Quirks: Misattribution of Memory

The following text borrows from Wikipedia, which offers a readable synopsis.

Memory plays an important role in a number of aspects of our everyday lives and allows us to recall past experiences, navigate our environments, and learn new tasks [1]. From this view, information about a source of memory is assumed to contain certain characteristics that reflect the conditions under which the memory representations were attained [2]. Judgments about these sources are made by evaluating the amount and nature of the characteristics [2]. The accuracy of their recall varies depending on the circumstances at which they are retrieved [2]. Generally speaking, **Misattribution of Memory** involves source details retained in memory but erroneously attributing a recollection or idea to the wrong source [1]. Misattribution is likely to occur when individuals are unable to monitor and control the influence of their attitudes, toward their judgments, at the time of retrieval [3].Thus, memory is adapted to retain information that is most likely to be needed in the environment in which it operates [1]. Therefore, any misattribution observed is likely to be a reflection of current attitudes [3].

Misattribution is divided into three components; cryptomnesia, false memories, and source confusion. It was originally noted as one of Daniel Schacter's, *The Seven Sins of Memory* [4]. His book, *The Seven Sins of Memory: How the Mind Forgets and Remembers*, identifies misattribution as a type of memory distortion or inaccuracy [4]. For example, people may assert that they saw a face in one context when they actually encountered it in another [4].

Components of Misattribution

Cryptomnesia

Cryptomnesia occurs when a forgotten memory returns without it being recognized as such by the subject, who believes it is something new and original. It is a memory bias whereby a person may falsely recall generating a thought, an idea, a song, or a joke, not deliberately engaging in plagiarism but rather experiencing a memory as if it were a new inspiration.

In the first empirical study of cryptomnesia, people in a group took turns generating category examples (e.g., kinds of birds: parrot, canary, etc.). They were later asked to create new exemplars in the same categories that were not previously produced, and also to recall which words they had personally generated. People inadvertently plagiarized about 3–9% of the time either by regenerating another person's thought or falsely recalling someone's thought as their own. Similar effects have been replicated using other tasks such as word search puzzles and in brainstorming sessions.

Research has distinguished between two kinds of cryptomnesia, though they are often studied together. The distinction between these two types of plagiarism is in the underlying memory bias responsible—specifically, is it the thought that is forgotten, or the thinker? The first type of bias is one of familiarity. The plagiarizer regenerates an idea that was presented earlier, but believes the idea to be an original creation. The idea that is reproduced could be another's idea, or one's own from a previous time. B. F. Skinner describes his own experience of self-plagiarism:

> "One of the most disheartening experiences of old age is discovering that a point you just made—so significant, so beautifully expressed—was made by you in something you published long ago."

The second type of cryptomnesia results from an error of authorship whereby the ideas of others are remembered as one's own. In this case, the plagiarizer correctly recognizes that the idea is from an earlier time, but falsely remembers having been the origin for the idea (or, having lost the specific memory of encountering it in print or conversation, assumes that it "came to" the

plagiarizer as an original idea). Various terms have been coined to distinguish these two forms of plagiarism — occurrence forgetting vs. source forgetting and generation errors vs. recognition errors. The two types of cryptomnesia appear to be independent: no relationship has been found between error rates and the two types are precipitated by different causes.

Cryptomnesia is more likely to occur when the ability to properly monitor sources is impaired. For example, people are more likely to falsely claim ideas as their own when they were under high cognitive load at the time they first considered the idea. Plagiarism increases when people are away from the original source of the idea, and decreases when participants are specifically instructed to pay attention to the origin of their ideas. False claims are also more prevalent for ideas originally suggested by persons of the same sex, presumably because the perceptual similarity of the self to a same-sex person exacerbates source confusion. In other studies it has been found that the timing of the idea is also important: if another person produces an idea immediately before the self produces an idea, the other's idea is more likely to be claimed as one's own, ostensibly because the person is too busy preparing for their own turn to properly monitor source information.

