Taxonomies of Child and Adolescent Developmental Psychopathology

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Abstract

Adolescence is the period of critical transition. Children entering adolescence go through a wide range of physical, cognitive, emotional, and social changes. The storm-and-stress portrayal of adolescence seems to emphasize the problems that some individuals exhibit. Identifying normative and nonnormative behaviors of youth helps demystify the long-endured stereotype of the transitional phase. This paper reviews taxonomic theories of the age-graded child and adolescent psychopathology. This article then summarizes research evidence for (1) stability in impulsivity as one of the main factors describing nonnormative behaviors and (2) the maturation gap in various parts of the brain development during adolescence as an explanation for normative adolescent risk-taking tendencies.
Keywords: Adolescence, Child Psychopathology, Normative, Nonnormative,

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Taxonomic theories of the age-graded child and adolescent psychopathology suggest two distinctively different developmental trajectories: life-course persistent and adolescent-limited trajectories [1, 2]. Individuals who display high-rate risk-taking and antisocial behaviors during early adolescence are at a greatly increased risk of becoming chronic offenders during adolescence and adulthood. In contrast, adolescent-limited offenders engage in risk-taking behaviors during their teenage years and are most likely to reform when they enter adulthood. This paper reviews research evidence for (1) stability in impulsivity as one of the major etiological factors distinguishing the two trajectories and (2) the maturation gap in various parts of the brain development during adolescence as an explanation for normative adolescent risk-taking tendencies regardless of the type of the developmental trajectories.

Impulsivity as a Precursor of Life-Course Persistent Psychopathology

Several large-scale longitudinal studies have found that early manifestations of impulsivity are one of the main characteristics of life-course persistent psychopathology [3, 4, 5, 6, 7]. Individuals who engage in a number of risk-taking behaviors during early adolescence (the ages 11 through 14 years),such as physical aggression, smoking, and substance use, exhibit much higher levels of impulsivity as early as age three than their counterparts of adolescence-limited offenders [8]. Impulsivity is known to be a multidimensional trait. The two most widely studied dimensions of impulsivity are acting without careful thought and delay of gratification [9]. Acting without careful thought is often characterized by hyperactivity. Hyperactive behaviors are commonly observed among individuals with a neurodevelopmental disorder known as attention deficit and hyperactivity disorder (ADHD). Individuals with ADHD are more prone to academic difficulties [10], impaired parent-child relationships [11], substance abuse [12], reckless driving [13], gambling [14], and unprotected sex [15].

Delayed gratification, also known as effort control, is a person's patience to postpone seeking a small and immediate pleasure in favor of a larger and later reward. Children who demonstrated their ability to delay gratification at age four were likely to do well at school throughout childhood and adolescence, score high on SAT exams, and delay sexual debut [16]. However, little research is available to adequately explain children's decision-making process and motivation for delay gratification.

A wide range of etiological factors for high stability in impulsivity has been explored. Traumatic and stressful life events that the life-course persistent offenders experience early on in their life have been well investigated.

In particular, impulsivity plays a critical role in diagnosing child maltreatment, such as sexual, physical, and emotional abuse and neglect. Abused and neglected children show a much higher level of impulsivity than children who are not exposed to maltreatment [17, 18]. The level of hyperactivity is not necessarily high among maltreated children. Childhood sexual abuse appears to have a more severe detrimental influence on female adolescents than male youth. Sexually abused female youth report first intercourse at an earlier age and unplanned pregnancy [19, 20].

Emotional abuse and neglect can begin as early as birth when the attachment figure (the primary caregiver, typically mother) is not available for a child to form a secure bond with the figure. A mother's unavailability can be caused by maternal depression [21, 22], incarceration [23], drug addiction [24], and/or domestic violence[25]. Emotional abuse and neglect by the attachment figure in infancy and childhood jeopardizes the healthy development of attachment organization, which, in turn, impairs the child's later social and emotional functioning. Emotionally abused children exhibit a higher level of impulsivity than non-abused children. The most remarkable consequence of childhood maltreatment is that children raised by uninvolved and neglectful mothers are more likely to parent their children in a similar manner than their mothers parented them [8]. This intergenerational transmission suggests that the experience of early childhood neglect and abuse generates a cascading effect rather than a mere genetic transmission from one generation to the next.

