The caregiving context in institution-reared and family-reared infants and toddlers in Romania

Anna T. Smyke,1 Sebastian F. Koga,1 Dana E. Johnson,2 Nathan A. Fox,3 Peter J. Marshall,4 Charles A. Nelson,5 Charles H. Zeanah,1 and the BEIP Core Group

1Tulane University, USA; 2University of Minnesota, USA; 3University of Maryland, USA; 4Temple University, USA; 5Harvard University, USA

**Background:** We assess individual differences in the caregiving environments of young children being raised in institutions in Romania in relation to developmental characteristics such as physical growth, cognitive development, emotional expression, and problem and competence behaviors. **Method:** Videotaped observations of the child and favorite caregiver in their ‘home’ environment were coded for caregiving quality, and this was related to child characteristics. Child emotional reactivity was assessed during responses to interactive tasks. Cognitive development was assessed from child responses to the Bayley Scales of Infant Development. Data regarding problem behaviors and competence were obtained from caregiver report. Children reared in institutions were compared on all of these measures to never institutionalized children to assist gauging degree of impairment. **Results:** Children raised in institutions demonstrated marked delays in cognitive development, poorer physical growth, and marked deficits in competence. Individual differences in caregiving environment were associated with cognitive development, competence, and negative behavior among these young children being reared in institutions. **Conclusions:** These data confirm previous findings regarding deficits associated with institutional care and extend our understanding of the impact of individual differences in caregiving quality on the development of young children in institutions. **Keywords:** Infancy, orphans, institutionalization, caregiving quality, cognitive deficits, physical growth, emotional expression, competence. **Abbreviations:** BEIP, Bucharest Early Intervention Project; BSID-II, Bayley Scales of Infant Development – II; DQ, Developmental Quotient; IG, institution group; ITSEA, Infant–Toddler Social Emotional Assessment; MDI, Mental Development Index; NIG, never institutionalized group; ORCE, Observational Record of the Caregiving Environment.

Historically, institutions have been the most common form of care for orphaned and abandoned children throughout the world, and they remain so today. Because institutional rearing often involves social and even material deprivation, disturbances of growth, cognitive development, and language as well as greater levels of problem behaviors have been noted for more than 50 years among young children raised in institutions (MacLean, 2003; Zeanah, Smyke, & Settles, 2006).

Studies published in the past 15 years have demonstrated impairments in young children being raised in Romanian institutions and in those adopted out of institutions. Children being raised in institutions have demonstrated cognitive delays, serious impairments in social behavior (Smyke, Dumitrescu, & Zeanah, 2002; Zeanah, Smyke, Koga, & Carlson, 2005), and abnormalities of cortisol regulation compatible with high levels of stress (Carlson & Earls, 1997). Young children adopted out of institutional care often have persisting cognitive, socioemotional, and health problems (Castle et al., 1999; Fisher, Ames, Chisholm, & Savoie, 1997; Gunnar, 2000; Johnson, 2000; Rutter et al., 1999).

Despite this, Rutter and colleagues (2001) noted surprising variability in the degree to which children were affected by their institutional experience and significant, if not full, recovery has been observed among many children adopted out of Romania (Fisher et al., 1997).

Interestingly, although studies of children adopted out of institutions have shown that many early developmental deficits improve, they have not shown consistently that individual differences in outcomes are related to individual differences in adoptive family environments. This raises the question of whether differences noted in children adopted out of institutions may relate to differences in the caregiving environments of the institutions from which they were adopted. Variability in quantity and quality of care has been noted across and within institutions in previous research, but too few studies have included direct observations of quantity and quality of care in institutions for young children. In fact, better quality institutions have been associated with less cognitive impairment in children raised there (Roy, Rutter, & Pickles, 2000; Tizard & Rees, 1974; Vorria et al., 1998). Still, demonstrating associations between caregiving characteristics in institutions and individual characteristics of the children being raised there has not been reported. Institutional rearing in Romania often has...
been characterized by rotating shifts of multiple caregivers, large child to caregiver ratios, and limited social, cognitive, and language stimulation (Carlson & Earls, 1997; Kaler & Freeman, 1994; Smyke et al., 2002; Zeanah et al., 2003). Staff often have inadequate education and face challenging working conditions. Nevertheless, quality of care varies among and within these settings, and it is important to know if these differences are associated with differences in young children’s development.

