ Memory for Text Passages

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Although memory is usually accurate, people are susceptible to memory distortions and illusions under a variety of conditions (for reviews, see Roediger, 1996, or Schacter, 1995). Recent work suggests that older adults may be particularly susceptible to distortions and illusions of memory; some examples are false fame judgments (Dywan & Jacoby, 1990), false recollection of events (Schacter, Koutstaal, Johnson, Gross, & Angell, 1997), and false recognition effects (Norman & Schacter, 1997; Tun, Wingfield, Blanchard, & Rosen, 1996). It has been speculated that the increased susceptibility to these illusionary memories results from an age-related impairment in source-monitoring abilities.

According to the source-monitoring framework (Johnson, Hashtroudi, & Lindsay, 1993), memories contain certain qualitative characteristics (e.g., amount of perceptual detail, semantic detail, or cognitive operations used to establish a memory) that assist in source differentiation. For example, a memory rich in perceptual and contextual detail is more likely to be attributed to an external source than an internally generated source (e.g., a memory for one’s own thoughts). In the absence of clear information to distinguish between sources, source judgments become difficult to make and confusion may arise. Confusion is heightened in those instances in which sources show high perceptual similarity (e.g., Johnson, Foley, & Leach, 1988) or high semantic similarity (e.g., Johnson, Raye, Foley, & Foley, 1981). An example of illusionary memories arising from source confusion among semantically similar items comes from recent work by Roediger and McDermott (1995). After studying a list of semantic associates (e.g., bed, rest, awake), subjects were given a recognition test for studied, new (filler) and critical nonpresented lures that were high semantic associates (e.g., sleep) of studied items. False alarms to critical nonpresented lures were nearly identical to hit rates for studied items. These results suggest that subjects in this study, unable to differentiate the source of familiarity for activated-studied and activated-critical items, relied on familiarity mechanisms alone to make their recognition judgments, and judged both types of items as studied.

It has been argued that older adults have difficulty encoding the perceptual and contextual details that allow for source differentiation. For example, Hashtroudi, Johnson, and Chrosniak (1990) found that older adults reported less perceptual and spatial information about their everyday activities than did young adults and made more source errors in discriminating between memories of perceived and imagined activities. Cohen and Faulkner’s (1989) findings were similar; in addition, they noted that older adults were misled by false information more often than were young adults. This latter finding suggests that source-monitoring problems in older adults may make them more susceptible to illusory memories.

One type of increased susceptibility to illusory memories, specifically the increased false recognition of semantic associates in older adults, was demonstrated recently by Tun et al. (1996). This study, which employed a procedure similar to that used by Roediger and McDermott (1995), found that older adults made more false recognitions of critical nonpresented items than did young adults. The overall recognition rates for studied items and false alarms to non-critical distractors, however, showed age equivalence. Rather than reflecting an overall weakening of memory in older adults, the presence of age differences only for recognition of critical items demonstrates a more specific age-related impairment in distinguishing between sources of familiar items (i.e., external-studied vs internal–semantically activated) as the potential locus of age differences in illusory memories.

Although the evidence described thus far indicates that older adults may be more susceptible than young adults to illusory memories, a recent study by Prull, Light, Collett, and Kennison (1997) found that older adults were more resistant to illusory memories than were young adults. The primary task employed by Prull and colleagues was a recognition test for words presented in a list of study items.
or presented as part of a fragmented-word identification task (in which words were fragmented by the removal of varying amounts of pixels, so that the most fragmented condition had 75% of a word's pixels removed, and the least fragmented had approximately 18% of a word's pixels removed). For the recognition test, subjects were asked to indicate whether a presented word had been included in the list of study items they received prior to the test. False recognition was calculated as the proportion of words from the fragment identification task incorrectly identified as belonging to the study list. Young adults were more likely than older adults to identify words revealed in the fragment identification task as part of the study list. The young adults, but not the older adults, demonstrated reliable illusory memories. These findings provide some initial evidence that there are circumstances under which older adults do not show enhanced susceptibility to illusory memories.

