CHAPTER
4

Misinformation Effects and the Suggestibility of Eyewitness Memory

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Social scientists and legal practitioners have long suspected that suggestive forensic interview practices are a major cause of inaccuracies in eyewitness testimony. However, it wasn't until Elizabeth Loftus published a highly influential series of studies on eyewitness suggestibility in the 1970s that a systematic body of scientific literature on this topic started to emerge. Since then, hundreds of empirical studies on eyewitness suggestibility have been published, all of them variants of the basic experimental paradigm that Loftus developed.

In the early 1970s, research and theorizing about memory was based almost exclusively on studies of memory for lists of words or sentences (see, e.g., Crowder, 1976). By studying memory for complex, fast-moving, and forensically relevant events (typically depicted in film clips or slide shows), Loftus demonstrated that it was possible to conduct well-controlled experiments that were high in ecological validity (Banaji & Crowder, 1989). Her studies provided clear evidence that suggestive interviews can lead to profound errors in eyewitness testimony, thus raising serious questions about the reliability of memory and eyewitness testimony. Her work established that scientific research on memory and suggestibility can and should inform the courts. In addition, her findings inspired many theoretical

debates about the constructive nature of memory, mechanisms of forgetting, and the permanence of memory.

In this chapter, we review the empirical evidence and theoretical proposals that have been put forward to account for the misinformation effect—the finding that exposure to misleading postevent information can lead eyewitnesses to report items and events they never actually saw.

THE MISINFORMATION EFFECT

In the experimental paradigm introduced by Loftus, participants view a slide sequence depicting a complex and forensically relevant event, such as a traffic accident or theft. Immediately thereafter, participants are questioned about the event they witnessed. The critical manipulation is that the questioning includes leading or misleading information. Finally, participants are tested on their memory for the witnessed event. The dependent variable of interest is the extent to which misled participants incorporate the misleading suggestions into their eyewitness reports (as compared to control participants that were not misled).

Early demonstrations of the effects of leading questions revealed several ways in which eyewitness reports could be influenced. For example, for participants who had seen films of automobile accidents, the question, "About how fast were the cars going when they *smashed* into each other?" elicited higher estimates of speed, and more false claims of having seen broken glass on a later test, than questions that used verbs such as *bumped* or *hit* instead of *smashed* (Loftus & Palmer, 1974). Subsequent studies showed that misleading postevent questions could also cause a variety of other distortions in eyewitness reports. For example, Loftus (1977) had participants view an accident involving a green car and later exposed them to misleading questions that presupposed the car was blue. When later asked to select the color of the witnessed car from a color wheel, misled participants showed a marked tendency to shift their color responses in the direction of the misinformation by selecting a "blue-green" color, a tendency that was not observed in control participants. Thus, most misled participants reported a color that was a blend of the original and postevent information (see also Belli, 1988, for similar evidence of color blends following postevent information). Finally, other studies showed that participants could be led to report entire objects that were not present in the originally witnessed event. In Loftus (1975), participants who were asked, "How fast was the white sports car going when it passed the *barn* while traveling along the country road?" (when, in fact, no barn appeared in the scene) were much more likely to later claim they had seen a barn than were control participants who had not been misled (Loftus, 1975).

Important to note, this study also showed that misinformation was more likely to influence later testimony when the false information appeared as a presupposition, rather than the direct focus of the question. For example, participants who were directly asked "Did you see a barn in the film?" were much less likely to later claim they had seen a barn than those who'd answered the previous question where the presence of the barn was presupposed (Loftus, 1975).

In 1978, Loftus, Miller, and Burns published a study demonstrating that eyewitness testimony was much more malleable than previously thought. The experimental procedure was nearly identical to that described in the studies reported earlier, with the crucial exception that the misleading postevent information directly contradicted some aspect of the originally witnessed event. In Loftus et al., for example, participants who witnessed an auto–pedestrian accident involving a stop sign were subsequently asked "Did another car pass the red Datsun when it was stopped at the yield sign?" In a later test of their memory for the witnessed events, participants were given a forced choice between the slide depicting the stop sign and a nearly identical slide depicting a yield sign. The finding was that 75% of the control participants (who had not been misled) correctly chose the slide they had seen depicting the stop sign, whereas only 41% of the misled participants did so—a 34% difference in accuracy. Additional studies showed that when participants who selected the misinformation were later asked to give a second guess (e.g., "Was it a 'stop sign' or a 'no parking' sign?"), their likelihood of selecting the original item was not greater than chance. On the basis of these findings, Loftus et al. claimed that misleading postevent information could not only supplement eyewitness memories, it could also transform them.

The "misinformation effect" documented by Loftus et al. (1978) is one of the best-known and most influential findings in psychology. Demonstrations of the surprising ease with which people could be led to report objects and events they had not seen challenged prevailing views about the validity of memory and raised serious concerns about the reliability of eyewitness testimony. Since its publication, countless studies have replicated and extended these findings: Misinformation effects have been demonstrated in participants of all ages (from preschoolers to older adults), for a variety of different types of events (live events, emotional events, naturally occurring events), types of misinformation (about people, places, and things), methods of delivering the misinformation (narratives, questionnaires, and face-to-face interviews), and all manner of methods for assessing memory for the witnessed event (e.g., free recall, cued recall, and recognition).

Early studies of the misinformation effect also identified factors that influence the magnitude of these effects. For example, Loftus et al. (1978) showed that misinformation effects increase as a function of the delay between the witnessed event and exposure to misinformation, presumably because memory for the original event becomes weaker over time. Social factors, such as the credibility of the postevent source, are also an important variable. Whereas participants are easily influenced by misinformation that is provided by a credible source, they will effectively resist suggestion that is provided by a source who lacks credibility or whom they perceive as having intentions to mislead (Dodd & Bradshaw, 1980; Smith & Ellsworth, 1987; Underwood & Pezdek, 1998). Indeed, even young children are less influenced by suggestion when it is provided by a peer rather than an authoritative adult (Ceci, Ross, & Toglia, 1987; Lampinen & Smith, 1995). A more recent, and related, finding is that the magnitude of the misinformation effect is also influenced by more subtle social cues, such as the perceived power and social at-

tractiveness conveyed by the accent of the person providing the misinformation (Vornik, Sharman, & Garry, 2003). Finally, the extent to which participants detect a discrepancy between their memories of the witnessed event and the postevent account also reduces misinformation effects (Tousignant, Hall, & Loftus, 1986), and in the extreme case where participants are given blatantly contradictory suggestions, they are sometimes not misled at all (Loftus, 1979c). In sum, although studies have identified some of the boundary conditions of the misinformation effect, the high reliability and robustness of these effects is well established.

