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Biography becomes autobiography: Distorting the subjective past

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This work addresses whether creating a biographical sketch for a fictional adolescent can increase confidence that one personally experienced these details in adolescence (memory distortion) and whether susceptibility to such distortion depends on whether adolescence is considered part of one's subjective past or subjective present. We divided the subjective past and present using the point at which a person experienced the last life event that changed his or her personality significantly. We operationalized the subjective past as events associated with the period before the last life-changing event and the subjective present as events associated with the period after that event. Participants' confidence in their own autobiographical memory increased after they wrote a brief story about a fictional character. This increase occurred only for those who considered adolescence to be part of their subjective past. These results indicate that subjective time (in addition to objective time) may be a valuable factor in determining who is susceptible to memory distortion. We discuss these findings in terms of familiarity attribution and source monitoring.

There is much interest in autobiographical memory distortion. Modern conceptualizations hold that memory is an extremely flexible, constructive process rather than a perfect copy of the past: "In a world of constantly changing environment, literal recall is extraordinarily unimportant. It is with remembering as it is with stroke in a skilled game. Every time we make it, it has its own characteristics" (Bartlett, 1932/1995, p. 204). Indeed, literal recall's unimportance and error-proneness have prompted several theorists to argue that recollection is constructed here and now instead of being the retrieval of a ready-made memory from a storage bin in our mind (Conway & Rubin, 1993; Conway & Pleydell-Pearce, 2000; Koriat, Goldsmith, & Pansky, 2000).

The present work explores two main questions. First, can we create a quick and efficient procedure that will allow us to distort memories about

recent life events? Second, are there particular periods in a person's life that are more susceptible to memory distortion than others?

Distorting memory

Researchers have used a variety of techniques to demonstrate memory's fallibility. These include word lists (Deese, 1959; Roediger & McDermott, 1995), stories (Bartlett, 1932/1995; Bransford & Franks, 1971), and pictures or other visual materials (Carmichael, Hogan, & Walter 1932; Hannigan & Reinitz, 2001; Loftus & Palmer, 1974). Most of these techniques are designed to induce false memories for details from one's past. For example, the participant reads a list of words or sees a series of pictures and later misremembers reading a word or seeing a picture that was never shown.

Another line of research focuses on planting memories of entire events that were never experienced in one's past. For example, Loftus (1993) and others have shown that people can be led to falsely believe that certain events occurred in their childhood. In one study, Loftus and Pickrell (1995) convinced 25% of their participants that they had been lost in a shopping mall as very young children. In another study, Hyman, Husband, and Billings (1995) convinced many of their participants that they had knocked over a punch bowl at a wedding and spilled punch on the bride's parents. In such studies, the experimenter uses strong forms of suggestion (e.g., "Your mother told us that when you were 5 years old, you got lost in a mall"). In other work, researchers asked participants to vividly imagine critical life events such as being pulled from the water by a lifeguard. The act of imagining can increase participants' confidence that such events occurred in their childhood, a phenomenon called imagination inflation (Garry, Manning, Loftus, & Sherman, 1996; Hyman & Pentland, 1996). Other forms of suggestion also work. Wade, Garry, Read, and Lindsay (2002) doctored a photograph so that it depicted participants in a hot air balloon. After seeing themselves in the hot air balloon, participants falsely remembered the event from their childhood.

Some memory distortions are a type of source monitoring error (Johnson, Hashtroudi, & Lindsay, 1993). Applied to autobiographical memory, a source monitoring error occurs when people misattribute a familiar experience to their personal past when the experience was derived from another nonpersonal source such as a doctored photograph, imagination, or experimenter suggestion. These nonpersonal sources all increase the familiarity with which participants process critical events. In turn, participants misattribute the familiarity to past experience rather than correctly attributing it to the manipulation that created the feeling

of familiarity (Bernstein, Whittlesea, & Loftus, 2002; Ceci & Bruck, 1993; Jacoby & Whitehouse, 1989).

The preceding discussion suggests that false memories may arise, in part, from the misattribution of familiarity. In the present study, we sought to increase participants' confidence in a variety of life events by increasing the familiarity of those events. In most memory implantation procedures, investigators choose a few critical items, perhaps two to four. In the present study, we manipulated 12 items per participant, and these 12 items were chosen semirandomly from a set of 36 items. During the manipulation, participants created a biographical sketch about a fictional character. We expected that participants might experience life events as more familiar if these events had occurred in someone else's life. In other words, participants might hijack the biography of another person that they themselves had constructed and then integrate it into their own autobiography.

Individual differences in memory distortion

Our second major question in the present work is whether some periods in a person's life are particularly vulnerable to memory distortion. For example, if person A had moved to a foreign country a week ago, whereas person B moved more than 5 years ago, would they both be susceptible to attempts to distort their memory of something that happened, say 2 years ago?

