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10-year study of women raising kids amid wartime conditions in southern Israel discovers how the stress can impair maternal empathy as well as children's "prosocial" skills such as helping, sharing, & cooperating with others.

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The U.N. estimates that over half a billion children around the world are growing up under traumatic circumstances caused by ethnic, religious, national, or tribal conflicts.

Over the last two decades researchers have assembled strong evidence of the harm that growing up in such circumstances of "early-life stress" does to the developing psyche. Now, one research team has extended the scope of their investigations to study the impact of wartime trauma upon the mothers of young children.

By observing mothers and mother-child relationships over a decade's time in an area near Israel's border with the Gaza territory, a team led by Jonathan Levy, Ph.D. (</about/people/jonathan-levy-phd>), a 2017 BBRF Young Investigator, and Ruth Feldman, Ph.D. (<https://ruthfeldmanlab.com/people/>), a 2008 and 2006 BBRF Independent Investigator, were able to compare women under chronic stress with women living elsewhere who were not directly exposed to war conditions.

Earlier research had established that the development of empathy in children is sustained by sensitive parental care, particularly what the team calls the experience of "parent-infant synchrony" in which parent and child learn to coordinate their gaze, their affective expression, even their posture, all contributing to a dialogue that promotes positive engagement and mutual understanding.

In the current study, published in the journal *Developmental Cognitive Neuroscience* (<https://www.sciencedirect.com/science/article/pii/S1878929318302196>), the researchers recruited 232 mothers of children aged 2 to 3. While 84 of the mothers and their children came from Tel-Aviv, and served as controls, 148 of the mother-child pairs were from an area near the Gaza border, which throughout the study period was exposed to intermittent and unpredictable rocket bombardments, some of which resulted in serious injuries and death.

Parenting was assessed during middle childhood and then a few years later. When their children were on the cusp of adolescence, at about 12 years of age, 88 of the mothers underwent magnetoencephalography (MEG) imaging, measuring magnetic fields induced by brain activity. Half of these mothers had been exposed to war conditions. The scans were conducted while the mothers performed tests designed to reveal biological markers—brain wave patterns—emanating from brain areas that give rise to empathetic behavior.

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Our results demonstrate that raising children in a region of chronic and unpredictable stress takes a toll on the mother's social brain," the researchers wrote.

Specifically, they found evidence of these disruptions in a neural marker of mature empathy, wave patterns called gamma oscillations in the brain's visceromotor cortex. These, the team says, correlate with behavioral changes they noticed in their prior studies of the same war-exposed women, who were found to be "less sensitive and empathetic and more stressed and negative." In the current study, among mothers who had raised their young children under war conditions, the parent-infant synchrony that correlates with empathy in the child tended to be reduced in intensity.

These results, said the team, validate their prior behavioral findings "from a neural perspective," implicating brain circuitry associated with mature empathy "as a mediator between maternal behavior and children outcomes."

The study therefore directs attention to the mothers of children worldwide growing up in conditions of chronic stress, said the researchers, and "underscores the need to develop targeted interventions for mothers who are raising children in the shadow of war and conflict."

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