

Biased Retellings of Events Yield Biased Memories

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When people retell events, they take different perspectives for different audiences and purposes. In four experiments, we examined the effects of this postevent reorganization of events on memory for the original events. In each experiment, participants read a story, wrote a biased letter about one of the story characters, and later remembered the original story. Participants' letters contained more story details and more elaborations relevant to the purpose of their retellings. More importantly, the letter perspective affected the amount of information recalled (Experiments 1, 3, and 4) and the direction of the errors in recall (Experiments 1 and 3) and recognition (Experiment 2). Selective rehearsal plays an important role in these bias effects: retelling involves selectively retrieving and using story information, with consequent differences in memory. However, biased memory occurred even when the biased letters contained little, if any, specific information (Experiment 4) or contained the same amount and kinds of story information as a neutral control condition (Experiment 3). Biased memory is a consequence of the reorganizing schema guiding the retelling perspective, in addition to the effects of rehearsing specific information in retelling. © 2000 Academic Press

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When things happen to us, we talk about them. Events do not just happen in words, but that is our primary means of conveying them. When we talk, we do not just recount events one by one in serial order as in a memory experiment. That would quickly bore our audience. Instead, we try to amuse or convince or otherwise captivate our listeners. Wade and Clark (1993), for

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example, found that people use verbatim quotes only when told to be accurate, not when asked to entertain. In ordinary circumstances, we take a perspective on the events we relate. We tailor what we say for the particular audience and to induce a particular effect. We select, we omit, we exaggerate, we embellish, and we dramatize as we relate events.

Both audience and goals affect how much information is included in retellings. When speakers relate events to attentive listeners, they talk more and remember more than when they relate events to inattentive speakers (Pasupathi, Stallworth, & Murdoch, 1998). Similarly, following Grice's maxims (1989), people relate different amounts of information depending on how much they think their audience needs to know in order to understand. Illustrating Grice's maxim of quantity, Vandierendonck and Van Damme (1988) observed that speakers related more details of a scripted story about a visit to a doctor's office when describing it to hypothetical Martians than when describing it to peers. Similarly, speakers related more details for a contest where accuracy was rewarded.

Not just the quantity but also the quality of a message is affected by the audience. Hyman (1994) found that participants' retellings to a peer contained more evaluations and more links to world knowledge than did retellings to an experimenter. Conversely, retellings to an experimenter included more story details as well as more of the narrative structure. In retelling, people also take into account the attitudes of their audience. Speakers adapted their descriptions of a target person in the direction of their audience's opinions, even when they were not told the audience's attitudes until after receiving the information about the target person (Sedikides, 1990). In addition, these biased retellings affected speakers' personal impressions of the target character.

Thus, we tell things differently to different audiences and for different ends. Can the perspective we adopt in retelling events actually alter our memory for those events? It is already known that prior perspective can both bias encoding and guide retrieval. A classic example is the study of Bransford and Johnson (1972). Their participants read paragraphs too abstract to be comprehensible without titles (e.g., "Washing Laundry"). Providing the title before reading and encoding the paragraph led to higher levels of comprehension and memory than did providing it after reading. Likewise, perspective can guide retrieval. Anderson and Pichert (1978) asked participants to read a story about two boys playing in a house from one of two perspectives, that of a home buyer or that of a burglar. After participants had recalled the story, they were given the other perspective and asked to recall again. The new perspective induced participants to recall more details, those related to the second perspective, from the original story. Although the current research is related to these studies on how perspective guides encoding and retrieval, the question we are asking is quite different. The question we wish to address is whether a perspective taken *after* an unbiased encoding of a story can

bias later recall of the event in the direction of the perspective, even when participants are not told to use perspective as a retrieval cue.

In related research, Johnson and colleagues found that the way people were instructed to think about events after they happened affected the way they rated qualitative aspects of their memories. People who were asked to think about the perceptual qualities of events rated their memories as higher on sensory and contextual detail than did people who were asked to think about their own thoughts and feelings about the events (Hashtroudi, Johnson, & Chrosniak, 1990; Johnson & Suengas, 1989; Suengas & Johnson, 1988). Moreover, participants who had been queried about their own thoughts and feelings just after an event later recalled less objective information and made more subjective elaborations than participants who had been queried about perceptual aspects of the event (Hashtroudi, Johnson, Vnek, & Ferguson, 1994). While Johnson and colleagues did not study retellings per se, these findings are suggestive that the way people talk or think about events may have implications for memory.

Intuitively, it does seem that we embellish our earthquake or almost missing a plane or mistaken identity stories to increase their drama or humor and that after a number of retellings we can no longer be sure what really happened and what we added or omitted for literary effect. The challenge is to bring this phenomenon into the laboratory. Numerous studies of flashbulb memories evoked by striking public events such as earthquakes or the Challenger disaster have shown that despite claiming strong memories for the events, people alter their stories on repeated recalls (e.g., Christianson, 1989; McCloskey, Wible, & Cohen, 1988; Neisser & Harsch, 1993). Although some research has suggested that the number of retellings is important for the formation of long-term flashbulb memories (Bohannon, 1988), no research has pinpointed the sources of memory and memory change in flashbulb memories.

Because these studies rely on the natural occurrence of striking events, there is no independent assessment of what really happened to the participants, nor is there control over the retellings. To control the original experience and the perspective of the retellings, we needed to provide them. We wrote stories containing rich enough information that they could be retold from more than one point of view. The Roommate Story describes your first week of your third year in college interacting with your two new roommates in a variety of settings. In those settings, each roommate did prosocial and annoying things. The Murder Mystery Story describes a murder with two suspects, each of whom did some incriminating and some exonerating deeds. After studying one of the two stories, participants were asked to prepare a biased message about one of the characters relying on the information in the stories. To eliminate any biasing effects of an active listener or any dampening effects of a passive listener (Pasupathi et al., 1998), participants wrote their communications instead of saying them out loud to another person.

Thus, these retellings are more in the spirit of letters or e-mail than in natural conversations where conversation demands interaction of all partners in relatively short interchanges. For the Roommate Story, participants in the bias conditions were asked either to write a letter of recommendation to a fraternity/sorority recommending one of the roommates or to write a letter to the Office of Student Housing complaining about one of the roommates and requesting reassignment. In both cases, the experimenter chose the roommate and the perspective. For the Mystery Story, participants in the bias condition were asked to write a summation to the jury urging conviction of one of the suspects, again chosen by the experimenter. For both stories, control participants wrote as much as they could remember about one of the roommates or suspects with no biasing perspective at the same time that the other participants wrote biased letters. Following a 20-min delay filled with other tasks, all participants were asked to recall (or recognize, in Experiment 2) as much as they could of the original story. If perspective of retelling affects memory, then memory and errors of memory in the biased conditions should be consonant with the perspective for the roommate or suspect written about. There should be no bias for the nondiscussed roommate/suspect. The first experiment used a recall paradigm, the second experiment used a recognition paradigm, and the third experiment used a recall paradigm with a new story. The fourth experiment substituted a biased evaluation for the biased retelling, to exclude rehearsal of specific items as a factor in later biased memory for specific information.

Retelling perspective could affect memory in two ways. First, retelling could lead to selective rehearsal of perspective-relevant information. People's retellings should include primarily the information that is relevant to the goal of their retelling; this selective rehearsal would presumably selectively strengthen that information. To the extent that selective rehearsal in the retellings is a factor, participants in the Neutral condition should also show effects of selective rehearsal. Specifically, they should recall more overall information for the discussed roommate or suspect. Although biased retellings are, by definition, a form of selective rehearsal, it is quite likely that selective rehearsal alone will not fully explain effects in memory. A second way that retelling perspective could affect memory is by inducing participants to form an overall schema of the character and the situation. This schema could then be used later to guide recall and recognition, leading to increased memory for schema-relevant information but also perhaps to errors in recall or false positives when recognizing schema-relevant material from elsewhere, most likely the other character in the story.

EXPERIMENT 1: RECALL OF ROOMMATE STORY

Participants in this experiment read the Roommate Story. A few minutes later, participants in the bias conditions wrote goal-directed letters about one

of the roommates, and participants in the Neutral condition recalled what they could remember about one of roommates. Following a short filled delay, all participants recalled the original Roommate Story.

First, we are interested in the retellings themselves. Retelling for the purpose of achieving some goal should be selective, including items that are relevant to that perspective. In addition, the retellings may include bias-consistent elaborations and judgments.

Second, we are interested in the effects of the selectively biased retelling on final free recall of the original story. Participants in the bias conditions should recall more perspective-consistent items for the discussed character. Errors involving the discussed character should also be consistent with retelling perspective.

Method

Participants

Seventy-five Stanford undergraduates (38 females, 37 males) participated in the experiment. They received either course credit or monetary compensation for participating. Twenty-five participants were randomly assigned to each of three retelling perspectives: the Social perspective, the Annoying perspective, and the Neutral condition (no perspective).

Materials

The story (see Appendix A) addressed the participant as “you” and described his or her first week at UC Berkeley with two new roommates. The names for the roommates were chosen to match the sex of the participant. After a brief introduction, the story related six typical college scenes, such as going to a party or the library. For three scenes, each roommate did two social, one neutral, and one annoying activity; for the other three scenes, each roommate did two annoying, one social, and one neutral activity, yielding a total of 54 activities associated with the roommates, 9 Social, 9 Annoying, and 9 Neutral items for each roommate. This rendered the roommates difficult to distinguish. The story was completed with neutral background information. The validity of social, annoying, and neutral items was established in pretesting.

Procedure

Participants were tested individually. There were three phases to the experiment: the study phase, the retelling phase, and the memory phase.

Study phase. In the study phase, each participant was given a copy of the story to read, and the experimenter read the following directions to him/her: “You will be asked to remember the details of the story below. Please carefully study the story. You will have five minutes to do so.” Following this, the participant performed an unrelated task for 2 min.

Retelling phase. In the retelling phase, the experimenter then selected one of the two story characters and instructed the participant to write about that roommate for up to 10 min. Participants wrote their letters in Microsoft Word on a Macintosh computer. The Word document began with the retelling instructions followed by blank space for typing the retelling.

Participants assigned to the Social perspective recommended the designated roommate for admission to a fraternity/sorority. The instructions focused participants on the fun and positive qualities of the roommate. The letter instructions (for a male roommate) for the Social perspective were as follows:

One of your new roommates, David, is pledging a fraternity and he needs a peer recommendation. The fraternity he has chosen has a reputation for partying and stresses sociability and athletic interest as its only criteria for joining. David is eager to become a member, so he asked you to write a letter stressing how much fun he can be. Please draft a letter of recommendation for David, being sure to cite specific experiences you had with him during your first week together. You will have ten minutes to draft your letter.