In previous studies of children raised in institutions in Romania and elsewhere, children raised in institutions are compared to children raised in family settings (foster care or with their birth parents), without determining whether child characteristics were related to caregiving characteristics. The association between quality of care and children’s development is important to examine because differences in children raised in institutions and in families may be due to variables other than rearing conditions. Since young children are not placed in institutions at random, the reasons why some children are raised in institutions may contribute importantly to any outcomes assessed. In Romania, for example, the chief reason given for child abandonment is poverty (Zeanah et al., 2003), which is associated with limited prenatal care, maternal malnutrition, and prenatal exposure to alcohol and other substances, all of which are known to increase the risk of compromised postnatal development (Nelson & Bosquet, 2000).

In this study, we explored whether individual differences in the caregiving environment were associated with individual differences in young children’s development. Because the children in this study were recruited from all six institutions for young children in Bucharest, they are broadly representative of institutional care in Romania. Although direction of effects cannot be determined from cross-sectional designs, associations between individual differences in the caregiving environment and children’s development are compatible with the relative importance of early experiences of caregiving in institutions. A major purpose of the present investigation is to determine if we can demonstrate such an association.

A second purpose of the current investigation is to extend the examination of child characteristics to areas other than cognitive and physical development, which have been the most frequently assessed characteristics. For example, there is good reason to expect that young children being raised in institutions will demonstrate significant behavioral problems. In addition to risk factors that precede placement, studies of children adopted out of institutions have found aggression, temper tantrums, hyperactivity, difficulty with attention and anxiety problems in young children (Ellis, Fisher, & Zaharie, 2004; Fisher et al., 1997; Gunnar, 2000; Kreppner, O’Connor, & Rutter, 2001; Rutter et al., 2001; Rutter et al., 1999). Another purpose of the current study is to examine behavior problems in children receiving institutional care in relation to caregiving quality.

Curiously, there have been no previous attempts to examine either competence or emotional expression among young children being raised in institutions, despite the presumed importance of these characteristics in explaining variability in outcomes (Rutter et al., 2001). Young children in institutions who are more competent and who display more positive affect may be better able to recruit support from caregivers, to withstand deprivation more heartily, and/or to recover from early setbacks more readily than less competent and more negative children. Another purpose of the present investigation is to determine if caregiving quality is related to these characteristics.

Because the measures we employed had not been used in published reports of Romanian children, our initial analyses compared outcomes in children reared in institutions and community children to assess developmental characteristics in these two groups of children. In keeping with the literature on institutional care, we predicted substantial differences in every domain of development. In this report, we were specifically interested in individual differences among children being reared in institutions. Therefore, we predicted that child characteristics, caregiving quality, and amount of adverse rearing environment would be associated with developmental outcomes in these young children across a range of different domains. We also had specific hypotheses regarding caregiving quality and amount of adverse rearing environment.

We predicted that better caregiving quality in young children being raised in institutions in Romania would be related to better outcomes in cognitive development, problem behaviors, emotion expression, competence, and physical development, after controlling for child age, ethnicity, gender, and birthweight. In keeping with previous research, we also predicted that developmental differences would be greater among children who had experienced a greater percentage of their lives in institutions. We expected that a higher percentage of a child’s life spent in an institution would be associated with poorer cognitive development, greater numbers of behavior problems, reduced levels of competence, and less positive expression of emotion.

Method

Participants

Participants were 208 infants and toddlers ranging in age from 5–31 months (\( M = 20.65, SD = 7.26 \)) at the time of baseline evaluation, which is the subject of this report (see Zeanah et al., 2003). Institutional caregivers or parents of community children provided some of the data regarding children’s developmental status.
Participants were drawn from all of the placement centers (institutions for young children) in the 6 sectors of Bucharest. All children less than 31 months of age in April 2001 living in institutions in Bucharest were included, with the exception of children scheduled for imminent adoption and children with serious handicapping conditions (e.g., fetal alcohol syndrome, severe cerebral palsy). Children were placed in the institutional setting at a variety of ages. Of the 125 subjects in the Institution (IG) group, 56 had resided in an institution since birth, usually after abandonment in the maternity hospital. While the average percentage of life institutionalized was 85.94 (SD = 21.14), the median percentage of life institutionalized was 98.16. The variation in percent of life institutionalized was conceptualized as a means to begin to deconstruct the age/exposure to institutionalization inter-relationship.