False Memories

False memories occur when a person's identity and interpersonal relationships are strongly centered around a memory of an experience that did not actually take place [7]. These false memories are often of a traumatic life experience and can become very detrimental to everyday life. False Memories are often the result of leading questions in a therapeutic practice termed Recovered Memory Therapy [8]. In this practice, psychiatrists often put their patients under hypnosis to recover suppressed memories. This can be detrimental, as the individual may recall memories that never occurred. For example, there are instances of reported cases in which individuals falsely recall sexual abuse and pursue justice. These cases are extremely painful to both the accuser and to the accused, and may result in wrongful conviction. Due to incidents like these, false memories and repressed memories have lost most of their validity and reliability in a court of law [8].

Source Confusion

Source confusion occurs when an individual misattributes a source of a memory [9]. Understanding the source of one’s memories is important to memory processes necessary for every day living. In one particular case of source confusion, a female rape victim falsely accused a memory doctor of being her rapist. In this case, the doctor had made a television appearance seen by the female victim prior to her attack. The women misattributed the doctor’s face with that of her attacker [8].

An additional example of source confusion involves Ronald Reagan. In this instance, Ronald Reagan tells a story about a heroic pilot to whom he personally awarded a medal [8]. However, he was actually recalling the story line from a theatrical production entitled “Wing and a Prayer” [8]. Reagan misattributed a real life experience with one he had actually seen in a movie. However, he strongly believed that he was involved in the medal process to this war hero.

A **source monitoring error** is a type of memory error where a specific recollected experience is incorrectly determined to be the source of a memory. This error occurs when normal perceptual and reflective processes are disrupted, either by limited encoding of source information or by disruption to the judgment processes used in source-monitoring. Depression, high stress levels and damage to relevant brain areas are examples of factors that can cause such disruption and hence source-monitoring errors.

One of the key ideas behind source monitoring is that rather than receiving an actual label for a memory during processing, a person's memory records are activated and evaluated through decision processes; through these processes, a memory is attributed to a source. Source monitoring relies heavily on the individual's activated memory records; if anything prevents encoding the contextual details of an event while it happens, relevant information will not be fully retrieved and errors will occur. If the attributes of memory representations are highly differentiated, then fewer errors are expected to occur and vice versa. Two cognitive judgment processes exist regarding source monitoring; these are commonly called *heuristic* and *systematic* judgement processes.

Heuristic judgments are made quickly without the conscious awareness of the individual, making use of perceptual, contextual, and other event-related information. These occur more frequently because they are efficient and occur automatically without the individual putting forth conscious effort. A decision is made about a source when relevant information is of a certain significance and the memory occurring at a certain time or place makes sense logically; errors then occur based on the amount of information stored at encoding or the way that an individual's brain makes decisions based on prior experiences. Within the source-monitoring framework, "heuristic" is a type of decision process; this term is directly related to the psychological heuristics.

Systematic judgments are decision processes whose procedures are accessed consciously by the individual; the same types of information used in heuristic judgments are also used in systematic judgments. In this process, all memory-relevant information is retrieved from memory and assessed deliberately to determine whether a memory is likely to have come from a specific source. Systematic judgments occur less frequently in source judgments because they are slow and require a lot of conscious effort. Errors occur due to a misassignment of the weight of certain aspects of memories: assigning high importance to visual information would mean that having poor details of this aspect would be cause for an assumption that the event didn't happen or was imagined. Errors will occur if an individual's subjective logic leads them to perceive an event as unlikely to occur or belong to a specific source, even if the truth was otherwise. Simple memory decay can be a source for errors in both judgments, keeping an individual from accessing relevant memory information, leading to source-monitoring errors.

There are three major types of source monitoring: external source monitoring, internal source monitoring, and reality monitoring, all of which are susceptible to errors and make use of the two judgment processes.

External source monitoring: This type of source monitoring focuses on discriminating between externally retrieved sources, such as events happening in the world surrounding the individual. An example of this would be determining which one of the individual's friends said something rude.

Internal source monitoring: This type of source monitoring focuses on discriminating between internally derived sources, such as the individual's memories. An example of this would be differentiating between memories of thought ideas and spoken ideas.

Reality monitoring: This type, also known as *internal-external reality monitoring*, is derived from the previous two types and focuses on discriminating between internally and externally retrieved sources. An example would be discriminating a plane crashing into a building portrayed in real life and on a newspaper.