The instructions for the Annoying perspective focused on the irritating characteristics of the roommate. The letter instructions (for a female roommate) for the Annoying perspective were as follows:

You have decided you don't want to live with Lisa anymore, and the Office of Student Housing requires a detailed letter of complaint before considering any roommate reassignments. The Office of Student Housing emphasizes lack of consideration and the occurrence of inconveniences as its only criteria for moving. You are anxious to move, so you decide to write a letter emphasizing how difficult Lisa is to live with. Please draft a letter of complaint against Lisa, being sure to cite specific examples from your first week together. You will have ten minutes to draft your letter.

Participants assigned to the Neutral condition were not given a retelling focus. They were instructed to recall everything possible about the designated roommate. The writing instructions (for a male roommate) for the Neutral condition were as follows:

Please recall as much of the detail of Mike's activities or any other information about him as possible. You do not need to worry about the exact wording or order of what you recall, just recall as much about Mike as you can. You will have ten minutes in which to do this task.

The retelling phase of the experiment was then followed by a 20-min delay filled by an unrelated perceptual experiment.

Memory phase. The memory phase followed the delay. First, participants used seven-point Likert scales to rate both the roommates on six dimensions: optimism, leadership, sociability, athletic ability, messiness, and inconsideration. These scales reflected the Social perspective (sociability, athletic ability) or the Annoying perspective (messiness, inconsiderate) or were unrelated to either perspective (leadership, optimism).

Finally, a recall test was administered. Participants typed their recall on the computer in a Word document which began with the following instructions:

For the final task today, please recall as much of the detail as possible of the original narrative which described your week with your two new roommates. That is, please recall as much as you can of the story that you studied at the beginning of today's experiment. You do not need to worry about the exact wording or order of what you recall, just recall as much of the story as possible.

Including the two delays, the entire experiment took slightly less than 1 h. The purpose of the experiment was explained to each participant at the end of the session.

Design

The experimental design provides three ways of examining the effects of biased retellings on memory. Of critical interest is how well participants remember perspective-relevant information for the discussed character; this can be compared to memory (1) in the alternate bias condition, (2) in the no-bias Neutral condition, and (3) for the roommate who was not dis-

cussed. Memory should be affected by selectively rehearsing perspective-relevant material. Selective rehearsal should lead to better memory for items relevant to the retelling perspective (comparison one) and for the discussed character (comparison three).

Memory may also be affected by the schema induced by the perspective. Such a schema would also promote selective memory for bias-relevant information (comparisons one and three), but it could also yield errors in recall or false positives in recognition of perspective-relevant information from the other roommate. Use of a schema (in addition to the effects of selective rehearsal) might lead to greater recall of perspective-relevant information in the bias conditions than in the Neutral condition (comparison two).

Results

Coding

The Roommate story was constructed such that it contained 54 activities: 9 Social, 9 Annoying, and 9 Neutral for each roommate (see Materials above). Retellings and recall protocols were coded for mention of each of these 54 activities (e.g., played a volleyball game) *and* for whether or not the participant correctly attributed the activity to the appropriate roommate (e.g., Lisa played volleyball). All protocols were coded by at least two coders. Coding was blind for recall protocols; it was not possible to code retellings blind as perspective of retelling would be obvious even to a naive coder.

Retellings

The letters were coded for the number of items of each type (Social, Neutral, Annoying) included in the letters. A 3 (Perspective) 3 (Item Type) \times 2 (Roommate) \times 2 (Sex) ANOVA was done on the mean number of story items included in the letters. There was a main effect of condition; participants in the Neutral condition included more story items than did participants who took the Social or Annoying perspectives [$F(2,63) = 45.03, p < .001$]. This is not surprising as participants in the Neutral condition were not instructed to limit their discussion of a character to a particular perspective. There was also a main effect of item type; participants included significantly more Annoying items in their letters [$F(2,126) = 20.24, p < .001$].

The most notable significant effect was the desired interaction between perspective and item type [$F(4,148) = 58.91, p < .001$]. Participants in the biased conditions included more items consistent with their letter perspective. As shown in Fig. 1, Participants who wrote to a fraternity/sorority included more Social items and participants who wrote to the Office of Student Housing included more Annoying items. Participants in the Neutral condition did not show any bias in their retellings. It is important to note, however, that the interaction is driven by the fact that participants taking a biased perspective did not include perspective-irrelevant items in their letters (e.g., Annoying retellings included few Social items). Biased letters did *not* contain more perspective-relevant items than did Neutral retellings. Thus, a simple

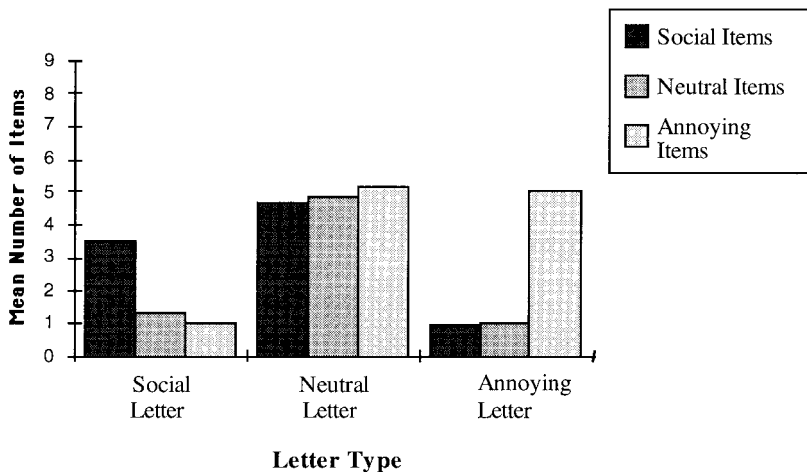


FIG. 1. Mean number of story items used in the retelling phase of Experiment 1.

rehearsal mechanism would predict no differences in later memory for perspective-relevant items between bias and control conditions.

A second analysis was done on the number of elaborations in the letters; a 3 (Perspective) \times 3 (Item Type) \times 2 (Story Character) \times 2 (Sex) ANOVA was done on mean number of elaborations. An elaboration was defined as any judgment that went beyond the text (e.g., Rachel is bubbly; David is a slob) and is also indicative of bias in the letters. Participants in the biased conditions made more elaborations ($M = 4.18$) than those in the Neutral condition, who made very few elaborations ($M = 0.4$) [$F(2,63) = 34.30$, $p < .001$]. This finding makes sense given the nature of the task; participants who were asked to write letters were encouraged to go beyond the text much more than were participants given the Neutral recall instructions. In general, participants' elaborations were classified as social or annoying rather than as neutral [$F(2,126) = 50.83$, $p < .001$].

Most important is the significant interaction between perspective and type of elaboration [$F(4,126) = 102.17$, $p < .001$]. Participants overwhelmingly made elaborations that were consistent with the perspective of their letters. More specifically, as is shown in Fig. 2, participants who wrote recommendations to Greek organizations elaborated on the social and athletic qualities of their roommates, while participants who wrote complaints to the Office of Student Housing elaborated upon the negative and annoying qualities of their roommates.

Likert Scales

Seventy-three of the participants rated the two story characters on six dimensions. These scales were collapsed into Social scales (sociability, athleti-

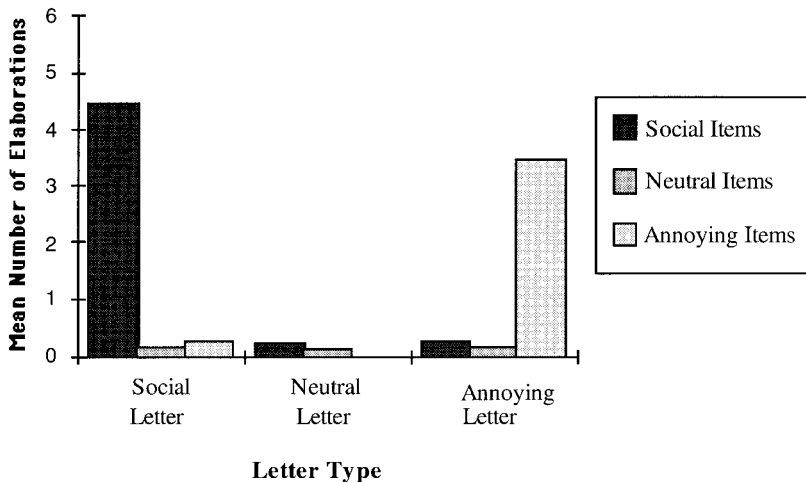


FIG. 2. Mean number of elaborations in the retelling phase of Experiment 1.

cism), Neutral scales (leadership, optimism), and Annoying scales (messiness, inconsideration). Because the results were the same regardless of whether the individual or the collapsed scales were used, we will report only the data from the collapsed scales.

A 3 (Perspective) \times 2 (Discussion) \times 3 (Item Type) \times 2 (Story Character) \times 2 (Sex) ANOVA was done on the ratings. There was a main effect of scale [$F(2,122) = 48.24, p < .001$]. Overall, participants gave higher ratings on the Social and Annoying scales than on the Neutral scales. This effect lends validity to the scales; it makes sense that the roommates should be rated lower on the Neutral scales which were not supported by any story information.

Although it appears that participants were using the scales appropriately, the only significant interaction was between perspective and item type; participants in the Social condition rated both story characters lower on the Neutral dimensions than did participants in the other two conditions [$F(4,122) = 3.25, p < .02$]. No other effects were significant and as such the results will not be discussed further here. The lack of effects is somewhat surprising given the findings of Sedikides (1990).

Memory

The second author and a research assistant scored the 75 recall protocols for correct recall of story items, attribution of the items to roommates, and intrusions or elaborations (see earlier under Coding). The correlation between the two raters was .93 for the number of items recalled. These scores were averaged for the data analyses. The correlation between the two raters was only .73 for the confusions between the two roommates. Due to the

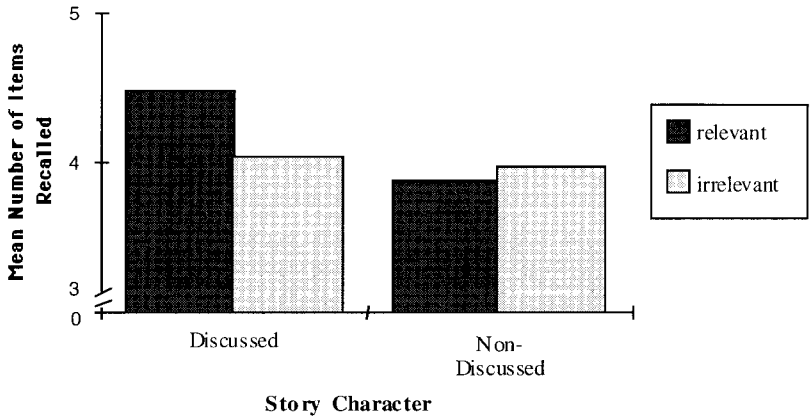


FIG. 3. Mean number of perspective-relevant and perspective-irrelevant items correctly recalled in the memory phase for the bias conditions for the discussed and non-discussed characters in Experiment 1.

lower interrater reliability for the confusions, a third rater was used to resolve discrepancies.

