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The effects of considering nonlist sources on the Deese–Roediger–McDermott memory illusion

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Abstract

In the Deese–Roediger–McDermott (DRM) memory illusion participants indicate that nonpresented words were on a list that contained the word's associates. We compared standard DRM instructions with source-monitoring/strong-warning instructions that included both an example list and a source-monitoring test that allowed participants to identify nonstudy-list sources (Experiment 1: an associate of list words; Experiment 2a: generated by participants themselves) as the origin of words. In Experiment 2b source-monitoring instructions did not include a strong warning. In all experiments the DRM illusion in the source-monitoring/strong-warning or source-monitoring/no-strong-warning condition was reduced, but not eliminated, even with immediate testing. The illusion's robustness is discussed in terms of the source-monitoring framework. © 2002 Elsevier Science (USA). All rights reserved.

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A full understanding of how memory works will account for why some situations lead to accurate memory performance and, importantly, why other situations lead to inaccurate memory performance. The recent literature has focused a great deal on the latter. Roediger and McDermott's (1995) revival of the Deese (1959) paradigm has sparked tremendous efforts by cognitive psychologists to understand "false memory" errors. The Deese–Roediger–McDermott (DRM) paradigm involves presenting participants with lists of words (e.g., *bed*, *rest*, *awake*, *tired*, *dream*, etc.) that are all associated with a critical word, in this case *sleep*. In conditions where the critical word has not been presented, participants will still recall it as having been present (e.g., Payne, Elie, Blackwell, & Neuschatz, 1996; Read, 1996; Roediger & McDermott, 1995; Smith, Tindell, Pierce, Gilliland, & Gerkens, 2001) or recognize it as old (e.g., Johnson et al., 1997; Mather, Henkel, & Johnson, 1997; Payne et al., 1996; Roediger & McDermott, 1995). Not only do participants seem to believe that critical *nonpresented* words were on the study lists (old), they are often quite sure of their *old* responses. This certainty has been demonstrated in participants' confidence ratings (e.g., Read, 1996), remember rather than know judgments (e.g., Norman & Schacter, 1997; Read, 1996; Roediger & McDermott, 1995; but see Mather et al., 1997), willingness to identify which of two possible speakers said the word (e.g., Hicks & Marsh, 1999; Payne et al., 1996; see also Hicks & Marsh, 2001), and willingness to identify something unusual about the presentation of the word (Read, 1996).

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In addition to being highly replicable, the DRM memory illusion has shown resistance to strong warnings (Gallo, Roberts, & Seamon, 1997; McDermott & Roediger, 1998). Gallo et al. used two forms of warnings. In their cautious condition (minimal warning), participants were asked to be careful to minimize false recognitions and they were told that some words on the test were not words that they had heard, but were similar to words that they had heard. In Gallo et al.'s forewarned condition (strong warning), participants were given a demonstration of the memory illusion, a detailed description of the memory illusion, a second example, a warning to avoid the false memory error, and were reminded of their task in the recognition test instructions. False recognition rates for *unrelated* lures were generally low: .14, .12, and .15, for the forewarned, cautious, and uninformed groups, respectively. By contrast, false recognition rates for critical nonpresented lures like *sleep* were high, although the forewarned group (.46) did show a lower false recognition rate than did the cautious group (.74) and the uninformed group (.81). Thus the DRM memory illusion was still present, even after a strong warning and clear instructions to avoid such a memory error.

McDermott and Roediger (1998) went further in their attempts to eliminate the memory illusion. For example, consider their third experiment. On half of the word lists the critical word was presented and on half of the lists it was not. Half of the participants were given strong warnings about the memory illusion and were instructed to avoid it. *Immediately* following the presentation of each word list, participants were given a 4-item recognition test which included the critical word. Again, false recognition of *noncritical* words was low: low associates (.07) and unrelated lures (.00) for the warned group; low associates (.10) and unrelated lures (.00) for the no warning group. By contrast, false recognition for critical nonpresented words was high, although participants who had been warned about the DRM memory illusion showed a lower false recognition rate (.59) than participants who had not been warned (.80). Again, an extensive warning reduced but did not eliminate the DRM memory illusion.

Clearly the DRM memory illusion is a powerful effect. Even after strong warnings and with immediate testing, participants mistook words that were only related to words they heard for words they actually heard (see also Underwood, 1965). The present research also attempts to eliminate the illusion from the viewpoint that it is a source memory error.

The DRM memory illusion as a source memory error

Payne et al. (1996) clearly outlined how the DRM illusion could be understood in terms of fuzzy trace theory. By contrast, the purpose of the present research is to explore an alternative way to conceptualize the DRM memory illusion, namely, as a source memory error (see also Hicks & Marsh, 1999, 2001; McDermott & Roediger, 1998; Smith et al., 2001). We believe that the DRM memory illusion is the same type of source memory error that is made in the *suggestibility effect* or *misinformation effect* (e.g., Loftus, 1992) and the *false fame effect* (e.g., Jacoby, Kelley, Brown, & Jasechko, 1989). In the misinformation paradigm, participants witness a slide or series of slides. Later they read a text that accurately describes the slide (control condition) or a text that contains misinformation about the slide, such as describing a coat rack that had not been present in the scene (misled condition). When participants are later tested on their memory for the original slide, participants in the misled condition are more likely than participants in the control condition to indicate that misleading information was part of the original slide (the suggestibility effect). In the false fame paradigm, participants pronounce a list of nonfamous names. Later they read a list that contains famous names, nonfamous names that were pronounced earlier, and new nonfamous names. Participants label each name as *famous* or *nonfamous*. The false fame effect occurs when participants label nonfamous names that were pronounced earlier as famous at a higher rate than they label new nonfamous names as famous.

All three of these illusions involve participants responding to information that could have been presented by several sources (*suggestibility*: the slides or the text; *false fame*: the set of famous names or the recently pronounced list; *DRM*: the study list or the activation from the presentation of related words). In each paradigm the test questions ask participants to indicate if information was from source 1 (*suggestibility*: the slides; *false fame*: the set of famous names; *DRM*: the study list). The memory illusion occurs when people mistakenly say information from source 2 came from source 1 (*suggestibility*: text items came