WHAT HAPPENS TO MEMORY FOR THE ORIGINALLY SEEN DETAIL FOLLOWING EXPOSURE TO CONTRADICTORY POSTEVENT MISINFORMATION?

One of the most influential aspects of Loftus's work on misinformation phenomena were the bold theoretical proposals that she initially advanced to account for these effects (Loftus, 1979a, 1979b; Loftus & Loftus, 1980; Loftus et al., 1978). Specifically, Loftus proposed a "destructive updating" process whereby contradictory misleading postevent information replaces the original information and, as a consequence, permanently erases the original information from memory. Her claim that misinformation could permanently erase information from memory generated tremendous interest, and many researchers set out to show that the original details were not gone from memory but merely rendered less accessible by the misinformation (e.g., Bekerian & Bowers, 1983; Christiaansen & Ochalek, 1983).

In 1985, McCloskey and Zaragoza published an article in which they argued that the traditional misinformation effects (e.g., Loftus et al., 1978) could not be taken as evidence that misleading postevent information caused impairment of original event details. The arguments advanced by McCloskey and Zaragoza (1985a) began with the observation that in the typical eyewitness suggestibility experiment (as in real-world eyewitness testimony situations) participants' memory for the witnessed event is far from perfect, even before they are exposed to misinformation (as evidenced by the finding that control performance is well below ceiling). Hence, according to McCloskey and Zaragoza, the finding that participants given a choice between stop sign and yield sign report the misleading item (yield sign) does not necessarily imply that the participant once had a memory for a stop sign that was now impaired. Rather, for those participants who fail to remember the stop sign (e.g., because they failed to encode it), the misleading suggestion "yield sign" does not conflict with a stored memory representation, it merely fills a gap in memory. McCloskey and Zaragoza argued further that misled participants who fail to encode the originally seen detail (stop sign) are likely to systematically select the more recently presented misleading detail (yield sign) because "yield sign" is all they remember and they have no reason to distrust the postevent source. In contrast, control participants who fail to encode the original stop sign detail, and were never exposed to misinformation about a yield sign, will have no reason to favor the incorrect misleading response (yield sign) on the test.

Rather, they will be forced to guess, thus leading them to select the correct alternative (stop sign) 50% of the time on a two-alternative forced-choice recognition test. McCloskey and Zaragoza concluded that for these reasons, misled participants are likely to perform more poorly than control participants on the stop-sign-versus yield-sign test even when their original memory has not been impaired by the misinformation. Finally, McCloskey and Zaragoza also noted that the demand characteristics of the experiment (where the postevent information is presented by an authoritative experimenter as truth) may lead some misled participants to report the suggested detail on the test even if they can remember the original event detail (see also Lindsay, 1990).

To assess whether contradictory misinformation erases or impairs access to original event details, McCloskey and Zaragoza (1985a) developed a Modified Test procedure in which the misleading detail was not an option. Rather, participants had to choose between the original detail and a new detail. In their experiments, participants who witnessed an office theft involving a handyman holding a hammer were later given the misleading suggestion that he was holding a screwdriver. In contrast to the Standard Test where participants are given a choice between the original and misleading item (hammer vs. screwdriver), on the Modified Test, participants were given a choice between the originally seen item and a new item (hammer vs. wrench).[1] In six experiments using the Modified Test procedure, they found that misled participants selected the original item as often as control participants (grand mean was 72% vs. 75% correct for misled and control conditions, respectively, when collapsing across experiments), thus providing no evidence of memory impairment. In the same six experiments, McCloskey and Zaragoza tested a second group of participants with the standard misinformation test (a choice between the original [e.g., hammer] and misleading [e.g., screwdriver] items) and showed that under these circumstances there were robust misled–control performance differences (collapsing across the six experiments mean performance was 37% vs. 72% for misled and control conditions, respectively, a difference of 35%). Collectively, the McCloskey and Zaragoza results showed that, when given the opportunity, misled participants had an overwhelming tendency to select the misleading alternative over the item they originally saw on the final memory test, thus replicating the misinformation effect first demonstrated by Loftus et al. (1978). However, when the misleading alternative was not an option on the test, participants evidenced the ability to remember the original event detail as well as participants who had not been misled. These results support the conclusion that factors other than memory impairment contribute to these dramatic errors in participants' performance.

McCloskey and Zaragoza's (1985a, 1985b) claim that contradictory misinformation does not impair memory for originally seen details was highly controver-

[1] In all of these experiments, the materials are completely counterbalanced so that across participants, hammer, screwdriver, and wrench serve as the original, misleading, and new information equally often.

sial and generated considerable debate, a debate in which the authors of this chapter held contrasting points of view (e.g., Belli, 1989; Loftus & Hoffman, 1989; Loftus, Schooler, & Wagenaar, 1985; McCloskey & Zaragoza, 1985b; Metccalfe, 1990; Tversky & Tuchin, 1989; Zaragoza & McCloskey, 1989; see also Ayers & Reder, 1998, for a review). McCloskey and Zaragoza's "no impairment" claim seemed to fly in the face of decades of research on retroactive interference effects, and considerable research was devoted to obtaining unambiguous evidence of memory impairment caused by contradictory misinformation. Although McCloskey and Zaragoza's (1985a) results with the Modified Test have been replicated many times and under a variety of conditions (e.g., Belli, 1993; Bowman & Zaragoza, 1989; Loftus, Donders, Hoffman, & Schooler, 1989) clear evidence that misinformation *can* impair memory for original event details has now been obtained with the Modified Test procedure (Belli, Windschitl, McCarthy, & Winfrey, 1992; Eakin, Schreiber, & Sergent-Marshall, 2003; Schooler, Foster, & Loftus, 1988; Schreiber & Sergent, 1998), though it has been difficult to identify the circumstances under which it consistently does so. Payne, Toglia, and Anastasi (1994) conducted a meta-analysis of 44 published experiments that used modified recognition tests and showed that, individually, only 14 of the 44 experiments yielded significantly poorer misled than control performance. Collectively, however, the overall memory impairment effect across the 44 experiments was statistically significant.