The first dependent variable (Correct Recall) is the number of story items recalled and correctly attributed to the appropriate roommate. The second dependent variable (Misattributions) is the number of story items that were recalled but were attributed to the incorrect roommate. There were not enough elaborations and intrusions to analyze.

There are two main questions. First, do biased retellings affect memory? More specifically, for participants who wrote biased letters, did retelling lead to greater recall of perspective-relevant items for the discussed but not the nondiscussed character? This question should be answered in the affirmative if biased retellings affect memory. Second, do biased retellings and neutral rehearsal lead to similar memory effects? If a rehearsal mechanism is primarily involved, participants in the Neutral condition should also show better recall of information for the discussed than the nondiscussed character.

Do biased retellings affect correct recall? If retelling perspective biases memory, then participants who wrote biased letters should correctly remember more perspective-relevant information for the discussed but not the non-discussed character. A 2 (Discussion) \times 2 (Item Type) \times 2 (Perspective) \times 2 (Story Character) \times 2 (Sex) ANOVA was done on mean number of perspective-relevant and perspective-irrelevant items recalled in the bias conditions. Letter perspective interacted with item type; participants who wrote Social letters remembered more Social items whereas participants who wrote Annoying letters remembered more Annoying items [$F(1,42) = 37.92, p < .001$]. Moreover, as shown in Fig. 3, the critical interaction between discussion and item type was marginally significant [$F(1,42) = 3.72, p < .06$]. As

predicted, there was a trend for participants to remember more perspective-relevant information for the discussed ($M = 4.46$) than the nondiscussed character ($M = 3.87$). Participants remembered equal numbers of perspective-irrelevant items for the discussed ($M = 4.03$) and nondiscussed characters ($M = 3.95$).

In addition, the four-way interaction between story character, discussion, item type, and letter perspective was significant [$F(1,42) = 13.80, p < .002$].¹ Participants in the bias conditions recalled more perspective-relevant information about the discussed character; however, in the Social condition the effect was stronger when the participants had discussed the Lisa/David character and in the Annoying condition the effect was stronger when the participants had discussed the Rachel/Mike character.

Further analyses revealed that retelling from an Annoying perspective had greater effects on memory than retelling from a Social perspective. Both planned comparisons and individual ANOVAs revealed that the interaction between discussion and item type was significant in the Annoying condition [$F(1,27) = 5.67, p < .03$] but not the Social condition ($F < 1$). Participants who retold with an Annoying perspective recalled more Annoying items for the discussed than the nondiscussed character. Although there was a trend for subjects in the Social condition to recall more Social items for the discussed than the nondiscussed character, this effect did not reach significance.

Are memory effects different following biased retellings from neutral rehearsal? The above analyses indicate that the biased retellings did affect memory. However, did the biased retellings have a different effect on memory than Neutral rehearsal? When the data from the Neutral condition were analyzed in a 2 (Discussion) \times 2 (Item Type) \times 2 (Sex) \times 2 (Story Character) ANOVA, there were no significant effects of discussion ($F < 1$) or item type [$F(1,21) = 1.04, p > .3$], and the interaction was also nonsignificant [$F(1,21) = 1.65, p > .2$]. Participants in the Neutral condition did not show a benefit in memory following rehearsal of story items, even though they practiced as much perspective-relevant information as did participants in the Bias conditions.

When the data from each of the experimental conditions were compared (separately) to the Neutral condition in 2 (Perspective) \times 2 (Discussion) \times 2 (Item Type) \times 2 (Sex) 2 (Story Character) ANOVAs, memory differed from the Neutral condition after an Annoying retelling [$F(1,42) = 3.03, p < .07$] but not after a Social retelling ($F < 1$). These interactions were further qualified by four-way interactions involving story character: The Annoying condition was particularly different from the Neutral condition for the char-

¹ The critical interaction is the three-way interaction for which the data is presented. The four-way interaction represents the same bias effect qualified by an item effect: the bias effect is greater for some characters than others. The effect of character does not modulate our conclusions and does not replicate in later studies, so it will not be further discussed.

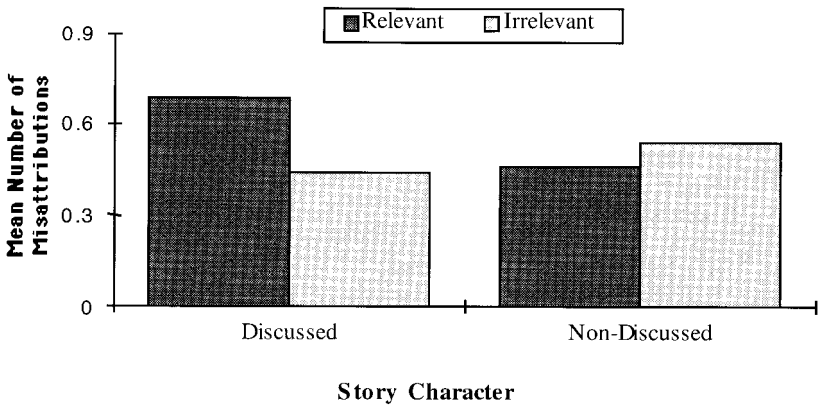


FIG. 4. Mean number of perspective-relevant and perspective-irrelevant items incorrectly attributed to the discussed and nondiscussed characters in the memory phase for the bias condition in Experiment 1.

acter of Lisa/David whereas the Social condition was more different for the Mike/Rachel character [$F(1,42) = 5.84, p < .03$].

Do biased retellings affect misattributions in recall? If biased retellings affect memory, more perspective-relevant items should be misattributed to the discussed than the nondiscussed character. The data on misattributions are particularly interesting; differences in misattributions in final recall cannot be attributed to rehearsal mechanisms because there were few misattributions made in the letters. An item was coded as misattributed if it was an item from the story which had been attributed to the wrong character (e.g., Rachel/Mike played volleyball; Lisa/David actually played volleyball).

Although there were not a large number of misattributions, a 2 (Discussion) \times 2 (Item Type) \times 2 (Perspective) \times 2 (Story Character) \times 2 (Sex) ANOVA was done on mean number of misattributions in the experimental conditions. As shown in Fig. 4, participants in the bias conditions showed a trend to misattribute more perspective-relevant items to the discussed character than to the nondiscussed character [$F(1,42) = 3.49, p < .07$]. This effect was not dependent on participants being in the Social or Annoying conditions ($F < 1$) but it was qualified by an interaction with story character [$F(1,42) = 4.13, p < .05$].

Are misattribution effects different following biased retellings from neutral rehearsal? Separate 2 (Discussion) \times 2 (Perspective) \times 2 (Item Type) \times 2 (Story Character) \times 2 (Sex) ANOVAs were computed on misattributions in order to compare each of the bias conditions to the control condition. There were significantly more perspective-relevant misattributions to the discussed character in the Social condition than in the Neutral condition [$F(1,42) = 3.35, p < .08$] but misattributions in the Annoying

condition did not differ significantly different from the Neutral control condition ($F < 1$).

Discussion

Does a biased retelling of an event after the fact alter memory for the event? To address this question, participants read the Roommate Story, which described their first week of classes with two new roommates, each of whom did a variety of prosocial and annoying things. In the biased conditions, participants wrote letters about one of the roommates either recommending them to a social club or requesting a change in housing. Participants in the Neutral condition simply recounted all that one of the roommates had done. After a filled interval, all participants recalled the entire story. Retelling perspective did affect memory. Participants in the biased conditions recalled more perspective-related information for the roommate they wrote about. They also misattributed more relevant information to the target roommate. In contrast, there was no bias for the character who was not written about.

What mechanism might underlie the effect of biased retelling on memory? It is unlikely that participants engaged in "output monitoring" during final recall (Anderson & Pichert, 1978) if only because participants were encouraged to recall everything they could from the story. Output monitoring would have occurred if participants had failed to report perspective-irrelevant information at test solely because they decided it was not relevant to the perspective they had been given earlier. This is similar to a criticism which has been leveled at misinformation studies, namely, that participants recall both the original and postevent information but go along with the experimenter due to some kind of social demand characteristic (e.g., see Weinberg, Wadsworth, & Baron, 1983, for a discussion of this). Output monitoring is an unlikely explanation for our results as participants did report remembering many perspective-irrelevant items, for both the discussed and the nondiscussed characters. There appeared to be no constraints on reporting perspective-irrelevant information.

Our data do support the idea that people selectively use story information in their retellings and that this selective rehearsal leads to better information for that memory. For example, participants who wrote letters to the Housing organization retrieved and used Annoying events, and these Annoying items were later better remembered.

In hopes of better understanding the mechanisms underlying our effects, we did additional regression analyses to see which variables would be significant predictors of final recall. As expected, the number of story items included in the retelling was a significant predictor of final recall. Practicing lots of story items led to greater recall of story items. More interestingly, we also found that the number of elaborations included in the retelling was a small but significant predictor of recall. Number of elaborations can be

thought of as a measure of bias; the more bias in the letters, the more memory for perspective-relevant information. This is important as it suggests a mechanism other than selective rehearsal; rehearsal mechanisms would predict that the number of story items but not number of elaborations should be a significant predictor of final recall.

Three additional points also suggest that the effects are unlikely to be explained solely by selective rehearsal. First, the bias appears in the misattributions even though misattributions in the letters were rare. Second, there was not a significant effect of selective rehearsal in the Neutral condition: in the Neutral condition, retrieval and practice of story items did *not* have effects on final memory. Third, even though the biased and Neutral retellings included equal numbers of perspective-relevant story items, in some cases the bias in memory was greater after biased retellings than after Neutral rehearsal. Thus, although selective rehearsal is an important and powerful cause of bias effects of memory, it cannot explain all of the observed results. Beyond selective rehearsal, the perspective of retelling seems to reorganize the story information in ways that bias and distort memory.

Interestingly, memory bias was stronger for the negative, Annoying perspective than for the positive, Social perspective. Stronger effects for the Annoying perspective than the Social perspective could be due to several factors. The annoying behaviors seem to share more features with each other than the social ones as each annoying behavior was an inconsiderate act. The social behaviors were less tightly interlinked as they occurred in more different ways, including both purely social activities and athletic ones. The annoying acts had a direct and negative impact on the hypothetical you whereas the social acts had a positive impact but typically on others, not on you. Any or all of these reasons—common features, negativity, or hypothetically involving the reader—could account for the greater effect of the annoying perspective in reorganizing story information and biasing memory.

EXPERIMENT 2: RECOGNITION OF THE ROOMMATE STORY

The systematic misattributions in the first experiment are intriguing but the actual numbers are low. As indicated previously, misattributions are particularly interesting as they are unlikely to be due to rehearsal mechanisms as participants made few of these errors in their letters. In order to further investigate these memory errors, Experiment 2 replicated the first experiment using a more sensitive measure of memory, recognition. Participants were asked whether or not a roommate had done each activity.

Method

Participants

One-hundred and sixty-six Stanford students participated in the experiment. They received either course credit or monetary compensation for participating. Sixty-seven subjects partici-

pated in one of two large group sessions, as a fund-raiser for either the Stanford Symphony Orchestra or for Rincadelt (a Stanford dormitory organization). The remaining 99 subjects participated in the experiment in small groups and were recruited via campus-wide fliers.