Children living in institutions were in the custody of local governmental officials and informed consent was provided by legally responsible personnel. In addition, we obtained consent from all birth parents whom we could locate (n = 29) for children to be randomized into foster care. Eleven children originally cleared for participation in the study (6 boys, 5 girls; 7 Romanian, 1 Roma, 3 unknown; Mean age = 18.09 months), later were determined to have conditions that met exclusion criteria. These children were excluded from analyses, although their inclusion did not alter any results. In addition, never institutionalized infants and toddlers were recruited from a pediatric community health center in Bucharest. Seventy-two community families began the study at baseline. Shortly thereafter, 7 families chose to discontinue participation (7 girls; 7 Romanian; Mean age = 21.92 months). Child characteristics may be found in Table 1. For other details of the study sample see Zeanah et al. (2003).

### Procedures

After the study was approved by the Institutional Review Boards at the investigators’ universities and by the National Authority of Child Protection and the Ministry of Health in Romania, baseline assessments of physical development and growth, cognitive level, problem behaviors and competence, and emotional expression were obtained on participants from the Institution (IG) and Never Institutionalized (NIG) groups. Data collection involved 3 visits to the BEIP laboratory and a 1½-hour home visit either at the child’s home (NIG) or at the placement center (IG). All measures were administered by Romanian research assistants who had received specialized training from the US team.

### Measures

#### Cognitive development

The Bayley Scales of Infant Development II (BSID-II; Bayley, 1993) were used to assess developmental status. The Mental Development Index (MDI), a scaled score, ranged from 50 to 150. Children who obtained scaled scores below 50 were assigned a numeric MDI score of 49. Raw scores were assigned an age equivalent score to enable analyses when scaled scores <50 were obtained (Lindsey & Brouwers, 1999). Developmental Quotients (DQ) were computed for each child (i.e., [age equivalent score/chronological age] × 100), allowing analyses to be carried out on the entire sample. For later institution-only regression analyses, we generated a dummy variable consisting of children who had MDI scores of 50 or greater (≥50 = 0) or below 50 (<50 = 1).

#### Physical growth

Measurements of weight (gm), height (cm), weight for height, and occipitofrontal circumference (cm) were converted to z scores (Centers for Disease Control, 2002). (See Table 2.) Birthweight was obtained from record review (IG) or from parent report (NIG). Birthweight information was available for 86% of the children from the IG and all but 3 of the children from the NIG. For purposes of data reduction, factor analysis was conducted, resulting in a single size factor. This variable was used in more in-depth analyses.

#### Emotional expression

The temperament/emotion expression episodes were modified from the puppets and peek-a-boo episodes in the Laboratory Assessment of Temperament Battery (LAB-TAB; Goldsmith & Rothbart, 1999) to measure emotion expression in response to social situations. During the episode, a female examiner introduced a pair of puppets to the child and acted out a conversation between them. The caregiver was seated behind the child. For coding, each 2-minute episode was divided into 30-second epochs to identify discrete emotion behaviors as well as intensities of facial and bodily expressions of positive and negative emotions. Data reduction was based on Kochanska, Coy, Tjebkes, and Husarek (1998) and resulted in standardized aggregates for both positive and negative affect. The negative affect aggregate was composed of