Most recent behavioral genetics research has identified the serotonin transporter gene known as 5HTT in the association of impulsivity with aggression following childhood maltreatment [25]. The variation in the length of the transporter gene polymorphism affects the rate of serotonin uptake. The variation explains post-traumatic stress disorder and depression vulnerability among individuals who experienced childhood emotional trauma. It also explains the alcoholism or suicidal behavior of maltreated people.

Equally important to note is the reciprocal influences of children's impulsivity on the quality of parenting [26]. Traditionally, child psychopathology was recognized as a genetic predisposition. Recent studies show that children with psychopathology cause higher stress in the relationship with their mother, and mothers with psychopathology induce higher stress in the relationship with their child [27]. Both parties contribute to developing chronic stress in the parent-child relationship and also to exacerbating each other's psychopathology. If the child's impulsivity is formed through the years of dysfunctional interactions with the mother is left untreated, impulsive behaviors persist throughout adolescence.

As reviewed, life-course persistent trajectories present continuity in maladaptive behaviors that have their origins in the early years prior to the adolescent period. Moreover, they explain both biological and environmental influences that promote and sustain impulsivity set in motion very early in life. A high level of impulsivity during the first decade of life appears to be a key to distinguishing life-course persistent psychopathology from adolescence-limited psychopathology. The next section will discuss the brain development of adolescents that explains a reason why both groups of youth equally engage in risk-taking and antisocial behaviors during middle and late adolescence despite their distinctively different early experiences.

The Brain Immaturity of Youth as a Common Ground for Risk-Taking Behaviors

The brain grows at a faster rate than any other part of the body. By age two, a baby's brain reaches approximately 75% of an adult brain's size [28]. By the age of five, a child's brain weighs 90% of its adult weight, while the total body of the child is 30% of the adult's body weight [28]. The prefrontal cortex is a specific area of the brain that undergoes substantial development throughout adolescence and well into the 20s. The prefrontal cortex controls several important executive functions, including attention, problem-solving, decision-making, emotion regulation, judgment, and impulse control [28]. As the prefrontal cortex is biologically immature during adolescence, the ability to inhibit impulses, regulate a wide range of emotions and make a good decision is not fully developed.

In contrast, front striatal reward circuits in the brain emerge and mature during early adolescence. They are neural pathways connecting frontal lobe regions to the striatum that mediate motor and behavioral functions within the brain [29]. In addition, the ventral striatum, one of the two striatum subparts, is rapidly growing during this time. The ventral striatum is known as a vital part of the front striatal reward circuits of the brain [30, 31]. It is reported that the maturation of the reward circuits encourages youth to proceed bravely out into some unknown places and seek novel and adult-like activities. Needless to say, many activities that youth seek come with a fair amount of risk, such as driving a car and experimenting with drugs.

This maturational gap between the less developed prefrontal cortex and the more developed reward circuits results in a period of risk for adolescents.

Researchers argue that the youth's risk-taking tendencies are the result of normal adolescent development and the lack of experience associated with engaging in these novel and adult-like behaviors.

It should be noted that peer influences play a major role in magnifying the adolescent tendencies to approach novel and exciting activities despite the risks associated with them. Youth with high levels of risk-taking and novelty seeking are likely to seek out friends who have similar interests and desires [32]. This peer selection process operates on shared excitement for novel behaviors and favorable emotional states exchanged in peer relationships. As a consequence, peer socialization is established in a sense that an adolescent introduces new activities and suggests ideas of new adventures that other adolescents have not experienced before.

Summary

No child develops in isolation. Numerous social agents, such as parents, peers, schools, media, religion, politics, and historical events, exist in the child's rich environment. According to the Ecological Systems Theory [33], each social agent not only makes an independent and direct influence on the child's development but is also interrelated to other agents to create joint influences. Almost all the spheres of child functioning are shaped through a dynamic process; child psychopathology is not an exception. Recognizing child and adolescent psychopathology as a dynamic developmental process allows researchers to investigate the likelihood of risk of child maladjustment by addressing the complex interplay between a child, their relationship with others, and their community and culture. Moreover, it presents an exciting opportunity for practitioners and educators to develop a strengths-based strategy to reduce vulnerability to child maladaptive behaviors across the first two decades of life.

Despite the popular characterization of adolescents as impulsive and lacking cognitive control, it needs to be clearly stated that a small proportion of adolescents account for a large share of the serious forms of risk-taking that cause concerns about adolescents. A small portion of youth are likely to be on the life-course persistent trajectory. It is hopeful that the accumulating research evidence for normative and non-normative child and adolescent development leads to more effective intervention programs for youth with life-course persistent psychopathology.

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