Twenty-seven subjects, mainly those in large groups, wrote inappropriate letters and their data were discarded. Discarding their data did not alter the pattern of results. The remaining data included 40 participants in the Social retelling condition, 48 participants in the Neutral rehearsal condition, and 51 participants in the Annoying retelling condition.

Materials

The same story was used as in Experiment 1. A recognition test was constructed to replace the recall memory test. There were 128 questions on the recognition test. All questions had the same format: Did (insert roommate) (insert some activity)? For example, one question was "Did Lisa play volleyball?"

There were 64 different activities crossed with the two roommates for a total of 128 questions. Of the 64 activities, 54 were the critical items from the story (which were broken down into 9 Social, 9 Annoying, and 9 Neutral per roommate). Of the remaining 10 activities, 4 were ones that both roommates had done (e.g., gone to the coffee house), and 6 were misleading activities that neither roommate had done. The 6 misleading items were split between items relevant to the Social perspective (e.g., played charades) and items relevant to the Annoying perspective (e.g., copied your homework).

The fact that activities were crossed with roommate meant that two versions of each question were created, one for each of the two roommates (e.g., the test contained both of the following questions: "did Lisa play volleyball?" and "did Rachel play volleyball?"). Matching questions never appeared in the same half of the test, and questions that could be contradictory never appeared on the same page of the test booklet (e.g., "Did Lisa major in Engineering?" and "Did Lisa major in History?" never appeared on the same page). Four different random orders of the test were used.

Procedure

As in Experiment 1, there were three phases in Experiment 2: the study phase, the retelling phase, and the memory phase. All participants read the story, did a 2-min unrelated filler task, wrote one of three kinds of letters (Social, Neutral, or Annoying), participated in an unrelated experiment, and then took a memory test, in this case a recognition test.

There were two other procedural changes in Experiment 2, with the more important one being the change in the testing situation. Participants were tested in groups rather than individually. As a result, the experiment was administered as a paper-and-pencil task rather than on the computer. Each participant was given one page on which to write a retelling and one page for final recall; the instructions were printed on the top of all pages. The final change was that the Likert scales were eliminated in Experiment 2, due to the lack of results in Experiment 1.

Results

Retellings

As in Experiment 1, the letters were coded for numbers of story items and elaborations of each type included in the letters. A 3 (Letter perspective) \times 3 (Item Type) \times 2 (Story Character) \times 2 (Sex) ANOVA was done on the mean number of story items. Overall, there was a main effect of item type [$F(2,254) = 19.36, p < .001$], with more inclusion of Neutral items than of Social or Annoying items. This is not surprising as the Neutral items could be included in any of the letter-writing perspectives. There was also

a main effect of letter [$F(2,127) = 55.84, p < .001$], with participants in the Neutral condition recalling more items overall, again because they did not need to be selective and could include information relevant to either of the perspectives. There was a marginally significant effect of story character; participants used more story items when writing about Dave/Lisa [$F(1,127) = 3.28, p < .08$] but this effect only held for participants writing a Social letter [$F(2,127) = 6.84, p < .003$].

Most importantly, there was a significant interaction between letter perspective and item type [$F(4,254) = 58.21, p < .001$]. As in the previous experiment, participants included more items of the kind consistent with the letter they were writing. That is, participants who wrote to a fraternity/sorority included more social and athletic items ($M = 3.2$) than did participants writing letters of complaint ($M = 0.45$). Participants writing to the Office of Student Housing included more Annoying items ($M = 4.0$) than did participants writing recommendations ($M = 1.05$). Participants writing Neutral letters included both Social ($M = 2.8$) and Annoying ($M = 4.04$) items, so biased and Neutral letters did not differ significantly in numbers of perspective-relevant items. The biased letters differed from the Neutral rehearsals in that the biased letters contained fewer perspective-irrelevant items. No other effects were significant.

The data from the elaborations provide additional support for the success of the letter manipulation. A 3 (Letter Perspective) \times 3 (Item Type) \times 2 (Story Character) \times 2 (Sex) ANOVA was done on mean number of elaborations. Overall, the results paralleled those from Experiment 1. Participants in the Neutral condition elaborated less than did participants in the Social and Annoying bias conditions [$F(2,127) = 30.19, p < .001$]. Likewise, participants made fewer neutral elaborations than social or annoying elaborations [$F(2, 254) = 30.14, p < .001$]. More interesting is the significant interaction between letter perspective and type of elaboration [$F(4,254) = 76.42, p < .001$]. As before, participants overwhelmingly made elaborations that were consistent with the perspective of their letters. Participants writing to a fraternity/sorority elaborated more on the positive and social qualities of the target roommate ($M = 2.9$) whereas participants requesting a housing change elaborated more on the negative and annoying qualities ($M = 2.0$) of the designated roommate. Participants did not elaborate on perspective-irrelevant qualities; annoying elaborations were nonexistent in recommendations ($M = .0$) and social elaborations were rare in the complaints ($M = .38$).

Recognition Memory

An activity was counted as having been attributed to a story character if the participant responded "yes" to a question. Each attribution could have been correct or incorrect, and each item could have been attributed to both of the characters, one of the characters, or neither of the characters.

Correct attributions. Within the bias conditions, we compared memory for perspective-relevant and perspective-irrelevant items correctly attributed to the discussed and the nondiscussed characters. A 2 (Discussion) \times 2 (Item Type) \times 2 (Letter Perspective) \times 2 (Story Character) \times 2 (Sex) ANOVA was done on mean number of items correctly attributed in the biased conditions. There were main effects of sex [$F(1,83) = 8.70, p < .005$] and of story character [$F(1,83) = 5.42, p < .03$] but neither of these variables was involved in any significant higher-order interactions. There was also a main effect of discussion, with participants correctly attributing more items to the character they had discussed [$F(1,83) = 10.09, p < .003$].

Overall, the critical interaction between discussion and item type was not significant ($F < 1$); although participants did correctly attribute more items to the discussed character, this effect was not limited to perspective-relevant items. However, when the Social and Annoying conditions were analyzed separately, it became clear that the interaction was significant in the Annoying [$F(1,47) = 4.11, p < .05$] but not the Social condition ($F < 1$). Thus, after an Annoying retelling, participants correctly attributed more Annoying items to the discussed character ($M = 7.2$) than the nondiscussed character ($M = 6.2$) but attributed equal numbers of Social items to the discussed ($M = 6.3$) and nondiscussed ($M = 6.3$) characters. Participants in the Social condition, on the other hand, correctly attributed more items to the discussed character for both perspective-relevant and perspective-irrelevant items.

Although there was evidence for bias in Annoying condition, this bias was not greater than the effects of rehearsal in the Neutral condition. A Neutral retelling led to more correct attributions to the discussed than the nondiscussed roommate [$F(1,44) = 8.46, p < .007$]; this did not interact with item type [$F(1,44) = 1.50, p > .2$]. Comparisons of both experimental conditions to the Neutral control condition revealed no significant differences (F 's < 1).

Misattributions. Perspective-consistent bias was apparent in misattributions. A 2 (Discussion) \times 2 (Item Type) \times 2 (Letter Perspective) \times 2 (Story Character) \times 2 (Sex) ANOVA was done on the mean number of incorrect attributions in the biased conditions. There was a main effect of letter [$F(1,83) = 4.09, p < .05$]; people made more misattributions after having written a letter to a sorority/fraternity. There was also a main effect of story character [$F(1,83) = 4.56, p < .04$]. The critical interaction between discussion and item type was marginally significant [$F(1,83) = 3.79, p < .06$]; participants in the biased conditions misattributed more perspective-relevant items to the discussed ($M = 3.14$) than to the nondiscussed character ($M = 2.56$). They attributed equal numbers of perspective-irrelevant items to the discussed ($M = 2.96$) and the nondiscussed characters ($M = 3.0$). This interaction was not qualified by letter perspective (Social vs Annoying) or story character.

When the misattributions from the Neutral condition were analyzed in a

2 (Discussion) \times 2 (Item Type) \times 2 (Story Character) \times 2 (Sex) ANOVA, there was no main effect of Discussion ($F < 1$), and the interaction between discussion and item type did not reach significance [$F(1,44) = 2.19, p > .1$]. Each of the biased conditions was compared to the Neutral condition in separate 2 (Letter Perspective) \times 2 (Discussion) \times 2 (Item Type) \times 2 (Story Character) \times 2 (Sex) ANOVAs on misattributions. However, neither of the biased conditions was significantly different from the pattern of data in the Neutral condition.

Discussion

As in the first experiment, all participants read the Roommate Story. Participants in the biased conditions then wrote a letter about one of the roommates from a perspective that focused on Social or Annoying actions. Participants in a Neutral control condition simply recalled everything they could about the target roommate. After a filled interval, all participants were tested on their recognition memory for the story actions and which story character performed them. As before, memory bias was stronger for the Annoying perspective than for the Social perspective. Participants who had taken an Annoying perspective were better at correctly attributing Annoying actions to the discussed character. Participants in both bias conditions were more likely to misattribute perspective-relevant activities to the target character than to the nondiscussed roommate.

Thus, as in Experiment 1, there is evidence that biased retellings affect memory. It is more difficult, however, to pinpoint the mechanisms underlying the bias effects in the current experiment. Experiment 2 provides little support for the selective rehearsal mechanism in that bias effects are weakest for correct attribution of story items. A selective rehearsal account would predict that participants should be particularly good at attributing the kinds of information that they practiced during the retelling phase; however, in Experiment 2 the bias effects are weakest for correct attribution of story items, occurring only in the Annoying condition. The strongest bias effects occur in the misattribution data. As in Experiment 1, participants rarely misattribute items in their letters, suggesting that this effect can not be explained solely by rehearsal mechanisms. Nevertheless, in the biased perspective conditions, participants misattributed more perspective-relevant information to the discussed character than to the nondiscussed character. While bias in misattributions is evident when comparing the two bias conditions, it was not robust and did not appear in the comparison between bias and Neutral conditions.

EXPERIMENT 3: RECALL OF MURDER MYSTERY STORY

The third experiment was a replication of the first with a new story, the Murder Mystery Story. This story described a murder with two suspects,

each of whom did incriminating and exonerating things. After reading the story, participants in the bias condition were asked to write a summation for the jury accusing one of the suspects. Participants in the Neutral condition recalled information about one of the suspects. After a filled interval, recall of the original story was tested.

Method

Participants

Sixty-two Stanford students (32 males and 30 females) participated in the experiment for course credit. All participants were tested individually. None of the participants had been in the previous experiments. Only 57 participants' data were collected for the attribution questions due to experimenter error. Twenty-five participants were assigned to the Neutral control condition and 37 participants were assigned to the biased Prosecution condition.

