The roles of associative strength and source memorability in the contextualization of false memory ☆

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Abstract

We tested the impact of associative strength and retrieval heuristics in false source memory. We arranged 12-item associative lists in descending order of backward associative strength to a critical non-presented item and then split them into 6-item sub-lists at the median. High- and low-strength sub-lists were correlated with presentation source. Source claims for falsely remembered critical items were more often to the presentation source of high-strength items, which we have labeled the *source-strength effect*. With only two exceptions in Experiment 2, the source-strength effect was produced even when differences in source memorability led participants to infer generally that items lacking source evidence were presented in the low-strength source. Indeed, the influence of associative strength on source attributions was shown to be completely independent of this inference strategy in a third experiment. This study demonstrates that source details of concepts most highly related to critical items are retrieved with false memories.
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After people encode a list of words related associatively to a non-presented theme item (henceforth known as the critical item), that item is falsely recalled and recognized at high rates (Deese, 1959; Read, 1996; Roediger & McDermott, 1995). This procedure of presenting people with lists of items associated to a non-presented item, commonly called the DRM procedure (after Deese, 1959; Roediger & McDermott, 1995), has prompted many studies examining its theoretical implications (for a review, see Roediger, McDermott, & Robinson, 1998). A most striking finding in this literature is the degree to which falsely remembered critical items are accompanied by vivid feelings of recollection (e.g., Brainerd, Wright, Reyna, & Majardin, 2001; Roediger & McDermott, 1995). People report remembering attributes of critical items such as the modality in which they were presented, associations thought of upon ostensibly encountering them in the study list, and where they were positioned in a study list, among other recollective attributes (e.g., Gallo, McDermott, Percer, & Roediger, 2001; Hicks & Marsh, 1999; Mather, Henkel, & Johnson, 1997; Neuschatz, Payne, Lampinen, & Toglia, 2001; Norman & Schacter, 1997).

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In the current study, we explored the reasons why people come to believe that critical items were presented in a specific context by investigating the causes of an effect reported by Hicks and Hancock (2002). These researchers presented subsets of DRM lists to people in two different contexts, a male versus female speaker on a videotape. The male presented half of the items in each list theme, and the female presented the remaining items. Most important, the researchers explicitly manipulated the pairing of items to each context. In the control condition, they randomly assigned half of the items in a given list to the male or female context (cf. Hicks & Marsh, 1999). When critical items were falsely recalled or recognized, context attributions were no more likely to the male as compared to the female source. In the experimental conditions, however, Hicks and Hancock deliberately correlated presentation context to list items of either low or high associative strength with reference to the critical item. For example, items in a given DRM list that were higher in associative strength to the critical item were presented by the male, whereas the remaining list items were presented by the female. In these conditions, context attributions to critical items were more often to the context that presented list items of higher associative strength. We describe the finding that the critical item seems to take on the context characteristics of its strongest associates as the *source-strength effect*.

The Source Monitoring Framework (SMF; Johnson, Hashtroudi, & Lindsay, 1993; Mitchell & Johnson, 2000) describes two general types of processes that influence how memories are attributed to certain contexts (or sources), and either type of process could potentially explain the source-strength effect. Some attribution processes are classified as memory processes. To translate remembered information into specific attributions, the rememberer sets criteria defining the types and amount of information that should be retrieved for memories from a certain source, evaluates the match between these criteria and the information retrieved for a given item, and decides that the item originated in the candidate source if the match is high. Inferential processes also impact source attributions. The SMF describes inferential processing as the use of general knowledge (as opposed to episodic details) to determine which of several contexts is the most plausible or logical source of a given item (e.g., Bayen, Nakamura, Dupuis, & Yang, 2000; Hicks & Cockman, 2003). Inferential processes allow people to make source attributions on the basis of educated guessing, as opposed to evidence from memory.

From the perspective of the SMF, there are two types of mechanisms that may underlie the source-strength effect. The effect may arise because people retrieve source-specific details when critical items are probed. Such details may be retrieved directly from the critical item representation or from studied words that are most highly associated to the critical item. These alternatives are considered separately in General discussion, but at the core of each is the assumption that source details from the most highly associated list words are the most likely to be retrieved when critical items are considered on a memory test. Therefore, either mechanism represents a mnemonic locus of the effect that produces the illusion that critical items were presented in a particular context.

Alternatively, associative strength may impact inferential processes, leading participants to guess that the critical item shares a source with its most highly associated words. We explored the latter possibility in the form of a specific inference strategy that may explain patterns of source attributions in the DRM paradigm. Specifically, when asked to indicate the source of a critical item, participants may retrieve related list words that they studied, determine the source of these words, and infer that the critical item shares the same source (Gallo et al., 2001; Mather et al., 1997). This *recalling-associates* strategy is particularly likely when all of the list words related to a critical item are presented in a single source, and studies using this methodology have found that participants are as likely to attribute critical items to the source of their list items as they are to correctly specify the source of the list items themselves (Gallo et al., 2001; Gallo & Roediger, 2003; Mather et al., 1997). When words from a list are split between two sources (e.g., Hicks & Hancock, 2002), this inferential process could create the source-strength effect if one assumes that highly associated list words are the most likely to come to mind when participants try to retrieve words related to a critical item. The critical aspect of this alternative hypothesis is that participants do not directly retrieve source details associated with a critical item. Instead, they infer that critical items share a source with the most highly associated list items following a failed attempt to remember source details directly associated to the critical item.

To avoid confusion, we will present a specific example illustrating the differences between the memory-based and inference-based explanations of the source-strength effect. Assume that a person studied words associated to the critical item "sleep," by hearing the strong associates over headphones (e.g., "nap" and "bed") and seeing the weak associates on a computer screen (e.g., "coma" and "sedative"). According to the memory-based account, when the person searches for source evidence associated with "sleep," she should find evidence consistent with the auditory source. That is, she should experience an illusory memory of hearing the word "sleep" in the study phase created by the strong associative relationship of the heard items to "sleep." According to the inference-based account, when the person searches for source evidence associated with "sleep," she should find no evidence in favor of the word being either seen or heard in