This article further examines aging and illusory memories, extending previous work by examining young and older adults' false recognition responses to thematically relevant story actions. Previous work has examined the production of illusory memories for words, but it is not clear whether such effects will be observed for more complex materials (i.e., schematized stories). In the two experiments reported here, participants were asked to read a series of short paragraphs, each describing a common, everyday activity. In some paragraphs, critical events of an activity were excluded, and those sentences were replaced by thematically unrelated sentences to keep paragraph length constant. Later, participants were asked to perform a recognition test for each paragraph's actions. This test contained questions about studied actions, critical (i.e., theme consistent) nonpresented actions, and filler actions. We hypothesized that if older adults do indeed show an increased susceptibility to illusory memories, then relative to young adults, they would have more false recognitions of the critical (i.e., theme consistent) nonpresented story actions. We also hypothesized that there would be no age differences in recognition of studied story actions and filler actions, congruent with the findings reported by Tun et al. (1996). Age differences in responses to filler actions would suggest that there is no enhanced susceptibility to illusory memories in older adults as a result of specific impairments in source-monitoring abilities, but rather that increased false recognition in older adults reflects a general age-related weakening of recognition ability.

**EXPERIMENT 1**

**Method**

**Subjects**

Participants consisted of 40 young adults (graduate and undergraduate students in the Psychology Department at Saint Louis University [SLU]; mean age = 21 years, range 18–31 years) and 40 healthy, active, community-dwelling older adults (SLU alumni; mean age = 72 years, range 66–83 years). Young adults were given extra-credit course points for their participation, and older adults were given a movie pass for their participation. Older adults had slightly more years of education than the young adults, 16.82 years versus 15.37 years, respectively, \( t(78) = -3.13, p = .0025 \). Older adults also had higher vocabulary scores than did the young adults on a modified 25-item Nelson-Denny Vocabulary Test (Nelson & Denny, 1960), \( M \) old = 20.37, \( M \) young = 14.9, \( t(78) = -7.84, p = .000 \). Young adults had larger forward (\( M = 7.37 \)) and backward (\( M = 5.62 \)) digit spans as compared to the older participants (\( M \) forward = 6.87, \( M \) backward = 5.1), \( t(78) = 1.96, p = .054 \) for forward digit span, and \( t(78) = 1.99, p = .051 \) for backward digit span. Both age groups reported comparable ratings of their current health status on a 10-point self-rating scale, with 10 considered excellent, \( M \) young = 8.1, \( M \) old = 7.72, \( t(78) = 1.03, p = .30 \).

**MATERIALS and Procedure**

A normative study of common activities (Galambos, 1983) provided the materials used to construct our stories. Each story was a 12-sentence paragraph, with each sentence representing a single action of a larger activity. Two types of stories were created. The complete stories contained all 12 actions determined by Galambos to be a part of an activity, whereas the incomplete stories contained 8 actions from one activity (e.g., “Going Grocery Shopping”) mixed with 4 actions from an unrelated activity (e.g., “Going to the Movies”). A sample complete and incomplete paragraph for one story activity is shown in Table 1.

| Table 1. Sample Paragraphs From the Complete and Incomplete Versions of a Story Activity |
|-----------------------------------------|-----------------------------------------|
| **Going Grocery Shopping**              | **Incomplete**                          |
| Bob noticed that he was running low on food, so he made a list of items he needed to get at the grocery store. He entered the store through the front door. He got a cart and pushed it towards the first section. Bob walked through the aisles looking for items on his list. When he found an item on his list, he would reach for it and take it off the shelf. Bob always checked the price before deciding to make a purchase. As he found his items, he carefully loaded them into his shopping cart. When he had found everything on his list, he pushed the cart towards the checkout lanes. Many other people had been shopping, but Bob found the shortest line and waited. He unloaded the cart and placed each item on the counter so the cashier could calculate the cost. Bob then reached for his wallet and paid for his purchase. Bob picked up his bags at the end of the lane and left the store. |
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Participants read three complete and three incomplete stories in a single testing session, which was broken into two study-test blocks; the story type order (i.e., complete or incomplete) was determined randomly. Each paragraph focused on a different activity, so that none of the participants read both the complete and incomplete versions of a single activity. Each story and all recognition test items were presented by an IBM-compatible 486 desktop computer on a SVGA 15" monitor. The text was black, 36-point Times New Roman font set against a white background, designed using Microsoft's Power Point Viewer, version 6.0.

