

Brain Development in Adolescents

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Adolescence is a transitional stage of physical and psychological development that generally occurs during the period from puberty to legal adulthood. Adolescence is usually associated with the teenage years, but its physical, psychological or cultural expressions may begin earlier and end later. For example, puberty now typically begins during preadolescence, particularly in females. Physical growth (particularly in males) and cognitive development can extend into the early twenties. Thus, age provides only a rough marker of adolescence, and scholars have found it difficult to agree upon a precise definition of adolescence.

A thorough understanding of adolescence in society depends on information from various perspectives, including psychology, biology, history, sociology, education, and anthropology. Within all of these perspectives, adolescence is viewed as a transitional period between childhood and adulthood, whose cultural purpose is the preparation of children for adult roles. It is a period of multiple transitions involving education, training, employment, and unemployment, as well as transitions from one living circumstance to another.

The end of adolescence and the beginning of adulthood varies by country. Furthermore, even within a single nation, state or culture, there can be different ages at which an individual is considered mature enough for society to entrust them with certain privileges and responsibilities. Such privileges and responsibilities include driving a vehicle, having legal sexual relations, serving in the armed forces or on a jury, purchasing and drinking alcohol, purchase of tobacco products, voting, entering into contracts, finishing certain levels of education, marriage, and accountability for upholding the law. Adolescence is usually accompanied by an increased independence allowed by the parents or legal guardians, including less supervision as compared to preadolescence.

Adolescence can be defined biologically, as the physical transition marked by the onset of puberty and the termination of physical growth; cognitively, as changes in the ability to think abstractly and multi-dimensionally; or socially, as a period of preparation for adult roles. Major pubertal and biological changes include changes to the sex organs, height, weight, and muscle mass, as well as major changes in brain structure and organization. Cognitive advances encompass both increments in knowledge and in the ability to think abstractly and to reason more effectively. The study of adolescent development often involves interdisciplinary collaborations. For example, researchers in neuroscience or bio-behavioral health might focus on pubertal changes in brain structure and its effects on cognition or social relations. Sociologists interested in adolescence might focus on the acquisition of social roles and how this varies across cultures or social conditions. Developmental psychologists might focus on changes in relations with parents and peers as a function of school structure and pubertal status. Some scientists have questioned the universality of adolescence as a developmental phase, arguing that traits often considered typical of adolescents are not in fact inherent to the teenage years.

The development of the nervous system in humans, or neural development or neurodevelopment involves the studies of embryology, developmental biology, and neuroscience to describe the cellular and molecular mechanisms by which the complex nervous system forms in humans, develops during prenatal development, and continues to develop postnatally.

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