Cogitive Causes

Causes of Cryptomnesia

Cryptomnesia is a source-monitoring error in which people often have difficulty determining whether a concept was internally generated or experienced externally. People occasionally misattribute the creation of a novel thought or idea as their own, when in fact they are retrieving it from a previous experience. Some individuals fail to establish memories with enough detail to generate a source attribution, causing a misattribution of memory to the wrong source [10]. People often truly believe that the information they plagiarized was actually that of their own.

Unintentional plagiarism is greater for information generated by others than ourselves. Researchers believe this may due to having better memory and associations for words we generate, as self-generated information is better remembered later [11]. Moreover, cryptomnesia increases when information is generated by others before a self-generated idea. This may be due to the likelihood that people were thinking of their next response, rather than processing the source of the information [12].

Causes of false memories

False recognition can occur as the result of making an implicit associative response, an automatic association between two concepts in memory [4]. It is believed that associative responses never come to conscious attention, thus the activation of the concept is assumed to be implicit [4]. An implicit associative response has shown to arise when seeing a word such as "car", might cause people to unconsciously think of an associative such as "truck". If the word truck is later presented to them, they may state they recognize seeing the item when they had actually generated it themselves. It is believed that the activation from the shown word may also activate the associative word, allowing the information to be easily accessible to the mind [13]. Research has also shown that the more similar the presented and associative words are, or the more similar list items there are, the more likely it is that a false recognition error will be made [4].

Gist-based similarity, the robust encoding of semantic information rather than distinctive encoding,[4] is another cause of false recognition. When studying a list of numerous related words, there is a high level of semantic overlap between memory items. The inability to keep each concepts separate and distinct from one another makes it difficult to recollect specific details, subsequently causing people to make responses based on memory gist's rather than specific details. People may form a well-organized idea of what the semantic gist is, and anything that is semantically similar to that idea may be falsely recognized. Gist-based similarity has also been shown to occur in circumstances in which implicit associative responses are an unlikely source of misattribution [4].

The false recognition error also becomes evident when a time pressure is presented during a recognition decision.[14] Processes that work to discover a source for the basis of recognition take time to execute, as a result of a lack of time, false recognitions errors are made more often.
It has also been noted that misattribution may be a product of adaptive features of memory, rather than a product of a flaw in the memory system. The misattribution error often leads to conclusions of an inefficient memory system, however some researchers believe that the error is a cost associated with the benefits of a functioning and adequate memory system [4]. The misattribution error reflects an adaptive memory system in which information that does not require people to remember all the specific details is lost. Specific details would only be preserved in situations where the specific details need to be remembered, such as memories of a highly emotional experience.[4] The use of semantic gists may be a fundamental mechanism of memory, allowing people to categorize information and generalize across situations, a function associated with higher intelligence.[4]

Neurological Causes

Neurological Basis of False Recognition

Brain-damaged patients have provided useful insights into the underlying biological mechanisms involved in false recognition. Results from studies comparing levels of false recognition between patients with frontal lobe damage and age-matched controls, showed a significantly higher level of false recognition amongst the frontal lobe damaged individuals [4]. The damage is believed to have caused disruptions in the adequate encoding of item-specific details or caused defective retrieval monitoring processes. These types of processes are needed to accurately recall the origins of memory representations, and without them, errors of origin can be made. Studies of false recognition in amnesic patients with damage to either the medial temporal lobe or other diencephalon structures, have demonstrated that the same processes involved in accurate recognition, are also involved in false recognition [4]. These cortices play a role in strategic monitoring processing, as they attempt to examine other cortical outputs. If these cortices were damaged, there would be no control over the cortical outputs, increasingly the likelihood of a false recognition error. Additionally, patients suffering from amnesia or Alzheimer's disease have a reduced level of false recognition, believed to be caused by taking too many trials to create the semantic gist information needed for the attribution error [4].