This is a question about whether there are particular people, either because of life experience or because of other aspects of their personality, who are more susceptible to memory distortion. Schooler and Loftus (1993) noted several factors that influence a person's sensitivity to memory distortion. Among these are field dependence, locus of control, hypnotic suggestibility, introversion or extroversion, working memory, and intelligence. Other investigators have found that participants who scored highly on the Dissociative Experiences Scale and the Creative Imagination Scale were more likely to accept suggested false memories as true (Hyman et al., 1995; Hyman & Billings, 1998; Winograd, Peluso, & Glover, 1998). Similarly, Heaps and Nash (1999) demonstrated that dissociative tendencies and hypnotizability related in a positive and predictable way to imagination inflation. In another study, hypnotizability predicted the acceptance of false memory suggestions (Barnier & McConkey, 1992). Thus, several variables have been linked to individual susceptibility to memory distortion (although see Platt, Lacey, Iobst, & Finkelman, 1998). Most studies examining individual differences in memory distortion have focused on stable personality characteristics. However, our interest here is in more transient personality characteris-

tics that might predict who will be particularly sensitive to memory distortion. We discuss this possibility in the next section.

Discrepancy between past and current psychological state as predictor of memory distortion

There is much work showing that people sometimes retrospectively overestimate the intensity of their previous emotional state (Schrader, Davis, Stefanovic, & Christie, 1990; Bryant, 1993; Breckler, 1994). Levine (1997) suggested that a person's memory of a past emotional state is biased by one's current appraisal of the original emotion-eliciting event. Parkinson, Briner, Reynolds, and Totterdell (1995) reported that people's recall of prior emotions shifted with current mood (see also Keuler & Safer, 1998; Robinson & Clore, 2002). Similarly, the recall of past pain intensity is assimilated to one's current state of pain intensity (Eich, Reeves, Jaeger, & Graff-Radford, 1985; Smith & Safer, 1993). There is also ample evidence that one's current psychological state affects not only how much is remembered but also what is remembered about the past (cf. Kolers, 1973; Tulving & Thompson, 1972).

In accordance with Lewin's (1935) theory, human behavior is a function of the current "phenomenological field," which consists of the psychological past, psychological present, and psychological future. Lewin postulated that the psychological past is not a direct and stable reflection of past experience; rather, it is continuously transformed by the actual psychological present and the expected psychological future. In light of this theory and in light of the research done on recollection of the emotional past, we propose that the current psychological situation may transform memories of the past and render them malleable.

More precisely, we predict that memories belonging to the subjective past are prone to distortion, whereas memories belonging to the subjective present are minimally prone to distortion. However, this prediction begs the following question: When does the subjective present begin, and when does the subjective past end? Or, more generally, where is the border between past and present? We think that one such border may be represented by an empirical time point, namely, a life-changing event. Coping with this kind of event is difficult and often results in a character transformation: "I am not what I was before." Overcoming such an event, the person may lose touch with the events that occurred before. Thus, one may become alienated from one's past after a life-changing event.

We operationalize the psychological past as the events associated with the period before the last life-changing event, whereas the psychological present involves the events associated with the period after the last life-changing event. We speculate that people will be prone to memory distortion particularly if they are asked about events from their psychological past.

Distortion of memories for recent and distant past

In most research on memory distortion, participants typically report on a few key events from their childhood. There is evidence suggesting that it is easy to distort and create memories for the very distant past (cf. Spanos, Burgess, Burgess, Samuels, & Blois, 1999). It is also possible to create memories of recently experienced events. For example, Goff and Roediger (1998) found that the greater the number of intermediate acts performed between an experience (flipping a coin) and recall of that experience, the greater the likelihood that memory errors would occur. In a similar study, Thomas and Loftus (2002) observed that repeated acts of imagination induced participants to believe that they had performed bizarre actions such as sitting on dice. Life-changing events may serve much like Goff and Roediger's intermediate acts or Thomas and Loftus's repeated acts of imagination. All three act as distractors that make events from the recent past more malleable and prone to distortion. So the same time point (e.g., 1999) can be "yesterday" for the person who had a life-changing event before 1999 or "eons ago" for the person who has a life-changing event after 1999. Therefore, it is possible that subjective time, not just objective time, is an important determinant of one's susceptibility to memory distortion.

Another reason to assume that memory malleability is not simply dependent on objective time may be found in Conway and Rubin's work on the "reminiscence bump" (Conway & Rubin, 1993; Holmes & Conway, 1999; Rubin & Schulkind, 1997; Rubin, Rahhal, & Poon, 1998). This effect refers to the fact that adults asked to recall memories from their life history produce the most memories from later adolescence and early adulthood. Memories from these time periods appear to be the most accessible, perhaps because they are well rehearsed. Also, such memories may be particularly important in shaping one's personal identity and self. Given the well-rehearsed nature of reminiscence bump memories and their possible importance in the formation of personal identity, we wondered whether it is possible to distort memories for events from late adolescence and early adulthood. In the present study, we attempted to overcome the reminiscence bump by taking into account subjective factors relating to the psychological past and psychological present.

