

# The Effects of Psychosocial Deprivation on Attachment: Lessons from the Bucharest Early Intervention Project

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*Abstract:* The absence of typical caregiving, including warm and responsive parenting, has been suggested to significantly affect the young child's ability to form adaptive relationships with adults and peers. The Bucharest Early Intervention Project (BEIP), a randomized controlled trial of foster/family care for young children with a history of institutionalization has provided the context to assess these relationships. Here we review data from the BEIP with specific focus on attachment. The findings clearly show the importance of early family care on the emergence of attachment, on the prevention of psychopathology, and on links between brain and social behavior.

*Keywords:* attachment, institutionalization, deprivation, neglect, brain development

John Bowlby wrote about the negative effects of early maternal separation and institutionalization some 65 years ago (Bowlby, 1952). In a report for the World Health Organization, he detailed these effects and advocated that young children should not be placed into institutions but rather should remain or be placed into families where they might receive warm, responsive, and loving care—all missing from institutional settings. However, in many parts of the world today, 8 million abandoned or orphaned children are still being raised in socially depriving institutions (UNICEF, 2007).

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Bowlby's original thesis was that infants required responsive, individualized, and loving care and that the presence of such caregiving allowed infants to develop a sense of security and trust in the world around them. It also provided the foundation and model for the development of social relationships with others. These first relationships between caregivers and infants were prototypical of what the child might expect as he or she got older and formed the basis for his or her developing relationships with other adults and peers. The data on the importance of early attachment relationships in the development of later social relationships and emergence of psychopathology has generally supported Bowlby's initial claims, though much of this work is correlational.

There is now significant scientific evidence that being raised in institutions has detrimental effects on brain development and behavior, and greatly increases the risk of psychopathology. Children raised in these socially deprived settings have less gray matter (Sheridan, Fox, Zeanah, McLaughlin, & Nelson, 2012), show a heightened incidence of attention deficit disorder as well as other forms of psychiatric problems (Humphreys, Gleason et al., 2015; Rutter, Sonuga-Barke, & Castle, 2010). There are also data suggesting that being raised early in life in an institution has adverse effects of the development of social relationships, though up until recently these data were correlational in nature.

The Bucharest Early Intervention Project is the first and only randomized controlled trial of foster/family care for institutionalized children (Zeanah et al., 2003). As such it presents an opportunity to rigorously test the ideas first proposed by Bowlby about the importance of attachment and the effects of absence of a caregiving context in which the young child is exposed to "typical" patterns of caregiving. The study, which began in Bucharest, Romania ten years after the fall of Ceascescu, recruited a sample of young children living in institutions in that city. These children (mean age of 22 months) were assessed on a wide range of domains including cognition, brain activity, and attachment status while they were still living in these institutional settings. After this initial, baseline assessment, children ( $n = 136$ ) were randomized to either receive care as usual (CAU) in the institutional settings in which they were currently living or to be removed from institutions and placed into high quality family foster care (FC). The families who accepted these children were recruited and screened by the study staff, and throughout the intervention (until each child reached the age of 54 months), these families were provided significant psychological and economic support for caring for these previously institutionalized children. The children were subsequently assessed at 30, 42, and 54 months of age and again at 8 and 12 years of age (Nelson, Fox, & Zeanah, 2014).

Prior to randomization, all the children were living in institutions in Bucharest and had attachments assessed. Study staff conducted and videotaped an assessment of each child's attachment status using a procedure called the Strange Situation procedure (Ainsworth, 1978), which was first developed by Mary Ainsworth, a psychologist who had studied with Bowlby. The procedure involves a series of episodes designed to explore a young child's exploration and comfort seeking with a familiar caregiver (i.e., attachment figure) and unfamiliar adult (i.e., stranger). Trained observers code the child's responses to brief periods of separation and reunion with the attachment figure and with the stranger. Ratings of the young child's proximity seeking, contact maintenance, and affective responses to the adults during these episodes are completed. Children's patterns of attachment are then classified based on the organization of their behaviors. The procedure has been used extensively on various populations of children in the United States and around the world. Children's attachment patterns to the caregiver are classified as secure, avoidant, resistant, or disorganized.

For infants who were living in institutions, the first issue faced by the investigative team was who to identify as the child's primary caregiver in the Strange Situation. We asked the institutional caregivers to identify the child's favorite caregiver. In the uncommon situations in which no favorite could be identified, we identified a caregiver who worked with the child regularly and knew the child well. A comparison group of same age infants who were born and raised in families in Bucharest with no history of institutional rearing also was recruited and observed with their mothers in the Strange Situation procedure. The videotaped data were sent to coders who were blind to the status of the children.