### Table 1 Demographic characteristics of institution-reared and family-reared children

<table>
<thead>
<tr>
<th>Child characteristics</th>
<th>Institution group (n = 124)</th>
<th>Community group (n = 66)</th>
<th>Significance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age (months) (SD)</td>
<td>21.07 (7.29)</td>
<td>19.32 (7.16)</td>
<td>ns</td>
</tr>
<tr>
<td>Ethnicity</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Romanian</td>
<td>56.8%</td>
<td>90.9%</td>
<td>***</td>
</tr>
<tr>
<td>Roma (Gypsy)</td>
<td>28.8%</td>
<td>6.1%</td>
<td></td>
</tr>
<tr>
<td>Unknown/Other</td>
<td>14.4%</td>
<td>3.0%</td>
<td></td>
</tr>
<tr>
<td>Gender</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Female (%)</td>
<td>50.4%</td>
<td>53.0%</td>
<td>ns</td>
</tr>
<tr>
<td>Percent of life institutionalized</td>
<td>86.06 (21.09) (n = 112)</td>
<td>0 (n = 63)</td>
<td>***</td>
</tr>
<tr>
<td>Birthweight (gm.) (SD)</td>
<td>2834 (596)</td>
<td>3331 (454)</td>
<td></td>
</tr>
</tbody>
</table>

*Note: ***p < .001, **p < .01, *p < .05, ns = nonsignificant.*
Table 2 Mean scores (SD) for measures of cognitive development, growth, competence, negative behavior, caregiving environment, and emotional expression by group

<table>
<thead>
<tr>
<th>Measure</th>
<th>Institution group</th>
<th>Community group</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cognitive development</td>
<td>( n = 124 )</td>
<td>( n = 66 )</td>
</tr>
<tr>
<td>Mental Development</td>
<td>66.16 (15.43)</td>
<td>102.87*** (12.98)</td>
</tr>
<tr>
<td>Developmental Quotient</td>
<td>74.26 (13.26)</td>
<td>103.43*** (10.88)</td>
</tr>
<tr>
<td>Growth</td>
<td>( n = 123 )</td>
<td>( n = 62 )</td>
</tr>
<tr>
<td>Height (z)</td>
<td>-0.89 (90)</td>
<td>0.6*** (98)</td>
</tr>
<tr>
<td>Weight (z)</td>
<td>-1.25 (1.07)</td>
<td>-0.06* (1.02)</td>
</tr>
<tr>
<td>Head circumference (z)</td>
<td>-0.77 (97)</td>
<td>0.17*** (79)</td>
</tr>
<tr>
<td>Weight for height (z)</td>
<td>-0.79 (1.03)</td>
<td>0.002*** (99)</td>
</tr>
<tr>
<td>Size</td>
<td>-0.93 (77)</td>
<td>0.044*** (89)</td>
</tr>
<tr>
<td>Competence and negative behavior</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Competence</td>
<td>-1.71 (2.45)</td>
<td>0.0*** (1.00)</td>
</tr>
<tr>
<td>Negative behavior</td>
<td>0.63 (1.18)</td>
<td>0.00* (1.00)</td>
</tr>
<tr>
<td>Caregiving environment</td>
<td>( n = 122 )</td>
<td>( n = 64 )</td>
</tr>
<tr>
<td>Caregiving quality</td>
<td>2.18 (60)</td>
<td>2.8*** (54)</td>
</tr>
<tr>
<td>Caregiver available</td>
<td>24.80 (6.87)</td>
<td>29.34*** (1.81)</td>
</tr>
<tr>
<td>Child unoccupied/watching</td>
<td>15.79 (8.53)</td>
<td>24.53*** (5.50)</td>
</tr>
<tr>
<td>Emotional expression</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Positive</td>
<td>-0.46 (65)</td>
<td>-0.09* (77)</td>
</tr>
<tr>
<td>Negative</td>
<td>-0.13 (44)</td>
<td>-0.28* (24)</td>
</tr>
</tbody>
</table>

Note: ***\( p < .001 \), **\( p < .01 \), *\( p < .05 \).

variables reflecting the expression of fear, anger, and sadness.

