



Attention to item-specific processing eliminates age effects in false memories

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Received 11 June 2004; revision received 5 August 2004

Available online 28 September 2004

Abstract

One possible reason for age differences in false memory susceptibility is that older adults may not encode contextual information that allows them to distinguish between presented and non-presented but internally activated items. The present research examines whether older adults can reduce false memories when given external contextual support. In the first two experiments, semantically related lists were presented in the context of sentences that either elicited or did not elicit meanings of items that converged on a non-presented theme word. Semantically related lists were presented as the second word of cue-target pairs in Experiment 3. Results demonstrated that when gist-based processing of list items was made less accessible, older and younger adults showed similar reductions in false recall and recognition. Finally, although both groups showed reductions, measures of response latencies indicated that non-presented critical theme words were internally activated. These results have implications for encoding deficit and strategy selection as they relate to accounts of age-related deficits in memory.

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Keywords: False memories; Relational processing; Cue-encoding deficit

Age-related deficits in recall and recollection are well documented (for reviews see Anderson & Craik, 2000; Balota, Dolan, & Duchek, 2000). Older adults are less likely to correctly recall or recognize previously presented material. More recent research has demonstrated another type of age-related memory deficit in which older adults exhibit an increased propensity to make errors of commission involving recall or recognition of events that had not previously been experienced. For example, researchers have demonstrated that older adults show higher levels of false recall and recognition when presented with lists of both semantic (Balota et al., 1999; Kensinger & Schacter,

1999; La Voie & Faulkner, 2000; Norman & Schacter, 1997; Tun, Wingfield, Rosen, & Blanchard, 1998) and phonological associates (Sommers & Huff, 2003).

In an effort to understand the nature of the age deficit in errors of commission, numerous studies have been conducted comparing older and younger adults within the Deese/Roediger–McDermott (DRM) paradigm. In these studies individuals are presented with lists of semantically related words (e.g., bed, rest, tired) and then complete recall and/or recognition tests (Deese, 1959; Roediger & McDermott, 1995). The typical finding is that individuals (both younger and older) falsely recall or recognize highly related but non-presented theme words or lures (Balota et al., 1999; Deese, 1959; Mather, Henkel, & Johnson, 1997; Robinson & Roediger, 1997; Roediger & McDermott, 1995). Older adults

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also sometimes demonstrate higher rates of false memories than younger adults when absolute levels of false recognition are compared (Norman & Schacter, 1997), and consistently demonstrate higher levels of false memories when false recall is computed as a proportion of veridical recall (i.e., Balota et al., 1999).

Resistance to false memories in older and younger adults

Although the DRM effect is a powerful phenomenon, researchers have discovered that both older and younger adults are capable of reducing false recall and recognition. For example, when older and younger participants encoded pictorial information along with DRM list items in the study phase, they were less likely to falsely recognize the non-presented critical target at test (Schacter, Israel, & Racine, 1999). Schacter et al. proposed that false memories could be reduced if individuals rely on a “distinctiveness heuristic”, and modify their decision strategy toward more conservative responding. Both older and younger adults have been shown to reduce false memories in a categorized picture paradigm, when they were given instructions at the time of retrieval that discouraged designating items as old simply on the basis of general similarity to studied items (Koutstaal, Schacter, Galluccio, & Stofer, 1999).

Distinctive processing at encoding has also been implicated in reducing false recognition of semantically related lures in young adults (Arndt & Reder, 2003; McCabe, Presmanes, Robertson, & Smith, in press). Distinctive processing refers to an *encoding* orientation that focuses on processing specific and individual item information that occurs when the to-be-remembered stimulus is initially encountered. When semantically associated list items were made perceptually distinct, by presenting each item in a font unique from that used to present other items, participants were less likely to erroneously recognize the critical theme word, than when semantic associates were presented in the same non-distinct font. This increase in item-specific processing has been shown to reduce false memories both between and within participants, providing support that the use of item specific information in the form of individuating unique cues is a memory process that occurs at encoding.

According to the distinctive processing framework, false memories can be reduced if individuals are able to remember item-specific information associated with studied items. This account contrasts with the distinctiveness heuristic in that the focus is on information acquired at encoding rather than on adopting a particular recognition criterion at retrieval. In fact, the distinctiveness heuristic only reduces false memories in a between-participants design (i.e., Dodson & Schacter, 2001), providing additional support that use of this heuristic

affects the criterion chosen at retrieval. It is noteworthy that the distinctiveness heuristic and distinctive processing share common features, in that both have been shown to reduce false memories in younger adults, and both rely on the encoding of specific distinct information for the reduction to occur. However, an important difference is that distinctive processing relies on the ability of participants to have access to encoded individuating cues, whereas the distinctiveness heuristic is a mode of responding based on participants’ metamemorial awareness that true recognition of studied items should include recollection of distinctive detail. The specific distinctive feature need not be remembered in detail; rather just the presence of that feature need be remembered. Reductions in false recognition are explained by a global shift in response strategies across conditions (e.g. Schacter et al., 1999).

Contextual cue encoding deficit in older adults

Research has demonstrated that older adults are able to reduce false memories by relying on the “distinctiveness heuristic” (Schacter et al., 1999). However, other research (Kensinger & Schacter, 1999) suggests that older adults cannot reduce errors of commission by engaging in distinctive processing. Kensinger & Schacter (1999) found that whereas younger adults reduced false memories across five study-test trials in the DRM paradigm, older adults continued to make similar levels of false recall and false recognition responses across the five study-test trials. They concluded that older adults failed to use item-specific information that accrued from repetition.

One possible reason why older adults may not be able to reduce false memories after engaging in distinctive processing, is that they may not encode or may not effectively use item-specific contextual and perceptual cues that individuate items within a given list (i.e., Glisky, Polster, & Routhieaux, 1995; Park, Puglisi, & Sovacool, 1983; Trahan, Larrabee, & Levin, 1986). Older adults are less likely to benefit from contextual reinstatement at retrieval (Rabinowitz, Craik, & Ackerman, 1982). Additionally, older adults are less likely to remember the source of information (McIntyre & Craik, 1987). Although these findings suggest that a deficit in the encoding of contextual cues develops as we age, more recent research suggests that older adults may encode but may not have access to perceptual context unless attention is directed to that context (Naveh-Benjamin & Craik, 1995). Naveh-Benjamin and Craik found that when attention was explicitly directed to perceptual context, older adults showed levels of veridical memory comparable to that of younger adults for contextual information.

These findings suggest that older adults may be capable of encoding perceptual-contextual attributes that can be used to individuate items. Older adults encode these

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