We explored two main questions in the current study. First, we examined whether writing stories about a fictional character would increase participants' confidence that certain events had occurred during their adolescence. Second, we explored whether susceptibility to memory distortion depends on participants' subjective present and past. Specifically, we predicted that people who had a life-changing event recently would be susceptible to memory distortion, whereas participants who had their

last life-changing event in the more distant past would be minimally prone to memory distortion.

EXPERIMENT

METHOD

Participants

In the first session, 65 undergraduates from the University of Washington participated. For the second session, only participants younger than 21 years of age who reported their last life-changing event in the past 1.5 years or more than 4 years before were included, resulting in a final sample of 51 participants (mean age 19.14, $SD = 0.67$).

Design

We used a 2 (condition: no story completion vs. story completion) \times 2 (group: subjective past vs. subjective present) mixed design. Condition was a within-subject factor, and group was a between-subject factor.

Materials and procedure

Participants completed two sessions separated by a week. During the first session, participants completed a life events inventory (LEI) containing 36 items. The LEI asked participants to rate their confidence that certain events had occurred to them between ages 15 and 17. They did so by marking a number between 1 (*certain the event did not occur*) and 8 (*certain that the event did occur*). Of the 36 items on the LEI, three groups of 12 items were chosen at random a priori and were counterbalanced across participants. One set of 12 items served as control (no story completion) items, and the remaining sets served as experimental (story completion) and distractor items. Immediately after completing the LEI, participants answered two personal questions. They gave their current age and then listed up to two events that they felt had changed their personality significantly. For each life-changing memory, they were asked to write down how old they were when the event happened to them and to write two or three key words depicting the event.

After the first session, participants were divided into two groups based on the number of years since their last life-changing event. We called participants whose last life-changing event occurred in the past 1.5 years the “subjective past” group; participants whose last life-changing event occurred more than 4 years ago were the “subjective present” group.

Participants returned 1 week later for Session 2. First, they performed a story completion exercise about a 16-year-old named John. Participants were given 24 life events to guide them in their story construction about John. Participants were asked to provide one or two sentences for each of the 24 events. For example, the participant might have incorporated the event “broke a hand” into John’s life story by writing, “One day John broke his hand while playing soccer.”

All 24 story completion events were connected with events that had appeared on the LEI 1 week before. To disguise the fact that these 24 events were the same events that participants had seen the week before, the 24 story completion events differed from the 24 LEI events in their level of abstraction. Of the 24 story completion events, 12 were superordinate and 12 were subordinate to items that had appeared on the original LEI. Examples of subordinate–superordinate pairs of items include “Found a ring with a precious stone” (subordinate) and “Noticed jewelry lying on the ground” (superordinate); “Had to go to the emergency room late at night” (subordinate) and “Needed a hospitalization” (superordinate); “Broke a hand” (subordinate) and “Fractured a bone” (superordinate); “Had your house robbed” (subordinate) and “Had your valuable property stolen” (superordinate). The 12 superordinate items were experimental items, and the 12 subordinate items were distractors. An additional 12 items from the original LEI were not included in the story completion, but they appeared later as no–story completion items on the second LEI. After the story completion task, participants completed the same LEI that they had completed in the first session.

RESULTS

The mean age of the last life-changing event for the total sample was 16.7 years. The mean age of the last life-changing event for the subjective past and subjective present groups was 18.2 and 14.3, respectively. Twenty-four participants made up the subjective past group, and 27 participants made up the subjective present group.

The first question we addressed was whether the story completion increased participants’ confidence on the second LEI in comparison with their scores on the first LEI. To determine this, we calculated for each item the percentage of participants whose responses increased, decreased, or remained unchanged from the first to the second administration of the LEI. We then collapsed these change scores across all participants and items, displayed separately in Figure 1 according to condition (no story completion or story completion) and according to group (subjective past or subjective present).

As Figure 1 shows, the majority of scores did not change (66.3% in the no–story completion condition and 62.3% in the story completion condition). Additionally, when participants did change their ratings, positive change scores were more likely to occur than negative change scores. For the purposes of the present experiment, the most interesting result is found by comparing the right bars of the figure for the total sample: There was more increase in the story completion items (23.2%) than in the no–story completion items (16.7%). To determine whether the observed increase is significant, we used pairwise comparisons of the distri-