Each experimental session began with a study-test block, in which participants read a series of three stories. Participants were allowed to read each story at their own pace before progressing to the next story. Immediately after reading three stories, participants were given a recognition test for story actions. Twenty-four questions were presented for each story, and all questions for a single story appeared before memory for the next story was queried. Half (12) of these questions asked subjects about actions that were typically part of a given story's activity. For the complete version stories, these questions were for old, studied (theme consistent) actions. For the incomplete version stories, however, only 8 of these questions probed memory for old, studied (theme consistent) actions, whereas the remaining four questions were for new, critical nonstudied actions (theme consistent). For example, in the complete version of the "Going Grocery Shopping" story shown in Table 1, when the main character located items from his shopping list, he reached for them and took them off the shelf. In the incomplete version of this story, this action is not mentioned. So for participants who studied the complete version of this story, the question "Did Bob reach for items on the shelves?" was an old, studied action question, but for the incomplete version this question was a new, critical nonstudied, but thematically consistent, action question. The remaining questions (12) probed memory for actions thematically inconsistent with the studied stories. For the complete story versions, all these questions were new (filler) questions. But for the incomplete versions, four of these questions probed memory for old, studied (theme inconsistent) actions (e.g., giving an usher tickets in the incomplete version of the "Going Grocery Shopping" story), whereas the 8 remaining questions were new filler questions. Table 2 provides a summary of the types of questions participants were asked for each story version. Question type was randomized for each story's recognition test, but again, all questions for one story were given before any questions for another story were provided.

After the first study-test block, participants' digit spans (forwards and backwards) were assessed. These activities were followed by the recognition task, and then a second study-test block began for a different set of three stories, using the same procedures as the previous study-test block, but replacing the digit span task with a vocabulary test.

Results

Figures 1–3 display the results for the recognition test measures. All results are shown as mean proportions with standard error bars. Figure 1 shows the mean proportion of false alarm responses, Figure 2 shows the mean proportion of correct responses (hits), and Figure 3 shows the mean correct recognition scores. As we were interested primarily in responses to critical nonpresented items (the illusory memory effect), this data will be discussed first.

False Alarms

The proportion of “yes” responses to new items was analyzed in a 2 (age) X 2 (item type: critical, nonpresented vs filler) analysis of variance (ANOVA). Overall, older adults
(M = .445) were more likely to make false alarms than young adults (M = .374), F(1,78) = 7.78, MSe = .027, p = .007. In addition, all participants were more likely to give false alarms to critical nonpresented items (M = .639) than filler items (M = .180), F(1,78) = 468.56, MSe = .018, p = .000, revealing a robust false recognition effect in both age groups. Older adults, however, were only slightly more likely to give false recognition responses to critical nonpresented items versus filler items than were young adults, F(1,78) = 3.32, MSe = .018, p = .07. Although this analysis revealed only a marginal interaction of age and new item type (critical vs filler), planned contrasts between age groups for each type of item revealed that the age difference for critical items, t(78) = 2.52, p = .014, was larger than the age difference for filler items, t(78) = 1.94, p = .06. Calculations of effect size indices (Cohen's d) for these age differences is supportive of these findings, d = .571 for critical items, and d = .439 for filler items. We were unable to obtain a reliable age x item type interaction, but planned contrasts and effect size indices point to the possibility that older adults show larger false recognition responses than do young adults.

Correct Responses

The proportion of "yes" responses to studied items is shown in Figure 2. These data were analyzed in a 2 (age) x 2 (theme consistency: consistent vs inconsistent) ANOVA. Overall, there was no main effect of age, F < 1.0, but there was a main effect of theme consistency, F(1,78) = 62.30, MSe = .016, p = .000, as well as an age x consistency interaction, F(1,78) = 4.34, MSe = .016, p = .041. Post hoc analyses indicate that although both age groups were better at recognizing consistent than inconsistent items (within-young adults contrast F(1,39) = 24.65, MSe = .011, p = .000; within—older adults contrast F(1,39) = 37.83, MSe = .021, p = .000), this difference was larger for the older adults (.200) than it was for the young adults (.116), F(1,78) = 4.34, MSe = .032, p = .041.

Corrected Recognition Scores

Figure 3 shows the results for the corrected recognition scores, calculated as "yes" responses to studied theme-consistent items minus "yes" responses to critical nonpresented items for the consistent condition, and as "yes" responses to studied theme-inconsistent items minus "yes" responses to filler items for the inconsistent condition. A 2 (age) x 2 (theme consistency) ANOVA on this data revealed main effects of age, F(1,78) = 12.16, MSe = .022, p = .001, and theme consistency, F(1,78) = 99.06, MSe = .036, p = .000, but no age x theme consistency interaction, F < 1.0. Clearly, older adults exhibit less accurate recognition memory overall than young adults, but both age groups showed less accurate recognition for consistent as compared to inconsistent items.

