

PediatricsⁱⁿReview[®]

Adolescent Psychological Development : A Review

Eric Hazen, Steven Schlozman and Eugene Beresin

Pediatrics in Review 2008;29;161

DOI: 10.1542/pir.29-5-161

The online version of this article, along with updated information and services, is located on the World Wide Web at:

<http://pedsinreview.aappublications.org/content/29/5/161>

Pediatrics in Review is the official journal of the American Academy of Pediatrics. A monthly publication, it has been published continuously since 1979. Pediatrics in Review is owned, published, and trademarked by the American Academy of Pediatrics, 141 Northwest Point Boulevard, Elk Grove Village, Illinois, 60007. Copyright © 2008 by the American Academy of Pediatrics. All rights reserved. Print ISSN: 0191-9601.

American Academy of Pediatrics

DEDICATED TO THE HEALTH OF ALL CHILDREN™



Adolescent Psychological Development: A Review

Eric Hazen, MD,* Steven
Schlozman, MD,[†] Eugene
Beresin, MD*

Author Disclosure

Drs Hazen, Schlozman, and Beresin disclosed no financial relationships relevant to this article. This commentary does not contain a discussion of an unapproved/investigative use of a commercial product/device.

Objectives After reading this article, readers should be able to:

1. Discuss the processes of physical, emotional, social, cognitive, and moral development in adolescence.
2. Know the contributions of major developmental theorists, including Erik Erikson, Jean Piaget, and Lawrence Kohlberg, to the understanding of adolescent development.
3. Describe the relationship between adolescent behavior and recent findings from studies of brain development.
4. Identify the primary tasks of adolescent development.

Introduction

Adolescent patients present a unique set of challenges to pediatricians. A polite, compliant child can appear to transform into a surly, rebellious teen before a doctor's eyes. Adolescence can be a tumultuous time, even when it is unfolding in a healthy manner. For this reason, and because there is so much individual variation in adolescent development, it can be particularly challenging to determine what is "normal" in adolescent development. Although previously believed to be uniformly a time of turmoil, this view has not been substantiated by large-scale studies. (1) Most teenagers progress through this period of life with few obvious behavioral problems. However, a sound and trusting doctor-patient relationship is required to appreciate the inner struggles many adolescents endure. A working understanding of the developmental tasks of adolescence and the processes through which they are achieved provides the best tool for a pediatrician in evaluating an adolescent's development.

Any discussion of adolescent development should include a definition of adolescence itself. Determining the exact onset and conclusion of adolescent development can be difficult, with complex biologic, psychological, and social paradigms all playing roles. Cultural factors also must be considered in determining the developmental norms of adolescence. Normal development from one cultural perspective may appear aberrant when viewed through the lens of another culture, and in an increasingly multicultural society, such considerations are especially important. For example, an Asian youth who begins to question his parents' values may be viewed very differently by Western versus Eastern cultures. Although the West may view this move as a healthy and normal emotional development, the youth's parents might consider it to be pathologic and dangerous. Cultural differences such as this are generalizations, but keeping these potential differences in mind is extremely important to any clinical consideration of adolescent populations.

Given individual and cultural variability, the most useful definition of adolescence is not by age norms but by the developmental tasks that are achieved during this stage (Table). Developmental processes often are separated into distinct domains, such as physical, cognitive, psychological, and moral development. Although this article follows the same approach, it is important to note that such domains are in constant flux, interact with each other, and do not occur in isolation. For example, the physical changes associated with puberty and their timing have a profound impact on the social and emotional functioning of the adolescent. In addition, the boundaries between developmental domains are not always distinct. For example, physical changes in the brain during adolescence correspond

*Instructor in Psychiatry, Harvard Medical School, Boston, Mass.

[†]Assistant Professor of Psychiatry, Harvard Medical School, Boston, Mass.

*Professor of Psychiatry, Harvard Medical School, Boston, Mass.