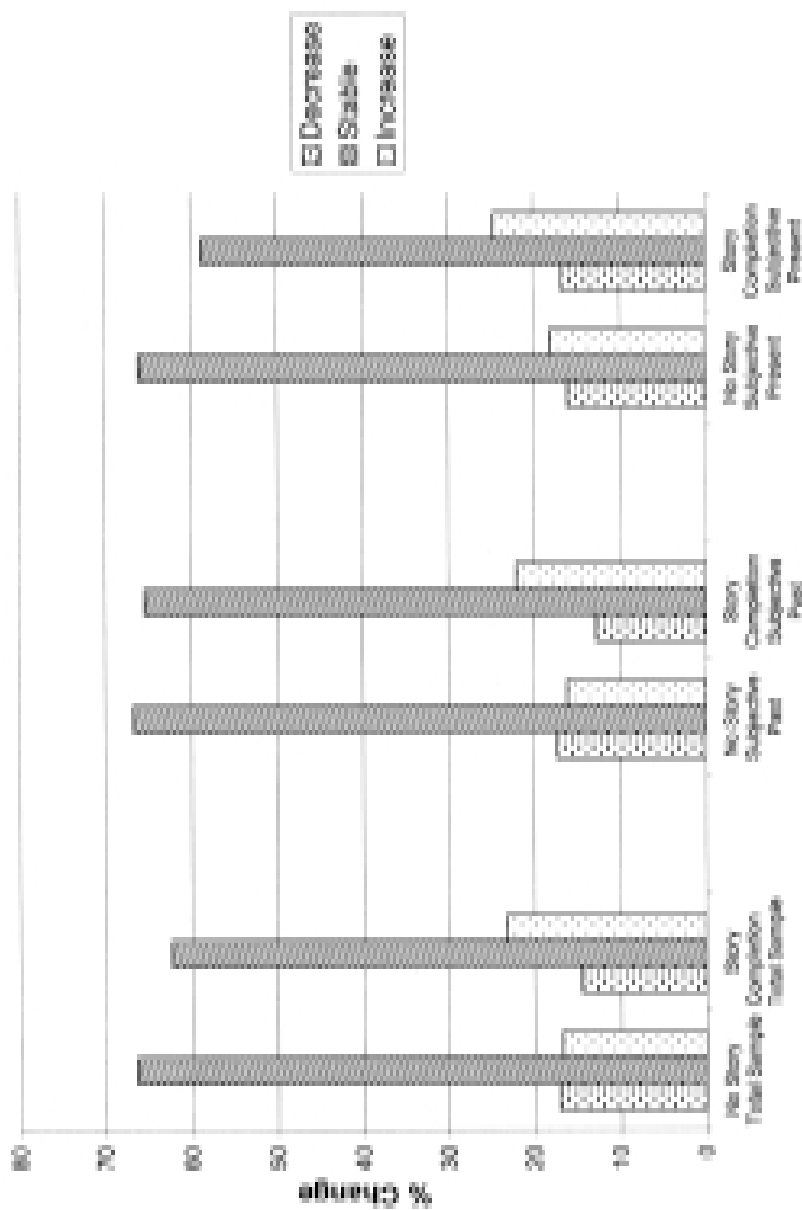


Figure 1. Percentage of no-story completion and story completion items staying the same, increasing, and decreasing for total sample, subjective past group, and subjective present group

butions for these conditions. For this purpose, we used the Wilcoxon matched-pairs signed-ranks test, which incorporates information about the magnitude of the differences between paired values. In support of our first prediction, the percentage of items that increased was significantly different for the no-story completion and story completion conditions, $Z = 2.75$, $df = 612$, mean negative ranks = 154.04, mean positive ranks = 168.09, $p < .01$. Further analyses supported our second prediction: The significant difference between the no-story completion and story completion conditions resulted largely from the subjective past group, $Z = -2.53$, $df = 324$, mean negative ranks = 75.87, mean positive ranks = 87.32, $p = .01$. The difference in the percentage of items that increased was not significant for the subjective present group, $Z = -1.39$, $df = 288$, mean negative ranks = 78.87, mean positive ranks = 81.42, $p > .1$.

To more precisely determine whether the story completion manipulation significantly increased participants' confidence in their own autobiographical memory, we compared the mean difference score (LEI2 – LEI1) for all no-story completion and story completion items for each participant. Figure 2 shows these mean differences for the no-story completion and story completion conditions for the subjective past group, subjective present group, and total sample.

As predicted, there was a significant difference between the no-story completion and story completion conditions for the total sample, $t(50) = 2.29$, $SEM = .12$, $p < .05$. Further analyses revealed that this difference was significant for the subjective past group, $t(26) = 2.33$, $SEM = .12$, $p < .05$, but not for the subjective present group, $t(23) = 1.03$, $SEM = .16$, $p > .1$. As for the magnitude of the effects, the subjective past group increased their confidence by .29 on an 8-point scale after completing a biographical sketch about a fictional character, whereas the subjective present group increased their confidence .18. When we conducted item analyses, the same pattern of effects emerged.

