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Alternatives for abandoned children: insights from the Bucharest Early Intervention Project

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The Bucharest Early Intervention Project is the first and only randomized controlled trial of foster care as an alternative to institutional care for orphaned and abandoned children. Across various domains of brain and behavioral development we demonstrated that children in families developed more favorably than children in institutions, that foster care remediates some but not all compromises associated with institutional placement and that earlier placement in foster care leads to more developmental gains in some but not all domains. In addition to early placement, higher quality of care provided and more stable placements for children all enhanced outcomes. These results have important implications for science, practice and policy.

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Millions of orphaned, abandoned, and maltreated children worldwide require care that cannot be provided by their parents or families. For hundreds of years, these children have posed challenges that have led to two major societal approaches: caring for children in institutional settings (orphanages), or placing children in families, through foster care or adoption.

Before the study this paper describes, only a small number of descriptive studies, mostly conducted in the mid-20th century, had compared children in foster care to children in institutional care [4–13]. Results demonstrated that

children in foster care developed more favorably than children in institutions. On the other hand, interpreting these results is challenging, given that it is plausible that more handicapped children might be more likely to be placed in institutions rather than foster care. More recent studies of children adopted from institutions similarly show substantial gains after family placement, but they are limited by the potential for selection bias inherent in adoption. In addition, most did not assess the children within the institutions before adoption.

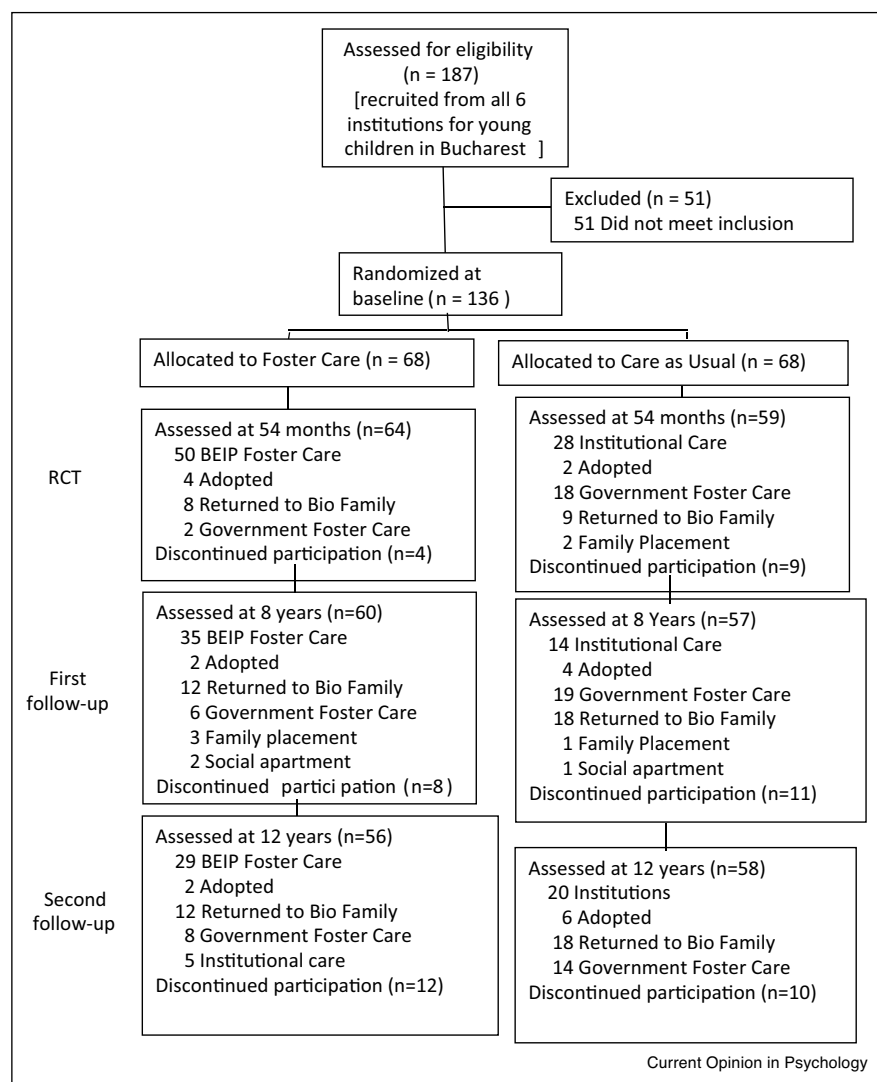
Origins and design of the Bucharest Early Intervention Project

Following the infamous economic policies of Nicolae Ceausescu, Romania faced an unprecedented child protection crisis at the turn of the 21st century, with an estimated 170 000 children living in large, socially impoverished institutions [1,14]. Our group was invited to conduct an intervention study by the Romanian Secretary of State for Child Protection, because of a policy debate about the best approach to caring for large numbers of abandoned children [1].