Materials

The Murder Story (see Appendix B) was used. This story described the murder of Ellington Breese by toxic gas and described clues and behaviors that either incriminated or exonerated each of the two suspects. The narrative was adapted from a story used by Greene (1981) who in turn adapted it from a book of short mystery stories (Wren & McKay, 1929).

As with the Roommate Story, the Murder Story was also structured around two characters. The two suspects were matched for number of incriminating clues (e.g., Walters returned unexpectedly early from Washington) and exonerating behaviors (e.g., the housekeeper thought Boardman looked calm, not like someone who had just killed someone). Overall, there were many more incriminating items in the story (14) than exonerating ones (6). The imbalance was the result of trying to retain the original "whodunit" feel of the mystery story; these stories tend to be about guilt and possible motives rather than exonerating behaviors.

The Murder Story also contained four ambiguous clues (e.g., fingerprints on a flask) which were not attributed to either character. These items were added to see if participants would spontaneously attribute them in free recall. A series of short questions at the end of the experiment required participants to attribute these ambiguous items to a particular suspect.

Procedure

The procedure was exactly the same in Experiment 1 except that participants read the Murder Story instead of the Roommate Story. Accordingly, the retelling instructions were also different: one-half the participants wrote to a jury arguing why the suspect should be convicted (Prosecution Perspective); the rest simply remembered information about one of the characters (Neutral perspective).

Study phase. Participants read and studied the Murder Story for 5 min and then participated in an unrelated task for 2 min.

Retelling phase. Following the brief delay, participants wrote about one of the characters in the story; they typed their retellings in Microsoft Word on a Macintosh computer. The Prosecution perspective required participants to write a summation to the jury explaining why one of the characters should be found guilty of the crime. The instructions for a participant taking the Prosecution perspective toward Jonathan Walters were:

Jonathan Walters is being tried for the murder of his uncle Ellington Breese. As the head prosecutor, you need to convince the jury that Walters is guilty of first-degree murder. Please write the summation that you will present to the jury. To make

your case, you will need to show that Walters had the motive and the opportunity to commit the crime, and was the kind of person capable of such a horrible deed. You will need to support your case with incriminating evidence from the police report. You will have ten minutes to write your summation.

Participants in the Neutral condition were simply asked to recall about one of the characters. The instructions for the Neutral condition regarding Jonathan Walters were:

Please recall as much of the information from the police report about Jonathan Walters as possible. You do not need to worry about the exact wording or order of what you recall, just recall as much about Walters as you can. You will have ten minutes in which to do this task.

The retelling phase of the experiment was followed by a 20-min delay during which participants did an unrelated experiment.

Memory phase. As in Experiment 1, in the final recall phase, participants were asked to recall as much of the original story as they could. This recall was typed into a Microsoft Word document on a Macintosh computer. Following the free recall period, participants were asked 12 specific questions about the story. These questions required participants to attribute clues/behaviors to a particular suspect and to rate their confidence in their answers. Of the 12 questions, 6 asked about incriminating clues (3 per suspect), 2 involved exonerating behaviors (1 per suspect), and the remaining 4 questions pertained to the ambiguous clues. These questions did not yield any interpretable results and will not be discussed further.

Results

Coding

The story was constructed so that it contained seven incriminating and three exonerating items for each suspect. Retellings and recall protocols were coded for mention of each of these 20 items (e.g., had been a chemist's assistant) *and* for whether the participant correctly attributed the item to the appropriate suspect (e.g., Boardman had been a chemist's assistant). All protocols were coded by two coders; discrepancies in coding were resolved by a third coder. Coding was blind for recall but not retelling protocols.

Retellings

A 2 (Perspective) \times 2 (Item Type) \times 2 (Suspect) \times 2 (Sex) ANOVA was done on the mean number of correct items used in the letters. As shown in Fig. 5, letters written with either a Prosecution or Neutral perspective did not differ in either the number of incriminating items or the number of exonerating items included [$F(1,54) = 1.94, p > .1$]. However, an analysis using proportions rather than mean number of items revealed a significant interaction between item type and perspective; participants used a higher percentage of exonerating items when taking a Neutral perspective than when taking a Prosecution perspective [$F(1,54) = 4.04, p < .001$]. It is notable that participants who wrote with a Prosecution perspective did not discuss any more incriminating items than did participants writing with a

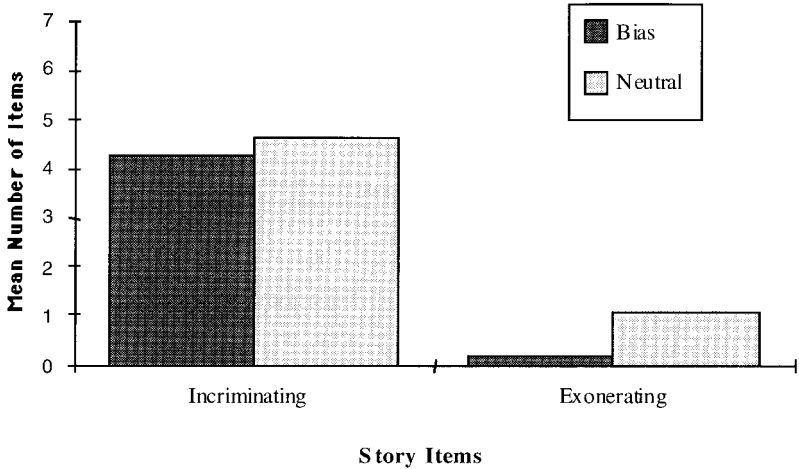


FIG. 5. Mean number of incriminating and exonerating story items included in the retelling phase of bias and neutral participants in Experiment 3. Participants in the two conditions did not differ in number of incriminating items used in their letters.

Neutral perspective; thus, a simple rehearsal mechanism would predict no difference between the two conditions in final recall of incriminating items.

The letters were also analyzed for misattributions and elaborations/judgments. There were few misattributions and no differences between those who wrote summations and those who did not ($F < 1$). Elaborations, however, did differentiate the groups, as is evident in Fig. 6. First, there were

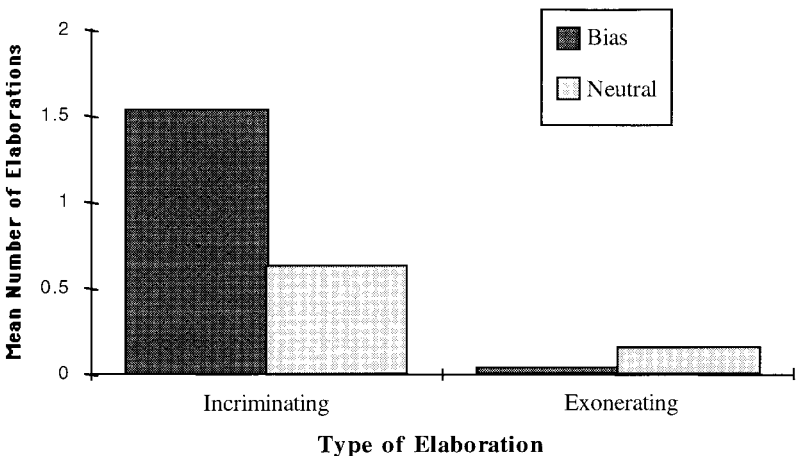


FIG. 6. Mean number of incriminating and exonerating elaborations included in the retelling phase of bias and neutral participants in Experiment 3. Participants in the bias condition made more incriminating elaborations than did participants in the Neutral condition.

many more incriminating elaborations than exonerating ones for both groups [$F(1,54) = 134.72, p < .001$]. Participants who wrote with a Prosecution perspective made more elaborations [$F(1,54) = 12.98, p < .002$] and more importantly, they made more incriminating elaborations [$F(1,54) = 31.36, p < .001$] than did participants who wrote with a Neutral perspective. This effect was stronger for the Walters character than for the Boardman character [$F(1,54) = 7.16, p < .02$].

In sum, the letters differed in that the summations (the Prosecution perspective) included more elaborations and specifically more incriminating elaborations. In addition, they contained a significantly lower proportion of correct exonerating information than did letters written with a Neutral perspective. Importantly, the two types of letters did not differ in the proportion of incriminating items used (61 vs 66%). Thus, the retellings differed in their bias (as measured by elaborations) but not in the rehearsal of incriminating information from the story, as both kinds of letters contained the same number of incriminating items.

Memory

Coding by two raters revealed a number of discrepancies which were resolved by a third rater using a very strict version of the coding. All of the following results reflect the strict coding.

Correct recall. Bias in recall was present following retelling with a Prosecution perspective. A 2 (Item Type) \times 2 (Discussion) \times 2 (Suspect) \times 2 (Sex) ANOVA was done on correct recall following a Prosecution perspective. The main effect of item type was significant [$F(1,32) = 355.55, p < .001$]; participants recalled more incriminating items. Most importantly, only the interaction between discussion and item type was significant [$F(1,32) = 5.24, p < .03$]. As is shown in the left-hand portion of Fig. 7, the participants in the biased condition recalled a greater percentage of incriminating items for the discussed than the nondiscussed character, but recalled a greater percentage of exonerating items for the nondiscussed than the discussed character. Thus, a biased retelling led to biased memory.

The Prosecution condition was compared to the Neutral condition to see if bias in memory following biased retelling could be accounted for solely by rehearsal of story items. A 2 (Letter Perspective) \times 2 (Item Type) \times 2 (Discussion) \times 2 (Suspect) \times 2 (Sex) ANOVA on mean proportion of items correctly recalled revealed two significant effects. There was a main effect of item type, with participants recalling a greater percentage of incriminating items than positive story events [$F(1,54) = 109.9, p < .001$]. The only significant interaction was the predicted one between discussion, item type, and letter perspective [$F(1,54) = 5.58, p < .03$]. Participants who took a Prosecution perspective recalled more incriminating items for the discussed character than the nondiscussed character; this was not the case for those who

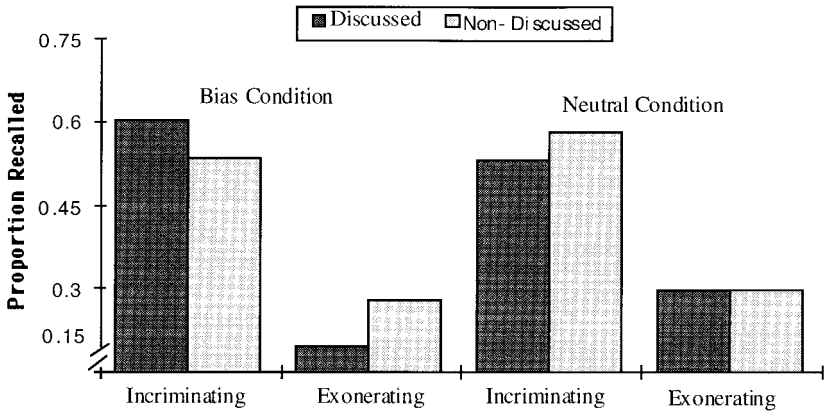


FIG. 7. Proportion of incriminating and exonerating items recalled in the memory phase for the discussed and nondiscussed characters. The bias condition is significantly different from the Neutral condition.

took a Neutral perspective. Exonerating items were recalled equally well by participants in both conditions.