Table. Tasks of Adolescent Development

Physical

- Growth spurt
- Growth of pubic and body hair
- Growth and maturation of reproductive organs

Boys:

- Increased muscle mass
- Onset of sperm production

Girls:

- Development of female body shape, including breast development
- Menarche

Social and Emotional

- Emotional separation from parents
- Greater sense of personal identity
- Identification with a peer group
- Exploration of romantic relationships and a sense of one's sexuality

Cognitive

- Increased capacity for abstraction and advanced reasoning
- Greater impulse control
- More effective assessment of risk versus reward
- Improved use and manipulation of working memory
- Improved language skills
- Increased capacity to self-regulate emotional states

Moral

- Usually a shift from preconventional to conventional level of morality in Kohlberg's theory
- Greater ability to take others' perspectives
- Morality less concrete and rule-based, more focused on role obligations and how one is perceived by others
- May question values of parents and institutions

to the development of new cognitive capabilities that, in turn, are involved in shifts in emotional regulation and processing.

Physical Development

From a biologic perspective, the beginning of adolescence is marked by the onset of puberty. The physical changes of puberty are triggered by increased pituitary sensitivity to gonadotropin-releasing hormone, leading to increased release of gonadal androgens and estrogens. Hormonal changes bring about a process of rapid physical changes in height, weight, body shape, and genital development.

For girls in the United States, puberty typically begins between the ages of 8 and 13 years with the development

of breast buds. Subsequent sexual development includes additional development of the breasts; enlargement of ovaries, uterus, labia, and clitoris; and thickening of the vaginal mucosa. Tanner described five distinct stages of sexual maturation in girls based on breast development and appearance and distribution of pubic hair. (2) Menarche typically follows 2 to 2½ years after breast bud development, around a mean age of 13 years in the United States.

On average, boys lag behind girls in most of the noticeable physical changes of adolescence. Testicular enlargement, the first sign of puberty in boys, typically begins around 12 years of age and is followed by development of pubic hair and growth of the penis. Tanner's five stages of sexual maturation in boys are based on the appearance of the pubic hair, penis, and testes. (3)

For both boys and girls, a period of rapid growth in height and weight follows the onset of puberty. Growth tends to occur distally in the hands and feet before moving proximally to the arms and legs and finally to the trunk. Linear growth can outpace increased muscle mass and can occur unevenly, contributing to a period of awkwardness experienced by many adolescents. On average, girls reach their peak growth velocity around 12 years of age, about 2 years before boys.

The age of onset of puberty and the rapidity with which the changes unfold vary substantially. Several identifiable factors appear to influence the timing of puberty, including health, nutritional status, and ethnicity. For example, on average, African American girls enter puberty slightly earlier than white girls. (4) In the United States, evidence suggests that sexual maturation in girls occurs earlier than it did 30 years ago. Rates of precocious puberty in girls, defined as the appearance of secondary sex characteristics before age 8 years or the onset of menarche before age 9 years, also appear to be rising. This finding may be due, in part, to rising rates of obesity. Obesity has been shown to correlate with earlier pubertal onset in girls, but with delayed onset in boys. (4)

Variations in the timing of puberty can have a significant psychological impact on adolescents whose development deviates from the mean. The impact differs with sex. Early-developing males tend to have greater self-confidence and a greater likelihood of academic, social, and athletic success than their peers, particularly when compared with late-developing males. (5) Conversely, early pubertal development in girls appears to be related to lower self-esteem and more concerns about body image. (5) However, unlike boys, late-developing girls, on average, do not appear to have significant difficulties with self-esteem. Even when these transformations un-

fold on schedule, the physical changes of adolescence have a major influence on the psychological functioning of an individual. Thus, regardless of the timing, it is important to remain sensitive to how physical development may be affecting the self-esteem and emotional life of every adolescent patient.

Adequate sleep is essential to support healthy physical development during adolescence. Adolescents are believed to require about 9 to 9½ hours of sleep per night. Although this interval is not increased significantly over the needs of preadolescents, several factors may contribute to inadequate sleep in many adolescents. During puberty, hormonal changes, including changes in melatonin secretion, cause a relative sleep phase delay, with a natural tendency toward later onset of sleep and later waking times. Such biologic changes come at a time of accelerating academic and social demands that may crowd out time for sleep. The healthy drive to connect with a peer group may come into conflict with the adolescent's need for sleep. Although this problem is not new, it is more challenging than ever with the variety of means of communication now open to adolescents, including instant messaging, internet sites, online video games, podcasts, cellular phones, and more. As adolescents increasingly engage in these activities in the privacy of their rooms, many parents may not be aware of the amount of time their children are spending online instead of in bed. In addition to fatigue and difficulties focusing in class, inadequate sleep during adolescence may increase the risk of health problems such as obesity.