What determines whether memory impairment effects are detected? On studies using the Modified Test, evidence of memory impairment has most consistently been obtained when participants are given an interpolated test that forces them to overtly commit to misinformation (by not providing the correct item as an option) prior to taking the Modified Test (Eakin et al., 2003; Foster, Schooler, & Loftus, 1988; Schreiber & Sergeant, 1998) but not when participants freely commit to the misinformation prior to taking the Modified Test (see Belli, 1993, for evidence that freely committing to the misinformation does not lead to such impairment). Presumably, forcing participants to overtly commit to the misinformation further boosts activation of the misleading item, thus inhibiting access to the originally seen details. Another factor that appears related to the detection of memory impairment effects is overall memory performance. Memory impairment effects have more readily been observed when overall memory performance is relatively high as opposed to when it is low (Chandler, 1989; Payne et al.. 1994), and when participants are misled about centrally presented items and tested after a lengthy retention interval (Belli, Windschitl, McCarthy, & Winfrey, 1992; although see Windschitl, 1996, for contradictory evidence regarding the effects of retention interval). There is some evidence that memory impairment effects are more likely to be observed when participants are preschoolers rather than adults (Ceci, Ross, & Toglia, 1987; although see Zaragoza, 1991, and Zaragoza, Dahlgren, & Muench, 1992, for failures to replicate these findings under nearly identical conditions).

Evidence for memory impairment has been more readily observed when the final test requires recall rather than recognition (for evidence of memory impair-

ment with cued-recall tests, see Belli, Lindsay, Gales, & McCarthy, 1994; Lindsay, 1990). An important condition for obtaining impairment effects in recall tests is that the misinformation is permitted as a potential response. When cued-recall tests disallow reporting of the misleading information (e.g., by providing a cue to which the misleading item does not apply), no impairment is observed (Zaragoza, McCloskey, & Jamis, 1987). Whether these impairment effects are at times due to destructive updating of memory traces or solely due to retrieval failure is still not completely resolved (e.g., Belli & Loftus, 1996), but what is clear is that the bulk of the evidence favors a role for the retrieval failure hypothesis in most of the conditions that have been observed so far (for recent treatments of this issue, see Chandler, Gargano, & Holt, 2001; Eakin et al., 2003). In summary, research on the memory impairment issue shows that one potential consequence of exposure to contradictory postevent information is impaired access to the originally seen event.

The paper by McCloskey and Zaragoza (1985a) and those that followed in response (Belli, 1989; Loftus & Hoffman, 1989; McCloskey & Zaragoza, 1985b; Tversky & Tuchin, 1989; Zaragoza & McCloskey, 1989) marked a turning point in the history of research on the misinformation effect. It soon became clear that research on the memory impairment issue—which focuses on the "fate" of the original memory following exposure to suggestion—did not address a fundamental aspect of misinformation phenomena, namely, participants' tendency to incorporate misleading postevent suggestions into their eyewitness reports. Whether or not misinformation impairs memory for originally seen details, the fact remains that participants can be easily led to report misinformation that has only been suggested to them. Hence, a critically important issue of both theoretical and practical concern is understanding the nature and extent of this misleading influence. Does misleading questioning simply influence what participants say, or might such questioning lead to the development of false beliefs about the witnessed event? Alternatively, is it possible that exposure to misinformation might lead participants to create genuine false memories of having witnessed the suggested events? Much of the research that followed was concerned with addressing these issues

DO PEOPLE DEVELOP GENUINE FALSE MEMORIES OF HAVING WITNESSED SUGGESTED DETAILS?

From her earliest writings, Loftus was a strong proponent of the view that misleading postevent suggestions led to distortions in eyewitness *memory* rather than simply influencing what eyewitnesses report (see, e.g., Loftus, 1979a, 1979b; Loftus & Loftus, 1980). However, as alluded to in the preceding section, the misinformation effect does not provide definitive evidence for this conclusion. It wasn't until researchers started employing methods that probed participants more extensively about the basis for their eyewitness reports that clearer evidence bearing on the false-memory hypothesis started to emerge. Although Loftus's claim that misleading suggestions can lead to false memories was ultimately proved correct, this re-

search has also shown that misled participants sometimes report misinformation for other reasons.

In the standard eyewitness suggestibility experiment, misinformation is presented to participants as an accurate description of the events they witnessed by an experimenter whom they are likely to view as knowledgeable and credible. As many have noted (see, e.g., Lindsay, 1990) this experimental situation is imbued with substantial demand. Participants may feel pressured to report the suggestion whether or not they believe the suggested information or misremember seeing it in the original event. Hence, to rule out the possibility that participants report misinformation simply because they are playing along, it is necessary to make every effort to eliminate this demand. At a minimum, participants need to be alerted to the possibility that the information provided by the postevent source may not correspond to the events they witnessed.

Although it is a relatively straightforward matter to change the demand characteristics of the experiment, it is somewhat more difficult to discriminate between situations where a participant-witness has developed a *false belief* in the suggested information as opposed to a *false memory* of having witnessed the suggested information. Even a high-confidence endorsement of the suggested details may simply reflect a strong belief that the suggested events transpired. As mentioned previously, in cases where participants have no memory that contradicts the misleading suggestions, they have little reason to distrust the experimenter and may therefore come to believe that the suggested information is true. In an attempt to be helpful, participant-witnesses are likely to report everything they know about the event without regard to whether they specifically recollect witnessing it at the original event or whether they learned it from another source

One method that investigators have used to more directly assess whether participants misremember witnessing the suggested information is to give them a source-monitoring test, which forces them to discriminate between possible sources of information in memory. In the typical study, participants are asked to identify the source of the suggested item by choosing among multiple possible sources (e.g., the witnessed event, the postevent questions, both, or neither). Note that source-monitoring test procedures inform participants prior to the test that the postevent narrative and questions contain information that was not in the witnessed event, thus reducing any perceived demand to go along with the suggested information.

Studies have shown that when misled participants are given a source-monitoring test, rather than a traditional recognition test, their tendency to claim they remember witnessing the suggested items is substantially reduced (Zaragoza & Lane, 1994) and in some cases eliminated (Lindsay & Johnson, 1989; Zaragoza & Koshmider, 1989). Nevertheless, a great deal of evidence supports the conclusion that misled participants do claim to remember witnessing the suggested details, even when given a source-monitoring test (Belli, Lindsay, Gales, & McCarthy, 1994; Lindsay, 1990; Chambers & Zaragoza, 2001; Drivdahl & Zaragoza, 2001; Frost, Ingraham, & Wilson, 2002; Hekkanen & McEvoy, 2002; Lane, Mather, Villa, & Morita, 2001; Mitchell & Zaragoza, 1996, 2001; Zaragoza & Lane, 1994;

Zaragoza & Mitchell, 1996; see Zaragoza, Lane, Ackil, & Chambers, 1997, for a review). Moreover, if, in addition to the mild warning provided by the source-monitoring test, participants are told very directly and explicitly that they were misinformed (e.g., by telling them that the misleading source contained inaccuracies [Zaragoza & Lane, 1994] or telling them that the experimenter was trying to trick them [Chambers & Zaragoza, 2001]), they still persist in claiming they remember witnessing the suggested items on the source-monitoring test (see also Lindsay, 1990, for evidence that the very strong warning *not* to report any information from the postevent source on the test does not always eliminate false reports on a cued-recall test).