False Memories and PET Scans

A follow-up to the previous research was conducted by Daniel L. Schacter and colleagues. Similar to the study by Henry L. Roediger and Kathleen McDermott, subjects were read a list of associated words before they went into the PET scanner. During the first scan, subjects would make recognition judgments to determine what were the previous presented words [4]. During the second scan, subjects had to make judgments about words that were not presented. For example: bed, rest, dream, tried, and awake would be in the list but not the word "sleep". As with the study by Henry L. Roediger and Kathleen McDermott, subjects claimed to remember similar amounts of non-presented words as they did the words that were actually presented[4]. The researchers noted that brain activity during the true and false recognition tasks were very similar. Monitoring the blood flow in the brain revealed there were in the left medial temporal lobe for both veridical and illusory recognition[15].

That is not to say that there were not differences. While monitoring blood flow in the brain during false recognition, a part of the frontal lobe that is thought to be a key monitor of memories actually showed greater activity when presented with a false recognition than with a true one[4]. There seemed to be some discrepancy as subjects attempted to scrutinize the out-placed words, but were overcome by powerful memory illusion[4]. This study demonstrates the ability of technology to help researchers understand to a greater extent the power of false memories.

Source Confusion and FMRI Scans

T. Awipi and L. Davachi sought to provide evidence of competing subregions in the medial temporal lobe (MTL) that differed on the type of content they encoded. The researchers conducted a study in which subjects were asked to perform an encoding task in a functional magnetic resonance imaging (FMRI) scanner, where they were presented with 192 full colour photographs of scenes (containing a centrally presented novel scene and a smaller image of one of six objects). Participants were also instructed to imagine using the presented object in each scene, and were asked to report whether they were successful. A memory test was administered after participants were removed from the scanner. The test consisted of all previously viewed scenes (old) and an equal number of novel scenes (new). They were asked to make an old/new judgement, and if the scene was responded as being old, they were asked to report is as being "remembered" or "familiar". They were then asked to pick an object that was paired with that scene. The researchers

were trying to determine the levels of activation for source recollection for the objects paired with the scene during encoding [16].

The researchers found that perirhinal cortex activation was greater for objects recalled, and parahippocampal cortex activation was greater when scenes were recalled [16]. The results provide evidence of distinct encoding activation in the subregions of the medial temporal lobe [16]. The first subregion is the perirhinal cortex, which encodes item information. The second subregion, the parahippocampal cortex, is involved in source information. The evidence provides support for the role of the right perirhinal cortex in attributing an object to the right source [16]. As decreased activation was associated with poorer performance, decreased activation of the right perirhinal cortex could be a possible mechanism for source confusion.

Experimental Research

Misattribution

In one of the earliest studies involving misattribution, the Canadian cognitive psychologist Bruce Whittlesea presented subjects with a list of common words. Each word was briefly displayed to the subject [4]. The task required the subject to judge whether a target word was semantically related to any word in the list[17]. Unlike Whittlesea's first experiment involving the recognition of target words, this study involved the manipulation of processing fluency through the conceptual context of the target word, rather than the physical context[17]. After the subjects were given a brief moment to study the list of words, the subjects were presented with sentences that would contain a word that was capitalized at the end of the sentence that would have either been, or not been, from the previously presented list. The word at the end of the sentence was either highly predictable given the context of the sentence, for example: "The stormy seas tossed the BOAT", or the end word was less predictable such as: "She saved her money and bought a LAMP"[4]. The subjects were then required to state whether the capitalized end word had appeared, or not, on the previous list of words. If not, they were to respond by saying that the word was "new" versus it being "old".

The study revealed that the new words that were highly predictable were more likely to be incorrectly identified as being previously seen, whereas the new words that were less predictable were not so identified [4].In fact, subjects actually named predictable words faster than they did unpredictable words. Whittlesea was able to conclude from this study that subjects misattributed their fast responses for highly predictable words as an indication that they had previously experienced the word whereas in fact that was incorrect. As a result, the fluency of processing caused the subjects to misinterpret their quickness as a case of familiarity [4].

Cryptomnesia

Some of the most common experimental designs in the study of cryptomnesia involve solving word puzzles. One such study from Stanford University in 1993 monitored subjects' memory for solutions found to a word puzzle game when paired against a computer opponent. After several rounds of generating solutions in turn, participants were asked to generate a list of solutions they provided themselves, or a list of new solutions and rate their confidence in the source of each solution listed [5]. Subjects were more likely to plagiarize solutions given by the computer opponent than their own solutions after indicating that they were very confident that the solution was truly novel; when subjects indicated that they were "guessing" whether the solution had been seen before, they were more likely to duplicate solutions they had found during the first round of the test.

