

## RESEARCH



FACTS and

FINDINGS

A collaboration of Cornell University, the University of Rochester, and the Center for School Safety

## Puberty and Mental Health

by Kathleen McCormick, Kirsten M. McKone, and Jane Mendle

If you have ever been an adolescent (or if you have ever had an adolescent in your home), you are abundantly aware that puberty is a challenging time. The pre-teen and teenage years are marked by rapid social and emotional changes that are related to visible physical changes. Puberty is the second most rapid period of growth during life, behind only infancy. However, unlike infancy, individuals are aware that they are changing and can compare themselves to their peers. This awareness explains some of the differences in adjustment across youth, as some people move through puberty with ease, while others may struggle.



### Individual differences in puberty

While puberty is a universal experience, each adolescent experiences puberty's changes in different ways. These individual differences in puberty can lead to diverse outcomes. Recently, researchers have begun to explore the effects of the tempo and timing of puberty on mental health (Kaltiala-Heino, Marttunen, Rantanen & Rimpelä, 2003; Mendle & Ferrero, 2012; Michaud, 2015). Pubertal tempo refers to the rate at which a particular individual progresses through puberty. While the average duration of puberty is about 4-4.5 years, it can range from 1.5 to 7, 8, or even 9 years! Pubertal timing is the comparative development of an adolescent relative to others of the same age and gender. One finding of particular concern to researchers is the connection between early pubertal timing and psychological outcomes. Earlier puberty relative to peers seems to increase susceptibility to a vast array of problems (Mendle, Turkheimer, & Emery, 2007). Because of this, it is important to understand the ways in which an individual's biology and social environment contribute to psychological adjustment.

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## Is puberty starting earlier?

A frequent question posed to researchers studying adolescent health is whether the age of puberty has changed. The American Academy of Pediatrics (AAP) states that the data indicate a shift toward earlier pubertal development for girls but that further research is needed for boys (2012).

For girls, this development is defined by earlier breast development and first menstruation, a trend occurring over the past century (Biro et al., 2013). Records show that the age of menarche (a female's first menstrual period and one way that researchers have tracked historical change in the timing of puberty) has fluctuated across time, ranging from about 12-13 years in ancient Greece to 14-15.5 years in mid-19th century Europe (Amundsen & Diers, 1973; Mendle, Turkheimer & Emery, 2007). The current average age of menarche is around 12.3 years in the United States, with variations by race and ethnicity (Finer, 2013).

Tracking the average age of puberty for males presents more of a challenge, but the age at which boys' voices mature--or break--in male choirs throughout history has provided some clues. Records kept by the Leipzig choir in the 18th century show male singers experienced voice breaking between 17.5 and 18.5 years of age (Daw, 1970). The Copenhagen Municipal Choir reports the median voice breaking age as 10.4 years with data collected from 1994 to 2003 (Juul, Magnusdottir, Scheike, Prytz & Skakkebaek, 2007). However, the AAP (2012) asserts that data are insufficient to point definitively towards earlier pubertal development in boys. Perhaps more important for parents, educators, and youth themselves is another question: What do these trends mean for youth today?

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## The challenges of early puberty

How much of a risk is early puberty? The Great Smoky Mountains Study, among others, found that girls who experienced early puberty were more likely to report higher levels of criminality, psychiatric problems, substance abuse, social isolation, and risky sexual behavior than peers who developed later (Copeland et al., 2014). Early puberty has also been associated with depression, anxiety, eating disorders, and aggression (Ge, Conger, & Elder, 2001a; Lynne, Graber, Nichols, Brooks-Gunn, & Botvin, 2007; Zehr, Culbert, Sisk, & Klump, 2007). These associations are not just present in the United States, but globally: studies conducted on populations in China, England, Finland, and Germany, for example, have all identified a relationship between early puberty and psychological difficulties (Deng, Tao, Wan, Hao, Su, & Cao, 2011; Dick, Rose, Viken, & Kaprio, 2000; Joinson, Heron, Lewis, Croudace, & Araya, 2011; Wiesner & Ittel, 2002).

There are both social and biological theories as to why early puberty is challenging. Researchers have hypothesized adolescents who appear more developed may be treated as older than they really are. While an adolescent may look physically mature, he or she likely has the same cognitive and emotional maturity as other children that age. This discrepancy between physical and emotional maturity can lead to additional stress as early maturing adolescents must navigate novel situations with fewer coping skills than their same age peers will have upon beginning puberty. Hormones may be implicated as well in behavior, since early maturing girls differ



from their peers in biological ways that continue into adulthood. Sex hormones can lead to an increase in negative emotions and sensitivity in social interactions (Brooks-Gunn & Warren, 1989). Additionally, development of judgment and self-regulation does not come until the end of the maturational process. Together an increase in negative affectivity and underdeveloped decision-making skills can mean increased conflict and social difficulties. It is important to note though that the association between hormones and behavior is more established in adults. More research is necessary to see if the same associations apply to adolescents.



## What about boys?

Most of the research on early puberty has been conducted in girls. Unfortunately, there is far less research on psychological outcomes and male pubertal development. There is even less research with definitive results or generalizable outcomes. Why? It is much more difficult to track male puberty because there is not an equivalent milestone to menarche in women. Nevertheless, researchers are trying to understand both trends in male pubertal development and what earlier development might mean for boys. Although early puberty was historically believed to be advantageous for boys (Jones & Bayley, 1950), more recent studies have found early development in boys to be related to distress and hostility (Ge et al., 2001b). Still, considering the conclusion of the AAP on early puberty in boys and the opinions of researchers in the field, there is not nearly enough research being done on pubertal timing and tempo for this group. Without a definitive and easily assessed measure of pubertal development in boys, it is hard to understand the impact of puberty on psychological health.

## Questions remain

Understanding the psychological and social effects of puberty on behavior is critical in assessing adolescent risk-taking and sexual behavior. The current body of pubertal research points to the necessity of gauging an individual's feelings about puberty in evaluating their distress and level of susceptibility to negative outcomes. Knowing that adolescent perceptions of developmental timing and tempo are highly salient – whether or not they match reality – may be important in identifying youth that are more likely to struggle with puberty. More research is needed in order to fill the gap between the current understanding of the challenges of puberty and effective interventions for youth experiencing this turbulent time. Studying early development, and adolescence more generally, is important because of the impact puberty can have on life trajectories. By studying puberty, researchers can better address the question: Why do certain adolescents navigate these changes well while others struggle? This is a question many teens and pre-teens likely have themselves. ★

## The Takeaway

- Puberty is a memorable and often difficult time for adolescents
- Age of puberty has varied throughout history, but recent data shows a trend towards earlier menarche and breast development in girls
- Puberty is a different experience for everyone and can vary widely on when it begins and how long it can last
- Early maturing girls in particular face challenges stemming from social, biological, and environmental factors
- More research needs to be conducted to determine pubertal trends and implications of timing and tempo for boys
- Puberty is important to study because it is a critical time in an adolescent's life and can have long lasting implications



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