It might be argued that participants' tendency to claim they remember witnessing the suggested items on the source-monitoring test is a reflection of a false belief that they saw the suggested item rather than a genuine false memory of having witnessed the suggested event. To address this possibility, several studies have also assessed the phenomenological experience that accompanies participants' "memory" of witnessing the suggested item or event (cf. Schooler, Gerhard, & Loftus, 1986). One method that has been used to assess the phenomenological experience of false memories is Tulving's (1985) remember/know procedure, a technique that has been used quite extensively in other domains (see Gardiner & Java, 1993, for a review). Following recall or recognition of a test item, participants are asked to indicate whether they remember seeing it during the original event or they just know it occurred, but cannot actually remember the specific episode (see also Zaragoza & Mitchell, 1996, for a related measure where participants are asked to distinguish between "remembering" and "believing"). The distinction between "remembering" and "knowing" is carefully explained to participants (see, e.g., Gardiner & Java, 1990; Rajaram, 1993) and it is emphasized that one can be quite confident that something happened without being able to recollect the specific experience. The question of interest is whether misled participants given remember/know instructions would indicate they "remember" witnessing suggested details, and several studies have now shown that they do (Drivdahl & Zaragoza, 2001; Frost, 2000; Roediger, Jacoby, & McDermott, 1996; Zaragoza & Mitchell, 1996).

In summary, even when participants are warned about the misinformation and are given a source-monitoring test that forces them to discriminate between different sources of information in memory, they continue to claim they remember witnessing suggested details. Moreover, on measures of their phenomenological experience, participants indicate that they recollect seeing the suggested items, much like they recollect memories derived from perceptual experiences. Collectively, these studies provide clear evidence that participants sometimes develop genuine false memories for items and events that were only suggested to them.

A THEORETICAL FRAMEWORK

The belief that one remembers witnessing an item that was only suggested is an example of a situation where a memory derived from one source (e.g., misleading

suggestions provided by an experimenter) is misattributed to another source (e.g., the witnessed event), an error we refer to as a source misattribution error. Marcia Johnson and colleagues (see Johnson, Hashtroudi, & Lindsay, 1993; Johnson & Raye, 1981; Lindsay, 1994) have developed a general theoretical framework, the source-monitoring framework (SMF), that provides some insight into how such errors come about.

According to the SMF, memory for source is an attribution (see also Jacoby, Kelley, & Dywan, 1989, for a similar approach) that is the product of both conscious and nonconscious judgment processes. From this view, information about the source of a memory is not stored directly, but is based on an evaluation of the characteristics of the memory representation. The SMF assumes that memory representations are records of the processing that occurred at encoding and thus contain features or characteristics that reflect the conditions under which the memory was acquired (where and when each piece of information was acquired, modality of presentation, emotional reactions, records of reflective processes, etc). So, for example, if a memory contains a great deal of visual detail, an individual would likely attribute this memory to an event he or she saw. People can, and often do, accurately attribute the source of their memories because memories from different sources tend to differ on average in the quantity and quality of the characteristics associated with them (e.g., memories of perceived events typically have more vivid perceptual, temporal, and spatial information than memories of imagined events; Johnson, Foley, Suengas, & Raye, 1988). Nevertheless, because there can be overlap in the distributions of the features associated with memories from different sources, errors can occur. For example, imagining words spoken in another person's voice increases people's tendency to confuse what they imagined they heard the person say with what they actually heard the person say, presumably because it increases the overlap between the characteristics of the two sources of information (Johnson, Foley, & Leach, 1988).

In situations where eyewitness suggestibility is a concern, the overlap between the witnessed event and postevent interviews is extensive. First, the two episodes are intimately related because they share a common referent—the witnessed event. Note that the common referent factor is inherent in every eyewitness interrogation because, by definition, the postevent interview is always about the witnessed event (Mitchell & Zaragoza, 2001). As a consequence, with the exception of several misleading details in the postevent interview, the content of the original and postevent episodes is nearly identical. Second, in attempting to answer questions about the witnessed event, participants are likely to actively retrieve and reconstruct the originally witnessed events in their minds. This process of activating the original memory while processing the postevent misinformation likely increases the overlap between the original event and postevent questioning even further. Hence, from the perspective of the SMF, it is not surprising that participants sometimes confuse suggested items for items they witnessed firsthand.

The SMF also assumes that the accuracy of source-monitoring judgments is heavily influenced by the circumstances at the time of retrieval (i.e., the appropri-

ateness and stringency of the decision-making processes and criteria used). A good illustration of this is Lindsay and Johnson's (1989) finding that a suggestibility effect is obtained with a yes–no recognition test but not on a source-monitoring test. They proposed that yes–no recognition tests may encourage participants to use a familiarity criterion when responding on a test of memory for the witnessed event. Because the test list consists primarily of witnessed items interspersed with novel foils, responding on the basis of familiarity will in most cases lead to a correct response. For this reason, participants may slip into a tendency of using high familiarity as the basis for deciding whether or not a test item was seen. Of course, the suggested items are familiar not because they were witnessed but because participants had been exposed to them recently in the context of a postevent narrative. In contrast to the yes–no test, the source-monitoring tests direct participants to retrieve and use source-specifying information, thereby enhancing participants' ability to discriminate between memories of the witnessed event and memories of the postevent narrative.

Just as the criteria for deciding whether something was "seen" might change as a function of test demands, the SMF also posits that the criteria by which people judge a memory as "real" might change over time. Specifically, Johnson et al. (1993) posit that the amount of perceptual detail needed to accept a remembered experience as a real memory (and not imagined or suggested) is much greater for recent events than for events from the distant past (see also Belli & Loftus, 1994). In support of these predictions, Frost (2000) has shown that when misled participants are asked whether the suggested details they report are "remembered" or "known," participants are more likely to claim they "remember" seeing the misinformation on delayed tests than on immediate tests.

