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Dyslexia as a multi-deficit disorder: Working memory and auditory temporal processing

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Abstract

Dyslexia is difficulty in acquiring reading skills despite adequate intelligence and sufficient reading opportunities. Its origin is still under debate. Studies usually focus on a singular cause for dyslexia; however, some researchers argue that dyslexia reflects multiple deficits. Two of the abilities under investigation in dyslexia are working memory (WM) and auditory temporal processing (ATP). In order to better evaluate the relative roles of WM and ATP in dyslexia, in the present study, we tested the contribution of WM and ATP to different types of reading performance and phonological awareness in dyslexia, using a multidimensional approach.

Seventy-eight adults with dyslexia and 23 normal-reading adults performed WM and ATP tasks, as well as reading and phonological awareness tests. Readers with dyslexia showed poorer performance on all tests. Both WM and ATP were significant predictors of reading performance and phonological awareness among participants with dyslexia. Dividing participants with dyslexia according to their performance level on WM and ATP tasks revealed group differences in reading and phonological awareness tests. Both WM and ATP contribute to dyslexia, and varying levels of difficulties in both of these abilities are observed among this population. This is strong evidence in favor of the multi-deficit approach in dyslexia, and suggests that researchers should consider this approach in future studies of dyslexia.

Keywords: Dyslexia; Working memory (WM); Auditory temporal processing (ATP)

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