

Early child deprivation and neglect impair memory and executive functioning at age 16

January 15 2019



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Young children experiencing deprivation and neglect in institutional settings have impaired memory and executive functioning at ages 8 and 16 compared with peers placed early in quality foster homes, report

investigators at Boston Children's Hospital. The study, interpreting the latest findings from the randomized controlled trial, the Bucharest Early Intervention Project (BEIP), was published today in the *Proceedings of the National Academy of Sciences*.

"This study shows us that the effects of deprivation and neglect in [early childhood](#) continue well into the second decade of life, providing strong evidence that early experience has a long-term impact on [cognitive functioning](#) in adolescence—a very important period of social and biological development," says Mark Wade, Ph.D., of the Division of Developmental Medicine at Boston Children's Hospital and the paper's first author.

An estimated 8 million [children](#) worldwide live in institutions. The long-running BEIP study compares psychosocial, cognitive and brain outcomes in children raised in Romanian orphanages, versus those adopted early in life by carefully vetted foster families and children who were never in institutions.

An analysis last fall reported high levels of mental health problems when institutionally-reared children reached adolescence, in particular difficult behaviors such as rule-breaking, excessive arguing with authority figures, stealing or assaulting peers. But these problems were reduced among children placed early with foster families.

The new analysis focused on cognitive functioning, in particular memory and [executive](#) functioning. "Executive functioning includes several [cognitive processes](#) that help individuals be more goal-oriented and solve problems," explains Wade. "It is important in academic achievement and social functioning in childhood, and is also related to long-term occupational attainment, income and other aspects psychosocial well-being."

The findings:

- Children in all groups, institutionalized or not, improved on several measures of memory and executive functioning as they got older (from age 8 to 16).
- Among institutionalized children, even those eventually placed in foster care, early impairments in attention, short-term visual memory, [spatial planning](#) and problem solving (all components of executive functioning) among persisted through adolescence.
- The gap in spatial working memory between ever-institutionalized children and those raised in the community widened by adolescence.

There was one note of hope:

- When institutionalized children were placed early in quality [foster care](#), early difficulties in visual-spatial memory and new learning diminished by adolescence, making them indistinguishable from other children by age 16.

"Institutionally-reared children start out with more difficulties, but when they are assigned early to positive caregiving environments, they may demonstrate some catch-up on certain aspects of executive functioning," says Wade. "A safe, nurturing, and cognitively stimulating environment in a family-based setting is critical to children's long-term success, and may help some who struggle early get back on track during adolescence."

EEG predictor?

The study also found that an EEG measure of brain activity at age 8, namely higher resting EEG alpha power, predicted better [executive functioning](#) at ages 8, 12, and 16.

"This may point to a neural mechanism that supports children's cognitive development," says Charles A. Nelson, Ph.D., director of the Laboratories of Cognitive Neuroscience at Boston Children's Hospital and senior author on the paper.

More information: Mark Wade et al. Long-term effects of institutional rearing, foster care, and brain activity on memory and executive functioning, *Proceedings of the National Academy of Sciences* (2019). [DOI: 10.1073/pnas.1809145116](https://doi.org/10.1073/pnas.1809145116)

Provided by Children's Hospital Boston

Citation: Early child deprivation and neglect impair memory and executive functioning at age 16 (2019, January 15) retrieved 30 April 2024 from <https://medicalxpress.com/news/2019-01-early-child-deprivation-neglect-impair.html>

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