

# Puberty may offer window to reset effects of early deprived care on stress-response system

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Puberty may offer a window of opportunity to recalibrate how children who experienced early life adversity respond to stress, according to a new study by University of Minnesota researchers published in the

*Proceedings of the National Academy of Sciences (PNAS).*

Children who experience deprived caregiving environments in infancy—where children's development lags behind because they are not provided sufficient social, emotional, and physical support, such as those in institutional (orphanage) care—show a blunted response of the [stress](#) hormone cortisol. This lower response, which is associated with effects like problems regulating attention, can last into middle childhood and remain even after a child is removed from the unsupportive environment as early as 1.5 to 2 years of age.

To measure cortisol reactivity, researchers analyzed the saliva samples of 299 children and adolescents aged seven to 15 years old, after asking them to participate in a stressful task during which they gave a speech and performed mental arithmetic while being filmed and evaluated by judges. Nurses also conducted physical exams to determine participants' pubertal stage. Overall, participants took part in three annual sessions across two consecutive years.

Of the participants, 129 were previously institutionalized as infants or toddlers and were later adopted into well-resourced and generally supportive homes, while 170 were born and raised by their natal families.

The study found:

- post-institutionalized participants exhibited increased cortisol reactivity as they advanced through puberty, bringing their stress responses in line with those experienced by their non-adopted peers;
- non-adopted participants showed no significant differences in cortisol reactivity at any pubertal stage.

"The system that produces cortisol is a powerful endocrine system whose functioning supports adaptation and when dysregulated, either producing very high or very low [cortisol](#) levels, is associated with poor physical and [mental health](#)," said Megan Gunnar, the study's lead author and a Regents Professor of developmental psychology in the College of Education and Human Development. "That puberty seems to be a time when this stress system recalibrates to current conditions offers a real opportunity for intervention with high-risk kids to support healthier life trajectories."

**More information:** Megan R. Gunnar et al, Pubertal stress recalibration reverses the effects of early life stress in postinstitutionalized children, *Proceedings of the National Academy of Sciences* (2019). [DOI: 10.1073/pnas.1909699116](https://doi.org/10.1073/pnas.1909699116)

Provided by University of Minnesota

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