To address the challenges and limitations of previous research, we decided to conduct a randomized controlled trial (RCT) of foster care as an alternative to institutional care among children who had been abandoned in infancy and were being raised in institutions. The unique and crucial advantage of randomizing infants already living in institutions is that both groups share pre-existing risk factors, and any differences in outcomes can be confidently attributed to the intervention. Thus, this was the only design that could provide definitive evidence of which form of care was preferable [1,2].

We also wanted to assess the children's development comprehensively, and we determined that measures of brain and behavioral functioning could be used to address the questions of concern. We recruited 136 children 6–31 months of age who were living in Bucharest in institutions, following abandonment and who had neither obvious genetic syndromes or severe neurological conditions. All the children had lived at least half of their lives in institutions. We also recruited 72 typically developing children from pediatric clinics in Bucharest to serve as a comparison group, since the measures we planned to use had not been used in Romania before (see design in [Figure 1](#)).

Figure 1



Participants in BEIP.

Following baseline assessments, we randomly allocated half of the sample to care as usual and half of the sample to placement with foster parents whom we recruited, managed and supported. As illustrated in Figure 1, the original RCT was conducted from baseline through age 54 months. At that point, we turned support of the foster care network over to local governmental authorities in Bucharest. We then conducted follow-ups of the children at 8 years and 12 years.

Ethical issues

Studying a vulnerable population and conducting an RCT raises a number of concerns. We [1,15,16] and others [17–19] have discussed these issues in detail. Briefly, we conducted a study with a vulnerable population only

because it addressed a question relevant to them. Second, we did not interfere in any decisions about changes in placement of the children since legally those decisions had to be made by Romania's child protection officials. Third, we used only measures that posed no more than minimal risk to participants. Fourth, there were multiple levels of oversight of the study within Romania and at each principal investigator's university.

The BEIP intervention

We endeavored to create a foster care program in Bucharest that was culturally appropriate, feasible, replicable and informed by developmental science. We have previously described these efforts in detail [1,20]. The essence of the foster care intervention was to recruit, train and

support foster parents willing to make a full and long-term commitment to the children in their care.

Drawing upon our experiences of intervening with young children in the U.S. [21], we recruited and trained foster parents who could understand and respond effectively to meet the needs of young children in their care. We knew from informal observations and pilot assessments [22] that these young children had serious developmental delays and deviances, and we expected that they would present challenging behaviors to parents caring for them. We also knew that resources for special needs children were not widely available at that time in Romania. Therefore, we knew that the care that foster parents provided would be the major means through which children's developmental delays and deviant behavior would be addressed.

A particular challenge that we faced was that not only was the fledging child protection system in Bucharest overwhelmed and underfunded at the time, the entire profession of social work in Romania was inexperienced due to Ceausescu's elimination of social work as a profession (deeming it unnecessary). Therefore, we provided expert mentoring to BEIP social workers from the United States.

Mental health clinicians from Tulane University who had had many years of experience working with young maltreated children in foster care provided weekly consultation to BEIP social workers about how to support foster parents in caring for formerly institutionalized children. Social workers had frequent in person and phone contact and tried to be responsive to needs that foster parents expressed.

Scientific questions

BEIP addressed three major questions across multiple domains of development (Table 1). First, we documented developmental differences between young children living in institutions and those with no history of institutionalization living in families. Second, we determined if and how much recovery foster care might produce for young children who had been abandoned and placed in institutions, using a stringent intent to treat analysis, in which data were analyzed by original group assignment rather than subsequent placement status. This provided a conservative estimate of intervention effects. Third, we examined whether the timing of placement affected outcomes and how this varied across domains of development.

Table 1

Domains of assessment

	Baseline 6–31 months	30 months	42 months	54 months	8 years	12 years
Cognition						
IQ	x	x	x	x	x	x
Executive functions	x	x	x	x	x	x
Language						
Expressive		x	x		x	
Receptive		x	x		x	
Emotional expression	x	x	x			
Psychopathology						
Symptoms				x	x	x
Disorders				x	x	x
Impairment				x	x	x
Attachment						
Formation	x					
Security	x		x			
Organization	x		x			
Disorders	x	x	x	x	x	x
Social behavior						
Competence	x	x	x			
Peer relations					x	x
Social skills					x	x
Stress response						x
Brain functioning						
EEG	x	x	x		x	x
ERP	x	x	x		x	x
Brain structure						
MRI					x	

Outcomes

Baseline results

At baseline, there were no differences between the children later randomized to foster care or care as usual, but these children living in institutions were different from their never institutionalized counterparts in virtually every developmental domain [1,23].