A 2 (age) x 2 (theme consistency) analysis of variance on d' scores for this data indicates that the young adults are more sensitive overall to differences between studied and new items than are the older adults, M' = 1.314 and 1.052 for the young and old, respectively, F(1,78) = 8.36, MSe = .328, p = .005, but there is no age x consistency interaction for d', F < 1.0. The lack of a reliable interaction here weakens the argument that older adults are more susceptible to false recognition effects, and implies that there are limits to the range of circumstances that will reliably produce age-related differences in illusory memory susceptibility. The main effect of theme consistency was reliable, though, as theme-consistent studied and new items were more difficult to differentiate than theme-inconsistent items, M' consistent = .762, M' inconsistent = 1.604, F(1,78) = 66.98, MSe = .423, p = .000. So even though older adults are less able to discriminate between studied and new items, they are not differentially impaired in differentiating studied from new consistent items, as was predicted by the application of a source-monitoring perspective to the false recognition effect.

Discussion

Experiment 1 provides only marginal support for the hypothesis that older adults are more susceptible to illusory memories (i.e., false recognition of thematically consistent story actions). Older adults appear to make more false alarms to critical nonpresented items than do young adults, but they also demonstrate lower levels of recognition accuracy overall, as indicated by both the corrected recognition scores and d' analyses. In contrast to previous studies, we found that older adults made more false alarms to critical items, and d' analyses. As this finding does not replicate previous work on illusory memories in older adults, we decided to conduct an additional experiment to test the replicability of the findings from Experiment 1. In Experiment 2 we made one change: We not only measured subjects' level of accuracy in making recognition responses, but we also measured the latency to make these responses. In the Tun et al. (1996) work described earlier, recognition judgment response latencies by older adults to critical nonpresented lures, the functional equivalent of our critical nonpresented items (i.e., the new, theme-consistent items), were identical to response latencies to studied items. This was not the case for the young subjects, who were slower to identify the critical nonpresented items as old than they were to identify the studied items as old. Tun et al. interpreted this finding as
lending support to the hypothesis that older adults treat new semantically associated information like old studied information, a false memory effect. We hypothesized that the latency to make recognition judgments might be a better indicator of age differences in false recognition, so we included it in Experiment 2. We predicted that while recognition accuracy responses might only reveal marginal age differences in false recognition, recognition response latencies would show that older adults are equally slow in responding "old" to studied and critical items, where young adults are slower in responding "old" to critical items as compared to studied items.

**EXPERIMENT 2**

**Method**

**Subjects**

Participants consisted of 40 young adults (graduate and undergraduate students in the Psychology Department at SLU; M age = 22 years, range 18-29 years) and 40 healthy, active, community-dwelling older adults (SLU alumni; M age = 72 years, range 65-83 years). As in Experiment 1, young adults were given extra-credit course points and older adults were given a movie pass for their participation. Participants had similar levels of education, 15.62 years for young adults and 16.52 years for older adults. Likewise, the participants were equivalent in digit span (M forward: young = 7.00, old = 6.82; M backward: young = 5.85, old = 5.57) and self-ratings of health (M young = 8.17, M old = 7.77). Older adults had higher vocabulary scores than did the young, though (M old = 20.05, M young = 15.27, f(78) = -6.70, p = .000).

**Materials and Procedure**

The materials and procedure were identical to that of Experiment 1, with the following exceptions. Paragraphs were presented in white 36-point type on a black background using Micro Experimental Laboratory, version 2.0 (Schneider, 1988). As in Experiment 1, participants were allowed to read each paragraph at their own pace. Participants read 3 paragraphs, then immediately performed the recognition test for story actions. Subjects then performed the forward and backward digit span tasks and completed a short vocabulary test. As in Experiment 1, all the questions for a single story were presented before the next story's questions appeared. Each question remained on the screen until the subject made a key-press response, using his or her left index finger to make a "yes" response and his or her right index finger to make a "no" response for recognition judgments. Response latencies for these key presses were recorded by the computer in centiseconds. This procedure was repeated for the second set of three stories, until subjects had read and answered questions about six paragraphs.