In an extension of this test, after each puzzle solution was generated, participants were asked one of two questions: is this word greater than 3 letters long? (physical judgement) or does this word

have a positive connotation? (semantic judgement). Participants then generated lists of solutions as in the first test. While the same correlation of confidence level and error type were seen, participants were much more likely to plagiarize answers after making a physical judgement as compared to a semantic one [5].

False Memories

Researchers Henry L. Roediger and Kathleen McDermott conducted an experiment in 1995 that dealt with a procedure developed by James Deese. This procedure, known as the Deese-Roediger-McDermott paradigm, invites subjects to believe they have experienced a particular word in a given list [4]. The subjects are read a list of associated words by the experimenter. These associated words could be for example: bed, rest, dream, tried, awake, etc. [4][13]. After the subjects have heard these words, they are required to engage in a free recall task in which they must list the words they have heard. The researchers carried out two experiments. The first one involved six lists of associated words. The second experiment involved a wider set of materials, in which twenty-four 15-item lists where read to the subjects [13].

The results of both experiments demonstrated that the subjects were confident about their incorrect answers regarding words heard in the list. For example, given the list; bed, rest, dream, tried, awake. Many of the subjects heard “sleep” which was not one of the words presented. This false memory effect occurs because the words associated with sleep are in the list leading subjects to believe that the words associated with the words provided in the list have to be right. In fact, with the second experiment the results were 55% false recall rate compared to 40% for the first experiment [13]. This indicated that the more words and lists available the harder it is to actually recall words correctly [13]. This experiment illustrates how subjects can provide false recall without noticing their errors. Even after the researchers indicate that they did not say the mistaken words, subjects still felt very convinced that the researcher had said the word.

False memories can also be created through leading questioning and simple use of imagination[18]. In 1996, Ira Hyman Jr. and Joel Petland published a study showing that subjects can falsely 'remember' anecdotes from their childhood, based on suggestions from the researcher and corroboration of these fictitious events from family members [19]. Subjects' parents were interviewed to create a list of memorable childhood events (vacations, instances of being lost, etc.), to which one false event was added, namely spilling a bowl of punch at wedding reception. For each event, subjects were provided with several cues to aid in memory (age at the time, location, nature of the event, etc.) and asked to describe the situation in as much detail as possible. If a participant was unable to recall any event, they were asked either to quietly think about the event for about a minute and then provide any additional information remembered (control condition) or imagine the event happening and describe the people who would have been involved, what the location would have looked like and how the event might have occurred (imagery condition).

After three interviews in this fashion, 25% of participants from the imagery condition reported remembering the false situation of spilling the punch bowl, as compared to fewer than 10% of subjects in the control condition [19]. An overall improvement in the detail of responses given and the confidence of those responses was observed for both true and false memories in the imagery condition, while those in the control condition showed much less improvement. While participants who 'remembered' the false situation rated this event as being less emotionally intense than the other remembered true events, participants rated their confidence in accurately remembering the false scenario than any of the true events.

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Articles on Misattribution Error

Emotion, directed forgetting, and source memory.

Otani, Hajime, Libkuman, Terry M., Goernert, Phillip N., Kato, Koichi, Migita, Mai, Freehafer, Sarah E., Landow, Michael P., British Journal of Psychology, Vol 103(3), Aug, 2012. pp. 343-358.

Abstract:

We investigated the role of emotion on item and source memory using the item method of directed forgetting (DF) paradigm. We predicted that emotion would produce source memory impairment because emotion would make it more difficult to distinguish between to-be-remembered (R items) and to-be-forgotten items (F items) by making memory strength of R and F items similar to each other.

Participants were presented with negatively arousing, positively arousing, and neutral pictures. After each picture, they received an instruction to remember or forget the picture. At retrieval, participants were asked to recall both R and F items and indicate whether each item was an R or F item. Recall was higher for the negatively arousing than for the positively arousing or neutral pictures. Further, DF occurred for the positively arousing and neutral pictures, whereas DF was not significant for the negatively arousing pictures. More importantly, the negatively arousing pictures, particularly the ones with violent content, showed a higher tendency of producing **misattribution errors** than the other picture types, supporting the notion that negative emotion may produce source memory impairment, even though it is still not clear whether the impairment occurs at encoding or retrieval.

