

Action Video Games Improve Multi-sensory Perceptual Noise-Exclusion in Developmental Dyslexia

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Abstract

For about 10% of children reading acquisition is extremely difficult because they are affected by a heritable neurobiological disorder called developmental dyslexia (DD), mainly associated to an auditory-phonological disorder. The causal role of cognitive and perceptual deficits typically associated to DD can be investigated through intervention studies. Recently, it has been demonstrated that visual-attention, reading speed and phonological short-term memory could be simultaneously improved by using action video game (AVG) training both in shallow and deep alphabetic orthographies. Here, in a cross-over AVG and non-AVG experimental study, we investigated multi-sensory perceptual noise-exclusion mechanisms, manipulating the signal-noise ratio in a visual and an auditory search task. Our findings showed that after 12 hours of AGV training both visual and auditory perceptual noise-exclusion mechanisms were improved and phonological decoding speed was accelerated in children with DD. These findings suggest that the plasticity of the right multi-sensory fronto-parietal network could explain the reading improvements induced by the AVG training in children with DD.

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