Separate 2 (Letter Perspective) \times 2 (Discussion) \times 2 (Suspect) ANOVAs on correct recall were done to compare the Prosecution and Neutral perspective participants' recall of incriminating and exonerating story items. Again, the interaction between perspective and discussion was significant for incriminating items [$F(1,54) = 4.65, p < .04$], but not for exonerating story items [$F(1,54) = 1.13, p > .2$]. Participants who wrote a summation later recalled a higher proportion of incriminating items for the discussed than the nondiscussed character, but this pattern did not appear following a Neutral retelling which involved equal rehearsal practice of story items (see Fig. 7). For incriminating items, there was also a significant interaction between condition and sex [$F(1,54) = 5.12, p < .03$] but as it did not interact with the discussion variable it does not qualify the main finding. Thus, the Prosecution perspective not only led to biased recall but to a greater bias than a Neutral control condition with equal rehearsal practice of story items.

Errors. Given the small number of errors in final recall, a combination error variable was created by collapsing over different kinds of errors, including misattributions, elaborations, and changes in the valence of story items. Collapsing over the error types did not change the pattern of the data, but allowed for enough power to reach conventional levels of significance. We began by looking for evidence of bias in errors following a biased retelling. A 2 (Discussion) \times 2 (Item Type) \times 2 (Suspect) \times 2 (Sex) ANOVA was computed on number of errors in recall following a Prosecution perspective. There was a significant interaction between discussion and item type

$[F(1,32) = 11.53, p < .003]$; participants in the bias condition made more negatively valenced errors for the discussed than the nondiscussed suspect. Thus, after writing a prosecution summation, participant's final recall protocols contained more misattributions of incriminating clues to the discussed suspect, more transformations of neutral or positive items into incriminating events related to the discussed suspect, and more negative evaluations regarding the discussed character. Thus, replicating our earlier findings, biased retelling led to biased errors in recall.

Is the bias in memory after biased retelling greater than after a Neutral retelling for errors as well as for correct recall? A 2 (Discussion) \times 2 (Item Type) \times 2 (Suspect) \times 2 (Sex) ANOVA was computed on the number of errors in recall following a Neutral perspective. Importantly, there was no significant effect of discussion ($F < 1$) and the interaction between discussion and item type was not significant [$F(1,22) = 1.53, p > .2$]. Participants in the Neutral condition did not make more errors for the discussed character and in particular did not make more incriminating errors regarding the discussed character. When the two conditions were compared directly to each other in a 2 (Perspective) \times 2 (Discussion) \times 2 (Item Type) \times 2 (Suspect) \times 2 (Sex) ANOVA on mean number of errors in recall, the critical interaction between perspective, discussion, and item type was marginally significant [$F(1,54) = 2.87, p < .10$]; this was qualified by a significant four-way interaction between perspective, discussion, item type, and suspect [$F(1, 54) = 4.34, p < .05$]. The bias in errors in recall was greater in the Prosecution condition than in the Neutral condition when participants had written about Boardman (the secretary) but not when they wrote about Walters.

Discussion

In this experiment, participants read a story describing a murder, with two suspects. Afterward, participants in the biased retelling condition wrote a prosecuting summation accusing one of the suspects. These summations contained more incriminating elaborations but no more incriminating facts or misattributions for the selected suspect than did the retellings produced by participants writing with a Neutral perspective. Following a filled interval, participants were asked to recall the original story. Participants who had taken the Prosecution perspective recalled more incriminating items and made more incriminating errors for the suspect they wrote about. Recall of incriminating items for the discussed suspect was greater in participants who had taken a biased perspective than in participants who had taken a Neutral perspective in their retellings. Together, these findings show strong evidence for the effect of biased retellings on memory and provide evidence that the biased recall cannot be accounted for solely by selective rehearsal in the retellings.

EXPERIMENT 4: EVALUATIVE RETELLINGS

If the reorganizing schema provided by the perspective is responsible at least in part for the biased recall, then biased recall should appear even when the retellings minimize recall of specific information from the story. In fact, in real-life discussions of people and events, people often use their memories to make general attributions and evaluations without mentioning the specific information on which the attributions and evaluations are based. To more closely simulate that situation, participants in Experiment 4 were asked to generally evaluate a story character from the Roommate Story (e.g., I don't like Rachel because she's messy) without supporting their arguments with specific story items (e.g., I don't like Rachel because she left dishes in the sink, used my suntan lotion, and talked loudly on the phone). Because this procedure asks participants not to relate specific events in their retellings, any differences in recall of the story are less likely to be due to mentioning events in the letters. This manipulation, then, is both more realistic and weaker. Finding final recall biased in the direction of the retelling perspective would strengthen the case that a retelling schema, and not rehearsal of story items, accounts for biased recall.

Method

Participants

Sixteen Stanford University students (13 females, 3 males) participated in the experiment for pay. The experiment was run in small groups.

Materials

The Roommate Story was used. The only differences in materials were in the instructions given during the letter-writing period (see Procedure). Because the experiment was run in small groups, subjects used paper and pencil for all tasks rather than responding on a computer.

Procedure

As in Experiments 1–3, Experiment 4 had three phases: a study phase, a retelling phase, and a memory phase. The major difference was in the nature of the retelling phase.

Study phase. Participants read and studied the Roommate Story for 5 min.

Retelling phase. Following a 2-min unrelated task, all participants wrote about why they no longer wished to live with one of the characters. The Social perspective was not used in this particular experiment as it had yielded weaker results in previous experiments.

The retelling manipulation had two parts. The first part involved an Impression Task in which participants were asked to write about one of the characters using the Annoying perspective. The instructions differed from those used in Experiments 1 and 2 in that they emphasized general, brief writing based on impressions rather than story facts. For example, female participants who were asked to write about Lisa were told:

You have decided you want to move, and the administrator in charge of housing wants to know why. The Office of Student Housing emphasizes lack of thought-

fulness and considerable inconvenience as its only criteria for moving, and you decide to explain that you feel Lisa is too difficult to live with. You will have five minutes in which to write your explanation.

Please just write a brief statement, similar to what you would say if you were really talking to the person in charge of housing. Just write generally about what you think about Lisa, explaining how difficult living with her has been for you. Don't include specific story items since you are just writing about your impressions.

Following the Impression Task, participants did the Assessment Task. In the Assessment Task, the participants were asked to generate five traits and to rate the story character on them. This was designed to have the participants thinking generally about the target roommate. The following instructions in the Assessment task were given to female participants asked to complain about Lisa:

The resident assistant (R.A.) in your building is trying to understand why you and Lisa are having problems living together. Your R.A. learned in a workshop that you can get a lot of information about how considerate and thoughtful a roommate is by asking for the five most outstanding adjective traits that describe her and a rating on each, where one is low and five is high.

Please think carefully about the five most important traits that characterize Lisa's thoughtfulness, or lack of it, and rate her on them.

Following the retelling phase, all participants did an unrelated experiment for 20 min.

Memory phase. All participants were then asked to recall the original story, as in Experiments 1 and 3. The subjects were then asked to take a recognition test (as in Experiment 2) following the free recall period.

Results

Retellings

Impression task. Three types of items were coded in the summary statements. Participants could include general *evaluations* of a character (e.g., "Rachel is inconsiderate"). Participants could include *generalizations* of a specific story item (e.g., writing "takes things without asking and doesn't return them" most likely refers to the borrowing and loss of the leather jacket). Participants could also explicitly mention *story items* (e.g., "Lisa's alarm wakes me up every morning.>"). Two raters coded these three types of information and classified each statement as being positive or negative. There was little disagreement between raters, and the second author resolved all discrepancies.

Participants again followed instructions in composing the letters. As can be seen in Fig. 8, the letters contained four times as many elaborations as story items. Eighty-one percent of the participants never mentioned a story item. Overall, the letters had a negative tone; participants included more negative information ($M = 5.69$) than positive information ($M = 0.125$) [$F(1,14) = 71.47, p < .001$]. Participants used more negative story items [$F(1,14) = 2.28, p < .15$], made more negative elaborations [$F(1,14) =$

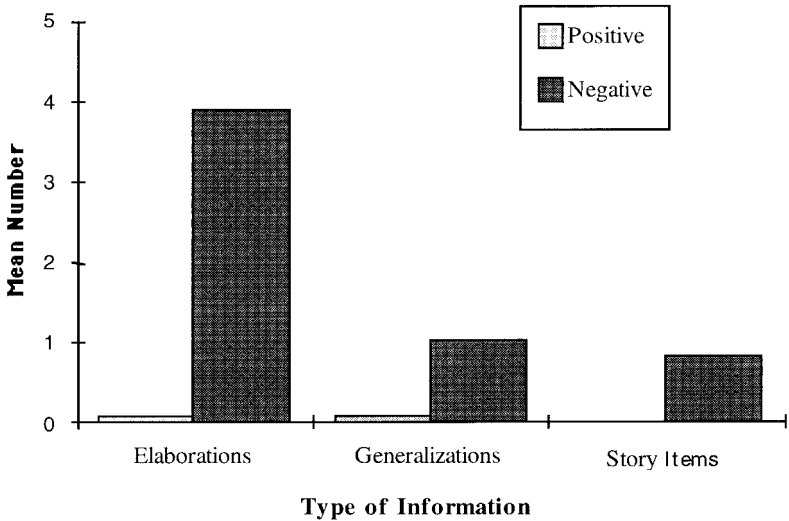


FIG. 8. Participants included more negative story items, made more negative elaborations, and made more negative generalizations in the Impression Task (retelling phase).

152.10, $p < .001$] and more negative generalizations [$F(1,14) = 12.80$, $p < .004$].

Assessment task. Two raters classified each of the adjectives as either positive or negative; there were very few disagreements and those were resolved by the second author. Participants used more negative adjectives to describe the story character ($M = 3.38$) than positive adjectives ($M = 1.5$) [$F(1, 14) = 4.19$, $p < .07$].

Each adjective was assigned a score based on the value assigned to the adjective by the participant and the valence attributed by the raters. For example, if a participant described Lisa as “outgoing: 4,” that was given a score of +4; if a participant described Lisa as “messy: 2,” that was given a score of -2. These scores were averaged across the five adjectives generated by the participants; the average score was -1.9094, which did not include zero in a 95% confidence interval.

Thus, the overall assessment of the discussed character was negative, both in number of words used and in the combination score that reflected both valence and strength of the rating. Combined with the analysis of participants’ written statements about the character, the data clearly indicate that the participants were thinking negatively about the discussed character.

Memory

Two (Discussion) \times 2 (Item Type) \times 2 (Story Character) ANOVAs were done on mean number of items recalled and on mean number of confusions. Sex of subject was not included in the analyses as the male-female ratio

was skewed (13 females, 3 males). There were not enough elaborations to analyze.