Overdistribution in source memory.
Brainerd, C. J., Reyna, V. F., Holliday, R. E., Nakamura, K., Journal of Experimental Psychology: Learning, Memory, and Cognition, Vol 38(2), Mar, 2012. pp. 413-439.
Abstract:

Semantic false memories are confounded with a second type of **error**, overdistribution, in which items are attributed to contradictory episodic states. Overdistribution **errors** have proved to be more common than false memories when the 2 are disentangled. We investigated whether overdistribution is prevalent in another classic false memory paradigm: source monitoring. It is. Conventional false memory responses (source **misattributions**) were predominantly overdistribution **errors**, but unlike semantic false memory, overdistribution also accounted for more than half of true memory responses (correct source attributions). Experimental control of overdistribution was achieved via a series of manipulations that affected either recollection of contextual details or item memory (concreteness, frequency, list order, number of presentation contexts, and individual differences in verbatim memory). A theoretical model was used to analyze the data (conjoint process dissociation) that predicts that (a) overdistribution is directly proportional to item memory but inversely proportional to recollection and (b) item memory is not a necessary precondition for recollection of contextual details. The results were consistent with both predictions.

Imagery encoding and false recognition errors: Examining the role of imagery process and imagery content on source misattributions.
Foley, Mary Ann, Foy, Jeffrey, Schlemmer, Emily, Belser-Ehrlich, Janna, Memory, Vol 18(8), Nov, 2010. pp. 801-821.
Abstract:

Imagery encoding effects on source-monitoring **errors** were explored using the Deese-Roediger-McDermott paradigm in two experiments. While viewing thematically related lists embedded in mixed picture/word presentations, participants were asked to generate images of objects or words (Experiment 1) or to simply name the items (Experiment 2). An encoding task intended to induce spontaneous images served as a control for the explicit imagery instruction conditions (Experiment 1). On the picture/word source-monitoring tests, participants were much more likely to report "seeing" a picture of an item presented as a word than the converse particularly when images were induced spontaneously. However, this picture **misattribution error** was reversed after generating images of words (Experiment 1) and was eliminated after simply labelling the items (Experiment 2). Thus source **misattributions** were sensitive to the processes giving rise to imagery experiences (spontaneous vs deliberate), the kinds of images generated (object vs word images), and the ways in which materials were presented (as pictures vs words).

Remembering what we did: How source misattributions arise from verbalization, mental imagery, and pictures.
Henkel, Linda A., Carbuto, Michelle, Applied memory. Kelley, Matthew R. (Ed.); pp. 213-234. Hauppauge, NY, US: Nova Science Publishers, 2009. ix, 337 pp.
Abstract:

(from the chapter) Memory **errors** in everyday life are pervasive and can range from being minor inconveniences to having significant consequences. At the root of many memory **errors** are source **misattributions** in which a person mistakenly claims that the source of a remembered event was

something other than what it actually was (e.g., a person claiming to have performed an action that he or she merely thought about completing; erroneously remembering that he or she saw an event when he or she actually only read about it or saw pictures of it). The present chapter examines how source **misattributions** can create false beliefs and memories in which people claim that they did things that they actually did not. The role of three different but related everyday experiences in the creation of such memory **errors** is explored in depth—hearing or talking about various experiences, engaging in mental imagery, and viewing photographs—followed by presentation of a new study examining how photographs can lead to false claims of having committed actions that were not actually performed.

Schema-driven source misattribution errors: Remembering the expected from a witnessed event.
Kleider, Heather M., Pezdek, Kathy, Goldinger, Stephen D., Kirk, Alice, Applied Cognitive Psychology, Vol 22(1), Jan, 2008. pp. 1-20.
Abstract:

When recollection is difficult, people may use schematic processing to enhance memory. Two experiments showed that a delay between witnessing and recalling a visual sequence increases schematic processing, resulting in stereotypic memory **errors**. Participants watched a slide show of a man and a woman performing stereotype-consistent and stereotype-inconsistent actions, followed by an immediate or delayed memory test. Over a two-day delay, stereotype-inconsistent actions were increasingly misremembered as having been performed by the stereotype-consistent actor (Experiment 1). All the source **errors** increased, regardless of stereotype consistency, when the wrong actor was suggested. When we merely suggested that 'someone' performed an action (Experiment 2), only stereotype-consistent source **errors** were increased. Although visual scenes are typically well remembered, these results suggest that when memory fades, reliance on schemata increases, leading to increased stereotypic memory **errors**.