We found that the majority of the institutionalized infants displayed patterns of disorganized attachment classifications. Further, the experienced coders developed a continuous rating scale to examine the degree of attachment that had formed between the young child and the familiar caregivers. Infants received a score of "5" if they showed fully formed attachment behaviors and a score of "1" if they showed no attachment behaviors. They received a "2," a "3," or a "4" if they demonstrated some attachment behavior but less than expected for fully formed attachments. We found that 100% of the community sample received a score of "5," indicating fully formed attachments, whereas only 3% of the infants living in institutions demonstrated fully formed attachments. The remaining 97% showed absent, incomplete, or odd and abnormal attachment behaviors.

Bowlby and Ainsworth had always considered that in various caregiving situations that infants would "attach" to an adult even though sometimes that adult was abusive or maltreated them. What had not

been considered was that infants would show no evidence of any attachment to a caregiver, as we found in these infants raised in the contexts of extreme social deprivation present in the institutions. Incompletely developed attachments have been replicated in three other studies involving children currently or previously living in institutions (Carlson, Hostinar, & Gunnar, 2014; Dobrova-Krol, Bakermans-Kranenburg, van IJzendoorn, & Juffer, 2010; Herreros, Neriz, & Magnani, 2014).

These same infants were followed up when they were 42 months of age. By then half had been randomized to be removed from institutions and placed into families. The range of ages of the infants in the study at the time of randomization was 9–30 months. Hence, at the 42-month assessment, some children had been in a family for over two years and some had been in a family for only one year. We looked to see whether the intervention had an effect (whether there was greater security of attachment at age 42 months in the children in family care versus those who remained in the institutions), and among the children placed into families, we examined whether the age of placement mattered.

At 42 months, children were videotaped in the lab in the Strange Situation procedure, and these videotapes were coded with an age appropriate coding system to examine attachment security. The data from this coding (Smyke, Zeanah, Fox, Nelson, & Guthrie, 2010) clearly showed that those children placed into families showed more secure attachments (49.2%) than those who randomized to care as usual (17.5%). More importantly, when we examined timing or age of placement as a factor we found that among the foster care group, those who were placed before the age of 24 months were significantly more likely to display secure attachment compared to those placed after 24 months of age. These data speak significantly to a number of important issues regarding the emergence of attachment relationships in infancy and early childhood. First, they suggest that even in the most extreme of caregiving situations in which infants display no evidence of attachment to a caregiver, there is still sufficient plasticity to allow for the emergence of secure adaptive relationships with an adult caregiver. Second, timing is critical. This plasticity is not unlimited and evidence suggests the sooner a child is placed in an adequate caregiving environment, the more likely they will recover from the deleterious effects of deprivation—earlier is better.

The children in this study have been followed prospectively and security of attachment at 42 months of age has continued to predict important later outcomes across multiple domains of development. For example, security of attachment at 42 months among children with histories of institutional rearing predicted reductions in internalizing

signs in girls at 54 months, sustained levels of stable, typical IQ scores through age 12 years (Almas et al., 2016), social skills at 8 years (Almas et al., 2012), a reduction in callous unemotional traits in boys at 12 years (Humphreys, McGoron et al., 2015), and overall competence at 12 years (Humphreys, Miron, McLaughlin, Sheridan, Nelson, Fox, & Zeanah, under review).

Further evidence that attachment appeared to be an important pathway to more successful adaptation comes from mediational analyses that are designed to demonstrate whether intervening variables (mediators) better explain the relations between independent variables and outcomes. For example, McLaughlin, Zeanah, Fox, and Nelson (2012) examined the link between attachment and the emergence of psychopathology in the sample of children at 54 months of age. We found that greater attachment security at 42 months of age predicted lower rates of internalizing disorders in both girls and boys. Importantly, developing secure attachments at 42 months explained how girls in foster care had reductions in psychopathology at 54 months compared to girls receiving care as usual. We also found that quality of caregiving when children were 30 months of age was associated with symptoms of psychopathology at 54 months. Ratings of security of attachment at 42 months also mediated the associations between quality of caregiving and fewer symptoms of psychopathology (McGoron et al., 2012). Finally, response to distress at age 42 months was associated with reductions in callous unemotional traits. Security of attachment also mediated the effects of response to distress on reducing callous unemotional traits in early adolescent boys (Humphreys, McGoron et al., 2015).

