Timing Deficits in ADHD: Insights From the Neuroscience of Musical Rhythm

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Abstract

Everyday human behavior relies upon extraordinary feats of coordination within the brain. In this perspective paper, we argue that the rich temporal structure of music provides an informative context in which to investigate how the brain coordinates its complex activities in time, and how that coordination can be disrupted. We bring insights from the neuroscience of musical rhythm to considerations of timing deficits in Attention Deficit/Hyperactivity Disorder (ADHD), highlighting the significant overlap between neural systems involved in processing musical rhythm and those implicated in ADHD. We suggest that timing deficits warrant closer investigation since they could lead to the identification of potentially informative phenotypes, tied to neurobiological and genetic factors. Our novel interdisciplinary approach builds upon recent trends in both fields of research: in the neuroscience of rhythm, an increasingly nuanced understanding of the specific contributions of neural systems to rhythm processing, and in ADHD, an increasing focus on differentiating phenotypes and identifying distinct etiological pathways associated with the disorder. Finally, we consider the impact of musical experience on rhythm processing and the potential value of musical rhythm in therapeutic interventions.