

Early behavior problems may be linked to 'aging' biomarkers in preschoolers

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Credit: Robert Kraft/public domain

Preschoolers with oppositional defiant behavior are more likely to have shorter telomeres, a hallmark of cellular aging, which in adults is associated with increased risk for chronic diseases and conditions like diabetes, obesity and cancer.

This phenomenon was uncovered by UCSF researchers, who also identified maternal [clinical depression](#) as an independent predictor for shortened telomeres in young children, according to a study published on Tuesday in the journal *Translational Psychiatry*.

Likened to the plastic tips of shoelaces, telomeres cap the ends of chromosomes and act as buffers against the loss of protein-coding DNA during cell division. While telomere shortening happens naturally with aging, mounting research indicates the process is accelerated by psychological and biological stress.

"These are the first steps in a new field aiming to understand early determinants of children's telomeres. There are not any studies yet that examine [telomere length](#) changes from birth to adulthood, so the long-term implications are unknown," said lead author Janet Wojcicki, PhD, assistant professor in the UCSF Department of Pediatrics. "In adults, however, short telomeres predict earlier onset of many diseases, and shorter telomere length likely tracks from childhood throughout life."

Wojcicki's team of researchers assessed the length of telomeres from the white blood cells of a relatively homogenous group of low-income Latino children, which included 4-year-olds (108) and 5-year-olds (92), recruited at birth from two San Francisco hospitals. (Many of the 5-year-olds were the same children tested at age 4.)

The researchers also looked at the telomeres of their mothers and screened for prenatal and postnatal maternal depression, as well as behavioral disorders in the children at ages 3, 4 and 5. These conditions included oppositional defiant behavior, characterized by hostility, irritability and refusal to comply with authority figures.

The children of mothers, who had clinical depression when their children were 3 years old, were found to have telomeres that were

shorter than those of the offspring of non-depressed mothers when they were tested at ages 4 and 5. However, having major depression prenatally or during the year after birth, or milder symptoms of depression, were not related to children's telomere length.

A growing number of studies has shown that [shorter telomeres](#) in adults and children correlate to early childhood trauma, exposure to violence, maltreatment and deprivation.

"Currently there are far more questions than answers about the myriad factors that shape and promote healthy telomere maintenance in early childhood. We may be catching a small glimpse of the intergenerational transmission of health," said senior author Elissa Epel, PhD, of the UCSF Department of Psychiatry.

Among children with oppositional defiant behavior at ages 3, 4 or 5, shorter telomere length may be partially attributed to maternal depression, according to the researchers. Additionally, children with shorter telomere length were found to have mothers with shorter telomere length. This may be linked to both genetics and family stress, said Wojcicki.

While the study adds to a large volume of literature showing [depression](#) in mothers may have far-reaching ramifications on children's physical health and behavior, further research is needed to gauge its impact on children's cell aging, said the study's authors.

"These findings underscore the importance of intervening early to address behavior issues in children as well as to treat [maternal depression](#)," said Wojcicki. "While long-term studies are needed, our results suggest that maternal mental health issues and child behavioral problems can impact [children](#) at the cellular level."

Provided by University of California, San Francisco

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