Source monitoring in eyewitness memory: Implicit associations, suggestions, and episodic traces.
Hekkanen, Steve T., McEvoy, Cathy, Memory & Cognition, Vol 33(5), Jul, 2005. pp. 759-769.
Abstract:

Both the distinctiveness heuristic and discrepancy detection hypotheses were investigated by independently manipulating both schema consistency and incidental suggestion hi an eyewitness memory paradigm. A sequence of slides was shown, followed by a postevent questionnaire that contained both schema-typical and schema-atypical information. Fifteen minutes later, a source-monitoring task was administered. In Experiment 1, the proportion of source **misattribution errors** was greater for schema-typical items than for schema-atypical items, and the proportion of **errors** on suggested items was greater than that on control items. Suggestion affected schema-typical and schema-atypical items equally, providing no support for the predictions of either hypothesis. In Experiment 2, the interval between the questionnaire and the source test was manipulated. The results of Experiment 1 were replicated under the short delay, whereas the proportion of **errors** increased under the long delay. An associative network model involving two types of episodic traces was used to account for the results.

Emotional content and reality-monitoring ability: fMRI evidence for the influences of encoding processes.
Kensinger, Elizabeth A., Schacter, Daniel L., Neuropsychologia, Vol 43(10), 2005. pp. 1429-1443.
Abstract:

Memory for emotional items can be less prone to some types of memory distortion, such as reality-monitoring **errors**, than memory for neutral items. The present fMRI study examined whether this enhanced reality-monitoring accuracy reflects engagement of distinct processes recruited during encoding of emotional information. Participants only imagined named objects (word-only trials) or imagined named objects and then also viewed photos of them (word-picture trials). Half of the items were emotional (e.g., snake, casket). Later, participants heard object names and indicated whether the corresponding photo had been shown. Reality-monitoring **errors** occurred when participants attributed an item from a word-only trial to a word-picture trial. Such **misattribution errors** occurred less frequently for emotional than neutral items. Activity in emotion-processing regions (e.g., orbitofrontal cortex, amygdala) reduced the likelihood of later **misattributions**, likely due in part to interactions with

regions that promote memory accuracy (e.g., the hippocampus). Distinct neural processes also increased the likelihood of reality-monitoring **errors**, depending on the emotional content of the items. Activity spanning the fusiform and parahippocampal gyri (likely reflecting mental imagery) increased the likelihood of reality-monitoring **errors** for neutral items, while activity in the anterior cingulate increased the likelihood of reality-monitoring **errors** for emotional items.

Schema reliance in source monitoring: The impact of aging and emotional focus.
Mather, Tamar Esther Mara, Princeton U., US
Dissertation Abstracts International: Section B: The Sciences and Engineering, Vol 61(5-B), Nov, 2000. pp. 2791.
Abstract:

Three experiments investigated the interplay of emotion and aging on reliance on schematic knowledge when remembering. Of additional interest was whether older adults' reliance on schematic knowledge is associated with declines in reflective processes supported by frontal brain regions. For generality, these issues were investigated in three types of situations: memory for a story (Experiment 1), memory for who said what (Experiment 2), and memory for options from past choices (Experiment 3). The same three findings emerged across each of these different types of situations. First, younger adults (17-26 yrs) asked to focus on how they feel about an event later relied more on their schematic knowledge when attributing information to the event than did younger participants who had not focused on their feelings. Second, in the conditions that did not require emotional self-focus, older adults (62-85 yrs) showed more schema reliance than did younger adults. Third, this increased reliance for older adults in the non emotional self-focus conditions was negatively correlated with a measure of frontal brain region or executive function. This pattern of results suggests that both emotional focus and age-related changes increase schema reliance when making source judgements about a previously-experienced event. Relying on general knowledge about an event can be a useful strategy to help fill in gaps in memory or to avoid more effortful extended retrieval. However, schema reliance can also result in memory source **misattributions**. The source **misattributions** associated with schema reliance are most likely due to a combination of factors, including disruption of the reflective processing required to encode and consolidate source-specifying information, increased associations that may later be misattributed to the event itself, and shifts in which aspects of the event are focused on. Schematic knowledge in memory attributions plays an important role in helping people remember information. However, reliance on schematic information can lead to memory **misattribution errors** that are especially pernicious because they seem so plausible.