An important aspect of the source-monitoring account is that people can mistake the origin of some item in memory even if memory for the item itself is very good. Consistent with this idea, several of the studies reviewed in the following sections show that people can have very strong memories of the content of misleading suggestions yet misattribute their source.

MECHANISMS OF FALSE-MEMORY DEVELOPMENT

Inspired in part by the SMF, some progress has been made in identifying factors that, in combination with misleading suggestion, influence the creation of false memories for suggested events. We review some of this research in the following subsections. Because our primary concern in this section is false memories, we restrict this review to studies that have used methods that attempt to differentiate between false reports that reflect false memories and false reports that occur for other reasons (e.g., source tests, warnings, measures of phenomenological experience).

The Role of Processing Resources

When attentional resources are limited, memory for an item's source is more likely to be disrupted than is the familiarity of the memory's contents. This is because the

encoding and retrieval of source-relevant information are highly effortful, attention-demanding processes, whereas familiarity is a relatively automatic consequence of exposure to an item (Johnson, Kounios, & Reeder, 1994). Thus, limiting attentional resources can cause a relatively selective impairment of source-specifying information that renders the memory highly susceptible to misattribution (cf. Jacoby, Woloshyn, & Kelley, 1989). A study by Zaragoza and Lane (1998) verified these predictions. In one experiment, participants encountered the misinformation under conditions of either divided or full attention, and in a second experiment participants were either given ample time to make the source judgment or were forced to provide source judgments very quickly. The results showed that a scarcity of attentional resources—either when encoding misinformation or when retrieving misinformation—led to impoverished memory for the suggested information's true source but no impairment in memory for the content of the suggested item. This, in turn, led participants to misremember the suggestion as part of the witnessed event. These results are consistent with the finding that forgetting of source information that occurs over long retention intervals is accompanied by increased suggestibility (see, e.g., Lindsay, 1990; Zaragoza & Mitchell, 1996), although the possibility that other factors related to delay (e.g., weaker memory for the witnessed event over time) might contribute to these latter results cannot be ruled out. In sum, the finding that attentional resources influences suggestibility is highly relevant to assessing and predicting suggestibility in real-world contexts, where multiple environmental and internal stimuli (e.g., distraction due to heightened arousal) compete for attentional resources.

Repeated Suggestion and False Memory

Whereas the foregoing study shows that poor memory for the suggested item's source increases suggestibility, it is also the case that "source amnesia" is not a precondition for misattribution errors. Paradoxically, there are some variables, such as repetition, that simultaneously increase source misattributions and improve memory for the suggestions' source.

Understanding the cognitive consequences of repeated suggestive interviews has considerable practical, as well as theoretical implications. For example, repeated suggestive questioning is not uncommon in eyewitness interrogation procedures. Moreover, one of the reasons the therapeutic process is thought to be potentially conducive to the formation of false memories is because suggestions encountered in the course of therapy are likely to be repeated over time. Given the current controversy surrounding allegedly false memories induced by therapy (see chap. 8, this volume), the need for scientific evidence on the relationship between repeated suggestion and false memory seems especially acute.

Several studies that have attempted to mimic the complexity of real-world interview situations involving repeated suggestion have demonstrated striking examples of false memory in which participants claim to remember entire fictitious events, such as getting lost in a mall (e.g., Ceci, Hoffman, Smith, & Loftus, 1994;

Ceci, Loftus, Leichtman, & Bruck, 1994; Hyman & Billings, 1998; Hyman, Husband, & Billings, 1995; Hyman & Pentland, 1996; Loftus & Ketcham, 1994; Porter, Yuille, & Lehman, 1999). However, in the interest of ecological validity, in all of these studies repeated suggestion was confounded with several other variables including the passage of time, experimenter demand, and generation of elaborative details. Hence, the role that repetition alone played in the creation of these memories is difficult to discern.

Zaragoza and Mitchell (1996; see also Mitchell & Zaragoza, 1996) conducted several studies whose goal was to isolate the effects of repeated exposure to suggestion on false-memory creation. Zaragoza and Mitchell found that, relative to a single exposure, repeatedly exposing participants to suggestions increased the incidence of false memories for the suggested items, even when controlling for differences in recognition of the suggested items. Using a variant of the remember/know paradigm, they also showed that repeated suggestions increased participants' claims that they specifically recollected witnessing the suggested item in the video. In a follow-up study, Mitchell and Zaragoza showed that increasing the contextual variability of the repeated exposures (i.e., each repetition occurred in a different modality) further exacerbated the repeated-exposures effect. In both these studies, the deleterious effect of repeated exposures could not be attributed to better memory for the suggested information following repetition, because the repetition effects remained the same when the data were conditionalized on old–new recognition (see Mitchell & Zaragoza, 1996; Zaragoza & Mitchell, 1996). Hence, it is not the case that this false-memory effect is merely a function of the greater familiarity of the repeated suggestion. It was also the case that in both these studies, one consequence of repeated suggestion was an increase in participants' claims that the suggested item came from two sources: both the witnessed event and the postevent questionnaire. Hence, rather than impair participants' memory for the suggestions' actual source (the postevent questionnaire) repeated suggestion had the opposite effect. What became more difficult with repeated suggestion was discriminating between the original and postevent episodes, as evidenced by the increase in "both" responses. Recall that in the typical eyewitness suggestibility situation, simply knowing that some piece of information came from a postevent source is not very diagnostic with regard to its accuracy, because much of the information provided by the postevent source is highly accurate. Hence, the difficulty for participants was discriminating between information that was only in the postevent questionnaire as opposed to both the postevent questionnaire and the originally witnessed event.

How might repeated exposure to suggestion lead participants to misremember witnessing suggested events? In the studies by Zaragoza and Mitchell (1996; Mitchell & Zaragoza, 1996) the misleading suggestions were embedded in questions about the video event that participants were required to answer. They proposed that in answering such questions participants were likely to retrieve and reflect upon the events they had witnessed. When the questions contained misleading suggestions, it is likely that participants implicitly incor-

porated the suggested information into their imagined reconstructions of the witnessed event. With repetition, these images of suggested events probably became more elaborate and detailed (see Suengas & Johnson, 1988, for evidence that rehearsing imagined events serves to preserve and embellish them), thus increasing their similarity to records of actually witnessed events. In addition, it is likely that repetition increased the speed or fluency with which images of the suggested events could be generated by the subjects, thereby increasing participants' confidence that the memories were real (cf. Kelley & Lindsay, 1993).

