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Action video games improve reading and cross-modal attentional shifting as well as phonological skills in English-speaking children with dyslexia

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Abstract

Dyslexia is the most common neurodevelopmental disorder characterized by difficulties in learning to read. Action video games (AVG) improve reading efficiency in Italian children with dyslexia, without any direct phonological or orthographic stimulation. However, which mechanism underlying this improvement and the extent to which AVG training would be beneficial in deep English orthography, remain two critical questions. For an efficient reading acquisition children have to integrate written letters with speech sounds, rapidly shifting their attention from visual to auditory modality. Here, we tested reading and phonological skills, audio-visual processing, visual-to-auditory and auditory-to-visual attentional shifting in two matched groups of English-speaking children with dyslexia before and after they played AVG or non action video games. Words recognition and phonological decoding speed increased only playing AVG. Audio-visual processing and visual-to-auditory attentional shifting also ameliorated after AVG training. This unconventional reading remediation program reduced also phonological

short-term-memory and phonemes blending deficits. Consequently, the typical auditory-phonological disorders associated to dyslexia also improved playing AVG. Our findings demonstrate that a specific acceleration of audio-visual processing and visual-to-auditory attentional shifting can directly translate into better reading and phonological working memory in English-speaking children with dyslexia.

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