**Problem behavior and competence.** The Infant Toddler Social Emotional Assessment (ITSEA; Carter, Briggs-Gowan, Jones, & Little, 2003), a 195-item questionnaire, was administered to caregivers/parents to assess problem behaviors and competencies in children 12 months and older. Externalizing (activity/impulsivity, aggression/defiance, peer aggression); Internalizing (depression/withdrawal, anxiety, separation distress, inhibition to novelty); Dysregulation (negative emotionality, sleep, eating, sensory sensitivity); and Competence (compliance, imitation/play, attention, mastery motivation, empathy, prosocial peer relations) scores were obtained. Scores also were derived for maladaptive behaviors, social relatedness, and atypical behaviors. Because this measure had been normed by age group and gender (Carter et al., 2003), a given child’s score could be compared to scores for children of similar age and gender.

Principal components factor analysis was used for data reduction and produced a competence score (competence, social relatedness) and a negative behavior score (externalizing, internalizing, dysregulated, maladaptive, atypical) which were used in more in-depth analyses.

**Caregiving environment.** The Observational Record of the Caregiving Environment (ORCE; NICHD Early Child Care Research Network, 1996) was adapted and used to assess the child’s caregiving experience in either the institution or family setting. Children were videotaped with their preferred caregiver for 1½ hours. Caregivers were given no special instructions prior to the videotaping. Coding consisted of both qualitative ratings and quantitative ratings for caregivers and children. The former included such items as intrusiveness and stimulation of development. Quantitative items, 55 in all, included: caregiver available, caregiver interacting, and child unoccupied/watching and were rated during a series of 30 episodes. Coders first watched 10 minutes of videotape and then began to code for the presence or absence of the 55 quantitative items as they watched for 30 sec and then coded for 30 sec. This was accomplished in 10-minute blocks, followed by a 2-minute period of observation only. This pattern was repeated twice. Qualitative ratings were completed after 10 more minutes of observation.

The training process for coders included orientation to and study of the quantitative and qualitative items from the original ORCE manual as well as those added for purposes of the BEIP study. Practice tapes were coded and discussed and then reliability tapes were coded. In addition, a portion of tapes were double coded, to ensure ongoing fidelity of the coding process.

The Caregiving Quality score was obtained by averaging five qualitative scores (i.e., sensitivity, stimulation of development, positive regard for child, flat affect [reversed], detachment [reversed]), each of which received a rating from 1 (not at all characteristic) to 4 (highly characteristic). Caregiving Quality scores ranged from 1.0 to 3.8 \( (M = 2.39, SD = .65) \). Scale reliability was excellent (Cronbach’s alpha = .86). Inter-rater reliability ranged from .88 to .99 \( (M = .95) \). Scores for caregiver available, caregiver interacting, and child unoccupied/watching were selected from among the quantitative variables to examine not only how consistently caregivers were available but also the number of episodes in which caregivers actually interacted with the child. For most children living in families, a caregiver was present in 30/30 episodes, which represented a ceiling for this item, thus reducing variability. Children living in the institution, however, frequently did not have a caregiver present and available to them. In fact, there was a wide range of number of episodes in which this was true, reflecting a range in quality among the institutions. Children who were unoccupied/watching were not participating in meaningful activities with their caregivers or with their peers. This may be a marker for the degree to which caregivers organized and supported the participation of the children in meaningful activities. Where appropriate, analyses were conducted using \( t \)-tests for unequal variances.

**Results**

Results are organized to present initially comparisons of IG and NIG. Following this, we turn to predictors of developmental characteristics in the children.

**Institution vs. community**

For purposes of gauging both areas and degree of developmental impairment among children experi-
encountering institutional care, we compared children who had been raised in institutions to those raised in families.

**Control analyses.** We examined the distribution of gender, ethnicity, age, and birthweight for the IG and NIG (see Table 1) as well as the percent of life institutionalized for the IG. The ethnic distribution of the two groups differed: \( \chi^2(3) = 26.25, p < .001 \). Children in the NIG were primarily ethnic Romanians. A substantial minority of the IG was of Roma ethnicity. Birthweight data were missing for 13 of the children in the institution group and 3 children in the community group. We could not discern any pattern for the missing data regarding birthweight, and we considered them randomly distributed. On average, birthweight was lower for children in the institution than for those raised in families, \( t(168) = 5.51, p < .001 \). In the initial analyses, rearing environments (Institution vs. Never Institutionalized) were compared.