**Results**

Two measures were collected in this study: (a) the subject's responses to questions about story actions and (b) the subject's latencies to make these responses. The data for the accuracy of recognition responses will be discussed first.

**Response Accuracy**

The response accuracy data is displayed in Figures 4-6 for false alarm responses (Figure 4), correct responses (i.e., hits; Figure 5), and corrected recognition scores (Figure 6). The false alarm data will be discussed first.

**False Alarms.—** The proportion of "yes" responses to new items was analyzed in a 2 (age) X 2 (item type: critical vs filler) ANOVA. Young and older adults produced a similar proportion of false alarms to recognition questions, F(1,78) = 1.40, MSe = .018, p = .24. More false alarms were made to critical nonpresented items (M = .629) than to filler items (M = .182), F(1,78) = 477.14, MSe = .017, p = .000, revealing a robust false recognition effect. Most importantly, though, there was no age X item type interaction, F < 1.0. These findings indicate that older adults may not be more susceptible to false recognition of thematically related information, a finding generally consistent with Experiment 1.

**Correct Responses.—** The proportion of "yes" responses (hits) to studied items was subjected to a 2 (age) X 2
(theme consistency) ANOVA. This analysis revealed no effect of age, $F(1,78) = 1.71, MSe = .018, p = .195$, but as was the case in Experiment 1, there was a reliable effect of theme consistency, with more correct responses made to consistent ($M = .898$) than to inconsistent items ($M = .726$), $F(1,78) = 68.94, MSe = .017, p = .000$. Unlike Experiment 1, the interaction between age and theme consistency was not significant, $F(1,78) = 1.39, MSe = .017, p = .243$.

**Corrected Recognition.**—Corrected recognition scores were calculated in the same manner as for Experiment 1 and subjected to a $2 \times 2$ (age) X (consistency) ANOVA. This analysis revealed a main effect of age, $F(1,78) = 3.93, MSe = .028, p = .05$, with older adults showing less accurate recognition ($M = .380$) than young adults ($M = .433$) across levels of theme consistency, despite the lack of age differences in hits and false alarms. Consistent items were more likely to be recognized correctly than were inconsistent items, $F(1,78) = 120.38, MSe = .025, p = .000$, but there was no age by consistency interaction, $F < 1.0$.

A $2 \times 2$ (age) X (consistency) ANOVA on $d'$ scores for this data yielded results similar to those of Experiment 1. Young adults were marginally more sensitive to differences between studied and new items than the older adults, $M d'_{y} = 1.384$ and $M d'_{o} = 1.191$, $F(1,78) = 3.68, MSe = .404, p = .058$, but there was no age X theme consistency interaction for $d'$, $F < 1.0$. Studied and new theme-consistent items were more difficult to differentiate than were studied and new theme-inconsistent items, $M d'_{c} = .935, M d'_{i} = 1.640, F(1,78) = 55.99, MSe = .355, p = .000$. These results suggest that age differences in the ability to discriminate do not differ for consistent and inconsistent items as they should if there were an age-related increase in susceptibility to false recognition effects.

To summarize the recognition accuracy results, older adults do not appear to be any more susceptible to false recognition of unstudied theme-consistent information than do young adults. Age differences, however, are present for overall recognition accuracy. These results, which essentially replicate the findings of Experiment 1, indicate a lack of specific age-related impairments in source-monitoring processes that might produce an age-related susceptibility to illusory memories. The remaining analyses examine the response latency data.

**Response Latency**

Young and older adults’ mean response latencies to each type of recognition question are shown in Figure 7. These data were subjected to a $2 \times 2$ (age) X (consistency) X (response type: hit vs false alarm) ANOVA.

These analyses revealed main effects of age [$F(1,78) = 13.12, MSe = 2.322, p = .000$, theme consistency [$F(1,78) = 21.11, MSe = .275, p = .000$], and response type [$F(1,78) = 45.19, MSe = .488, p = .000$]. There was no interaction of age with theme consistency or response type, nor was there any three-way interaction of these variables ($F < 1.0$ in all cases, except for the age X response type interaction, $F(1,78) = 2.11, MSe = .488, p = .151$). In addition, there was no interaction of theme consistency with response type, $F < 1.0$. Collectively, these findings indicate that young adults are quicker to make recognition responses than are older adults. Both age groups, however, responded more quickly to consistent than inconsistent items and to studied items than unstudied items.

