

THE COGNITIVE NEUROPSYCHOLOGY OF FALSE MEMORIES: INTRODUCTION

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This special issue of Cognitive Neuropsychology is devoted to one of the most intensively investigated topics in recent memory research: the analysis of false memories. Experimental and theoretical studies of memory have long been informed by analyses of errors, distortions, and illusions in remembering (for reviews, see Estes, 1997; Johnson, Hashtroudi, & Lindsay, 1993; Roediger, 1996; Schacter, 1995). Within cognitive psychology, Sir Frederic Bartlett's monograph, *Remembering*, is generally recognised as a key source of modern research on memory distortions (Bartlett, 1932). Bartlett pioneered the use of errors and distortions as a tool for probing reconstructive aspect of memory. His approach enjoyed a revival during the 1970s, when a number of researchers developed new techniques for exploring memory distortions, and conceptualised them in the context of schema theories that were heavily influenced by Bartlett's thinking (Alba & Hasher, 1983). During the 1990s, there has been renewed interest in memory errors and distortions, sparked in part by a heated debate concerning the accuracy of traumatic memories recovered in psychotherapy (e.g., Loftus, 1993; Read & Lindsay, 1997). It is in the context of this debate that the term "false memory" has come into common usage in psychological research. False memories refer to recollections that are in some way distorted or, in extreme cases, involve remembering events that never happened at all.

Cognitive neuropsychologists, like cognitive psychologists, have long been aware of, and interested in, the occurrence of false memories. Until

recently, relevant research was comprised mainly of descriptive case studies of patients who produced confabulations about past experiences. During the past few years, however, there has been a marked increase in experimental research and theorising concerning the cognitive neuropsychology of false memories. New methods for systematically eliciting and analysing confabulation have been developed, and research has extended beyond the domain of confabulation to investigate experimentally different kinds of memory distortions and illusions in a variety of populations. In addition, electrophysiological and neuroimaging techniques have been applied to the analysis of false memories. This recent surge of research has—much in the spirit of Bartlett—attempted to use the occurrence of memory distortions as a window into the nature of basic memory processes (for review, see Schacter, Norman, & Koutstaal, 1998).

The papers in this special issue are characterised by a variety of methodological and conceptual approaches. Kopelman provides an opening overview of cognitive neuropsychological research on false memories, and relates this work to theoretical, clinical, and legal issues. The next four papers involve detailed case studies of brain-damaged patients. Dab, Claes, Morais, and Shallice report a series of experiments indicating impaired search and intact monitoring or verification processes in a case of confabulation. Dab et al. discuss the observed pattern of preserved and impaired abilities in the context of several recent theoretical accounts of confabulation and related memory distortions.

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Parkin, Ward, Bindschaedler, Squires, and Powell describe a patient with left frontal lobe damage who exhibits exceptionally high levels of false recognition. Their experiments indicate that encoding deficits play an important role in this patient's heightened false recognition.

Rapcsak, Reminger, Glisky, Kaszniak, and Comer describe two patients with frontal lobe damage who exhibit increased false recognition of faces on both anterograde and retrograde memory tests. They conclude that these patients fail to invoke effortful strategies that can normally be used to suppress false recognition. Ward, Parkin, Powell, Squires, Townshend, and Bradley describe a patient who shows elevated false recognition of faces and names of unfamiliar people. Ward et al. establish the specificity of the deficit, relate the impairment to component processes that have been postulated in theoretical models of person recognition, and conclude that inflated false recognition results from a failure in top-down regulation of the person recognition system.

Four papers focus on groups of brain-damaged patients. The articles by Koutstaal, Schacter, Verfaellie, Brenner, and Jackson, and by Melo, Winocur, and Moscovitch examine false recognition and recall in amnesic patients. Previous research delineated conditions in which amnesic patients are more or less susceptible than controls to false memory effects, and related these findings to theoretical distinctions between memory for general or gist information on the one hand and memory for detailed, specific information on the other. The papers by Koutstaal et al. and Melo et al. extend and refine the earlier findings, point toward possible differences among subgroups of amnesic patients, and also help to specify the conditions under which amnesic patients show greater or lesser susceptibility to false memory effects.

Balota, Cortese, Duchek, Adams, Roediger, McDermott, and Yerys examine false recall and recognition in patients with Alzheimer's disease. They use a "converging semantic associates" procedure initially developed by Deese (1959), recently revived and modified by Roediger and McDermott (1995), that produces high levels of false recall and recognition in healthy people (this procedure was

also used by Melo et al.). Balota et al. report evidence that, relative to their own level of veridical recall and recognition, Alzheimer's patients are more susceptible to false recall and recognition than are normal older adults. However, in absolute terms, Alzheimer's patients showed reduced levels of false recognition and similar levels of false recall compared to healthy elderly controls. Dalla Barba, Nedjam, and Dubois examined relations among confabulation, executive functions, and source memory in Alzheimer's patients. They found that confabulation arises with respect to the future as well as the past, and conclude that it results from a disorder of what they term "temporality".

Four papers focus on false memories in normal ageing. One of the more intriguing findings from recent research is that older adults are sometimes more susceptible to false memories than are younger adults, a finding that is replicated in the normal elderly controls studied by Balota et al. Using a variant of the Roediger and McDermott false recognition procedure that involves repeated study and testing, Kensinger and Schacter report that young adults reduce false recognition with repeated study/test trials whereas older adults do not. They relate this finding to the theoretical distinction between memory for gist and specific information. Jacoby also provides evidence that older adults can be more susceptible to false memories than younger adults, using a novel procedure in which subjects are biased to produce false memories by misinformation that is presented after an initial learning trial. Jacoby discusses his results and related findings in terms of an accessibility bias that influences performance independently of recollective processes.

The articles by Kensinger and Schacter and by Jacoby both consider the contribution of impaired recollection of source information to age-related increases in false memories. Mather, Johnson, and De Leonardis extend research on source monitoring and ageing into a novel domain: stereotype reliance. They show that older individuals, who are characterised by poor memory for the exact source of information, tend to rely more on pre-existing stereotypes when trying to remember who said what than do younger adults. They also report evidence that these effects are related to performance

on tasks sensitive to frontal lobe dysfunction. Similarly, Rubin, Van Petten, Glisky, and Newberg found that older adults' susceptibility to illusory memory conjunctions, where people falsely recognise as "old" re-combinations of previously studied items, is related to performance on frontal-sensitive tasks. They also report a separate study using event-related potentials that shows that brain activity during true recognition differs from that observed during false recognition of illusory conjunctions.

Dodhia and Metcalfe investigate two types of false memories—one involving misleading post-event information (Loftus, Miller, & Burns, 1978), the other involving false recognition of semantic associates in a variant of the Roediger and McDermott procedure—in the context of a formal computational model (CHARM). They demonstrate how the model can help to explain some of the effects they observe, but also present data concerning the suppression of false memories that are difficult for the model to handle. In discussing how the model needs to be altered to account for the observed patterns of data, Dodhia and Metcalfe provide a further illustration of how the investigation of false memory phenomena can be revealing at a theoretical level.

Taken together, the findings and ideas from the papers in the special issue constitute a compelling case that the study of memory errors, distortions, and illusions from a cognitive neuropsychological perspective can provide useful insights into basic memory processes (for further discussion and illustration, see Schacter, in press). They thus suggest that further development of the cognitive neuropsychology of false memories will be an informative and enlightening enterprise.

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