Correct recall. Participants recalled more story events related to the discussed character [$F(1,14) = 9.74, p < .009$]. The critical interaction between discussion and item type was marginally significant [$F(1,14) = 3.97, p < .07$]. Participants recalled more Annoying items for the discussed character ($M = 3.8$) than the nondiscussed character ($M = 2.2$), but they recalled just as many Social items for the discussed ($M = 2.4$) as the nondiscussed character ($M = 2.1$). Thus, the manipulation resulted in an increase in perspective-relevant items for the discussed character and no decrements in recall of perspective-irrelevant items. This critical interaction reached the standard level of significance when it was analyzed in an ANOVA which included all item types, including Neutral items [$F(2,28) = 3.66, p < .04$]. No other effects were significant.

Misattributions. Incorrect attributions of events were analyzed. Subjects incorrectly attributed 40% more annoying items to the character they had discussed ($M = 0.625$) than to the character they had not discussed ($M = 0.375$), but this trend did not reach significance [$F(1,14) = 2.13, p > .1$] perhaps because of the relatively small number of participants in this study. Few misattributions of Social items were made, but the trend was in the opposite direction; more Social items were misattributed to the nondiscussed character ($M = 0.25$) than to the discussed character ($M = 0.125$).

Recognition memory. We looked at the effect of discussion and story item type on both correct and incorrect attributions on the recognition memory test. There were no differences in attributional patterns; subjects neither correctly nor incorrectly attributed more perspective-relevant items to the discussed character (F 's < 1). The only significant effect was that participants were more likely to incorrectly attribute an item to the Rachel/Mike character than to the Lisa/David character [$F(1,14) = 7.89, p = .014$]. This lack of results using the recognition test measure is probably due to the small sample size.

Discussion

In this experiment, participants read the Roommate Story and then wrote letters requesting not to room with one of the story characters. Participants were asked to write general, evaluative letters without mentioning specific story events. They were also asked to evaluate the roommate they had just written about. The letters in fact contained general information for the most part and the evaluations were negative. Despite the fact that the retellings contained few, if any story items, final recall was biased in the direction of the retellings. This is evidence that it is the retelling perspective and not the rehearsal of specific items that led to later biased recall of items.

It should also be noted that neither this study nor the previous ones pro-

vided evidence for suppression in recall as a consequence of partial retrieval. Anderson, Bjork, and Bjork (1994) have demonstrated that practicing only part of a set of related items may lead to suppression of the unpracticed items. They found that memory for the unrehearsed items of a practiced category was actually lower than memory for unrehearsed items in an unpracticed category. Anderson et al. (1994) advanced the idea that unpracticed items from practiced categories had to be suppressed during the retrieval practice phase. Does practicing perspective-relevant items lead to a suppression of perspective-irrelevant items for the discussed character, when compared to memory for perspective-irrelevant items for the nondiscussed character? In Experiment 4, perspective-irrelevant items were equally well remembered for the discussed and nondiscussed characters, supporting no role for suppression. This is consistent with the findings of our earlier studies, suggesting that a suppression mechanism is not an appropriate explanation for our results.

GENERAL DISCUSSION

Does the way that events are retold after they happen alter memory for the events? We found a positive answer to that question in four experiments. Participants read stories with two characters. Then they were given a biased or Neutral perspective from which to retell some of the information from the story. In Experiments 1, 2, and 4, participants read about two roommates who did both prosocial and annoying things throughout the week. In biased retelling, they were asked to write about one roommate either to recommend that person to a social club or to request a release from living with that person. In Experiment 3, participants read a murder story with two suspects who did both incriminating and exonerating things. Participants in the biased condition were later asked to write a summation for the prosecution about one of the suspects. The retellings conformed to instructions. In all four cases, the retellings included both story items and evaluations of the story information consistent with the perspective. This adds to previous research showing that people relate information differently to different audiences, depending on their beliefs about the audience's attitudes (Sedikides, 1990), on instructions to be accurate or to entertain (Wade & Clark, 1993), and on the social distance of their audience (Hyman, 1994).

Not only did the retellings reflect the perspective provided, they also biased later memory for the original story. Recall was higher for perspective-relevant information for the discussed character in Experiments 1, 3, and 4. In some cases this bias in recall was greater than benefit in recall found following a neutral rehearsal of information (e.g., in Experiment 3). Misattributions of perspective-relevant information to the discussed character were higher in recall for Experiments 1 and 3 and in recognition for Experiment

2. Thus, retelling bias increases correct memory of information related to the bias and also increases memory errors in the direction of the bias.

What might account for these effects? First, the relevant information for the discussed character is selectively retrieved in the retellings and thus benefits from selective rehearsal. In general, an immediate memory test helps participants to remember information on a later memory test (*the testing effect*; see Brown, 1923, for an example; and Roediger, McDermott, & Goff, 1997, for discussion). Our data are consistent with this; the retrieval and use of perspective-relevant information during the retelling phase increased memory for perspective-relevant information for the discussed character. Part of telling stories is selectively using and practicing information, and this is likely to affect memory for this selected information. Thus, it is clear that selective rehearsal plays a role in the phenomena described here. However, it is unlikely that selective rehearsal can explain all of the results.

There is disagreement in the literature as to whether retrieving information may also lead to intrusions in memory (e.g., Bartlett, 1932). There is some evidence that retrieving information may lead to memory distortion when participants make intrusions and memory errors during the retrieval phase (e.g., McDermott, 1996; Brainerd & Reyna, 1996). Thus, one way that retellings may lead to memory distortion is if participants make errors in their retellings (e.g., see Roediger, Bergman, & Meade, in press; Bergman & Roediger, in press). However, it should be noted that in the current research errors rarely occurred in the retellings; thus although it is quite possible that in other circumstances retellings may lead to biased memories because they allow participants to “practice” errors, this cannot account for the present data.

Although selective rehearsal plays a role in the bias effects found in the current research, selective rehearsal cannot be the entire story for a number of reasons. First, as noted already, there were few perspective-relevant misattributions in the retellings, so selective rehearsal cannot account for the misattributions observed in both recall and recognition. Second, the bias in recall occurred even when the biased retelling did not lead to extra retrieval practice of story items. In Experiments 1 and 2, equal numbers of Annoying items were included in Neutral and Annoying retellings, but only the biased retellings lead to better memory for Annoying items. In Experiment 3, equal numbers of incriminating items were included in retellings regardless of whether a Prosecution or Neutral perspective was taken, but only the Prosecution perspective led to biased recall. Third, the bias in recall occurred even when participants practiced few (if any) story items during the retelling phase. In Experiment 4, participants were instructed not to include specific information and complied with instructions. Although we have no way of ruling out covert rehearsal, final recall showed the expected bias, despite lack of overt rehearsal. Finally, bias in the letters, as measured by the number of perspective-relevant elaborations, was a significant predictor of final recall in Experi-

ment 1. Although the number of story items in the retellings accounted for a significant amount of the variance, additional variance was explained by elaborations. If rehearsal mechanisms alone were responsible for the biased memories, we would not expect number of elaborations to be a significant predictor of biased recall. For all these reasons, selective rehearsal of story items during retelling cannot fully account for the biased memories; something else is needed.

What is needed to fully account for the biased memories is a reorganization of the story information guided by the perspective at retelling. The perspective suggests a schema for selecting some information and omitting other details and for linking the information selected. The schema imposes a top-down thematic structure on events which in these stories have only a list-like, temporal structure. The schema allows construction of a coherent, integrated retelling, such as those obtained here. To construct a coherent and integrated narrative often entails elaborations that bridge across and interpret the facts. Elaborations of this type appeared in abundance in the letters of all four experiments. These schemas serve not only to organize retellings but also to guide retrieval of information at some later time. It is the use of the schemas at later recall that seems to account for better memory for information related to the biasing perspective and especially for the errors in the direction of the bias. Thus, schemas were probably involved at two points in our paradigm: the use of schemas allowed for the creation of the rich retellings we observed, and these schemas also served to organize recall by providing structure and retrieval cues. However, in our studies schemas were *not* activated at encoding as participants were not given a perspective until the retelling portion of the experiment.

Effects of schemas at encoding are well known, dating at least from early studies on lists of randomly ordered items belonging to different culturally shared or subjective categories (Bousfield, Cohen, & Whitmarsh, 1958; Tulving, 1962). The use of schemas led to both correct and incorrect memory. In recall, participants used what might be called a category schema to reorganize the items into clusters from the same category. Not only that, they used the category schema in a top-down fashion, leading to intrusions of items from the same categories that did not appear in the original list, a paradigm that has recently been rediscovered (Deese, 1959; Roediger & McDermott, 1995).

Schemas present at encoding can also bias memory for narratives. Participants who read a passage supposedly about Adolf Hitler were more likely to falsely recognize thematically related passages than participants who had read the same passage about Gerald Martin (Dooling & Christiaansen, 1977). Similarly, participants who knew the motivation (e.g., an unplanned pregnancy) behind a character's actions made more motive-related intrusions in final recall of a simple scripted story (Owens, Bower, & Black, 1979). In both these cases, and others like them, participants used a schema in a top-

down manner to interpret and select the material they were encoding and to add to and fill in gaps in their memories.

Schemas provided after learning have also been shown to affect recall. For example, we described earlier how participants who are given an additional perspective at test (e.g., home buyer) may use this perspective as a retrieval cue and remember additional information (e.g., leaky roof) (Anderson & Pichert, 1978). Besides increasing correct recall, use of schemas postencoding may also lead to bias and memory errors. For example, new information learned after the fact can activate a schema which participants then use to reconstruct the original events. A classic demonstration of this phenomena was provided by Loftus and Palmer (1974), who questioned participants about a slide show they had just seen. One question asked how fast the cars were going when they "hit" or "smashed" into each other. One week later, those whose question read "smashed" were more likely to report seeing broken glass. Similar results were found by Koehnken and Brockmann (1987), whose participants also viewed an accident. Later, some participants were told that one of the drivers had been drinking. Those participants gave higher estimates of the driver's speed. These examples show how wording can activate particular accident schemas (e.g., severe accident; drunk driving accident) and how these schemas can then guide reconstructive memory and lead to bias.

The research on the postencoding use of schemas has either been focused on correct recall (e.g., Anderson & Pichert, 1978) or on memory distortions resulting from postevent information which strongly implied the biased memory. Although in our studies the experimenter also provided a perspective, this perspective was provided only during the retelling phase and not explicitly as a retrieval cue at the final recall test. Most importantly, the retelling instructions led participants to create rich descriptions filled with elaborations, quite different from being given a piece of postevent information by an experimenter. Rather than being given a piece of information linked to a strong schema (e.g., drunk driving accident), our participants were only given a perspective which they then used to create a unique way of thinking about the discussed story character. These rich, selective, elaborative retellings resulted in biased memories.

The study that comes closest to our own (which we learned about only after we had completed our first two experiments) is one by Greene (1981). Participants read a murder story (from which ours was adapted) and then decided which character was guilty. At a later time, they showed recall and recognition bias consistent with their judgments. However, these results are difficult to interpret because the procedure had a serious confounding. Participants may have selected the guilty character based on their memories for relevant story events. Thus, biased memory may have led to the perspective, rather than vice versa.