**Caregiving environment.** As expected, Caregiving Quality scores were higher for children in the NIG than for those in the IG (Table 2). Also, the number of episodes during which a caregiver was available to the child, and during which a caregiver interacted with the child, was markedly lower in the IG (Table 2), and children were observed to be unoccupied or watching, rather than participating, during more episodes in the children being reared in institutions than in the never institutionalized children.

**Physical growth.** Children reared in the institutional setting had poorer growth when compared to their community age mates. When birthweight was entered as a covariate, findings were similar, with the exception of weight for height which was no longer significantly different.

**Cognitive development.** The Mental Development Index (MDI) scores for children being raised in institutions were markedly below those of never institutionalized children, as were Developmental Quotient scores (see Table 2). These data also were examined by displaying the obtained scaled scores for each group by age (see Figure 1). As expected, MDI scaled scores for the NIG were consistent across the age range (\( M = 103 \)) at baseline and chronological age was not related to obtained scaled score, \( r = -.09 \). For the IG, the MDI scaled scores declined as chronological age increased, \( r = -.56, p < .001 \). There were no children in the NIG with MDI scaled scores less than 50, whereas there were 32 such scores in the IG.

**Emotional expression.** Children from the IG displayed positive affect less frequently, and negative affect more frequently, than community children.
With regard to cognitive abilities, we found that observed caregiving quality was positively related to DQ, while percent of life institutionalized and having had a Bayley MDI score <50 were both negatively associated with DQ. As caregiving quality increased and percent of the child’s life spent in the institution decreased, DQ was higher, indicating that caregiving quality was an important contributor to DQ even with other contributors accounted for.

We also examined physical size and found that it was associated (positively) only with birthweight. None of the other variables contained in the regression equation were associated with birthweight, either negatively or positively. Because substantial numbers of data points for the birthweight variable were missing for the children being raised in institutions, we chose to include birthweight in the control block only for the size variable.

Next, we examined caregiver reported competence for children receiving institutional care. We found that both age and observed caregiving quality were positively related to caregiver reported competence, while obtaining an MDI score of <50 was associated with lower levels of competence. Again, caregiving quality made significant contributions to children’s competence, over and above what was accounted for by other factors.

Finally, we examined caregiver report of children’s negative behavior. We found that negative behavior was associated with observed poorer caregiving quality as well as having obtained a Bayley MDI score <50 (see Table 3). Again, caregiving quality was related to negative behavior even taking into account contributions from other factors.

Discussion

This study represents the most ambitious attempt to date to explore the effect of individual differences in the caregiving environment and developmental status in young children being raised in institutions. The most important finding was that, even after controlling for a number of child characteristics and percent of life raised in an institution, observed caregiving quality was associated with cognitive development and competence in young children. This was a particularly rigorous test of the importance of caregiving quality because it was assessed in the context of several other potential risk factors. Nevertheless, because of the cross-sectional nature of the data, it is not possible to determine whether more compromised children elicited poorer quality care or whether poor caregiving led to more developmental delay and less competence. Both directions may plausibly occur over time: children who receive better quality caregiving may use their interactions with their caregivers to gain a more complex knowledge of the environment and their place within it, and children who explore actively and initiate interactions with their caregivers may elicit caregiving which more readily promotes development.

Caregiving quality was related to three of six developmental outcomes whereas percentage of time institutionalized was related only to one of six developmental outcomes, demonstrating that the mere fact of institutionalization is less powerful than the microcaregiving environment within which each child develops. Even within problematic institutional environments, individual differences in caregiving appear to be importantly related to young children’s development.

