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Attention deficit hyperactivity disorder from a neurosciences and behavioral approach: An introduction

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This special issue of Clinical Psychology Review brings together six reviews of research topics focusing on Attention Deficit Hyperactivity Disorder (AD/HD). They represent some of the fastest growing targets for research in the most common childhood psychiatric disorder. The primary emphasis of the reviews is on using neuroscience approaches, however, we also have included articles that reflect the substantial and influential research emanating from behavioral and neuropsychological approaches to studying ADHD. In the first article, Catharine Winstanley, Dawn Eagle and Trevor Robbins use a translational approach to describe how pre-clinical studies of the neurotransmitters implicated in ADHD are used to understand one of the core symptoms of ADHD, impulsivity. They also illustrate how animal models of ADHD behavior can elucidate the neural underpinnings of ADHD symptomatology. This article is particularly timely given the increasing interest in using translational approaches to understanding clinical disorders.

The article by Irwin Waldman and Ian Gizer reviews the progress in research using candidate gene approaches to studying genetic links in childhood ADHD. The review begins with a primer of study designs used in molecular genetic analysis to facilitate the understanding of how the results are generated in this burgeoning area. The authors then proceed by reviewing the literature on candidate gene studies of childhood ADHD and conclude with suggestions for future ADHD genetic studies.

Steady technological advances have stimulated the use of anatomic magnetic resonance imaging (MRI) to examine phenotypic alterations in ADHD. The review by Amy Krain and F. Xavier Castellanos begins with a discussion of limitations inherent in anatomic MRI studies and a review of the literature on normal brain development. The authors then review alterations in global brain volume followed by an examination of anatomic differences in the most commonly implicated regions in ADHD, the frontal cortex, basal ganglia, and cerebellum. The authors conclude with a discussion of findings focusing on the relationship between brain structure and function.

The following chapter reviews the literature on functional brain imaging. The authors, Catherine Fassbender and Julie Schweitzer, posit that researchers need to attend to the role that “hyperactivity” on a neural level may impact ADHD brain and behavioral functioning. They suggest that individuals may be using compensatory neural functioning and behavioral strategies secondary to impaired brain functioning. They present findings from both the childhood and adult ADHD functional brain imaging literature to support their hypothesis.

Neuropsychological studies of ADHD across the lifespan have become more sophisticated and hypothesis-driven over time. Larry Seidman reviews the neuropsychological literature to examine support for the hypothesis that executive dysfunctions correlate with ADHD. The author examines the role of psychiatric co-morbidity, gender, the relationship of brain structure

to function, psychopharmacology of ADHD, and the implications of these findings for the clinical assessment of individuals with ADHD throughout the lifespan.

There is long standing support for the use of behavioral interventions to treat ADHD in home and school settings. In the final article, Andrea Chronis, Heather Jones, and Veronica Raggi review the rich literature on the use of these empirically validated interventions and the rationale for each. They also discuss the factors that can help predict the effectiveness of treatment response. The authors conclude with a call for greater research to address the lack of treatments available for adolescents with ADHD.