

BRAIN DEVELOPMENT IN ADOLESCENTS

Submitted by the Child Witness Institute

KEY CONCEPTS	
Criminal capacity of children	Adolescent behaviour
Adolescents	Influence of environment on adolescence
Characteristics of adolescents	

INTRODUCTION

Since adolescents form the bulk of persons under 18 who appear as juvenile offenders in courts, it is important for lawyers and legal aid providers to have knowledge of key aspects of adolescent development. A better understanding of how brain development, socio-emotional development and environment affects adolescents will lead to a better understanding of why adolescents behave the way they do. This will enable role-players to identify the factors that contribute to a juvenile's delinquent behaviour and be in a better position to identify what would be the most effective intervention in a particular case.

Adolescence is the phase of life between late childhood and adulthood. It is a period of physical maturation, as well as mental and emotional development into an independent, responsible adult. The major developmental tasks of adolescence, discussed in the earlier session on socio-emotional development, include the establishment and nurturing of intimate relationships and the development of identity, future perspectives, independence, self-confidence, self-control, and social skills.

ADOLESCENT BEHAVIOUR

Adolescents display the following key characteristics during this phase of development:

- Adolescents go through many changes and with the onset of puberty they experience significant hormonal changes which impacts on their emotional state and can give rise to emotional turbulence. This contributes to volatile emotions and impulsive behaviour. It is this impulsiveness that is particularly relevant to minors in conflict with the law, as it can contribute to their involvement in criminal acts. These fluctuations in hormones, combined with the development of certain areas of the brain, cause many adolescents to react to stimuli without thinking, have low self-control, and an inability to postpone satisfaction.
- Risk-taking is very common in adolescents. There is a need to try out new things and experience new sensations and this is accompanied by a willingness to take physical or social risks without thinking of the consequences, which is evidenced by delinquent episodes of drug taking or alcohol abuse. This too is related to the development of different parts of the brain taking place at different times.
- As mentioned, thinking about consequences is difficult for adolescents. They tend to think in the present. They either lack the capacity to think through the consequences of their actions, or they ignore the future and focus more on the immediate risks and benefits of their actions.

- Adolescents tend to be concerned about the perceptions of others, and may feel both judged and judgmental. This could sometimes result in arrogance and sometimes in a sense of uncertainty, highlighting again the fluctuation of emotions experienced by teenagers.
- While young children seek approval mainly from their parents, adolescents seek approval from their peer group. This makes them more susceptible to peer pressure and bullying.
- Because of their strong desire to belong and “fit in”, adolescents are also highly susceptible to stigmatisation. Adolescents who feel stigmatised or alienated are more likely to engage in anti-social behaviour.
- Adolescents try to assert their independence and sense of self. This often involves challenging their parents and authority figures and acting out in rebellious ways. This is a normal part of the process of growing up, and most children will outgrow this on their own.

BRAIN DEVELOPMENT IN THE ADOLESCENT

Until recently it was believed that major changes to the brain took place in the first 5 or 6 years of life, but new scientific discoveries have shown that a basic reorganization of the brain occurs during adolescence:

- many synapses are eliminated
- there is an increase in white matter, and
- there are changes in neurotransmitter systems.

The changes that occur in the anatomy and physiology of the adolescent brain are far greater than was originally believed, and will have a profound effect on the cognitive processes and affect regulation of adolescents. The brain is fully grown relatively soon after birth, in the sense that the cerebral cortex soon reaches its maximum volume. However, important structural maturation processes continue to take place in adolescence.

The following is a very brief summary of the changes in the brain that impact on adolescent behaviour:

- Gray matter matures from back to front, so brain areas such as the prefrontal cortex (responsible for cognitive functions such as behavioural control, planning, and assessing the risk of decisions) mature later than the cortical areas (responsible for sensory and motor tasks).
- Changes in gray matter are as a result of removing synapses, formed in childhood, that have not been used.
- As the gray matter decreases in volume, the white matter increases in volume. The white matter consists of myelinated axons that conduct neural information rapidly and this process increases from childhood into early adulthood.