Not surprisingly, older children showed a higher level of cognitive impairment than younger children (Figure 1). This is compatible with the idea that cognitive ability deteriorates as institutional care continues. Length of institutional care also was lin-

Table 3 Regression equations showing influence of caregiving quality, percent of child’s life institutionalized, and Bayley MDI < 50 on Developmental Quotient, size, competence, and negative behavior after controlling for demographic variables – institution group

<table>
<thead>
<tr>
<th>Variable</th>
<th>DQ (n = 122)</th>
<th>Size (n = 108)</th>
<th>Competence (n = 99)</th>
<th>Negative behavior (n = 99)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>β(SE β)</td>
<td>ΔR²</td>
<td>β(SE β)</td>
<td>ΔR²</td>
</tr>
<tr>
<td>Control block</td>
<td>.144***</td>
<td>.213***</td>
<td>.178***</td>
<td>.102*</td>
</tr>
<tr>
<td>Age</td>
<td>−.245 (.13)</td>
<td>.021 (.01)</td>
<td>.234*** (.05)</td>
<td>.042 (.02)</td>
</tr>
<tr>
<td>Gender</td>
<td>1.931 (.66)</td>
<td>−.081 (.14)</td>
<td>.403 (.43)</td>
<td>−.146 (.22)</td>
</tr>
<tr>
<td>Ethnicity</td>
<td>−.272 (1.81)</td>
<td>−.128 (.15)</td>
<td>−.22 (.47)</td>
<td>−.313 (.23)</td>
</tr>
<tr>
<td>Birthweight</td>
<td>.567*** (.12)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Predictors</td>
<td>.424***</td>
<td>.024</td>
<td>.114***</td>
<td>.129**</td>
</tr>
<tr>
<td>Caregiving quality</td>
<td>3.487* (1.49)</td>
<td>−.153 (.13)</td>
<td>.863* (.40)</td>
<td>−.428* (.20)</td>
</tr>
<tr>
<td>Percent life in institution</td>
<td>−.089* (.04)</td>
<td>−.003 (.004)</td>
<td>−.005 (.01)</td>
<td>.001 (.006)</td>
</tr>
<tr>
<td>Bayley score &lt;50</td>
<td>−18.907** (2.10)</td>
<td>−.239 (.17)</td>
<td>−1.222* (.51)</td>
<td>.675** (.26)</td>
</tr>
<tr>
<td>Total R²</td>
<td>.54***</td>
<td>.18***</td>
<td>.25***</td>
<td>.18***</td>
</tr>
</tbody>
</table>

Note: ***p < .001, **p < .01, *p < .05.
early related to cognitive compromise in studies of children adopted out of Romanian institutions (O'Connor et al., 2000).

The second set of findings, concerning comparisons between Romanian never institutionalized children and institutionalized children, were largely unsurprising. Nevertheless, the magnitude of the differences between these two groups across multiple developmental domains confirmed previous findings regarding the association between institutionalization and serious developmental compromise, with large differences in growth, cognitive level, competence, and emotional expression all favoring never institutionalized children. Though Romanian institutions have received a good deal of negative international attention for their poor quality, the pattern of findings in this study is similar to what has been reported in other contemporary studies that have compared children residing in institutions and home-reared children in Greece (Vorria et al., 2003), the United Kingdom (Tizard & Rees, 1974), and the United States (Harden, 2002).

One surprising finding was that internalizing and externalizing behavior problems were no more common among children living in institutional care than among children reared in their families. Studies of internationally adopted post-institutionalized children have reported mixed findings on the question of whether externalizing problems are increased. Rutter and colleagues (2001) noted that Romanian children adopted into the UK had no greater incidence of behavior problems, including conduct and emotional problems and difficulties in peer interaction, than children adopted within the UK. Higher total CBCL scores, although scores were not within the clinical range, were obtained for a group of Romanian children adopted into Canada, when compared to a sample of Canadian children who were not adopted (Marcovitch et al., 1997). In contrast, Ellis and colleagues (2003) reported that 23.5% of their sample of 2–6-year-olds residing in Romanian institutions met the screening cut off for oppositional defiant disorder according to caregiver-completed questionnaires. In a sample of 9-year-old children residing in institutions, behavioral difficulties were noted for boys (emotional difficulties, conduct problems) and for girls (emotional disturbance) (Vorria et al., 1998). Abnormal behaviors, such as stereotypies, were noted in over 50% of a small sample of children adopted into Manitoba, Canada (Benoit, Joycelyn, Moddemann, & Embree, 1996). Similar abnormalities of behavior were noted by Beckett and her colleagues (2002) and are consistent with our findings that atypical behaviors are more common among infants and toddlers reared in institutions than among family-reared children.