The current research is also related theoretically to work on source moni-

toring or how people remember the origin of their memories. The actual sources in our experiment are the stories provided by the experimenters and the retellings provided by the participants; however, it is possible to think about the two story characters as analogous to two sources of information. Johnson and colleagues have postulated that source attributions are based on an assessment of a memory trace's qualitative characteristics; a memory is attributed to the source for which its characteristics are typical. Different sources have different typical characteristics; for example, imagined memories are normally associated with the processing involved in their creation whereas real memories are vivid and associated with spatiotemporal context (e.g., see Johnson, Hashtroudi, & Lindsay, 1993; Johnson & Raye, 1981). Source errors occur when memories have atypical characteristics; for example, a vivid and easily generated image might be misattributed to perception (Finke, Johnson, & Shyi, 1988; Johnson, Raye, Wang, & Taylor, 1979). Most of the recent research on source monitoring has been directed at understanding the role of low-level trace characteristics such as perceptual characteristics (e.g., Johnson, Foley, & Leach, 1988), or association to spatial and temporal context (Johnson, Foley, Raye, & Kim, 1982). Rarely have laboratory sources differed on the kinds of motivated characteristics (e.g., personality) which would allow participants to use reasoning processes to attribute source rather than to base their attributions on low-level trace characteristics. Our data have implications for how people may monitor source when sources differ semantically rather than perceptually. During the retelling phase, participants in the bias conditions created a way of thinking about the discussed character, and they later attributed activities using this schema. Similarly, when sources differ in motivations or personality, we would expect that people would base their source attributions on these differences rather than on low-level trace characteristics (e.g., perceptual characteristics). The theoretical Source Monitoring Framework has a role for reasoning processes (e.g., see Johnson, 1992); however, experimental work has focused more on perceptually driven processes. The current data provide experimental support for the role of higher-order reasoning processes in source monitoring.

The present set of studies is the first to show that retelling events from a particular perspective after the events have happened can alter memory for the events. The errors do not have to come from outside, from an investigator's deliberate or inadvertent questioning, from a leading question, or from additional information. Rather, in retelling a story a story teller naturally adopts a perspective and selectively uses, elaborates, and reorganizes the story information in order to achieve the retelling's goal. This is quite close to what seems to happen to us in real life. We use our memories for the events of our lives in many contexts, for example, in drawing inferences and making judgments (Tversky & Kahneman, 1974) or making arguments or evaluations, such as those used in letters of recommendation or prosecution

summaries. Another common context for using personal memories is telling others about amusing or annoying or influential events that have happened to us. When we retell the events of our lives, we do so from a particular perspective, using a schema to reorganize, interpret, and elaborate the information. We are constantly telling and retelling the significant events of our lives. Each time we do so, we risk error.

APPENDIX A

The Roommate Story² (S, Social; A, Annoying; N, Neutral)

You are a junior at UC Berkeley. You've just moved into a University apartment, and find yourself with two new roommates (David and Mike). Each of you has brought furnishings from home: David brought a coffee table (N), Mike donates his bean bag chair (N), and you have just purchased a white rug. During the first week of classes, the three of you start to know each other. David is an engineering major (N) from the Midwest (N), and Mike is a history major (N) from Los Angeles (N).

The first morning, David's alarm wakes you up (A). You get up, trip over a pile of David's books (which seem to be everywhere) (A), and stagger to the bathroom only to find it occupied by Mike for more than an hour (A). Later, the three of you eat breakfast together, and start talking: Mike has just come back from France (N), and describes a great sightseeing trip he took with his new friends (S). David, who has just returned from Spain (N), remarks on how he still keeps in close touch with his foreign friends (S). Afterwards, Mike leaves a pile of dirty dishes in the sink (A).

In the evening, the three of you decide to throw a party. Early on, David munches on lots of chips (N) and Mike eats a hamburger with the works (N). David spills red wine all over your new white carpet (A) in the process of mixing great drinks for his friends (S). As the party continues, Mike is always in the center of a large group (S), and David keeps telling funny jokes (S). Later on, it turns out Mike is a great dancer (S)—but he gets so into it that he knocks over your stereo (A).

The next day, the three of you go to the library. Over the next few hours, you try to concentrate as Mike sits across the table from you and hums loudly (A), while David (who is sitting next to you) constantly cracks his gum (A). Then Mike ties up the last available computer terminal for ages (A), and David checks out all of the books you wanted (A). Later on, David pays his overdue fines (N) while Mike borrows a hit movie to watch with friends (S). David runs into friends in the lobby (S) as you leave the library, so Mike reads the ads on the bulletin board (N).

That afternoon, the three of you decide to drop by the coffee house so that Mike can meet up with his high school friends (S). David often goes there to retell the same boring stories (A), and he also has good friends among the counter-help (S). The dim lighting hurts Mike's eyes (N), but that doesn't stop him from reading while you talk to him (A). Later, David eats a delicious piece of cake (N) and meets new people by sharing a table (S), while Mike hangs out with the band (S).

The next day you try to study, but Mike is talking on the phone so loudly that you give up quickly (A). Instead, you start to pick up David's trash (which seems to already be growing mold) (A), and pile up Mike's unwashed clothes into a smelly heap (A). Catching sight of

² The same story was used for female participants except that references to David were replaced with references to Lisa, and Rachel replaced Mike. All pronouns were changed to make female references.

David, you ask him if he has seen your leather jacket anywhere, and he replies that he borrowed it and he's not sure where he left it (A). A little while later, Mike grabs his wallet (N) and David puts on his hat (N), and they rush out the door—David hurries off to go rollerblading with a friend (S), and Mike sets off for a baseball game with his friends (S).

The three of you decide to spend the next day at the beach. David steps on a sharp shell (N), but that doesn't stop him from joining a fast-paced volleyball game (S). Mike puts down his green blanket (N) before he starts playing a friendly game of frisbee (S). Later that afternoon, Mike competes in a limbo contest (S) after he finishes off all of the food (including your lunch) (A). After David uses up all your suntan lotion (A), he asks the cute lifeguard for a date (S) as a fitting conclusion to the first week.

APPENDIX B

The Murder Story (I, Incriminating; E, Exonerating; A, Ambiguous)

The city of Philadelphia was shocked on the morning of June 5, 1925, by the news of the murder of a most distinguished citizen. Ellington Breese, founder and president of the Breese Chemical Works of that city, had been murdered by poison gas generated in his bedroom during the night.

The police investigation revealed the following pertinent facts: Breese had been found dead in his bed at eight in the morning by his housekeeper, who for years had awakened him at that hour. On the mantelpiece of his bedroom the police found only a newspaper and a glass flask of about one quart capacity. The flask stopper was missing. It was the kind of glass vessel familiar to any chemical laboratory. Experts said that one chemical poured upon another would have generated the poison gas immediately, and that diffusion in the room must have followed quickly. Suspicious but unidentifiable fingerprints were found on the glass flask (A).

The wavering finger of suspicion began to point with equal emphasis at two young men, each of whom was connected with the business. Jonathan Walters, nephew and only surviving relative of the murdered man, was one suspect. He appeared to be stunned when told the news, and had a hard time holding back tears (E). Adam Boardman, Breese's confidential secretary for several years, was the other. When told of his employer's death he was so startled that he had to sit down (E).

Each man protested his own innocence and expressed confidence in the innocence of the other. Several others came forward to vouch for the honesty of the two men. Breese's colleagues insisted that Walters would never be able to kill his uncle (E). Likewise, Boardman's previous employer made a statement about his faith in the secretary (E).

The police continued to be suspicious. Both men had enough laboratory experience to have manufactured the deadly gas. Walters had grown up watching and helping his uncle in the lab (I). Likewise, Boardman had been a chemist's assistant before he became Breese's secretary (I). And either man could have had access to the chemicals: Upon reading the weekly reports of Breese Chemical Works, police discovered that a stranger (whose description matched both suspects) had recently been spotted in an unauthorized area of the factory (A).

A police investigation revealed that neither suspect was on good terms with the victim. Several servants stated that Walters had often argued with his uncle about the proper way to run Breese Chemical Works (I). Likewise, Boardman himself admitted that he disliked his employer because he often required his secretary to work long hours with no extra compensation (I).

Both men had additional motives for committing the crime. Breese's will, which had never been a secret, left half his money to his nephew and the remainder to charities (I). His uncle's death provided Walters with the cash he desperately needed to pay off his enormous gambling debts (I).

On the other hand, although Boardman did not directly profit from the will, there had been

rumors that the secretary had been embezzling from the company, and that Breese was about to begin a massive investigation (I). It was unknown where he had obtained the money with which he had recently purchased several acres of land (I).

The coroner examined the body after receiving the housekeeper's call. Arriving before the police, he was the first to examine the body and thus he was the one who discovered the threatening unsigned note in Breese's pocket (A). Unfortunately, the police were unable to decide whether the note was written by Boardman or Walters. The police were also interested in the coroner's verdict that Breese had been dead at least four hours, and possibly for as long as ten hours. The police were disappointed by the coroner's estimate since a more exact time-of-death would have helped them to pinpoint the murderer.

Boardman, the secretary, had been with Breese in conference for most of the previous day until a little after 11:30 PM. He admitted it, and his leaving at this time was confirmed by the testimony of the housekeeper. She stated that at approximately 11:30, Boardman retired from Breese's quarters for the first time since his arrival and stopped at the bottom of the stairs to talk with her. The police noted the following two suspicious activities: First, Boardman returned to Breese's bedroom, in order, he said, to secure a briefcase which he had forgotten (I). In addition, Boardman closed the bedroom door upon leaving (I). However, according to the housekeeper, "he acted calm, not like someone who had just killed a human being! (E)"

Walters had also been in the house the night of his uncle's demise. By his own testimony, Walters returned unexpectedly early from Washington, DC, at one o'clock in the morning (I). This was confirmed by the housekeeper who said she heard him enter the house, and came out to ask if there was anything she might do. At that time he was standing directly in front of his uncle's door even though Walters' room was not on that floor of the house (I). The housekeeper told Walters his uncle was abed, and the nephew then went to his own room on the third floor. The housekeeper insisted she would have heard him if he had returned to the second floor (E).

Some circumstantial evidence was found that cast doubt on the stories of both men. The newspaper found on the mantle was the 6/4 edition of *The Washington Post*, suggesting Walters' presence in his uncle's bedroom after he returned from the capital (I). Likewise, the missing stopper from the chemical flask turned up in the pocket of the secretary's overcoat (I). However, the police admitted that either piece of evidence could have been planted in order to direct suspicion away from the real killer. In addition, the police located a flask that matched the one in Breese's bedroom, but were unable to link it to either man (A).

As the investigation continued, the police remained suspicious of both Walters and Boardman. Both suspects had the motives, the opportunity, and the ability to commit the crime. The police commissioner acknowledged that although he had many clues, he was certain that more evidence would be uncovered.

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