Emotional and Social Development

Erik Erikson is the most influential theorist of emotional development. He conceptualized development as a series of crises during which individuals must negotiate difficult, often conflicting tasks to maintain a developmental trajectory, which he termed the epigenetic model of development. He characterized developmental challenges as binary crises that force the individual to choose a more desirable emotional stance. (6) For example, the developmental task assigned to infancy is described as trust versus mistrust, suggesting that if infants do not learn to trust the world to care for them, they will develop a suspicious and paranoid stance when moving along the developmental trajectory. Erikson looked at adolescence as a period of identity formation and separation from adult caretakers. He refers to this stage as a choice between ego identity formation and role diffusion, making the case that if adolescents do not form a coherent sense of self and values, they will lack a consistent sense of identity as they progress into adulthood.

Theorists such as Blois have described adolescence similarly as a second separation from adult caretakers, noting that the first separation occurs when the younger child attains the motor and cognitive ability to move away from the parents' constant watch. (7)

There is, however, some question as to whether Erikson's conceptualizations accurately characterize early adolescence. Theorists such as Noam have argued that early adolescence is less concerned with identity formation and more focused on the development of group cohesion. (8) Noam has called this theory the psychology of belonging, and he notes that the middle school child who places a high priority on popularity is in the midst of a normal developmental stage. In this sense, proud membership within groups sets the stage for later confidence to move throughout different groups. Thus, according to this model, healthy early adolescence is characterized by identity with specific group values and norms, whereas healthy later adolescence is characterized by increasing comfort with one's capacity to choose among many different groups and to endorse selectively the values that have particular relevance to the individual.

These concepts have important clinical ramifications. Younger adolescents are more susceptible to peer pressure as a means of identifying with the group imposing the pressure. Any attempt to counsel younger adolescents must take these considerations into account. Older adolescents, on the other hand, generally respond more readily to challenges to resist peer pressure for the sake of forming their own unique sense of identity.

As adolescents are attempting to solidify their identities and develop increasing autonomy from parents, they occasionally regress and become more dependent, clinging, and in need for soothing caretaking. Development at all stages is not a linear process. Although they may appear aloof, independent, and impervious to adult guidance, adolescents are influenced strongly by the values and attitudes of parents and other trusted authorities. Parents should appreciate that despite attempts at separation, adolescents care deeply about the ideals expressed by close authoritative role models. Therefore, it is extremely important during this developmental period for adults to open lines of communication and be aware of the values and behaviors they are demonstrating to their youth. Teenagers ultimately are likely to accept and promulgate parental values, although they often arrive at them after going through periods of rebellion and rejection.

During the process of separation from parents, adolescents often look to other adults in their lives to serve as role models, sometimes to their parents' chagrin. Teach-

ers, coaches, and friends' parents frequently serve in this capacity. It is not unusual, particularly during early adolescence, for a teen to romanticize one of these relationships and develop a "crush" on an idealized adult authority figure. In the end, healthy relationships with adults propel adolescent psychological development by facilitating identity formation and separation from parents.

The development of a healthy and stable self-image is one of the major goals of psychological development in adolescence. Poor self-image correlates with many of the major problems that can emerge during adolescence, including difficulties in peer and family relationships, depression, unsafe sex, risky or "acting out" behaviors, poor school performance, and substance abuse. Parents and other authority figures can help foster a positive self-image not only through the example that they set in their own lives, but also through demonstrating acceptance of the adolescent. It is important for the development of a positive self-image by their children for parents to take notice of the positive qualities that they admire in their adolescent children and to express praise for such qualities.

