


# Chapter 2

## Neuropsychological Status From Preschool Age up to Adolescence: Evidence From Typical Children and Children With Disabilities

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### ABSTRACT

*According to Piaget's theory, there are four distinct neurodevelopment stages, each of which corresponds to a specific age group and is distinguished by a particular number of cognitive attainments. The stages are as follows: a) sensorimotor; b) preoperational; c) concrete operational; and d) formal operational. Four primary domains are used to track development from infancy to adolescence: a) speech and language; b) gross and fine motor abilities; c) social and emotional skills; and d) cognitive ability. By recognizing the normal growth milestones in every category, we may comprehend the variations linked to different abnormal developing patterns. In numerous cognitive domains, children with disabilities may have delays or deficits during childhood that may last into adulthood. Numerous studies have examined the changes in brain activity that corresponds with the acquisition of cognitive skills at each developmental stage. Some of these studies suggest that children with a variety*

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*of neuropsychological developmental disorders show neurocognitive deficits in areas like verbal communication, attention, memory, and specific executive functions, while language and visuospatial abilities vary.*

## **NEUROPSYCHOLOGICAL DEVELOPMENT**

Neuropsychological development from birth to adolescence is an ongoing process marked by significant changes in developmental, cognitive, linguistic, emotional, and behavioural areas (Berk, 2013; Hollister Sandberg & Spritz, 2010). Neurodevelopment proceeds in steps, with the diversity of its functions growing. For much of rapid evolution, the structure and function of the brain undergo significant alterations that correspond with the acquisition of motor, cognitive, academic, social-emotional, and sensory skills. This trek starts during pregnancy, when there may be prenatal indicators of either typical or disrupted development (Berk, 2013). Neurodevelopment can be influenced by risk factors both during infancy and during childhood development. In a similar vein, experiences, culture, trauma, and illness are important factors. Recognizing departures from expected behavior and skill acquisition requires a foundational understanding of the developmental trajectory of typical development.

This chapter looks at the stages of neuropsychological development of typical children from birth to adolescence outlined in Cognitive Development Theory (Piaget, 1936). It then outlines how the milestones of typical child development identified in cognitive development theory can be used to diagnose some prominent neuropsychological disorders, namely, autism spectrum disorder (ASD), attention-deficit/hyperactivity disorder (ADHD), and intellectual disabilities, including Down syndrome in ‘atypical’ children. The chapter then outlines key aspects to consider in relation to possible interventions to support ‘atypical’ children with neuropsychological disorders and which interventions may be appropriate.

### **Stages of Neuropsychological Development in Typical Children**

Piaget (1936) introduced the Cognitive Development Theory, suggesting that children acquire milestone cognitive functions during specific periods in their lives, by actively exploring their environment through motor and perceptual activities. Piaget's theory outlined four distinct stages, each corresponding to a discrete age group, and characterised by a distinct number of cognitive attainments a) the sensorimotor stage, b) the preoperational stage, c) the concrete operational stage and, d)

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