Chapter 19
Innovative Neuropsychological Interventions for ADHD and Asperger's Syndrome and Clinical Implications for Practitioners:
Integrating Traditional Approaches With Emerging Technologies

Maria Theodoratou
https://orcid.org/0000-0003-4200-4643
Hellenic Open University, Greece

Dimitra V. Katsarou
https://orcid.org/0000-0001-8690-0314
University of the Aegean, Greece

Kalliopi Megari
https://orcid.org/0000-0002-5861-7199
City College, University of York, Greece

Soultana Papadopoulou
University of Ioannina, Greece

Efthymia Efthymiou
https://orcid.org/0000-0003-0411-1720
Zayed University, UAE

Maria Sofologi
https://orcid.org/0000-0003-0380-2220
University of Ioannina, Greece

Georgios A. Kougioumtzis
https://orcid.org/0000-0002-2362-2094
National and Kapodistrian University, Greece

Vasiliki Yotsidi
https://orcid.org/0000-0001-7242-2948
Panteion University, Greece

Christiana Koundourou
https://orcid.org/0009-0005-4050-0493
Neapolis University, Pafos, Cyprus

Eugenia I. Toki
https://orcid.org/0000-0001-7995-8745
University of Ioannina, Greece

Marios Argyrides
https://orcid.org/0000-0002-9936-7229
Neapolis University, Pafos, Cyprus

Evangelos Mantsos
https://orcid.org/0009-0002-8490-2660
University of Western Macedonia, Greece

DOI: 10.4018/979-8-3693-9689-6.ch019

ABSTRACT

Attention-Deficit/Hyperactivity Disorder (ADHD) and Asperger's Syndrome, which now falls under Autism Spectrum Disorder (ASD) according to the DSM-5, represent two distinct yet sometimes overlapping neurodevelopmental disorders. Both conditions present significant cognitive, behavioral, and social challenges from early childhood through adolescence. As clinical understanding of these disorders has evolved, so too have the neuropsychological approaches to treatment. This chapter explores innovative intervention strategies that incorporate cutting-edge technology, evolving therapeutic practices, and a strengths-based approach to managing ADHD and Asperger's Syndrome. By doing so, it offers a modern, comprehensive framework for treating these conditions in pediatric neuropsychology.

INTRODUCTION

As diagnostic frameworks and clinical understandings of ADHD and Asperger's Syndrome have evolved, so too have the intervention strategies designed to address their core symptoms and associated challenges. ADHD remains one of the most prevalent neurodevelopmental disorders globally, with an estimated prevalence of 5% to 10% in children, presenting with symptoms of inattention, hyperactivity, and impulsivity (Faraone et al., 2015; Theodoratou et al., 2023). Similarly, Asperger's Syndrome, now classified under the broader category of Autism Spectrum Disorder (ASD) in the DSM-5 (American Psychiatric Association, 2013), is characterized by deficits in social communication, restricted behavior patterns, and specialized interests, often accompanied by high verbal intelligence and focused areas of expertise. ASD is a neurodevelopmental condition marked by diverse cognitive abilities, stemming from atypical brain maturation and associated neuroanatomical, functional, and broad neural system differences. Perspectives on ASD range from the neurodiversity movement, which emphasizes acceptance and inclusion, to traditional approaches advocating for intensive interventions (Megari et al., 2024).

While cognitive-behavioral therapy (CBT) and pharmacological treatments have proven effective in managing core symptoms (Li et al., 2023), they may not fully address the adaptive difficulties children face in modern digital environments, where technology can exacerbate distractibility and social isolation (Radesky & Christakis, 2016).

To bridge these gaps, researchers and clinicians are increasingly turning to technology-enhanced interventions that complement traditional therapies, offering interactive platforms for diagnostic assessment and targeted training. These tools leverage immersive technologies, such as Virtual Reality (VR) and computer-based cognitive training programs, to create personalized learning environments that align with the cognitive profiles and developmental needs of children with ADHD and ASD. For example, VR-based assessments simulate real-world challenges, enabling clinicians to evaluate attention regulation, impulse control, and social cognition under naturalistic conditions, providing ecologically valid data that surpasses traditional paper-and-pencil tests (Areces et al., 2016). Similarly, serious games—educational games designed for skill development—have been shown to improve executive functioning and emotional regulation in children with ADHD, while virtual role-playing exercises help children with Asperger's Syndrome practice social skills and flexible thinking in controlled, low-stress environments (Didehbani et al., 2016).