Intervention effects: foster care and care as usual

Results from the RCT were consistent across most developmental domains—children in foster care developed more favorably than children who received care as usual. Selected intervention outcomes are shown in Table 2a, with effect sizes and confidence intervals to allow comparisons across domains. Overall, the magnitude of the

effects illustrated in Table 2a are consistently in the small to medium range (all in the expected direction, FCG have better outcomes than CAUG). Because of the randomized design, these results are definitive proof that foster care placement led to enhanced functioning.

Perhaps more interesting, is when these same domains are examined comparing the FCG and NIG, demonstrating ‘catch-up’ of the FCG to a (quasi-matched) comparison group of children with no history of institutionalization (Table 2b). Here, effect sizes vary dramatically, with some domains showing almost complete catch-up (e.g., height, weight, EEG alpha power) and others demonstrating a lack of complete catch-up despite notable difference between those children

Table 2a

Selected intervention effects (CAUG > FCG)

Domain	54 months	8 year follow-up	12 year follow-up
Full scale IQ	−0.48 [−3.48, 2.53]	−0.36 [−3.16, 2.43]	−0.42 [−3.64, 2.80]
Height ^a	–	−0.40 [−1.61, 0.81]	−0.40 [−2.01, 1.22]
Weight ^a	–	−0.68 [−1.90, 0.54]	−0.46 [−2.25, 1.33]
Externalizing signs (girls/boys)	–	–	0.19 [−0.55, 0.92]/0.63 [−0.08, 1.35]
Internalizing signs (girls/boys)	0.62 [0.06, 1.19]/−0.14 [−0.86, 0.57]	–	–
RAD signs	0.66 [0.35, 0.97]	0.53 [0.21, 0.86]	0.58 [−0.41, 1.56]
DSED signs	0.37 [0.03, 0.72]	0.57 [0.32, 0.81]	0.43 [0.001, 0.85]
EEG alpha power ^b	–	−0.43 [−0.53, −0.33]	−0.56 [−0.58, −0.54]

Note. *d* effect size using maximum likelihood estimator [95% confidence interval]. – indicates no intent-to-treat finding or not assessed.

^a Height and weight presented after statistically controlling for age and sex.

^b EEG alpha power at 8 years presented from central regions; at 12 years overall relative alpha power is presented.

Table 2b

Foster care group catch-up (FCG > NIG)

Domain	54 months	8 year follow-up	12 year follow-up
Full scale IQ	−1.56 [−5.20, 2.30]	−2.07 [−4.59, 0.45]	−1.38 [−4.55, 1.79]
Height ^a	–	−0.13 [−1.02, 0.76]	−0.21 [−1.75, 1.34]
Weight ^a	–	0.03 [−0.97, 1.03]	−0.15 [−1.98, 1.68]
Externalizing signs (girls/boys)	–	–	0.75 [0.17, 1.33]/0.46 [−0.09, 1.00]
Internalizing signs (girls/boys)	0.51 [0.07, 0.95]/0.86 [0.08, 1.64]	–	–
RAD signs	−0.08 [−0.24, 0.08]	0.48 [0.32, 0.63]	0.64 [0.27, 1.00]
DSED signs	0.74 [0.47, 1.01]	0.50 [0.35, 0.65]	0.60 [0.35, 0.84]
EEG alpha power ^b	–	−0.24 [−0.35, −0.13]	0.00 [−0.02, 0.02]

Note. *d* effect size using maximum likelihood estimator [95% confidence interval]. – indicates no intent-to-treat finding or not assessed.

^a Height and weight presented after statistically controlling for age and sex.

^b EEG alpha power at 8 years presented from central regions; at 12 years overall relative alpha power is presented.

who did and did not get assigned to the intervention. For example, the magnitude of IQ differences between the FCG and NIG were large across all time points considered. Most often the FCG children, as a group, occupy a level of functioning that is intermediate to the CAUG and NIG.