These changes in the anatomy of the adolescent brain are associated with profound emotional and cognitive changes. The delayed maturation of the prefrontal cortex means that the mature limbic and reward systems are more in control with the result that rewards and emotions will have a greater impact on behaviour than rational decision-making processes, especially where this takes place in the presence of other adolescents or there is a prospect of a reward.

These findings can, therefore, be summarised as follows:

- A person's brain is not fully developed until they are in their early to mid-20's. Adolescence leads to physical maturation of the child's body, but the brain lags behind in development, especially in the areas that allow teenagers to reason and think logically.
- The frontal lobe, often called the "command centre," is one of the last parts of the brain to develop fully. It controls decision-making, including long-term planning, risk assessment, impulse control, and other behaviours associated with criminal culpability. The frontal lobe undergoes far more change during adolescence than at any other stage of life. Even as they become fully capable in other areas, adolescents cannot reason as well as adults because their frontal lobe is not fully developed.
- In particular, the prefrontal cortex – responsible for cognitive processing, problem solving, anticipating consequences and emotional control – is far less developed in teenagers than in adults.
- In addition, the amygdala, responsible for human emotions, is strongly aroused during puberty. As a result, adolescents are much more influenced by their emotions than their reasoning.

The changes in brain development that occur during adolescence have highlighted the difference between their reasoning capacity and that of an adult. Because their brains are still immature and developing, adolescents have less capacity to make responsible and rational decisions, use reasoned judgement, evaluate risks, and balance their emotions. Even as they become fully capable in other areas, teenagers cannot reason as well as adults because their frontal lobes have not yet fully developed.

The scientific research reinforces the growing global recognition that persons under the age of 18 do not have the same control and reasoning capacities as adults and cannot, therefore, held to the same standards of behaviour as adults because their brains are as yet not fully capable of reasoned decision-making, assessing the consequences of their actions, and restraining impulses in the same way that an adult can.

INFLUENCE OF ENVIRONMENT ON BEHAVIOUR

Cognitive, socio-emotional and moral development are all impacted by the environment in which a child grows up. As mentioned earlier, moral development is influenced by the environment in which children are raised. Children learn what is right and wrong by observing those around them. Some have good support networks and have grown up around supportive adults and positive role models. Others have grown up in difficult circumstances and have more limited choices available to them. Persons under 18 who grow up in residential care or who do not have families that provide nurturing, love and a sense of belonging may have difficulty developing feelings of competence and self-confidence, or of having loving relationships with others. Persons under 18 who are neglected and/or abused, or whose families are marred by conflict may never develop such feelings. This can contribute to the development of anti-social behaviour.

Children living in difficult circumstances often seem mature because they have developed good "streetwise" survival skills and are able to look after themselves. However, this relates to the ability to survive, not to emotional or cognitive maturity. These children may sometimes act in an aggressive or dismissive way when interacting with police and other authority figures. This bravado is often just a cover for their fear and insecurity. For many children with difficult family circumstances, their emotional and moral development is at a lower level than their outward behaviour suggests.

In addition, girls who are involved in the juvenile justice system tend to have different needs to boys. Some girls' risk factors for delinquency are similar to those of boys, but their histories, their offenses, and their experiences in the system tends to be different. Girls in conflict with the law are more likely than boys to have a history of maltreatment and other trauma, running away, and family conflicts. Girls, who have negative childhood experiences such as neglect, physical abuse or sexual abuse are at a greater risk of becoming delinquent. Female juvenile defendants also tend to have higher rates of mental health issues such as anger, depression and suicidal thinking than boys. Compared with boys, girls tend to have higher levels of need but a lower level of risk to the community.

Adolescent behaviour may also be influenced by learning disabilities and emotional and behavioural disorders. Globally, persons under 18 with developmental disabilities tend to be overrepresented in the juvenile justice system. Reacting to a juvenile's outward behaviour without understanding the underlying disability or impairment will not achieve long-term positive outcomes for either the juvenile or the community in which they live.