

Neurodevelopmental Disorder Associated

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Chapters and Articles

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Translational Medicine in CNS Drug Development

Siddharth Srivastava, ... Lisa Prock, in [Handbook of Behavioral Neuroscience](#), 2019

I Introduction

Neurodevelopmental disorders (NDDs) refer to a large, heterogeneous group of childhood-onset conditions that result from disrupted brain development and/or functioning. [NDDs](#) can impact an affected individual in many domains including cognition, self-help, social communication, [behavior](#), and motor control. NDDs are often diagnosed based on clinical descriptions of developmental impairments, such as autism spectrum disorder (ASD), [intellectual disability](#) (ID), language disorder, specific learning disorder, and attention-deficit hyperactivity disorder (ADHD) (American Psychiatric Association et al., 2013). A subset of NDDs are genetically defined diseases, such as [Rett syndrome](#) (RTT), [tuberous sclerosis](#) complex (TSC), and [fragile X syndrome](#) (FXS), which are commonly associated with variable developmental impairments (Sahin

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A systematic review of behavioral and neurobiological profiles associated with coexisting attention-deficit/hyperactivity disorder and developmental coordination disorder

Marija PranjićNavin RahmanAdelia KamenetskiyKaitlin MulliganStephen PihlAnne B. Arnett, in
[Neuroscience & Biobehavioral Reviews](#), 2023

1 Introduction

[Neurodevelopmental disorders](#) (NDDs) impact millions of children, unfold early in life, and encompass a broad spectrum of symptoms across multiple domains of functioning (Thapar et al., 2017). Although each condition is defined by a distinct constellation of features, NDDs are often comorbid with one another, posing challenges in treatment planning and care (American Psychiatric Association, 2013). Attention-deficit/hyperactivity disorder (ADHD) and [developmental coordination disorder](#) (DCD) are

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Neurodevelopmental Disorders as Model Systems for Understanding Typical and Atypical Mathematical Development

Marcia A. Barnes, Kimberly P. Raghobar, in
[Acquisition of Complex Arithmetic Skills and Higher-Order Mathematics Concepts](#)
, 2017

Conclusions and future directions

In this chapter we proposed that [neurodevelopmental disorders](#) associated with high rates of mathematics disability at school age and that are diagnosed before or at birth provide the field with model systems for testing hypotheses that may be more difficult to test in populations

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Social Cognition in Individuals With Intellectual and Developmental Disabilities: Recent Advances and Trends in Research

Daniela Plesa Skwerer, in
[International Review of Research in Developmental Disabilities](#)
, 2017

Abstract

This chapter provides an overview of recent research on [social cognition](#) and social functioning in people with intellectual and developmental disabilities (IDDs), with a particular focus on [neurodevelopmental disorders](#) associated with distinctive social-cognitive and behavioral phenotypes. We review the main experimental paradigms that have been used to probe social cognition in both typically and atypically developing populations and discuss findings primarily from research on two neurodevelopmental disorders that have been extensively studied in the last 3 decades: [Autism spectrum disorders](#) (ASD) and [William's syndrome](#) (WS). Viewed in the past as diametric opposites in

their social phenotypes, the two disorders have been intensely researched for their potential to provide insights

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Common mechanisms in intellectual disabilities: a challenge for translational outlooks

Daniela Valenti, ... Rosa Anna Vacca, in [Neuroscience & Biobehavioral Reviews](#), 2014

6 Concluding remarks and future perspective

In the present review we have shown that some neurodevelopmental disorders such as Down, [RTT](#) and Fragile X-related syndromes, as well as ASD, though different in their [genetic](#) origin and aetiology, share significant clinical and neuropathological overlaps (see Table 1) as well as common alterations of key proteins of mitochondrial [OXPHOS](#) apparatus (Fig. 1). [Oxidative stress](#) and abnormal [mitochondrial metabolism](#) seemingly represent a common molecular underpinning of these neurodevelopmental disorders associated with mental retardation and [intellectual disability](#).

