Do adults with mental retardation show pictorial superiority effects in recall and recognition?

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Abstract

We examined memory for pictures and words in adults with mental retardation and a control group of adults of normal intelligence. During acquisition, sets of simple line drawings and matching words were presented for study using an intentional learning procedure. The principle dependent measures were free recall and recognition. Measures of working memory span were also administered. Pictorial superiority effects occurred in free recall and recognition for both intelligence-level groups. Correlational analyses indicated that working memory span was primarily related to recall performance, irrespective of stimulus format. These data strongly suggest that persons with mental retardation can utilize nonverbal memory codes to support long-term retention as effectively as do adults of normal intelligence. © 2002 Elsevier Science Ltd. All rights reserved.

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1. Introduction

The topic of memory in adults with mental retardation has drawn a fair amount of attention in recent years (Detterman, 1979; Kavale & Forness, 1992; Turnure, 1991). Prior research indicates that adults with mild to moderate mental retardation perform more poorly than do those of normal intelligence on verbal memory measures, such as paired associate recall (Lebrato & Ellis, 1974), word recognition (Stan & Mosley, 1988; Woodley-Zanthos, 1993, Exp. 2) and recognition of target adjectives in sentence contexts (Cherry, Njardvik, & Dawson, 2000). There

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is also evidence of intelligence-related deficits in performance on some non-verbal memory measures, including picture recall (Boyd & Ellis, 1986; Katz & Ellis, 1991) and recognition of pictures of common objects (Dulaney, Raz, & Devine, 1996; Dobson & Rust, 1993) and faces (Ellis, Meador, & Bodfish, 1985; McCartney, 1987). On the contrary, other evidence has shown that adults with mental retardation remember spatial location information (an aspect of non-verbal memory) as well as do adults of normal intelligence. For instance, Ellis, Woodley-Zanthos, and Dulaney (1989, Exp. 1), among others, have found no significant differences in memory for spatial location information between adults with mild mental retardation and college students (see also Dulaney & Ellis, 1991; Ellis, Katz, & Williams, 1987, Exp. 2; Nigro & Roak, 1987). However, when adults with moderate mental retardation are compared to those with mild retardation and college students, intelligence-related deficits in memory for spatial location are observed (Katz & Ellis, 1991, see also Dulaney et al., 1996, for similar results).

One issue that has received scant attention in mental retardation literature concerns the occurrence of pictorial superiority effects in memory. The pictorial superiority effect refers to the finding that concrete items are better remembered when presented in a pictorial format than in a verbal format. Paivio (1971) advanced the dual-coding theory to explain the memorial advantage of pictures relative to their verbal referents. This theory holds that pictures can be dually represented in memory by visual and verbal codes, whereas words are represented primarily by verbal codes. Pictures are better remembered than words, on the assumption that two codes are better than one (see also Paivio & Csapo, 1973; Paivio, 1976). An alternative explanation for the memorial efficacy of pictures is that the sensory codes for pictures are richer than those of words, leading to a more differentiated representation that is less susceptible to interference (see Nelson, Reed, & Walling, 1976; but see Snodgrass & Asiaghi, 1977). Whether code redundancy or a richer sensory representation of items in picture format accounts for the pictorial superiority effect is a matter of theoretical interest and debate (see Kobayashi, 1986; Mintzer & Snodgrass, 1999, for discussion). The finding that pictures are better remembered than words is also a matter of practical importance, as pictures may be useful in educational contexts to aid in retention of written material (cf. Cherry, Park, Frieske, & Smith, 1996).

Ample experimental evidence documents the reliability and generality of pictorial superiority effects across a variety of different memory measures and subject populations. In particular, pictorial superiority effects have been found for college students in free recall (e.g., Paivio, Rogers, & Smythe, 1968; Paivio & Csapo, 1973; Toglia, Hinman, Dayton, Catalano, 1997), paired associate recall (e.g., Nelson et al., 1976), and recognition (e.g., Snodgrass & Asiaghi, 1977). Other evidence has shown that healthy older adults demonstrate a pictorial superiority effect as do younger adults in measures of free recall (Rissenberg & Glanzer, 1986; Winograd, Smith, & Simon, 1982) and recognition (Park, Puglisi, & Sovacool, 1983). Only scant evidence exists that pertains to the question of pictorial superiority in adults with mental retardation (cf. Ellis & Wooldridge, 1985). In Ellis and Wooldridge's (1985) study, adults with mild to