A less studied but related issue is the effect of repeatedly reporting suggested information on false-memory creation. Using a cued-recall paradigm, Roediger, Jacoby, and McDermott (1996) induced participants to report misinformation on a first occasion, and assessed whether this would alter participants' performance on a later recall test (relative to a condition with no inducing manipulation). The clear finding was that producing the misinformation on a first test increased the likelihood that participants misrecalled the misinformation on a later test (where they were explicitly warned to ignore the postevent information). Moreover, repeated reporting of suggested details also made participants more likely to claim they "remembered" witnessing the misinformation when instructed to use the remember/know procedure. Hence, Roediger et al. showed that repeated reporting of suggested information, like repeated exposure, increases false memories for suggested information.

MENTALLY ELABORATING ON SUGGESTED EVENTS

Several different lines of evidence have shown that mentally elaborating on suggested events increases false memory for these events. By "mental elaboration" we mean any type of mental processing that embellishes the suggested event with details or other characteristics that render it confusable with a memory for a "real" event.

Imagery Instructions

There is considerable evidence that imagery is a catalyst for false-memory formation. For example, there is evidence that both imagery ability (e.g., Dobson & Markham, 1993) and preference for an imagic cognitive style (e.g., Labelle, Laurence, Naden, & Perry, 1990) are related to susceptibility to false-memory creation. In addition, studies have shown that instructing people to imagine fictitious childhood experiences increases their belief that these fictitious events actually occurred (Garry, Manning, Loftus, & Sherman, 1996; Paddock et al., 1998) and can lead to false memories for fictitious childhood events (Hyman & Pentland, 1996). For example, Hyman and Pentland instructed participants to reminisce about a number of events from their childhood, including one that had never actually happened but had only been suggested by the experimenter (e.g., that they had

tipped over a punch bowl at a wedding onto the parents of the bride). Those participants who were repeatedly instructed to imagine these events over three sessions were later more likely to claim they remembered them (both fictitious and real) than participants who were repeatedly instructed to merely think about them. Similar findings have been obtained with a somewhat different paradigm where participants are repeatedly instructed to imagine performing simple actions (Goff & Roediger, 1998; Thomas, Bulevich, & Loftus, 2003).

Why might imagery be associated with false-memory creation? It is well documented that discriminating between imagination and reality can be difficult, especially when imagined events contain large numbers of features or characteristics that are typical of actually experienced events (e.g., Johnson, Foley, & Leach, 1988; Johnson & Raye, 1981). In the case of false memories, imagining a fictitious event likely results in a mental representation that closely resembles a real event, because the act of imagination involves creating a specific instantiation of the fictitious event in one's mind. To use an example from a study by Hyman and Pentland (1996), imagining that as a child I once spilled a punch bowl at a wedding probably involves creating a mental version of this incident that specifies such things as who was there, what they looked like, where the wedding took place, how I spilled the punch bowl, what the consequences were, how I felt about it, and so forth. In other words, imagining and visualizing an event (in this example, a fictitious one) involves reflectively elaborating on a hypothetical idea in a variety of ways so as to produce a more concrete, specific, and perceptually and semantically detailed version of the incident in one's mind. At a broader level, imagining a fictitious event likely renders the imagined event more familiar, available, and plausible, thus increasing the likelihood that one would accept the imagined event as a real one (see, e.g., Garry et al., 1996). Thus, there are probably multiple dimensions, both general (e.g., familiarity) and specific (e.g., sensory-perceptual detail), on which imagined events resemble real ones.

Sensory-Perceptual Elaboration

Although the association between imagery and false-memory creation is well documented, the mechanisms by which imagery induces false-memory creation are not yet well understood (cf. Thomas et al., 2003). Given that imagining a fictitious event likely involves a great deal of perceptual elaboration (as well as reflective elaboration on other dimensions) Drivdahl and Zaragoza (2001) set out to assess whether leading participants to reflectively elaborate on the perceptual characteristics of misleading suggestions would increase false memory for the suggested events. To this end, they used an eyewitness suggestibility paradigm where participants viewed a videotape depicting a burglary and were later exposed to misleading suggestions (e.g., they were misinformed that the thief stole a ring, when in fact he did not steal any jewelry). The perceptual elaboration manipulation was implemented by asking participants yes-or-no follow-up questions about the perceptual characteristics (e.g., location, physical appearance,

etc.) of a previously mentioned item. For example, some participants who had been misinformed that the thief stole a ring were asked the follow-up question, "Did he find the ring in the top drawer?" When a suggestion was repeated, participants answered a different question about the suggested item each time they encountered it (e.g., "Was the ring in a box?" "Did the ring have a gemstone?"). In this way, the follow-up questioning resembled interview situations where witnesses are pressed to provide specific details of fictitious or poorly remembered events. Two days later, participants were given a test of their memory for the source of the suggested items. The results showed that participants who answered questions that encouraged them to elaborate on the perceptual characteristics of the suggested items, such as their location and physical appearance, were much more likely to later claim they "definitely" remembered seeing them than participants in a no-elaboration group, who were exposed to the same suggestions but answered follow-up questions about relatively superficial aspects of the suggested items (e.g., its rhyming characteristics). Drivdahl and Zaragoza proposed that answering perceptual-elaboration questions increased false memory because it induced participants to form a more perceptually detailed, specific, and embellished representation of the suggested events than they would have otherwise done (see Thomas et al., 2003, for the related finding that instructing participants to include sensory details in their imaginings increased source misattributions). Consistent with this proposal, there is considerable evidence that the greater the vividness, clarity, and detail associated with imagined events, the greater the likelihood that they will be confused for actually experienced events (see Johnson et al., 1993, for a review). Note that one important way in which the Drivdahl and Zaragoza study differs from previous imagination studies is that participants were not explicitly instructed to imagine the suggested events, but were asked follow-up questions that encouraged the implicit generation of visualized detailed images of the suggested events.

Semantic Elaboration

Although the foregoing results show that the sensory-perceptual characteristics of imagined suggested events contribute to false-memory creation, it is also possible that the effects of imagery are also due in part to the meaningful elaborative processing that imaging entails. Note that attempts to imagine fictitious items/events are also likely to involve more abstract sorts of reasoning about the meaning and implications of the fictitious events, and a consideration of the plausible scenarios within which they might have transpired. This sort of elaborative processing may serve to establish stronger and more numerous connections between the misleading suggestions and other information in memory. To the extent that suggested memories that are embedded in a coherent network of relations are likely to be confused for "real" memories, it is possible that simply elaborating on the meaning and implications of suggested events might serve to increase false memory.

