

# The inequalities of prenatal stress

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Exposure to an acute stress in utero can have long-term consequences extending into childhood – but only among children in poor households, according to a new Stanford study that looked at the long-term impact of acute, parental stress.

Because [stress](#) is often confounded with other factors, the study used a natural disaster – a strong earthquake in Chile – to explore the impact on children's development of an acutely stressful event occurring during their mothers' pregnancy. This data could then be compared with similar children who did not experience the catastrophe in utero.

The results from the study, led by Florencia Torche, a sociology professor in the Stanford School of Humanities and Sciences, showed that among poor families, children prenatally exposed to the earthquake had lower levels of cognitive ability than children in a comparable control group.

"These children performed worse on a diverse set of skills critical for educational success, including arithmetic reasoning, verbal fluency, spatial analysis, logical thinking and problem-solving skills," said Torche.

Torche also found that while middle- and upper-class families have the resources to mitigate the effects from the event, disadvantaged children without extra help can fall up to half a year behind, according to research published August 13 in *Demography*.

The ability to catch up depends on the family's socioeconomic resources, found the sociologist.

"This is a troubling finding because it shows that [acute stress](#) exacerbates disadvantages that poor children already face," Torche said.

## **Studying acute stress**

While previous research has examined the effects of chronic stress, little is known about the long-term consequences of an acutely stressful event during pregnancy, said Torche. An acute stress a pregnant woman could

experience include witnessing a violent event, falling victim to a crime, almost being seriously injured or losing a job.

But because stress is often correlated with other challenging situations – like family turmoil, relationship difficulties or financial problems – it can be difficult to study, said Torche. That's why she used a disaster event to create a natural experiment: a 7.9 magnitude earthquake that occurred June 13, 2005, in Tarapaca, Chile.

"If we want to disentangle the [effect](#) of stress from these other common correlates, we need to isolate it," Torche said.

Unlike most natural disasters with devastating consequences – such as property damage, long-term displacement or public health emergencies – the losses from the Tarapaca earthquake were relatively small: 11 people died, 130 were injured and 180 homes were destroyed. With limited spillover effects that could have influenced health outcomes of a mother and her unborn child, Torche was able to more clearly isolate the direct impact of an acute stress on pregnant women.

Torche then combined birth records with a random sample of 591 children whose mothers experienced the earthquake during their pregnancy. These data were compared with a control group of 558 randomly selected children born in the same time period in Chilean counties unaffected by the earthquake.

Torche has closely studied these children since birth. Her first study published in 2011 found that exposure to an acute stress during pregnancy increased the number of preterm births.

"Given that preterm birth is associated with health and developmental problems during childhood, this finding provided initial evidence that prenatal exposure to acute stress could have negative consequences for

children," she said.

## **The consequences of fetal stress**

Here, Torche checked in with these children who were now 7 years old and starting school.

With a team of trained field researchers, Torche conducted a series of cognitive tests with each child in the treatment and control groups.

They assessed abilities such as verbal comprehension, spatial reasoning, memory and how quickly children processed information needed to perform a task.

At first, Torche found no statistically significant effects when she looked at the results for the entire sample. But as she dug deeper into the data, she made a striking discovery: only the children from poor households were negatively affected. There was no effect on children from middle- and upper-class families.

"It was only when I broke the results down by socioeconomic status that I found a very strong negative effect among the most disadvantaged families," she said.

Torche then broke it down even further. Because poor children face a range of educational disparities, how did disadvantaged children who experienced the earthquake compare to poor children in the control group who did not?

Torche found a difference that amounted to more than half a year of cognitive development. In other words, a low-income child in the second grade who experienced stress in utero was performing closer to a first-grade level.

## Resources to mitigate effects

After establishing an unequal effect of stress, Torche conducted a set of qualitative interviews to understand why children from middle- and upper-class families were unaffected. At the time of these interviews, the children were mostly 9 years old and in fourth grade.

In their interviews, upper- and middle-class parents shared that they constantly assessed their children's strengths and weaknesses. If a child showed signs of struggling in any way, they mobilized resources to intervene. This included hiring tutors, signing up for structured activities, and interacting more with teachers and the school to help their child inside and outside of the classroom.

"While some disadvantaged families have also resorted to the assistance of experts and educators, and have requested institutional support, they face substantial barriers in terms of time, economic resources and, equally important, access to social networks and mastery of cultural resources to effectively negotiate with institutions for advantages for their children," Torche wrote in the paper.

Torche noted that this finding shows that class-based parental responses that minimized effects of prenatal stress could further exacerbate social class disparities.

This research is yet another piece of evidence that shows the importance of supporting disadvantaged women and their [children](#), Torche said.

"The effect of prenatal exposure to an acute stressor emerged only among the most disadvantaged members of society. Given that these women are particularly vulnerable, and less likely to have access to health care, increasing access to health care and sources of support for this population is an important task," she said.

Provided by Stanford University

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