Pediatricians should be aware that physical illness can have a tremendous impact on self-esteem for many adolescents. This is true both for illnesses that have a visible impact on the patient's appearance, such as a deformity, as well as for less visible conditions, such as diabetes. At a time when group cohesion is of utmost importance, a medical illness can make an adolescent feel flawed or alienated from his or her peers. Additionally, illness can lead to greater dependence on parents when the adolescent is struggling to develop a sense of independence. Although many teens who have medical problems are able to cope with these challenges by using their own internal resources and existing supports of family and friends, it is important for the pediatrician to assess how an adolescent patient is coping with medical illness and refer for additional evaluation when concerns arise. Support groups and similar programs, such as diabetes camps, can help teens reduce the sense of isolation that illness can bring. Psychotherapy often can help adolescents who have significant difficulties coping with illness find their way back to a healthy developmental trajectory.

Another important psychological aspect of adolescent development involves impulsivity and risk taking. Although teenagers are advancing in maturity, younger adolescents, particularly, have a sense of grandiosity and invulnerability. This sense often is coupled with a limited capacity to grasp fully the potential ramifications of risky behavior or to conceive of long-term health risks of the lifestyle choices they make. The adolescent's newfound

physical maturity, sexual drive, intellectual advances, earning potential, and mobility may lead to trouble, even in the healthiest, most well-adjusted youth. Experimentation and risk-taking behaviors may include sexual behavior, use of alcohol and substances, and thoughtless behavior, such as going to dangerous neighborhoods late at night. Much of this behavior may have a neurologic basis as the brain develops through this period. Thus, adolescents require clear expectations and firm, caring limits from parents and pediatricians. Although they may not always like what they hear, adolescents usually perceive such limits as signs of loving protection. Limits must be set on unsafe behaviors, but experimentation is essential to the development of a sense of personal identity. By trying out different interests in everything from hairstyle to political world view, a teenager gradually assembles a clearer self-image.

Although some degree of risk taking is normal in adolescence, repeated engagement in high-risk activities, persistent disregard for attempts at limit setting by authority figures, and aggressive behavior may be signs of a more serious problem. Pediatricians should be aware of common risk factors predisposing adolescents to delinquent behavior, including parental psychiatric illness, learning disabilities, history of serious head trauma, and severe behavioral problems (such as fire setting or cruelty to animals) in early childhood. Often, behavioral problems during adolescence signify turmoil in the family system. For teens whose behavior seems to exceed the limits of normal experimentation, it is important to learn more about the social and family background in which these behaviors are occurring.

Cognitive and Brain Development

Much of modern thinking about cognitive development in adolescence has its roots in the work of Jean Piaget (1896 to 1980). According to Piaget, adolescence marks a shift from the rule-bound, concrete methods of problem solving during the concrete operations stage characteristic of younger children to the greater capacity for abstraction and flexible problem solving that characterizes formal operations. In the formal operations stage, typically defined as beginning around age 11 years, the adolescent develops the ability to think hypothetically and to generalize from empiric observations and develop abstract concepts that serve to guide future decision making.

Among the more exciting developments in the study of human development in recent years has been an increased understanding of the changes that occur in the brain during adolescence. Greater understanding of the

biologic processes involved in brain development has spurred new interest in examining the evolution of cognition during this time.

Structural brain imaging studies over the past decade have challenged concepts that most structural brain development is complete by early childhood. These studies have shown significant increases in the volume of white matter in adolescence that continues into the early 20s. (9) Such white matter growth is believed to represent fiber growth and myelination of brain pathways, facilitating connections among cortical regions. The process of myelination occurs in a caudal-to-rostral (or back-to-front) pattern, so pathways originating from sensory and motor regions mature earlier than prefrontal areas associated with executive functions.