Because we had predicted an age X response type interaction in response latency for consistent items (i.e., that older, but not young, adults would show equivalent response latencies to studied and critical unstudied theme-consistent items), we conducted this contrast, even though the overall analysis of response latencies revealed no interaction of age with response type and theme consistency. As was expected, young adults were faster to make recognition responses than were older adults, $F(1,78) = 11.65, MSe = 1.213, p = .001$. In addition, participants responded more quickly to studied items than unstudied theme-consistent items, $F(1,78) = 33.76, MSe = .269, p = .000$. Most important, though, there was a marginal interaction of age and response type, $F(1,78) = 3.08, MSe = .269, p = .083$, but not
in the predicted direction. Contrary to the findings reported by Tun et al. (1996), we found a difference in recognition judgment response latencies to studied and unstudied critical (theme-consistent) items in our sample of older adults, $F(1,39) = 19.93$, $MSe = .387$, $p = .000$. In fact, this difference in response latencies (62.1 centiseconds) was nearly double the difference between studied and critical items observed in young adults (33.3 centiseconds). So both age groups were slower or more hesitant in making “yes” responses to critical nonpresented items, but older adults were differentially slowed in this condition.

Discussion

The results of Experiment 2 have essentially supported the results from Experiment 1: Older adults are not more susceptible to false recognition of unstudied thematically consistent story actions as compared to young adults. Although the source-monitoring perspective predicts that older adults should have greater difficulty than young adults in discriminating studied from new, thematically consistent versus inconsistent actions, our results do not support this hypothesis. Both age groups experienced difficulty discriminating studied from new thematically consistent actions, and both age groups were slower to identify new critical items than studied items.

General Discussion

The combined results from the two experiments reported here provide evidence to refute the hypothesis that source-monitoring problems in old age will produce increased susceptibility to illusory memories in older adults. The source-monitoring model suggests that when information from two distinct sources becomes semantically similar, it becomes more difficult to discriminate the correct source of the information. In the current study, this difficulty in discrimination became apparent, as both young and older adults had difficulty discriminating between studied (external source) and critical new (internal source) items in making recognition judgments about story actions. The overall results suggest that this general ability to discriminate is more difficult for older adults, because their overall recognition is poorer than that of young adults, but the specific age difference in the ability to discriminate that is likely to produce an enhanced susceptibility to illusory memories in older adults is not present. That is, there was no consistent age difference across the two experiments in the false recognition of critical items. Rather, substantial memory illusions were evident in both age groups. Clearly, then, there are limits to the hypothesis that age-related reductions in source-monitoring ability will produce age differences in susceptibility to memory illusions. Further testing using a variety of paradigms is needed.

An additional issue is raised by the results of this study. It has been argued that older adults depend more on gist-driven memory processes than do young adults (Tun et al., 1996) in recollecting events, but the results from this study suggest there are limits to this claim. A reliance on gist-driven processing in older adults suggests that they are more likely, relative to young adults, to depend upon schema-activated information in their recollection of events. This reliance is likely to produce more schema-consistent intrusions in an older adult’s event recall than in a young adult’s. Although our study did not examine false recall, the lack of age differences in recognition of schema-consistent story actions suggests that this information is relied upon by both age groups equally in reconstructing memory for studied stories. Future work examining age differences in false recall rather than recognition will help clarify this matter.

One difference between Experiment 1 and Experiment 2 is worth mentioning here. Neither experiment provides overwhelming evidence for the existence of age differences in susceptibility to false recognition responses, but the effect was larger in Experiment 1 (Cohen’s $d = -.571$ for the critical items) than it was in Experiment 2 ($d = -.147$ for the same comparison). In Experiment 1 there was also a brief delay between study and test, which lasted approximately 10 minutes. There was no such delay in Experiment 2. It is possible that any age differences in susceptibility to false memories take time to develop, as the age differences we observed (although not reliable) were much larger when a delay period was introduced between study and test than when they were without the delay. We are investigating this possibility using a slightly different paradigm.

In conclusion, older adults in this study demonstrated an overall reduced recognition of story actions, rather than a specific reduced ability to reject unstudied theme-consistent story actions. These results suggest that age differences in false recognition effects are limited. Future studies are needed to define the boundaries of these effects.

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