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Domain Knowledge and False Memory

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Introduction

Many studies have demonstrated the power of schema or knowledge structure in organizing incoming information, which led to various kinds of memory errors. What a person already knew determined whether and how information would be remembered. Thus, it is clear that there is a close link between cognitive processes and structures and the types of memory errors committed. Based on this logic, the present study examined how participants' prior knowledge affects memory errors. This study used the DRM paradigm to examine false memory produced by a group of industrial design experts as compared to the control group.

In the DRM paradigm, participants study list of semantic related words (bed, awake, rest...) that are all related to a critical word that is not presented (sleep). High levels of false memory for lures (e.g. sleep) have been demonstrated in tests such as free recall and recognition (e.g., Roediger & McDermott, 1995). Studying expert behaviors offers a unique window into human cognition. While experts' behaviors on chess were the most researched area, a wide range of domains has been examined and various methods have been used in this area. The clearest finding from these studies was that memory performance on meaningful stimuli has found to be correlated with domain expertise. However, very few studies in this area have focused on the pattern of errors as affected by domain expertise.

McEvoy, Nelson, and Komatsu (1999) looked at the influence of preexisting knowledge on the production of false memory. They found that the probability of producing false memories in free recall varied with the strength of connections from the list words to the critical word and the density of the interconnections among the list words. In addition, false recognition was more likely when the list words were more densely interconnected. McEvoy et al. (1999) determined the association strength based on the word association norm and examined how the strength relates to false memory. Since the association strength between words develops through experiences, it is reasonable to assume that for the words that come from specific domain knowledge, experts of that domain and novices would have different types and strength of association. This would lead to different types and amount of false memory. This study investigated whether domain specific knowledge would induce or reduce false memories. A group of experts and novices were tested on words either related or unrelated to their knowledge of expertise.

Results and Discussion

Two types of semantically related list items were used in this study. One type of items were words selected from technical terms used in the domain of industrial design whereas the other type were common words. Four groups of participants were recruited: senior and junior non-industrial design students and industrial design students. Results showed that for the design-related lists, senior industrial design students not only performed better on both recall and recognition, but also had a higher rate of false recognition. In addition, age had an effect on the false recognition of common words, while the rate of false recognition of design-related terms was mainly determined by participants' domain knowledge. These results support the view that domain knowledge plays an important role in creating false memory.

Table. Mean Percentages of Correct Recall, Recognition and False Recognition as a Function of Age and Domain Knowledge

	correct recall		correct recognition		false recognition	
	common words	design-related words	common words	design-related words	common words	design-related words
Senior						
non-experts	.71	.49	.95	.86	.50	.29
experts	.73	.69	.94	.92	.57	.44
Junior						
non-experts	.72	.52	.94	.86	.35	.28
experts	.72	.52	.93	.89	.38	.28

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