To recap, we found that the story completion task increased participants' confidence that they had personally experienced various life events in their adolescence. However, this increased confidence seems to have been mediated by the particular time in people's lives that they had experienced their last significant life-changing event. The subjective present group, whose last life-changing event occurred at age 14, was not significantly affected by the story completion task. Conversely, the subjective past group, whose last life-changing event occurred at age 18, was significantly affected by the story completion task. These results suggest that the subjective present group was not susceptible to memory distortion, whereas the subjective past group was.

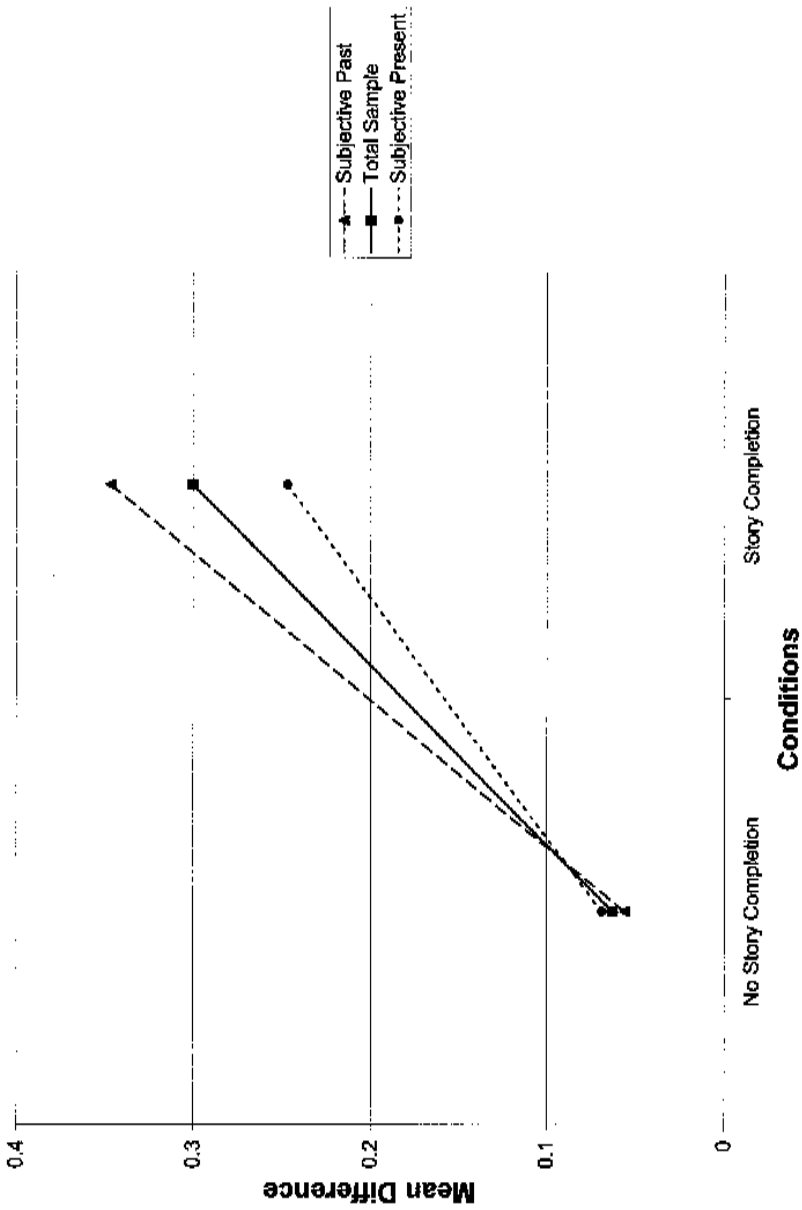


Figure 2. Mean overall signed difference scores for no-story completion and story completion items for total sample, subjective past group, and subjective present group

DISCUSSION

The major goal of the present study was to examine whether creating a biographical sketch for a fictional adolescent increased confidence in one's autobiographical memory of his or her own adolescence. Our second goal was to determine whether this increase in confidence depended on one's subjective past or present. We introduced a hypothetical borderline between the subjective past and subjective present, defined as the last life event that changed one's personality significantly. As we predicted, the biographical sketch (story completion task) increased participants' confidence in their own autobiographical memory of their adolescence. Moreover, this increased confidence occurred only for participants who considered adolescence their subjective past. We discuss each of these findings in turn and conclude with a brief discussion of the practical implications of this work.

There are several possible reasons why participants' confidence in their own autobiographical memory increases after they complete a biographical story about a fictional character. First, the LEI items were processed incidentally through the story completion task. During the story completion, participants focused on a task that appeared irrelevant to recollecting their own personal past. However, the story completion task was similar in structure to the natural process of recollecting the past. Perhaps the structural similarity between writing another's biography and recollecting one's own past created a type of unconscious plagiarism whereby participants mistakenly came to believe that the other's past experiences were their own experiences (cf. Marsh & Landau, 1995; see also Sheen, Kemp, & Rubin, 2001).