The other major finding from longitudinal structural imaging studies of brain changes during adolescence is an apparent decrease in cortical gray matter density in the frontal and parietal lobes. (10) This change also follows a caudal-to-rostral pattern. The significance of this change is unclear. Some have suggested that the decreases in gray matter are due to a process of pruning, an experience-driven maturational process in which active neuronal connections are strengthened and idle ones are lost, with subsequent apoptosis of inactive neurons. (10)

The data emerging from imaging studies are compelling for two reasons. First, this information challenges the concept that major structural brain development is complete by early childhood, showing major changes continuing through the early adult years. Second, these data may provide a biologic basis for understanding adolescent thinking and behavior not only in experimental settings, but in everyday life. For example, the ventromedial prefrontal cortex has been associated with the capacity to evaluate risk and reward to guide decision making. Imaging studies suggesting that this area is one of the last brain regions to mature is consistent with observations from behavioral studies involving activities such as gambling, in which adolescents are substantially more likely to take greater risks than are adults. Thus, the seemingly reckless adolescent is less able to marshal the regions of the brain best equipped to assess risk and benefits. (11) Similarly, maturation of other regions of the prefrontal cortex during adolescence may explain observed gains in working memory, emotion regulation, and the capacity for long-term planning. (12)

These findings are of more than academic interest because they suggest that the impulsivity, shortsightedness, and risk-taking behavior often associated with adolescence are biologically driven, at least in part. Thus, measures designed to change adolescents' thinking, such as antismoking campaigns, may not be sufficiently effective on their own, but need to be bolstered by measures that enforce behavior, such as parental supervision and laws against the sale of cigarettes to minors. In addressing the risky behaviors that are a frequent source of particular anxiety in parents and health-care practitioners, it is important to view these behaviors in a developmental context rather than attributing them to simplistic explanations, such as peer pressure. Understanding (and modifying) these behaviors requires some understanding of the cognitive, social, and emotional development of the individual.

One area of active research in the study of cognitive development in adolescence is the role of emotion in decision making. Because of the social and cultural

Among the more exciting developments in the study of human development . . . has been an increased understanding of the changes that occur in the brain during adolescence.

milieu that characterizes much of adolescence, many important decisions are made by teenagers in the setting of affectively charged environments. The dare, for example, to drink more alcohol or to drive too fast often is presented when the teenager is in a hotly emotional state. Cognitive developmentalists have referred to the decisions that stem from these emotionally charged moments as "hot cognitions." The high emotional resonance of these moments uses a great deal of limbic brain regions, and as a function of the incomplete myelination described previously, these decisions do not enjoy proportionately similar consideration from executive brain regions.

This work also has shown that when challenges are presented to adolescents in less emotionally hot settings, they make safer decisions and presumably use higher brain structures more effectively. Thus, any attempt to help adolescents to maintain their own safety also must focus on removing as effectively as possible some of the affective energy that adolescents might feel when con-

templating risky behavior. (13) One approach to this task is to anticipate some of the difficult decisions that adolescents are likely to face, such as getting into a car driven by a friend who is drunk, and helping them think through the process before it occurs, when they are outside of the emotional pressures of the moment. In addition, discussions about an adolescent's risk-taking behaviors, both past and future, might be most productive in moments of relative calm.

Moral Development

The study of moral development is somewhat controversial because it places morality under a scientific lens, implying a social and biologic basis for moral behavior. The study of moral development in adolescence is complicated further by this area being more highly variable than other realms. As the developmental theorist Lawrence Kohlberg (1927 to 1987) observed, not every individual reaches the same end. (14) A full consideration of these complexities is beyond the scope of this article, although some important shifts in thinking about morality that tend to occur during adolescence merit discussion.

Based on interviews with large numbers of people across a broad age span involving the discussion of moral dilemmas, Kohlberg described six stages of moral development that he grouped into three basic levels. At the preconventional level, the individual is rooted in a concrete, individualistic perspective, guided by self-interest in following rules to avoid punishment. Kohlberg attests that this is the level of most children younger than age 9 years as well as many adolescents and adult criminal offenders.

During adolescence, most people move from the preconventional to the conventional level of moral thinking in which moral thinking is guided by the individual's interpersonal relationships and place in society. The individual takes the perspective of others into account, and moral behavior is guided by role obligations and the need to be seen as a good person. It is clear that the shift from the preconventional to conventional level is tied closely to both cognitive and social development. Some degree of abstract thinking, the capacity to take the perspective of others, and concern about how one is viewed by peers are prerequisite skills for the level of conventional morality. However, Kohlberg argues that cognitive development is necessary but not sufficient for moral development, and many people who have the cognitive capability to do so do not advance to the conventional level. Furthermore, Kohlberg suggests that most adolescents and adults remain in the conventional level of morality.