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A systematic-review of olfactory deficits in neurodevelopmental disorders: From mouse to human

Ariel M. Lyons-Warren, ... Benjamin R. Arenkiel, in [Neuroscience & Biobehavioral Reviews](#), 2021

3.2 Neurodevelopmental disorders with olfactory deficits as part of the diagnostic criteria

A total of 60 % of patients with [hypogonadotropic hypogonadism](#) also present with [anosmia](#) or [hyposmia](#), and are diagnosed with Kallmann Syndrome (Balasubramanian and Crowley, 2007). Like ASD, [Kallmann syndrome](#) is a heterogeneous disorder associated with numerous [genetic mutations](#) (Stamou and Georgopoulos, 2018). A systematic study of types of olfactory deficits in Kallmann syndrome has not been published. However, Ragancokova et al. nicely demonstrate the power of linking animal models with patient mutations. In their study, a role for *Tshz1* in [OB](#) development was identified. Mice lacking *Tshz1* have impaired odor detection, but no deficits in odor

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Imitative and contagious behaviors in animals and their potential roles in the study of neurodevelopmental disorders

Amtul-Noor Rana, ... Hye Young Lee, in [Neuroscience & Biobehavioral Reviews](#), 2022

1.3 Imitative and contagious behaviors in neurodevelopmental disorders

Imitative deficits and their consequences have been greatly studied in patients with [autism spectrum disorders](#) (ASDs) and other [neurodevelopmental disorders](#) associated with autistic-like symptoms. Children with [ASDs](#) show difficulty in performing emotional contagion—such as automatic mimicry of whole-body fear and facial expressions (Hadjikhani, Joseph et al., 2009; Drimalla, Baskow et al., 2021)—as well as impaired mirroring—such as imitation of object use and body movements (Smith and Bryson, 1994; Forbes, Pan et al., 2016; Li, Sharma et al., 2017)—compared to their age-matched, neurotypical peers. Additionally,

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Understanding autism and other neurodevelopmental disorders through experimental translational neurobehavioral models

Judith R. Homberg, ... Allan V. Kalueff, in [Neuroscience & Biobehavioral Reviews](#), 2016

2 Animals models of neurodevelopmental disorders

Since a key function of the [nervous system](#) is to produce [behavior](#), behavioral analyses provide the most meaningful assessment of the [central nervous system](#) (CNS) and its deficits. For example, rodent tests are commonly used to measure neural phenotypes in behavioral genetics, developmental psychobiology, [psychopharmacology](#) and [neurotoxicology](#) (Buelke-Sam and Kimmel, 1979; Butcher, 1976; Elmazar and Sullivan, 1981; Reiter, 1978; Vorhees et al., 1979). However, because of multiple limitations inherent in experimental modeling of complex human brain disorders

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Imitative and contagious behaviors in animals and their potential roles in the study of neurodevelopmental disorders

Amtul-Noor Rana, ... Hye Young Lee, in [Neuroscience & Biobehavioral Reviews](#), 2022

4.1 The mirror neuron system and atypical activity in autism spectrum disorders

The large body of literature in both animals and humans suggests that imitative and contagious [behavior](#) abilities are involved in learning motor skills, social cooperation, and communication. Impairments in imitation are seen across various [neurodevelopmental disorders](#) and intellectual disabilities, as described earlier, which leads to deficits in learning and [social interaction](#). However, the mechanisms behind imitative deficits in patients with neurodevelopmental disorders associated with autistic-like symptoms remains unclear. Empirical studies have found abnormal [MNS](#) activity in [ASD](#) patients, which might explain their imitative difficulties (Khalil, Tindle et al., 2018). [Transcranial magnetic stimulation](#) studies have shown that the motor cortex, a major component of the MNS, has reduced activity in ASD patients compared to neurotypical controls when performing imitative tasks that involve finger movement, while controlling for basic motor abnormalities (Théoret, Halligan et al., 2005). Interestingly, another study found that children with [ASDs](#) can mirror facial expressions; however, functional magnetic resonance imaging (fMRI) results displayed little activity in the [inferior frontal gyrus](#), a major component of the MNS. This finding ultimately suggests that alternative pathways involving visual and motor attention may be unchanged in ASD children; however, the empathetic significance of emotional expressions may not be experienced (Dapretto, Davies et al., 2006). In other words, some patients with ASDs might display imitative [behaviors](#) by copying the motor

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4 Discussion

4.1 The mirror neuron system and atypical activity in autism spectrum disorders

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[Social Interaction,](#)

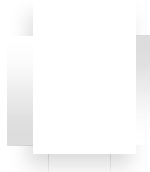
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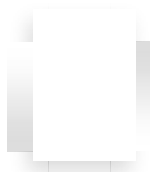
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