

Maternal stress at conception linked to children's stress response at age 11

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A new study published in the *Journal of Developmental Origins of Health and Disease* finds that mothers' stress levels at the moment they conceive their children are linked to the way children respond to life challenges at age 11. SFU health sciences professor Pablo Nepomnaschy led an interdisciplinary research team on this first cohort study.

Researchers measured [cortisol](#) levels from mothers-to-be starting before pregnancy and continuing through the first eight weeks of gestation, and then years later from their [children](#). Their goal is to understand the associations between maternal biological [stress](#) around the time of conception and the development of their children's stress physiology.

Using [urine samples](#) to measure reproductive hormones, the researchers identified the day children were conceived, as well as the moms' [cortisol levels](#), a biomarker of physiological stress, during the first eight weeks after conception.

Twelve years later, they studied how these children reacted to the start of a new school year (a well known "natural" stressor) and to a public-speaking challenge (a frequently used "experimental" stressor).

Maternal cortisol following conception was associated with different facets of the children's cortisol responses to those challenges, and many of these associations differed between boys and girls.

Study lead author Cindy Barha, who worked under Nepomnaschy as a [doctoral student](#), reports that sons of mothers who had higher cortisol in gestational week two had higher cortisol reactions to the experimental public-speaking challenge, but this association was not observed in daughters. In contrast, mothers with higher cortisol in gestational week five had daughters with higher 'basal' cortisol before the start of a new school term, but not sons.

However, both sons and daughters had higher cortisol responses to the start of a new school term, and in response to the experimental public speaking challenge, if their mothers had higher cortisol during gestational week five. The biological mechanisms mediating these associations are not yet known, but are likely to involve genetics and epigenetics as well as environmental and cultural factors shared by moms

and their children.

"Stress plays a critical role not only in children's ability to respond to social and academic challenges, but also in their development and health as adults," says Nepomnaschy. The researchers will continue their investigations into the connection between maternal and child stress from the moment of conception onwards. The findings will help to develop successful programs and interventions that prepare children to live healthy and fulfilling lives and realize their full potential.

More information: C. K. Barha et al, Early post-conception maternal cortisol, children's HPA activity and DNA methylation profiles, *Journal of Developmental Origins of Health and Disease* (2018). [DOI: 10.1017/S2040174418000880](https://doi.org/10.1017/S2040174418000880)

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