According to Kohlberg, the minority of people who progress into the more principle-based postconventional level do so after the age of 20 years. (14)

Kohlberg's ideas about moral development have been criticized on a number of accounts. Gilligan, for example, argues that Kohlberg's theory is too focused on a male perspective of morality based on justice. She proposes an alternative view based on caring for others. (15) Although ideas about moral development continue to be disputed, it is clear that cognitive, social, and emotional growth in adolescence underlie changes in thinking about morality that help form the basis of a value system to guide the individual through the complexities of adult life.

What is "Normal?"

Given the number of variables that play significant roles in adolescent development, clinicians often are uncertain when they are asked to assess what is "normal adolescent behavior." As noted previously, adolescents frequently regress developmentally during times of stress. Regressed behavior might include an increasingly rigid approach to problem solving or a return to activities associated with earlier developmental stages. For example, the teen who finds him- or herself reading books that he or she enjoyed as a much younger child often is responding to some stressor that provokes a return to what he or she might recall as "simpler times." When this behavior is short-lived (ie, no more than a few weeks), it tends to represent the normal ebbs and flows of the developmental trajectory. However, adolescents who become increasingly engrossed in regressed activities (intense attention to organizing and assessing a doll collection, for example) require further investigation. Such behavior does not necessarily represent significant problems but is a marker for additional inquiry.

Similarly, adolescents often experiment with unsettling topics and behaviors. Although safety concerns are paramount, such experiments are not necessarily pathologic. Adolescents might explore avant-garde web sites, for example, or listen to music or play video games that adults find off-putting and even repugnant. Categorical dismissal of these actions as pathologic misses the opportunity to model critical thinking and curiosity that are central to adolescent development. It behooves any clinician to have some understanding of adolescent popular culture to assess the cultural diet of the teen patient appropriately.

Finally, clinicians often are asked by parents whether sexual experimentation is healthy and normal. In these

situations, it is important to recall that sexual orientation is consolidated during late adolescence. Sexual behavior is a large part of adolescence, and experimentation is normal and to be expected. The clinician's role is to help adolescents understand the risks of their behavior and to be available as a nonjudgmental source of information and guidance.

Conclusion

Adolescence is a complex developmental process that varies substantially, both individually and culturally. Over the past 2 decades, advances in the neurosciences have shed new light on this process, with dramatic biologic changes in the brain underlying dynamic cognitive and psychological shifts that occur during this time. Continued work in this area likely will yield greater understanding of adolescent development.

When adolescent development is successful, the result is a biologically mature individual equipped with a sense of an independent self, the capacity to form close peer and group relationships, and the cognitive and psychological resources to face the challenges of adult life. Although many discussions of development end with the completion of adolescence, the young adult emerging from adolescence is not a finished product. Rather, modern developmental theorists generally view development as a process that continues throughout life. Change may not be as rapid and tumultuous in adult life, but young adulthood presents a new set of developmental tasks, such as the capacity to form stable, intimate relationships and the search for a fulfilling career. In the healthy individual, adolescent development sets the stage for the additional growth that lies ahead.