Second, because the LEI items appeared in the story completion task at a different level of abstraction, participants may have failed to realize that the source of the critical LEI items' familiarity was the story completion. It is also possible that the appeal to more abstract concepts activated the level of general autobiographical knowledge, scripts, and schemes. Pezdek, Finger, and Hodge (1997) argued that script-relevant information might be a precursor for the acceptance of false memories. If so, then perhaps the story completion task activated script-relevant information that, in turn, increased participants' acceptance of false memories. Third, the process of completing a biographical story might have increased the subjective plausibility of events, which Mazzoni, Loftus, and Kirsch (2001) argued is necessary before people come to falsely believe that certain events occurred in their autobiographical history. The story completion task required participants to make a coherent story from a variety of life events without causing them to reflect on the general likelihood of these events. Fourth, the story completion task included imagination, which has

already proven to be effective in distorting memories (Garry et al., 1996). Composing a coherent story from a set of disparate life events is a creative activity that entails imagination and narrative skill. Fifth, it is possible that, rather than distorting memory, our story completion task improved memory by helping people remember at least some events that really did occur to them. It is likely that a combination of these factors was at play in the present study.

As predicted, participants who experienced their last life-changing event recently (within the past 1.5 years) demonstrated significant memory distortion, whereas participants who experienced their last life-changing event in the distant past (more than 4 years ago) did not demonstrate significant memory distortion. We therefore conclude that participants from the subjective past group were susceptible to memory distortion, whereas participants from the subjective present group were not.

We believe that these findings can be explained, in part, by familiarity and source monitoring. The subjective present group appeared to carefully monitor the source of their familiarity. Participants in both the subjective present and subjective past groups probably experienced the experimental items as familiar; however, the subjective present group appears to have discounted the familiarity by attributing it to the story completion (see Bernstein, 2001; Jacoby & Whitehouse, 1989). In contrast, the subjective past group appears to have been less critical of the source of their familiarity. Therefore, they seem to have been more prone to memory distortion, and they tended to misattribute familiarity to their adolescence rather than to the story completion task. These findings suggest that the subjective past and subjective present groups may have used different source monitoring strategies when trying to determine the source of familiarity for the experimental items. We believe that people tend to monitor their psychological present very carefully, because the present is connected with working needs, goals, plans, and strategies. In contrast, they may fail to monitor their psychological past as carefully because the past is no longer directly relevant to daily coping strategies.

For a real-world example of our findings, let us examine a group convened for their 10-year high school reunion. In this group, we find a clear division between the people who are still living in high school and those who have moved on with their lives. The former group might be able to recall in minute detail events from high school that the latter group can, at best, only dimly recollect. The reason for this disparity, we believe, is that the high school dwellers probably have not experienced one or more significant life-changing events since they left high school, whereas those who have moved on probably have experienced one or more significant life-changing events in the interim. For the high school dwellers, high school represents the psychological present and feels “just like yesterday.”

For the movers on, high school represents the psychological past and feels “like ages ago.” If we were to take these two groups of people and subject them to a manipulation designed to distort their memory of their high school years, we would probably find that only those who have moved on in life would demonstrate significant memory distortion.

Utility of the story completion procedure

The story completion task in the present study referred to adolescence (time period from 15 to 17 years of age) instead of to childhood, as in traditional procedures. The fact that we succeeded in increasing participants’ confidence in a variety of life events that presumably had occurred fairly recently suggests that the story completion task may be a useful procedure in false memory research. The story completion procedure also has some advantages over other procedures typically used. In most standard procedures, a few critical items are chosen a priori for their proven utility as “good” items (e.g., Garry et al., 1996). These items typically receive low LEI ratings (between 1 and 4 out of a possible 8) because they are rather uncommon experiences (“I’m pretty sure that I did not break a window with my hand before the age of 10”). After a manipulation (usually an imagination exercise), participants increase their confidence that these events personally occurred in their childhood. We fashioned the present procedure after Bernstein et al. (2002), in which every LEI item was a potential experimental item. This approach allowed us to focus on the processing necessitated by the manipulation without reference to the intrinsic structure of the items. As in Bernstein et al., we obtained a significant increase in confidence in the present study using the full range of LEI items. The fact that the overall effect size we observed was comparable to that obtained in many studies that restricted their analyses to a few critical items chosen a priori for their special status (e.g., Manning, 2000; Garry et al., 1996) argues for the power of our manipulation. We therefore conclude that our story completion task offers one important advantage over many standard procedures used to distort memory of life events: multiple critical items.

