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Alterations in brain networks explain why some children are resilient to maltreatment

A study in Biological Psychiatry examines what makes people susceptible or resilient to the psychiatric effects of childhood maltreatment

Philadelphia, December 6, 2018 – People who experience childhood maltreatment frequently have perturbations in their brain architecture, regardless of whether they develop psychiatric symptoms, but a [study](#) in *Biological Psychiatry* found additional alterations in people who don't develop symptoms. The study, by researchers at McLean Hospital, Harvard Medical School, suggests that the additional changes may help compensate for the effects of maltreatment.

The findings shed light on the mystery of why some children are susceptible to the effects of maltreatment—which is a major risk factor for psychiatric complications including anxiety, depression, addiction, and suicide—and others are resilient.

“These are important findings as they provide a radically new perspective on resilience. Maltreated individuals without psychiatric symptoms are not unaffected or immune. Rather, they have additional brain changes that enable them to effectively compensate,” said lead author Kyoko Ohashi, PhD.

Dr. Ohashi and colleagues created models of brain networks in 342 young adults, over half of whom had experienced maltreatment as a child, by tracing pathways of connections throughout the brain. “We found that susceptible and resilient emerging adults with childhood maltreatment had the same abnormalities in brain network organization. Interestingly, resilient individuals had additional abnormalities in specific brain regions that reduced their susceptibility to different types of psychiatric symptoms, and this information was able to reliably predict whether individuals were not maltreated or were susceptible or resilient,” said Dr. Ohashi.

These additional abnormalities in resilient adults appeared to decrease the efficiency of information transfer in brain regions likely altered by maltreatment and that are involved in psychiatric symptoms, like pain, stress, depression, and anxiety. “This study highlights that resilience is an active process that is associated with its own alterations in brain function over and above the negative effects of stress. The observation that the illness-related network changes are present in the resilient individuals may help to explain why some individuals have periods of both vulnerability and resilience after traumatic stress exposure,” said John Krystal, MD, Editor of *Biological Psychiatry*.

“We wonder whether these additional changes in connectivity are the causes, consequences, or both causes and consequences of resilience,” continued Dr. Krystal. The study can't definitively say if the additional resilience-related alterations are present prior to stress or emerge following stress exposure. But, the findings give researchers an idea of how to help susceptible people develop resilience.

"These findings are intriguing because they introduce an entirely new possibility. Previously, we assumed that effective treatments would need to work by reversing some of the effects of maltreatment on brain development. These findings suggest that treatment might work instead by moving the brain organization of susceptible individuals more into line with the more effectively compensated brain organization of resilient individuals," said Dr. Ohashi.

Notes for editors

The article is "Susceptibility or Resilience to Maltreatment Can Be Explained by Specific Differences in Brain Network Architecture," by Kyoko Ohashi, Carl M. Anderson, Elizabeth A. Bolger, Alaptagin Khan, Cynthia E. McGreenery, Martin H. Teicher (<https://doi.org/10.1016/j.biopsych.2018.10.016>). It appears in *Biological Psychiatry*, published by [Elsevier](#).

Copies of this paper are available to credentialed journalists upon request; please contact Rhiannon Bugno at Biol.Psych@UTSouthwestern.edu or +1 214 648 0880. Journalists wishing to interview the authors may contact Martin Teicher, MD, PhD, at mteicher@mclean.harvard.edu or +1 617 855 2955.

The authors' affiliations and disclosures of financial and conflicts of interests are available in the article.

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