Escape from illusion: Reducing false memories.
Dodson, Chad S., Koutstaal, Wilma, Schacter, Daniel L.
Trends in Cognitive Sciences, Vol 4(10), Oct, 2000. pp. 391-397.
Abstract:

Illusory memories are unsettling, but far from uncommon. Over the past several years, increasing experimental and theoretical attention has focused on **misattribution errors** that occur when some form of memory is present but attributed to an incorrect time, place or source. Demonstrations of **errors** and distortions in remembering raise a question with important theoretical and practical implications: how can memory **misattributions** be reduced or avoided? We consider evidence that documents the occurrence of illusory memories, particularly false recognition responses, and then review three ways in which memory distortion can be minimized.

The aboutness principle: A pervasive influence on human inference.
Higgins, E. Tory
Social Cognition, Vol 16(1), Spr, 1998. Special issue: Naive theories and social judgment. pp. 173-198.
Abstract:

When people perceive a response (or outcome), whether their own or another person's, they represent it as being about something, and this thing that the response is about is inferred to be the source of the response. The first section of this article discusses natural assumptions underlying the operation of this aboutness principle and describes the problems with its use, illustrated by such well-established cases

of social-cognitive shortcomings as the correspondence bias, representativeness **error**, **misattribution**, accessibility bias, and saying-is-believing effect. The second section uses the aboutness principle to review lay psychological theories discussed in this special issue, including people's theories of causality, stability, and change in personal attributes, conditions for valid memories or judgments, group attribute clusters, and persuasive influences.

Repeatedly thinking about a non-event: Source misattributions among preschoolers.
Ceci, Stephen J., Huffman, Mary, Lyndia Crotteau, Smith, Elliott, Loftus, Elizabeth F.
The recovered memory/false memory debate. Pezdek, Kathy (Ed.); Banks, William P. (Ed.); pp. 225-244. San Diego, CA, US: Academic Press, 1996. xv, 394 pp.
Abstract:

(from the chapter) review the factors alleged to be responsible for the creation of inaccurate reports among [3–6 yr olds], focusing on so-called "source **misattribution errors**" / present the 1st round of results from an ongoing program of research that suggests that source **misattributions** could be a powerful mechanism underlying children's false beliefs about having experienced fictitious events / very young children may be disproportionatly vulnerable to these kinds of **errors** [this is] discussed in the context of the ongoing debate over the veracity and durability of delayed reports of early memories, repressed memories, dissociative states, and the validity risks posed by therapeutic techniques that entail repeated visually guided imagery inductions

Appropriating the actions of another: Implications for children's memory and learning.
Foley, Mary Ann, Passalacqua, Carmella, Ratner, Hilary H.
Cognitive Development, Vol 8(4), Oct-Dec, 1993. pp. 373-401.
Abstract:

Perspectives on reality monitoring and sociocultural learning were integrated in 4 experiments concerning children's memory of contributions to the outcomes of collaborative exchanges. 204 children (aged 4 yrs to 8 yrs 11 mo) made collages with an adult and were later surprised with a reality-monitoring task in which they were asked to remember who placed particular pieces on the collage. In Exps 1–3, 4-yr-olds were more likely to claim they contributed pieces that the adult actually contributed rather than the reverse. This bias was interpreted as evidence for appropriation, a process in which individuals adopt another person's actions as their own. The extent to which Ss committed **misattribution** (MA) **errors** depended on their involvement as decision makers (Exps 1 and 3) and on the outcomes of the collages themselves (Exp 2). Exp 4 demonstrated the importance of shared exchanges for producing the MA **errors** observed in Exps 1–3.