

Child development experts discover potential upside to prenatal stress

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New research with prairie voles by child development experts at UC Davis suggests that prenatal stress promotes developmental plasticity in babies, making them especially likely to benefit from good parenting as well as suffer from negligent care. Credit: Gregory Urquiaga/UC Davis

Prenatal stress might not be so bad for babies after all, depending on how they are raised.

New research with prairie voles by child development experts at the University of California, Davis, suggests that prenatal [stress](#) promotes developmental plasticity in babies, making them especially likely to benefit from good parenting as well as suffer from negligent care.

"It looks like prenatal stress can be good for us if we are lucky enough to have a supportive environment postnatally," said Sarah Hartman, a recent Ph.D. graduate in human ecology at UC Davis who conducted the research under the supervision of human development professor Jay Belsky and Karen Bales, professor of psychology.

"Most notably, our research challenges the prevailing view that prenatal stress undermines

children's health and development," Belsky said.

Hartman and her co-authors' work appeared online today (Feb. 7) in the journal *Psychological Science*.

Testing stress on prairie voles

Most experts believe prenatal stress is harmful to children's development, because children of mothers who experience stressors like domestic violence or poverty during pregnancy are more likely to develop behavioral difficulties such as attention deficit hyperactivity disorder. But is prenatal stress really to blame?

"Oftentimes, the same conditions that led to prenatal stress are present after the baby is born so it may be the continuation of stress that accounts for poor functioning later in life," Hartman said. "We explored whether prenatal stress—rather than leading to certain outcomes—influences a child's sensitivity to postnatal care, for better and for worse."

Evidence shows that babies whose mothers experienced high levels of stress in pregnancy tend to be more emotionally and physiologically reactive to their environment—they are often harder to soothe and more easily distressed, for example. Science also indicates that those very characteristics lead children to develop more poorly in negative environments but progress better than others when reared in supportive homes.

"Of course, it wouldn't be ethical to stress pregnant women to test the resulting proposition that prenatal stress promotes susceptibility to postnatal experiences," Belsky said.

So the team tested their theory with 78 pregnant [prairie voles](#), a rodent with humanlike qualities such as the ability to develop emotional attachments. For 10 minutes a day during the last week of pregnancy, the team placed half of the voles in

visual contact with an aggressive female vole—a stressful situation for a pregnant vole. The other half did not experience that stress.

Within 24 hours of birth, the team placed all the newborn voles with adoptive parents, half of whom were known to be attentive caregivers and half who were negligent. After 75 days, the voles were evaluated for anxious behavior and levels of the stress hormone corticosterone.

The results were striking and unequivocal, Belsky said.

"The voles that experienced prenatal stress proved to be the most and least anxious adults depending on the quality of their postnatal care," Belsky said. "The voles that didn't experience prenatal stress fell somewhere in between, and it made no difference whether they had good or bad parents."

Next steps

Belsky and Hartman are not recommending women increase their levels of stress during pregnancy, of course. And there is still a lot to learn about the biological mechanisms that increased the stressed voles' sensitivity to postnatal care.

But the findings could relieve anxiety for women who experience temporary stressful situations during pregnancy.

"Prenatal stress might actually promote child well-being when children are reared in supportive environments," Belsky said.

Provided by UC Davis

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