

# Visual processing as a potential endophenotype in youths with attention-deficit/hyperactivity disorder: A sibling study design using the counting Stroop functional MRI.

Fan LY, Shang CY, Tseng WI, Gau SS, Chou TL.

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## Abstract

Deficits in inhibitory control and visual processing are common in youths with attention-deficit/hyperactivity disorder (ADHD), but little is known about endophenotypes for unaffected siblings of youths with ADHD. This study aimed to investigate the potential endophenotypes of brain activation and performance in inhibitory control and visual processing among ADHD probands, their unaffected siblings, and neurotypical youths. We assessed 27 ADHD probands, 27 unaffected siblings, and 27 age-, gender-, and IQ-matched neurotypical youths using the counting Stroop functional magnetic resonance imaging and two tasks of the Cambridge Neuropsychological Test Automated Battery (CANTAB): rapid visual information processing (RVP) for inhibitory control and spatial span (SSP) for visual processing. ADHD probands showed greater activation than their unaffected siblings and neurotypical youths in the right inferior frontal gyrus (IFG) and anterior cingulate cortex. Increased activation in the right IFG was positively correlated with the mean latency of the RVP in ADHD probands. Moreover, ADHD probands and their unaffected siblings showed less activation in the left superior parietal lobule (SPL) than neurotypical youths. Increased activation in the left SPL was positively correlated with the spatial length of the SSP in neurotypical youths. Our findings suggest that less activation in the left SPL might be considered as a candidate imaging endophenotype for visual processing in ADHD.