Although IQs of FCG children were significantly higher than those CAUG children over time [26,27*], there were few intervention effects on executive functioning skills [28,29], which were not assessed in early childhood. FCG children also demonstrated an attention bias to positive facial expressions of emotion at both 8 and 12 years [30,31]. Social behaviors, including peer relations and social skills were enhanced [32,33]. Externalizing signs, CU traits and attachment disorder behaviors at 12 years all were reduced for children living in foster care [34**,35*,36,37*]. Brain structure and functioning at 8 and 12 years also were enhanced by the intervention [38,39,41*]. Further, cortical white matter volume partially mediated the effect of institutional rearing on EEG alpha power, suggesting that reductions in circuitry were associated with reductions in brain electrical activity. Also, white matter tracts in the external capsule and corpus callosum partially explained links between institutional rearing status and internalizing symptoms in middle childhood and early adolescence [39]. Children randomized to foster care demonstrated healthier stress responses, as indexed both by cortisol levels and autonomic nervous system indices [42**].

Timing of enhanced care

Because of the variability of children's ages at the time they were randomized to foster care (7–33 months), we were able to examine the effects of age at which their placements occurred in relation to outcomes (see

Table 3). For some, but clearly not all domains, children placed into foster care at earlier ages fared better than those placed at older ages. The ages at which differences became significant ranged from 12 to 24 months, but most were between 20 and 24 months of age. We have considered these results as compatible with sensitive periods in brain development [1,43,44,24].

Keys to the success of the intervention

Quality of caregiving, which was objectively coded from videotaped observations, was higher in the children in BEIP foster care than children who received care as usual [1]. During naturalistic interactions at 30 months, quality of caregiving was an important predictor of early psychopathology [45]. Secure attachments at 42 months, which were significantly more likely in children in foster care, mediated the effect of caregiving quality on psychopathology at 54 months [46]. In fact, secure attachment in early childhood also predicted other subsequent outcomes, including IQ and peer relations at 8 years [26,47].

At age 12 years, children who had remained in a stable foster placement since original randomization were less likely to display signs of internalizing and externalizing disorders [34**], as well as more likely to demonstrate an attention bias to positive emotional displays, while instability of foster care placement was related to threat bias. The magnitude of the positive bias was associated with fewer internalizing problems and better coping mechanisms [31]. Of course, children with higher levels of serious behavior problems might precipitate more disruptions, but we found no differences on multiple measures at earlier ages in children whose placements subsequently disrupted and those that did not, so it is unlikely that challenging behaviors led to the disruptions. Instead, the

Table 3

Timing effects: age of placements at which differences between earlier and later placed children became significant

	Assessed at 42 months	Assessed at 54 months	Assessed at 8 years	Assessed at 12 years
Stereotypies	12 months	12 months	n/a ^a	n/a ^a
Expressive language	15 months	n/a ^a	n/a ^a	n/a ^a
Receptive language	15 months	n/a ^a	n/a ^a	n/a ^a
IQ	24 months	24 months	Negative ^b	Negative ^b
Organization of attachment	24 months	n/a ^a	n/a ^a	n/a ^a
Security of attachment	24 months	n/a ^a	n/a ^a	n/a ^a
Indiscriminate behavior	24 months	24 months	Negative ^b	Negative ^b
Error related negativity	n/a ^b	n/a ^a	20 months	Negative ^b
Alpha and theta	Negative ^b	n/a ^a	24 months	Negative ^b
Social skills	n/a ^a	n/a ^a	20 months	n/a ^a
Cortisol reactivity	n/a ^a	n/a ^a	n/a ^a	24 months
Parasympathetic nervous system reactivity	n/a ^a	n/a ^a	n/a ^a	18 months
Competence	n/a ^a	n/a ^a	n/a ^a	18 months

^a n/a means that the variable was not assessed.

^b Negative means no timing effects were detected.

disruptions often resulted from decisions to reunify children with their biological families, sometimes with subsequent later returns to institutional care.

Conclusions

Implementation of a quality foster care intervention for young children who had experienced severe deprivation proved feasible and led to improved developmental outcomes across numerous domains compared to care as usual. Earlier placement into foster care, higher quality of care provided, and more stable placements all enhanced outcomes. Though early institutional rearing was associated with large deleterious effects across physical, cognitive, socioemotional and behavioral domains, the effects on cognitive development and psychopathology showed the least response to quality foster care intervention. The urgency of early family placements is underscored by others' findings that adoption of institutionalized Romanian infants before 6 months of age in led to near complete recovery across domains [48].

From a practice and policy perspective, the lack of sustained and meaningful support to the foster care program at the trial's conclusion was accompanied by an increase in disrupted placements and loss of some developmental and clinical gains. Given that developmental delays and deviance from deprivation seem not to be transient, sustained investments in high quality care are worth pursuing and sustaining.

Conflict of interest statement

Nothing declared.

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- of special interest
- of outstanding interest

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