One of the unique features of the Bucharest study is the recording and analysis of brain activity both prior to and after randomization to intervention. In an initial report of brain activity on the sample (Marshall, Fox et al., 2004), we found that the young children living in institutions had decreased EEG power (less power in the alpha frequency band) compared to community controls. The EEG power of this sample was remarkably low and this decrease (in the alpha frequency) was present across the different recorded scalp locations. Follow-up measurement of EEG power found that not until age 8 was there statistically significant evidence of an intervention effect, meaning that children placed in foster care had significantly higher levels of alpha power than children in the care as usual group (Vanderwert, Marshall, Nelson, Zeanah, & Fox, 2010). At age 8 years, those children who had been randomized to foster care and placed into families before 24 months of age were more likely to show a pattern of EEG alpha power that was indistinguishable from community controls. On the other hand, children placed into

foster care after 24 months of age or children randomized to remain in the institution continued to show a decrease in the magnitude of EEG power at age 8. Remarkably, this intervention effect (greater power in the foster care group) was still present when the sample was assessed at age 12 (although the timing effect was no longer evident; Vanderwert, Zeanah, Fox, & Nelson, 2016).

We looked at the link between attachment measured at 42 months and brain activity measured at age 8, as it may be associated with the emergence of social skills during the school age period. When children were 8 years old teachers rated their social skills. We found that teachers rated the social skills of children placed into families before age 20 months no differently than they rated community controls. And both of these groups were rated higher than children in the care as usual group or children placed into foster care after 20 months of age. Importantly, EEG power at age 8 significantly moderated the link between attachment security and social skills. Children with higher ratings of attachment security who also had high Alpha EEG power were more likely to have greater social skills. Hence, brain and attachment contribute to the emergence of social skills in this risk sample (Almas et al., 2012).

One of the commonly reported conditions associated with institutional rearing is attachment disorders. Rather than patterns of attachment, which may be considered risk or protective factors, attachment disorders define more extreme disturbances in attachment behavior in young children and are associated with significant functional impairment. Two types have been described, a disorder characterized by emotionally withdrawn inhibited behavior, known as reactive attachment disorder, and a disorder characterized by indiscriminate social behavior, known as disinhibited social engagement disorder. The former is characterized by a paucity or even absence of attachment behaviors, whereas the latter is characterized by a lack of reticence with strangers, a failure to check back with caregivers in novel environments, and willingness to go off with strangers. Both disorders have been found in children with a history of institutionalization and maltreatment (see Zeanah & Gleason, 2015, for review).

At baseline, we found that children living in institutions were significantly more likely to exhibit signs of both reactive attachment disorders and disinhibited social engagement disorder (Zeanah et al., 2005). Further, we found that the young children who had more signs of reactive attachment disorder showed fewer signs of attachment behavior in the Strange Situation and had lower levels of caregiving quality (measured by ratings observed naturalistic interactions). There was no relation-

ship between caregiving quality or attachment formation and indiscriminate behavior.

In follow-ups, we assessed the effects of the intervention on attachment disorders by assessing signs of reactive attachment disorder and disinhibited social engagement disorder at 30 months, 42 months, and 54 months. These follow-ups demonstrated a robust reduction in signs of reactive attachment disorder and a modest reduction in signs of disinhibited social engagement disorder over time (Smyke, Zeanah, Fox, Nelson, & Guthrie, 2010). At 12 years, there were intervention effects demonstrated both for signs of reactive attachment disorder and signs of disinhibited social engagement disorder (Humphreys, Gleason et al., 2015).

Although deprivation inherent in institutional rearing has been demonstrated repeatedly to be associated with elevated risk for indiscriminate behaviors for some time, much of this research was based upon caregiver reports of these behaviors. In order to assess the validity of these reports, we created an observational measure when children were 54 months of age called "Stranger at the Door." An unfamiliar adult came to the house or room where the child was living and (with the caregiver's prior knowledge and approval) asked the child to go off with her. We coded whether or not children left with this stranger and compared the behaviors of children in the two arms of our trial (foster care and care as usual) and a community sample. We found that children with a history of institutionalization left with a stranger at higher rates than children in the community (Gleason et al., 2014). As well, children in the care as usual group left more than community children with children in the foster care group somewhere in the middle. We also found that disorganized attachment classifications in the baseline assessments (average age 22 months) predicted 54-month indiscriminate behavior.

## CONCLUSION

Over 70 years ago John Bowlby brought the world's attention to the plight of young children who were living in orphanages and institutions in Europe. His work underscored the importance of the young child establishing a secure relationship with an adult caregiver in the first years of life. Such relationships formed the foundation for adaptive healthy lives. Even today, millions of children remain in institutions around the world. The consequences of this psychosocial deprivation



have long been understood but it is only recently with the results of the Bucharest Early Intervention Project that the science of early adversity has been firmly established. That project clearly showed the deleterious effects of early neglect and institutionalization. But more importantly, it showed in the context of a randomized controlled trial that early intervention, removing young children from institutions and placing them into families could ameliorate many of the negative effects of early deprivation. The study also showed the importance of attachment formation for positive cognitive, social, and adaptive behavior. And it reaffirmed what Bowlby argued for the critical nature of human social contact in the first years of life.

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