In a follow-up to the Drivdahl and Zaragoza (2001) study, Zaragoza, Mitchell, Payment, and Drivdahl (2004) examined the relative contributions of perceptual and meaningful elaboration on false-memory creation by manipulating the type of follow-up questions participants received about the suggested information. Participants in the semantic-elaboration group answered follow-up questions that led them to think about the meaning and implications of the suggested details, but not their perceptual characteristics. For example, some participants in the semantic-elaboration condition who received the misleading suggestion that the "thief stole a ring" were asked the follow-up question "How incriminating would a jury find it if they were told that the thief was found with a stolen ring in his possession?" If the suggestion was repeated, participants answered a different type of follow-up question every time they encountered it (e.g., "Was the fact that the thief stole a ring central to the plot?" "Do you think the thief was disappointed that he did not find other jewelry besides the ring?"). As in the Drivdahl and Zaragoza study, participants in the perceptual-elaboration group were asked follow-up questions about the perceptual characteristics of the suggested items. Relative to a repetition-control group that had repeated exposure to the suggested information but no elaboration, participants in both elaboration groups evinced higher levels of false memory for the suggested detail. The proportion of times participants claimed they "definitely" remembered seeing suggested details was .28, .41, and .59 in the repetition-control, perceptual-elaboration, and semantic-elaboration groups, respectively. Hence, a novel and unexpected finding was that semantic elaboration led to greater increases in false memory than perceptual elaboration (even though type of elaboration had no effect on any other dependent measure). Zaragoza et al. proposed that semantic elaboration promotes false memory by establishing stronger and more numerous connections between the misleading suggestions and other well-developed knowledge structures in memory (e.g., schemas regarding juries, what constitutes incriminating evidence, etc). In sum, it appears that misinformation that is embedded in a coherent network of relations is more likely to be confused for a "real" memory. (See also Drivdahl, 2001, for the related finding that inducing participants to think about the emotional consequences of suggested events also increases false memory.)

PHOTOGRAPH REVIEW

The foregoing studies on perceptual and semantic elaboration induced participants to mentally elaborate on suggested items that pertained to recently experienced events. When participants are misled about events from their remote past—such as their childhood—their relatively impoverished memory of their distant past may make it more difficult for them to construct a perceptually and semantically detailed image of the suggested childhood event. On the other hand, if participants are given cues, such as photographs, that help them retrieve aspects of

their childhood, they may be better equipped to form a compelling and plausible image of the suggested (i.e., fictitious) childhood event. This, in turn, should increase their susceptibility to developing a false memory for the suggested event. A fascinating study by Lindsay, Hagen, Read, Wade, and Garry (2004) provides evidence consistent with this prediction.

In the Lindsay, Hagen et al. (2004) study, participants were asked to remember three school-related childhood events: two true events provided by parents, and a third, fictitious event (putting slime in the teacher's desk in Grade 1 or 2). For participants in the photo group, the experimenter provided a color photo of their class picture at the time of suggested the event, and participants in all groups were encouraged to recall as much as possible using mental-context reinstatement and guided-imagery exercises over a period of several days. In a final test session, participants in the photo condition were twice as likely as participants in as participants in a no-photo condition to experience false memories, and their ratings of the extent to which remembering the event was like reliving it was comparable to the ratings they gave for true events. The authors proposed that although the photo did not depict the slime prank, the photo may have enabled participants to speculate about plausible scenarios involving the suggested event (e.g., "Who would my collaborator in the slime prank have been?"). Participants in the no-photo condition may have had difficulty constructing such scenarios because of their inability to recall relevant elements, such as who was in their classroom and the appearance of the teacher. The authors further proposed that participants may have used perceptual details from the photo (e.g., the teacher's appearance) to produce vivid images of the fictitious event, thus producing especially compelling false memories (see Lindsay et al., 1994).

NEW DIRECTIONS AND EXTENSIONS OF THE MISINFORMATION PARADIGM ENCOUNTERED OUTSIDE THE INTERVIEW CONTEXT

The misinformation paradigm provides a laboratory analogue of real-world situations involving eyewitnesses to forensically relevant events who are interviewed suggestively about the events they have witnessed. For this reason, most studies of misinformation effects have presented misinformation in the context of postevent questions or postevent narratives about the witnessed event. Recent studies have begun to document that eyewitness memories can also be contaminated by misinformation encountered outside the postevent interview context.

Studies of the social-contagion effect (Meade & Roediger, 2002; Roediger, Meade & Bergman, 2001) have shown that when two people witness the same event, a person's memory for the witnessed information can be contaminated by false information provided by the cowitness. In these studies, two participants (one of whom is a confederate) view a series of scenes and then engage in a collaborative-recall task where they each recall several items from each scene. However

some of the items "recalled" by the confederate are false in that they suggested objects that had not actually appeared in the scene (and thus serve as misinformation). The finding of interest is that when participants are later tested individually they recall these suggested items even when told to recall only those items they remembered from the scenes. Moreover, neither warning participants that others' responses might influence their recall, nor giving them a source-monitoring test (which oriented them to discriminate between items they saw and those the cowitness reported) eliminates the social-contagion effect (Meade & Roediger, 2002). These findings extend research on the misinformation effect by showing that even information provided by an unfamiliar peer can affect participants' memories for events they have witnessed.

Perhaps even more surprising than the social-contagion effects is the recent finding that participants will sometimes intrude details from one event into their memory of a different event (Allen & Lindsay, 1998; Lindsay, Allen, Chan, & Dahl, 2004).

In these studies, participants viewed a movie clip depicting a museum burglary and read a narrative description of either (a) the same event (i.e., the museum burglary they had seen), (b) a different, but thematically related, event (a palace burglary), or (c) a less closely related event (a school field trip to a palace). In every case, the narratives contained information that was not in the original movie clip. The finding of interest was that when participants were given a cued-recall test of their memory for the video, participants in all three conditions falsely recalled information from the narratives, though false recall was greater when the narrative described the witnessed event rather than a different event. A striking finding was that these intrusions occurred even when the narrative described an event (a school field trip to a palace) that was in many ways quite different from the event depicted in the movie clip participants had seen (a burglary in a museum).

