

Orphaned children exhibit genetic changes that require nurturing parents

December 5 2011



This is a child in a Russian Orphanage. Credit: Hanne Johnsen

Children who experience the stress of separation at birth from biological parents and are brought up in orphanages undergo biological consequences such as changes in their genome functioning, Yale School of Medicine researchers report in a new study.

Published online in the current issue of *Development and Psychopathology*, the study reports differences in [DNA methylation](#), one of the main regulatory mechanisms of [gene expression](#), or genome functioning. The investigators compared two cohorts: 14 children raised since birth in institutional care and 14 children raised by their biological parents.

Senior author Elena Grigorenko, associate professor at the Yale Child Study Center, and her colleagues took [blood samples](#) from children aged 7 to 10 living in orphanages and children growing up in typical families in the northwest region of the Russian Federation. They then profiled the genomes of all the children to identify which biological processes and pathways might be affected by deprivation of parental attention and care.

The team found that in the institutionalized group, there was a greater number of changes in the [genetic regulation](#) of the systems controlling immune response and inter-cellular interactions, including a number of important mechanisms in the development and function of the brain.

"Our study shows that the early stress of separation from a biological parent impacts long-term programming of genome function; this might explain why adopted children may be particularly vulnerable to harsh parenting in terms of their physical and mental health," said Grigorenko. "Parenting adopted children might require much more nurturing care to reverse these changes in genome regulation."

More information: *Development and Psychopathology*:
[doi:10.1017/S0954579411000605](https://doi.org/10.1017/S0954579411000605)

Provided by Yale University

Citation: Orphaned children exhibit genetic changes that require nurturing parents (2011, December 5) retrieved 25 April 2024 from <https://medicalxpress.com/news/2011-12-orphaned-children-genetic-require-nurturing.html>

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