Practical implications

We see at least two practical implications of our work. First, novelists routinely create biographies for their fictional characters. Our findings suggest that making up a story about a fictional character may leave the novelist’s own autobiographical memory vulnerable to contamination. A second implication of our study involves clinical practice. Many people who seek psychotherapy are undergoing some form of distress. If the distress results from either a recent or distant life-changing event (e.g., divorce, death of loved one), these people are particularly vulnerable to

memory distortion and possibly memory implantation for periods occurring before the life-changing event. Conversely, these people appear to be less susceptible to memory distortion for periods occurring after the life-altering event. Our results suggest that the subjective past is perhaps just as important as the objective past in determining one's susceptibility to memory distortion.

Notes

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References

- Barnier, A. J., & McConkey, K. M. (1992). Reports of real and false memories: The relevance of hypnosis, hypnotizability, and context of memory test. *Journal of Abnormal Psychology, 101*, 521–527.
- Bartlett, F. C. (1995). *Remembering: A study in experimental and social psychology*. Cambridge, England: Cambridge University Press. (Original work published 1932)
- Bernstein, D. M. (2001). *Remembering and believing depend: A processing account*. Unpublished doctoral dissertation, Simon Fraser University, Burnaby, British Columbia.
- Bernstein, D. M., Whittlesea, B. W. A., & Loftus, E. F. (2002). Increasing confidence in remote autobiographical memory and general knowledge: Extensions of the revelation effect. *Memory & Cognition, 30*, 432–438.
- Bransford, J. D., & Franks, J. J. (1971). The abstraction of linguistic ideas. *Cognitive Psychology, 2*, 331–350.
- Breckler, S. J. (1994). Memory for the experience of donating blood: Just how bad was it? *Basic and Applied Social Psychology, 15*, 467–488.
- Bryant, R. A. (1993). Memory for pain and affect in chronic pain patients. *Pain, 54*, 347–351.
- Carmichael, L., Hogan, H. P., & Walter, A. A. (1932). An experimental study of the effect of language on the reproduction of visually perceived form. *Journal of Experimental Psychology, 15*, 73–86.
- Ceci, S. J., & Bruck, M. (1993). Suggestibility of the child witness: A historical review and synthesis. *Psychological Bulletin, 113*, 403–439.
- Conway, M. A., & Pleydell-Pearce, C. W. (2000). The construction of autobiographical memories in the self-memory system. *Psychological Review, 107*, 261–288.
- Conway, M. A., & Rubin, D. C. (1993). The structure of autobiographical memory. In A. E. Collins, S. E. Gathercole, M. A. Conway, & P. E. Morris (Eds.), *Theories of memory* (pp. 103–137). Hillsdale, NJ: Erlbaum.

- Deese, J. (1959). On the prediction of occurrence of particular verbal intrusions in immediate recall. *Journal of Experimental Psychology*, *58*, 17–22.
- Eich, E., Reeves, J. L., Jaeger, B., & Graff-Radford, S. B. (1985). Memory for pain: Relation between past and present pain intensity. *Pain*, *23*, 375–379.
- Garry, M., Manning, C. G., Loftus, E. F., & Sherman, S. J. (1996). Imagination inflation: Imagining a childhood event inflates confidence that it occurred. *Psychonomic Bulletin & Review*, *3*, 208–214.
- Goff, L. M., & Roediger, H. L. (1998). Imagination inflation for action events: Repeated imaginings lead to illusory recollections. *Memory & Cognition*, *26*, 20–33.
- Hannigan, S. L., & Reinitz, M. T. (2001). A demonstration and comparison of two types of inference-based memory errors. *Journal of Experimental Psychology: Learning, Memory, and Cognition*, *27*, 931–940.
- Heaps, C., & Nash, M. (1999). Individual differences in imagination inflation. *Psychonomic Bulletin & Review*, *6*, 313–318.
- Holmes, A., & Conway, M. A. (1999). Generation identity and the reminiscence bump: Memory for public and private events. *Journal of Adult Development*, *6*, 21–34.
- Hyman, I. E. Jr., & Billings, F. J. (1998). Individual differences and the creation of false childhood memories. *Memory*, *6*, 1–20.
- Hyman, I. E. Jr., Husband, T. H., & Billings, F. J. (1995). False memories of childhood experiences. *Applied Cognitive Psychology*, *9*, 181–197.
- Hyman, I. E., & Pentland, J. (1996). The role of mental imagery in the creation of false childhood memories. *Journal of Memory and Language*, *35*, 101–117.
- Jacoby, L. L., & Whitehouse, K. (1989). An illusion of memory: False recognition influenced by unconscious perception. *Journal of Experimental Psychology: General*, *118*, 126–135.
- Johnson, M. K., Hashtroudi, S., & Lindsay, D. S. (1993). Source monitoring. *Psychological Bulletin*, *114*, 3–28.
- Keuler, D. J., & Safer, M. A. (1998). Memory bias in the assessment and recall of pre-exam anxiety: How anxious was I? *Applied Cognitive Psychology*, *12*, 127–137.
- Kolers, P. A. (1973). Remembering operations. *Memory & Cognition*, *1*, 347–355.
- Koriat, A., Goldsmith, M., & Pansky, A. (2000). Toward a psychology of memory accuracy. *Annual Review of Psychology*, *51*, 481–537.
- Levine, L. (1997). Reconstructing memory for emotions. *Journal of Experimental Psychology: General*, *126*, 165–177.
- Lewin, K. (1935). *A dynamic theory of personality*. New York: McGraw-Hill.
- Loftus, E. F. (1993). The reality of repressed memories. *American Psychologist*, *48*, 518–537.
- Loftus, E. F., & Palmer, J. C. (1974). Reconstruction of automobile destruction: An example of the interaction between language and memory. *Journal of Verbal Learning and Verbal Behavior*, *13*, 585–589.
- Loftus, E. F., & Pickrell, J. E. (1995). The formation of false memories. *Psychiatric Annals*, *25*, 720–725.
- Manning, C. G. (2000). *Imagination inflation with posttest delays: How long will it last?* Unpublished doctoral dissertation, University of Washington.

