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Individual cognitive training of reading disability improves word identification and sentence comprehension in adults with mild mental retardation

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Abstract

Reading therapy has been shown to be effective in treating reading disabilities (RD) in dyslexic children, but little is known of its use in subjects with mild mental retardation (MR). Twenty adult volunteers, with both RD and mild MR, underwent 60 consecutive weeks in a cognitive remediation program, and were compared with 32 untreated control subjects. The experimental group showed a significant improvement in word identification, as measured by oral production ($p = 0.0004$) or silent reading ($p = 0.023$), and sentence comprehension ($p = 0.0002$). Adults with MR appear to benefit from new approaches in the field of RD.

Keywords: Mild mental retardation; Reading disability; Cognitive remediation

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1. Introduction

Whatever the underlying causes of mental retardation (MR), adults with mild MR exhibit numerous deficits in terms of academic achievement, which worsen their social prognosis. However, these subjects are never assessed in studies on reading disability (RD) or illiteracy (Kish, Jurgeblut, Jenkins, & Kolstad, 1993; Shalla & Schellenberg, 1998). Thus, little is known about their ability to read, although learning to read is an important and achievable goal for children and adults with mental retardation. Reading is acquired during childhood through education, and involves several skills: visual, auditory, and motor. In terms of cognitive processing, one of the crucial steps is written word identification or recognition (Broom & Doctor, 1995; Goswami & Bryant, 1990). Two word identification strategies or routes are used: the first being a grapho-phonologic conversion, or assembling strategy, which depends on converting grapheme into phonemes and then blending those phonemes to form a word; the second being an orthographic or lexical strategy, which enables readers to target the whole word in a stock of familiar written words and to access the corresponding lexical entry (Humphreys & Evett, 1985). While necessary, word identification is evidently not sufficient for reading. Reading also involves the use of syntax rules and the assimilation of specific characteristics of written texts. This factor is why literacy measures usually assess sentence and connected text comprehension as well as word identification. Comprehension reading tasks can be classified into two main groups: the first requiring high-level processing with a fine-grain analysis of syntactic, semantic, and pragmatic cues; the second requiring low-level processing – such as use of graphical cues or understanding of the logic of a table or list – in order to extract selective information in specific forms, lists, tables or programs (Rivière, 2002).

In a previous descriptive study, we assessed reading in a group of 67 unselected adults with mild MR, using high- and low-level comprehension tasks, together with other specific tasks related to word identification and syntax (sentence comprehension) (Rivière et al., 1999; Cohen et al., 2001). All subjects exhibited reading deficits: 61% had a severe impairment in word identification tasks (less than 50% of words read correctly) and 80% in the syntax task (comprehension of sentences below 30%). On high- and low-level comprehension tasks, most of the subjects had a severe or moderate impairment. Furthermore, for most of them, reading speed was very slow, indicating that word identification was not an automated process, and that assembling was the main cognitive strategy used. In this sample, word identification scores appeared to be correlated with both total and verbal IQ scores (Cohen et al., 2001).

However, in children with normal intelligence, IQ does not predict reading skills whatever the task (global reading, syntax or word identification) (Share, McGee, & Silva, 1989; Siegel, 1989); and similarly, reading disability is not related to IQ score (Siegel, 1989). During the past 30 years, reading therapy has been shown to be effective in treating RD in dyslexic children (Lovett, Ransby, Hardwick, Johns, & Donaldson, 1989). Most data come from treatment studies designed to confirm a particular theoretical hypothesis. Consequently, remediation programs have been limited to a few specific points and have focused on the presumed underlying deficit: visual strategy (Geiger, Lettvin, & Fahle, 1994), phonology (Gittelman & Feingold, 1983; Hurford et al., 1994), perceptive temporal processing of auditory stimuli (Merzenich et al., 1996; Tallal et al., 1996), cognitive strategies (Das, Mishra, & Pool, 1995), or balance and motor control (McPhillips, Hepper, & Mulhem, 2000). Of note, in clinical practice, reading therapy is mostly individualized, and adapted to the patient according to his/her main areas of dysfunction. Treatments usually include training and exercises related to different cognitive aspects, and many current practitioners tend to include a specific focus on phonological awareness and naming