References

1. Offer D, Schonert-Reichl KA. Debunking the myths of adolescence: findings from recent research. *J Am Acad Child Adolesc Psychiatry*. 1992;31:1003-1014
2. Marshall WA, Tanner JM. Variations in pattern of pubertal changes in girls. *Arch Dis Child*. 1969;44:291
3. Marshall WA, Tanner JM. Variations in pattern of pubertal changes in boys. *Arch Dis Child*. 1970;45:13
4. Kaplowitz PB, Slora EJ, Wasserman RC, Pedlow SE, Herman-Giddens ME. Earlier onset of puberty in girls: relation to increased body mass index and race. *Pediatrics*. 2001;108:347-353
5. Litt IF. Pubertal and psychosocial development: implications for pediatricians. *Pediatr Rev*. 1995;16:243-247
6. Erikson EH. *Identity and the Life Cycle*. New York, NY: WW Norton; 1980
7. Blos P. *The Adolescent Passage: Developmental Issues*. New York, NY: International Universities Press; 1989
8. Noam G. The psychology of belonging: reformulating adolescent development. *Adolesc Psychiatry*. 1999;24:49-68
9. Gogtay N, Giedd JN, Lusk L, et al. Dynamic mapping of human cortical development during childhood through early adulthood. *Proc Natl Acad Sci*. 2004;101:8174-8179
10. Paus T. Mapping brain maturation and cognitive development during adolescence. *Trends Cogn Sci*. 2005;9:61-68
11. Crone EA, van der Molen MW. Developmental changes in real life decision making: performance on a gambling task previously shown to depend on the ventromedial prefrontal cortex. *Dev Neuropsychol*. 2004;25:251-279
12. Conklin HM, Luciana M, Hooper CJ, Yarger RS. Working memory performance in typically developing children and adolescents: behavioral evidence of protracted frontal lobe development. *Dev Neuropsychol*. 2007;31:103-128
13. Goel V, Dolan R. Reciprocal neural response within lateral and ventral medial prefrontal cortex during hot and cold reasoning. *NeuroImage*. 2003;20:2314-2321
14. Kohlberg L. Moral stages and moralization. In: Lickona T, ed. *Moral Development and Behavior*. New York, NY: Holt, Rinehart, and Winston; 1976:31-53
15. Gilligan C. *In a Different Voice: Psychological Theory and Women's Development*. Cambridge, Mass: Harvard University Press; 1984

PIR Quiz

Quiz also available online at www.pedsinreview.org.

6. The "psychology of belonging" helps explain an adolescent's desire to be a member of:
 - A. A club.
 - B. A friendship group.
 - C. A gang.
 - D. A team.
 - E. All of the above.
7. Separation from parents is critical to the development of:
 - A. Formal operational thinking.
 - B. Personal identity.
 - C. Postconventional moral reasoning.
 - D. Risky behavior.
 - E. Sex preference.
8. For optimal growth and development, a teenager is believed to require how many hours of sleep per night?
 - A. 6 to 6¹/₂.
 - B. 7 to 7¹/₂.
 - C. 8 to 8¹/₂.
 - D. 9 to 9¹/₂.
 - E. 10 to 10¹/₂.
9. Early onset of physical maturation has:
 - A. Advantages for boys.
 - B. Advantages for girls.
 - C. Disadvantages for boys.
 - D. Neither advantages nor disadvantages for boys.
 - E. Neither advantages nor disadvantages for girls.

Adolescent Psychological Development : A Review

Eric Hazen, Steven Schlozman and Eugene Beresin

Pediatrics in Review 2008;29;161

DOI: 10.1542/pir.29-5-161

Updated Information & Services

including high resolution figures, can be found at:
<http://pedsinreview.aappublications.org/content/29/5/161>

References

This article cites 11 articles, 5 of which you can access for free at:
<http://pedsinreview.aappublications.org/content/29/5/161#BIBL>

Subspecialty Collections

This article, along with others on similar topics, appears in the following collection(s):
Adolescent Medicine/Gynecology
http://pedsinreview.aappublications.org/cgi/collection/adolescent_medicine_gynecology
Genital System Disorders
http://pedsinreview.aappublications.org/cgi/collection/genital_system_disorders
Psychosocial Issues and Problems
http://pedsinreview.aappublications.org/cgi/collection/psychosocial_issues_problems
Growth and Development
http://pedsinreview.aappublications.org/cgi/collection/growth_development
Endocrine Disorders
http://pedsinreview.aappublications.org/cgi/collection/endocrine_disorders

Permissions & Licensing

Information about reproducing this article in parts (figures, tables) or in its entirety can be found online at:
</site/misc/Permissions.xhtml>

Reprints

Information about ordering reprints can be found online:
</site/misc/reprints.xhtml>

American Academy of Pediatrics

DEDICATED TO THE HEALTH OF ALL CHILDREN™