Age differences may account for some of the discrepancy in findings. Harden (2002) noted that a group of infants and toddlers in congregate care in the US did not differ on measures of behavioral difficulties but did differ on measures of child competence, findings more similar to those obtained in the current study. In other words, internalizing and externalizing problems may emerge as a later consequence of early institutional rearing.

Competence, despite its importance as a construct, has not been examined previously in children being raised in institutions. The substantial differences in competence demonstrated in this study suggest that the more limited findings with regard to behavior problems do not derive solely from caregiver minimization or bias, since behavior problems and competence were rated by caregivers. An important question for future exploration is the degree to which competence is impaired, because it may be a harbinger of later emerging behavioral problems in children formerly experiencing institutional care.

There are limitations to this report that should be noted. The results are cross-sectional in nature, and thus, the direction of effects of caregiving environment and developmental characteristics cannot be determined. As we follow these children’s development longitudinally, the question of direction of effects may be more readily determined. Furthermore, the fact that the individual characteristics that we assessed were not associated with differences in developmental status does not mean that other child characteristics might not be more important.

There is also a question about how much we can generalize to institutional settings and the effects of institutional rearing in the rest of Europe, Asia, Africa, and the Americas from these results, given the possibility of wide variability in such important factors as nutrition, instrumental care, and cognitive and emotional stimulation. Importantly, these findings in the main substantiate the findings from the previous 50 years about the developmental characteristics of children raised in institutions compared to children raised in families, albeit in a larger and more comprehensive examination of these characteristics than has been reported previously (Nelson, 2000; Zeanah et al., 2006).

Having an accurate understanding of the early rearing environment of institutionally reared young children can assist adoptive parents and individuals who provide treatment for internationally adopted children to do so in a knowledgeable and focused way. Additionally, countries that understand the effects of institutional care may be drawn to implement systems of foster care that permit young abandoned children to live with families, thus addressing the children’s need for sensitive, individualized care and for sufficient cognitive stimulation.

The current study provides a unique perspective for understanding the institutional ecology and the effects of institutionalization on the development of young children. Although children reared in institutions were markedly different from home-reared children in a number of developmental spheres,
there is evidence that children were not affected equally by the institutional experience. Further exploration of individual differences is one important direction for future research. Analyses of longitudinal data will allow us to explore risk and protective factors that may influence children’s reactions to the institutional environment as well as their ability to recover from the effects of institutional care via the intervention of foster care. Another important direction for research concerns the timing of remediation efforts. Though some preliminary efforts have been made in this direction in studies of children adopted out of institutions (Chisholm, 1998; Chisholm, Carter, Ames, & Morison, 1995; O’Connor et al., 2000; Rutter et al., 1998), contributions from these studies on this question are limited by lack of baseline measures and non-randomized samples of children. Follow-up of the current sample may enable us to examine hypotheses about critical and sensitive periods within specific developmental domains. Results from such analyses may clarify important questions regarding both the effects of deprivation and the degree of recovery that is possible.

Author note

Additional members of the BEIP Core Group: Susan W. Parker (Randolph Macon College, USA) and Hermi R. Woodward (University of Pittsburgh/MacArthur Research Networks, USA).

Acknowledgements

The Bucharest Early Intervention Project (BEIP) was funded by the John D. and Catherine T. MacArthur Foundation Research Network on Early Experience and Brain Development (Charles A. Nelson, Network Chair). The authors wish to acknowledge the many invaluable contributions of their Romanian partner institutions, the SERA Romania Foundation, the Institute for Maternal and Child Health (IOMC), and the Department for Social Welfare (DGAS), Sector 1, Bucharest. They are also deeply grateful to their Romanian team whose hard work and dedication have made this study possible. Thanks to Donald Guthrie and Scott Keith for assistance with data analysis.

Correspondence to

Anna T. Smyke, Tulane University Health Sciences Center, Department of Psychiatry/Neurology, 1440 Canal Street TB-52, New Orleans, LA 70112, USA; Email: asmyme@tulane.edu

References


Manuscript accepted 24 July 2006