

# Faster progress through puberty linked to behavior problems

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(Medical Xpress) -- Children who go through puberty at a faster rate are more likely to act out and to suffer from anxiety and depression, according to a study by researchers at Penn State, Duke University and the University of California, Davis. The results suggest that primary care providers, teachers and parents should look not only at the timing of puberty in relation to kids' behavior problems, but also at the tempo of puberty -- how fast or slow kids go through puberty.

"Past work has examined the timing of puberty and shown the [negative consequences](#) of entering puberty at an early age, but there has been little work done to investigate the effects of tempo," said Kristine Marceau, a Penn State graduate student and the study's primary author. "By using a novel [statistical tool](#) to simultaneously model the timing and tempo of puberty in children, we present a much more comprehensive picture of what happens during adolescence and why behavior problems may ensue as a result of going through these changes."

The team -- led by Elizabeth Susman, the Jean Phillips Shibley Professor of Biobehavioral Health at Penn State -- created a unique nonlinear mixed-effects model that incorporated data from 364 white boys and 373 white girls that had been collected as part of the National Institute of Child Health and Human Development's Study of Early Child Care and Youth Development, which had an initial goal of determining how variations in the environment are related to children's development. The data included information about breast and pubic hair development in girls and genital and pubic hair development in boys as

assessed by nurses, as well as weight and height for both boys and girls. The data also included information on internalizing and externalizing behavior problems as reported by boys' and girls' parents or other caregivers, and [risky sexual behaviors](#) as reported by the kids themselves.

"We found that earlier timing for girls was related to a slew of behavior problems, and we also found that a faster tempo of development independently predicted those same sorts of problem behaviors," said Marceau. "Although timing and tempo both predicted behavior problems in girls, timing and tempo weren't related to each other. For boys, though, we found a strong relationship between timing and tempo. For example, we found that boys who have later timing combined with slower tempo exhibited the least amount of acting out and externalizing problems."

The team's results will appear in the September issue of the journal *Developmental Psychology*.

Why does going through puberty at a faster rate relate to external [behavior problems](#) and internal [anxiety and depression](#)?

"The thought is that when the major changes of puberty are compressed into a shorter amount of time, adolescents don't have enough time to acclimate, so they're not emotionally or socially ready for all the changes that happen," said Marceau. "This is the explanation that originally was attributed solely to early timing, but we suggest that the same thing also is happening if the rate of puberty is compressed."

According to Susman, timing and tempo of puberty vary dramatically across kids. "Children are extremely sensitive to how fast or slow other kids are going through puberty, and that may contribute to both the internalizing depression-type problems or the externalizing problems of

acting out," she said.

In the future, Susman plans to examine the effects of tempo of puberty on later women's health problems. "One of the things that has concerned me over the years is the relationship between early puberty and later women's health problems," she said. "Specifically, there is some indication that early timing of puberty relates to more reproductive cancers, with the speculated mechanism being estradiol. If you're an early maturer, you have a longer exposure to this hormone. The question is whether the tempo of [puberty](#) has similar implications for women's health."

Provided by Pennsylvania State University

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