

Early Neglect Alters Kids' Brains

by Stephanie Pappas, Live Science Contributor | July 23, 2012 04:03pm ET

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About 8 million children worldwide grow up in orphanages like this one in Malawi, according to UNICEF.

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Until the 1990s, the orphanages of Romania were notorious for their harsh, overcrowded conditions. Those perceptions have been borne out in new research that finds growing up in such an environment can change the brain for good.

Institutionalization in early childhood can alter [a child's brain](#) and behavior in the long run, the research finds. Fortunately, early intervention can stave off the effects.

The study, conducted with children growing up in [Romanian orphanages](#), reveals changes in the brain composition of kids who spent their first years in institutions versus those who were randomly assigned to foster care. The findings point to a "sensitive [period](#)" in the brain for social development, said study researcher Nathan Fox, a child development researcher at the University of Maryland.

"Infants and young children expect an environment in which they are going to [interact and receive nurturance, not only food, but psychological nurturance](#), from adult caregivers," Fox told LiveScience. [[11 Facts About a Baby's Brain](#)]

The finding adds to evidence that early childhood experiences can have lasting impacts on the brain, with one recent study showing that [child abuse](#) may shrink regions in the brain's hippocampus.

Growing up in an institution

For 13 years, Fox and his colleagues have been following a group of children who lived as babies in orphanages around Bucharest, Romania. Although these institutions are called orphanages, Fox said, many of the children have living parents who had given the babies up to the state.

After the fall of Romanian dictator Nicolae Ceausescu in 1989, the [plight of children](#) living in these orphanages came to the forefront. Institutions were understaffed, abuse was rampant, and neglect was a way of life. Today, Fox said, the situation has improved — it's now illegal to institutionalize a child under 2 in Romania, for example. But the 136 infants in the latest study came to the orphanages in a time when conditions were still poor, he said.

"Conditions were quite regimented," Fox said. "They all had to eat at the same time, bathe at the same time, go to the toilet at the same time. There was very little training for caregivers and a [very bad ratio of caregivers](#) to children."

At the invitation of the then-Minister for Child Protection in Romania, Fox and his colleagues screened babies at six orphanages in Bucharest and assigned them randomly to either stay where they were or to go to foster homes (foster parents were paid for the care of the children until the kids reached age 4.5). Ever since, the researchers have been following the children, who are now 12, and evaluating their brains and behaviors.

"We included among our measures a measure of brain activity," Fox said. "We actually built a laboratory in one of the institutions and set up the equipment."

The institutionalized brain

The latest results come from the children's 8-year-old checkup, which included brain scans using magnetic resonance imaging (MRI) and electroencephalography (EEG); while MRI reveals brain structure, EEG shows electrical brain activity.

They found that early institutionalization changed both the structure and the function of the brain. Any time spent in an institution shrunk the volume of [gray matter](#), or brain cell bodies, in the brain. Kids who stayed in the orphanages **instead of going to foster care** also **had less white matter**, or the fat-covered tracts between brain cell bodies, than kids who, at a young age, moved in with families.

Staying in an orphanage instead of foster care also resulted in lower-quality brain activity as measured by EEG, Fox said. Teachers indicated these same kids were **also worse off socially**.

Part of the difference in the kids' behavior appeared to be explained by how warmly and securely bonded they were to their main caregiver, the researchers report this week in the journal *Proceedings of the National Academy of Sciences*. (In fact, past research has shown [children of nurturing mothers](#) had hippocampus volumes 10 percent larger than children whose mothers were not as nurturing.)

"The idea is that those kids who develop [a secure attachment](#) actually show enhanced brain activity at age 8," Fox said.

Intervening early

Importantly, Fox said, the kids in the study have almost all changed their living arrangements since that first random assignment to a foster home or orphanage. By age 8, only 10 of the children assigned to the orphanage remained there, with the others in adoptive homes, foster care or reunited with their biological families. Likewise, more than half of the foster-care kids had reunited with their biological parents or moved elsewhere. [[10 Tips for Raising Happy Kids](#)]

What that means is that the effect of getting a kid out of an orphanage early may be even stronger than this study suggests, Fox said. The effect of institutionalization during those critical early **periods** can be long-lasting, as can the effect of finding a stable home. That's an important message, given the approximately 8 million children around the world growing up in orphanages, Fox said.

"There's really no such thing as a good institution for an infant or young child," he said.

Likewise, Fox added, **children of neglectful parents may face similar brain consequences**. The majority of children seen by social services in the United States are there for reasons of neglect, he said.

"Due to substance use or poverty or whatever the reason, they're not given the **kind of stimulation and socialization that they expect**," Fox said. "For those children, it's a similar story to those children in the institutions we study."

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