FALSE MEMORIES FOR FORCED CONFABULATIONS AND FALSE CONFESSIONS

To date, most studies in the eyewitness suggestibility literature have focused almost exclusively on suggestive interviews involving false-memory implantation. In the implantation paradigm, the witness is given misinformation about a witnessed event, and suggestibility is measured as the extent to which the witness then (or later) assents to the misinformation provided by the interviewer. However, in real-world forensic and therapeutic settings, suggestive interview practices are not restricted to situations involving the explicit provision of misinformation. Rather, in some cases interviewers attempt to elicit from witnesses accounts that support their beliefs about what transpired (cf. Bruck, Ceci, & Hembrooke, 1998). To this end, interviewers may forcibly press witnesses to describe those events they believe transpired, even when witnesses cannot remember or never witnessed the events they are pressed to testify about (cf. Gudjonssson, 1992; Leo, 1996).

Might witnesses eventually develop false memories for events they had earlier been forced to confabulate? Intuitively, it seems unlikely they would do so. Presumably, events that are confabulated deliberately and under duress will be remembered as mere fabrications, even over the long term. However, contrary to this intuition, a recent study (Zaragoza, Payment, Ackil, Drivdahl, & Beck, 2001) showed that participants who were pressed to confabulate information about a witnessed event later evidenced false memories for some of the events they had earlier confabulated knowingly (see also Ackil & Zaragoza, 1998, for similar evidence with children), a phenomenon they call the "forced confabulation effect." In this study, participants viewed a movie clip and were then asked specific questions about both true and blatantly false events. In order to answer these false-event questions, the participants were required to confabulate, or make something up. For example, in going over a scene from the video, the experimenter said, "It [the chair] broke, and Delaney fell on the floor. Where was Delaney bleeding?" This question required a confabulated response because although Delaney did fall off a chair in the video, he clearly did not bleed nor hurt himself in any way.

As one might expect, participants firmly resisted answering such questions, but were repeatedly pressed to guess until they eventually acquiesced. To illustrate, the following is a transcript from a forced-confabulation interview:

Interviewer:	After he fell, where was Delaney Bleeding?
Participant:	He wasn't. He was? I didn't see any blood.
Interviewer:	What's your best guess?
Participant:	Where was he bleeding?
Interviewer:	Yeah.
Participant:	But he wasn't bleeding. Oh, I don't have a best guess. I didn't think he was bleeding. *His knee?*
Interviewer:	Okay, his knee.
Participant:	*It's not his knee!* (Zaragoza et al., 2001, p. 476)

Throughout the interview, the interviewer selectively reinforced some of the participants' confabulated responses by providing confirmatory feedback (e.g., "Knee is the correct answer!") and provided neutral (uninformative feedback for the remaining confabulated responses (e.g., "OK, knee"—see earlier transcript) (see Wells & Bradfield, 1998, for other evidence that confirmatory feedback leads to distortions in eyewitness testimony). One week later, a large proportion of participants misremembered witnessing the events they had earlier confabulated knowingly (even though they were warned in advance that they had been questioned about fictitious events). Moreover, confirmatory feedback increased false memory for forcibly confabulated events, increased confidence in those memories, and increased the likelihood that participants would freely report the confabulated events 1 to 2 months later. Important to note, the authors were able to show that these false-memory effects were not dependent on memory for the feedback.

In an ingenious experiment, Kassin and Kiechel (1996) demonstrated that false incriminating evidence can lead people to believe—and even remember—that they committed a crime they did not commit. Research on this topic is of great practical importance as the presentation of false incriminating evidence is a common interrogation technique, and studies have shown that coerced confessions increase the conviction rate even when participants recognize they are coerced, even when it is stricken from the record, and even when jurors claim it had no influence on their verdict (Kassin & Sukel, 1997). In their study, participants engaged in a computer reaction-time task and were incorrectly accused of hitting the wrong key and damaging the computer. All of the participants initially denied hitting the key, and indeed none of them had done so. Two variables were manipulated: First, in order to influence participants' certainty in their own innocence, the pace of the computer task was varied (either very fast paced or slow paced). Second, they varied whether or not participants received the false incriminating evidence (the "misinformation"). Specifically, for participants in the false-witness condition, an experimental confederate claimed she saw the participant hit the key, whereas for participants in the no-witness condition the same confederate said she had not seen what happened. There were three outcome measures: participants' willingness to sign a confession (a measure of compliance), participants' tendency to freely report to another participant that they had hit the key/damaged the computer (a measure of internalization), and participants' tendency to "recall" specific details to fit the allegation, such as "I hit it with the side of my right hand after you called out the 'A'" (Kassin & Kiechel, 1996, p. 127). The latter served as a measure of confabulation (or false memory). The results showed that both variables influenced participants' performance on all measures: Compared to participants in the slow-pace/no-witness group, participants in the fast-pace/false-witness group were more likely to sign the confession, internalize guilt for the event, and confabulate details in memory consistent with the false belief. Interestingly, the false incriminating evidence was a critical ingredient in producing confabulations. No participants in the no-witness groups (whether slow *or* fast paced) produced confabulations. In summary, these findings extend studies of misinformation phenomena by showing that people can be misled about their own actions, not just events they have observed. Moreover, like the forced-confabulation studies, these studies show that coercing witnesses to say things against their will (describing events they did not see, providing self-incriminating statements), can seriously distort their memories over the long term.

THE SCOPE OF FALSE MEMORIES OF SUGGESTED EVENTS

Most of the research on misinformation phenomena reviewed here has documented false memories for selected aspects of a witnessed event (e.g., a false memory that the thief had a gun, when in fact he had no weapon). In recent

years, the controversy surrounding allegedly false recovered memories of childhood abuse has raised important questions about the extent of people's susceptibility to memory illusions. In particular, a question of central concern in this debate is whether people can be led to develop false memories for entire events that never actually transpired (see chap. 8, this volume). Once again, Elizabeth Loftus has been at the forefront of the effort to provide scientific evidence that bears on this issue of pressing social concern by developing innovative methods for addressing such questions in the laboratory (e.g., Loftus, Coan, & Pickrell, 1979/1996)

Although the recovered/false-memory debate has captured a great deal of attention in recent years, research on this problem is in many ways a natural outgrowth of research on misinformation phenomena. Although the latter focuses on participants' memories for details of recent eyewitness events, many of the factors that appear to promote the creation of false memories for suggested childhood events (e.g., imagery, repetition, forced generation, mental elaboration) were discovered in the context of basic research on the misinformation effect. Our hope is that the ongoing recovered/false-memory debate may resolve itself as the once lively debates on the misinformation effect have largely been resolved, with scientists who once took adversarial positions beginning to see that their points of agreement are more numerous than those points on which they disagree. Finally, as this chapter has shown, research on the misinformation effect is an ongoing energetic direction of investigation that continues to provide unique insights into the nature of memory and its susceptibility to error.

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