- Marsh, R. L., & Landau, J. D. (1995). Item availability in cryptomnesia: Assessing its role in two paradigms of unconscious plagiarism. *Journal of Experimental Psychology: Learning, Memory, and Cognition*, *21*, 1568–1582.
- Mazzoni, G. A. L., Loftus, E. F., & Kirsch, I. (2001). Changing beliefs about implausible autobiographical events: A little plausibility goes a long way. *Journal of Experimental Psychology: Applied*, *7*, 51–59.
- Parkinson, B., Briner, R. B., Reynolds, S., & Totterdell, P. (1995). Time frames for mood: Relations between momentary and generalized ratings of affect. *Personality and Social Psychology Bulletin*, *21*, 331–339.
- Pezdek, K., Finger, K., & Hodge, D. (1997). Planting false childhood memories: The role of event plausibility. *Psychological Science*, *8*, 437–441.
- Platt, R. D., Lacey, S. C., Iobst, A. D., & Finkelman, D. (1998). Absorption, dissociation, and fantasy-proneness as predictors of memory distortion in autobiographical and laboratory-generated memories. *Applied Cognitive Psychology*, *12*, 77–89.
- Robinson, M. D., & Clore, G. L. (2002). Belief and feeling: Evidence for an accessibility model of emotional self-report. *Psychological Bulletin*, *128*, 934–960.
- Roediger, H. L. III, & McDermott, K. B. (1995). Creating false memories: Remembering words not presented in lists. *Journal of Experimental Psychology: Learning, Memory, and Cognition*, *21*, 803–814.
- Rubin, D. C., Rahhal, T. A., & Poon, L. W. (1998). Things learned in early adulthood are remembered best. *Memory & Cognition*, *26*, 3–19.
- Rubin, D. C., & Schulkind, M. D. (1997). The distribution of autobiographical memories across the lifespan. *Memory & Cognition*, *25*, 859–866.
- Schooler, J. W., & Loftus, E. F. (1993). Multiple mechanisms mediate individual differences in eyewitness accuracy and suggestibility. In J. M. Puckett & H. W. Reese (Eds.), *Mechanisms of everyday cognition* (pp. 177–204). Hillsdale, NJ: Erlbaum.
- Schrader, G., Davis, A., Stefanovic, S., & Christie, P. (1990). The recollection of affect. *Psychological Medicine*, *20*, 105–109.
- Sheen, M., Kemp, S., & Rubin, D. (2001). Twins dispute memory ownership: A new false memory phenomenon. *Memory & Cognition*, *29*, 779–788.
- Smith, W. B., & Safer, M. A. (1993). Effects of present pain level on recall of chronic pain and medication use. *Pain*, *55*, 355–361.
- Spanos, N. P., Burgess, C. A., Burgess, M. F., Samuels, C., & Blois, W. O. (1999). Creating false memories of infancy with hypnotic and non-hypnotic procedures. *Applied Cognitive Psychology*, *13*, 201–218.
- Thomas, A. K., & Loftus, E. F. (2002). Creating bizarre false memories through imagination. *Memory & Cognition*, *30*, 423–431.
- Tulving, E., & Thompson, D. M. (1972). Encoding specificity and retrieval processes in episodic memory. *Psychological Review*, *80*, 352–373.
- Wade, K. A., Garry, M., Read, J. D., & Lindsay, D. S. (2002). A picture is worth a thousand lies: Using false photographs to create false childhood memories. *Psychonomic Bulletin & Review*, *9*, 597–603.
- Winograd, E., Peluso, J. P., & Glover, T. A. (1998). Individual differences in susceptibility to memory illusions. *Applied Cognitive Psychology*, *12*, 5–27.