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# Attachment in Institutionalized and Community Children in Romania

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This study examined attachment in institutionalized and community children 12–31 months of age in Bucharest, Romania. Attachment was assessed using ratings of attachment behaviors and ratings of caregiver descriptions in a structured interview. As predicted, children raised in institutions exhibited serious disturbances of attachment as assessed by all methods. Observed quality of caregiving was related to formation and organization of attachment in children living in institutions. These results held even when other variables, such as cognitive level, perceived competence, and quantitative interaction ratings, were controlled for. Ratings of attachment behavior in the Strange Situation and caregiver reports of signs of Reactive Attachment Disorder converged moderately. The implications of these findings for different perspectives on attachment are discussed.

Children raised in institutions are at dramatically increased risk for a variety of social and behavioral problems, including disturbances of attachment (Zeanah, 2000). In fact, disturbances of attachment have been central to the literature on the effects of institutionalization for more than 50 years. Descriptive studies of institutionalized children by Spitz (1945), Goldfarb (1945), Provence and Lipton (1962), and Wolkind (1974) among others, documented the aberrant behaviors that later came to comprise the clinical syndrome of Reactive Attachment Disorder (RAD).

Perhaps the most important early study in this regard was Tizard's study of young children placed in residential nurseries in London in the 1960s (Tizard & Hodges, 1978; Tizard & Rees, 1975). She identified a group of 65 children placed in these nurseries at birth or soon thereafter. Between the ages of 2 and 4 years, 24 of the children were adopted, 15 of the children were returned to their birth families, and another 26 remained institutionalized. When the 26 still institutionalized children were assessed at age 4 years, eight (30.8%) were emotionally withdrawn and unresponsive, displaying unusual social behaviors and no evidence of discriminated attachments. Another 10 (38.4%) children were indiscriminate, approaching and seeking attention from relative strangers as readily as from familiar caregivers. The remaining eight (30.8%) children had managed to develop a preferred attachment to a caregiver at the nursery (Tizard & Rees, 1975). The first two clusters of children comprised an important basis for the criteria later used to define two clinical types of RAD, the emotionally withdrawn/inhibited type and the indiscriminately social/disinhibited type, which are described in both the *Diagnostic and Statistical Manual of Mental Disorders* (4th ed., text rev. [*DSM–IV–TR*]; American Psychiatric Association, 2000) and *The ICD-10 classification of mental and behavioral disorders: Clinical descriptions and diagnostic guidelines* (World Health Organization, 1992).

This clinical approach to disturbed attachment in children raised in institutions has continued in contemporary studies. Smyke, Dumitrescu, and Zeanah (2002), for example, studied signs of RAD in young children raised in a single, large institution in

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Bucharest, Romania. They found significantly more signs of both types of RAD in the institutionalized group compared with a never institutionalized community group attending child care. More importantly, they also found that children from two different units in the same institution demonstrated differences in the frequency with which they showed signs of RAD. On the unit in which the total number of caregivers assigned to each child during 1 week was reduced from 17 to 4, children had significantly fewer signs of both emotionally withdrawn/inhibited and indiscriminately social/disinhibited RAD. One purpose of the present study is to attempt to replicate findings of signs of both emotionally withdrawn/inhibited and indiscriminately social/disinhibited RAD in a larger and more representative sample of children raised in institutions in Bucharest.

In addition to this study of currently institutionalized children, two longitudinal studies of children adopted out of Romanian institutions have reported consistently high levels of indiscriminate or disinhibited attachment behavior. Chisholm, Carter, Ames, and Morison (1995) and Chisholm (1998) found indiscriminate behavior to be one of the most persistent social abnormalities in her study of children adopted out of institutions. She identified indiscriminate "friendliness" in a number of children at a median of both 11 and 39 months post adoption.

In the Chisholm sample, measures of indiscriminate friendliness did not map well onto measures of security of attachment. Chisholm (1998) found that although security of attachment (measured by parent report) between these children and their adoptive mothers increased significantly between 11 and 39 months after adoption, levels of indiscriminate friendliness did not diminish, at least in the group adopted after 8 months of age. In addition, in a home-based separation–reunion procedure that was administered to children after adoption from institutions (time post adoption: $M = 39$ months), Chisholm found that the majority of children adopted from Romania after 8 months of age had unusual, atypical insecure patterns of attachment. She did find, however, higher scores on 1 of 2 measures of "indiscriminate friendliness" in insecurely vs. securely attached children adopted out of institutions.

O'Connor, Bredenkamp, Rutter, and the ERA Study Team (1999) and O'Connor, Rutter, and the ERA Study Team (2000) also identified indiscriminate behavior in a number of children adopted from Romanian institutions into the United Kingdom, who were assessed at ages 4 and 6 years. A longer duration of deprivation (operationalized as length of institutionalization) was linearly related to signs of indiscriminate behavior in the children at follow-up. Comparing parents' reports of disinhibited behavior to children's attachment classifications in a home-based version of the Strange Situation Procedure, this group found some convergence (O'Connor, Marvin, Rutter, Olrick, Britner, & ERA Study Team, 2003). That is, children reported to be highly indiscriminate were more likely to have Strange Situation Procedure classifications that were neither secure nor organized insecure. In fact, in their Romanian sample, 73% of the highly indiscriminate children were classified as insecure-disorganized/controlling or insecure-other, and 27.5% of the children with these unusual classifications had highly indiscriminate behavior. Another purpose of the present study is to examine convergence of SSP classifications of attachment and indiscriminate sociability in currently institutionalized children.

Notably absent from the Chisholm (1998) and O'Connor et al. (2000, 2003) samples is any description of the emotionally withdrawn/inhibited type of RAD. This absence is in contrast to the Smyke et al. (2002) findings, which indicated that a substantial minority of young institutionalized children in Romania had clear signs of the emotionally withdrawn/inhibited type. Zeanah and Smyke (2002) suggested that this discrepancy could be explained by children forming attachments following adoption. Once attachments have formed, children no longer show absence of attachment, which is what the emotionally withdrawn/inhibited type describes (see also Zeanah, 1996, 2000; Zeanah & Boris, 2000). Another purpose of the current study is to replicate and to extend those findings by examining, for the first time, the Strange Situation classifications of attachment in institutionalized children reported to have high levels of emotionally withdrawn/inhibited RAD.

Because the Strange Situation was developed to assess quality of attachment between child and caregiver (Ainsworth, Blehar, Waters, & Wall, 1978), it is unclear how well it can detect the presence or absence of attachment, which is likely to be an important question in institutional settings. Only one previous study has examined Strange Situation classifications of attachment in young children and their caregivers in the context of institutions. Vorria et al. (2003) found that 66% of the Greek institutionalized infants (11–17 months of age) whom they studied had disorganized attachments with their caregivers, and another 8% had unclassifiable attachments. Only 24% of the children were securely attached to their caregivers. By contrast, in a comparison group of home-reared infants, 41% were securely attached, 25% were disorganized, and 22% were unclassifiable. Even though these differences were sub-

stantial, the authors speculated that this comparison group may not have been typical of Greek infants as they were recruited from child-care centers, and it is reported to be unusual for infants in Greece to attend child care (Vorria et al., 2003). In any case, neither birth weight, prematurity, health status, gender, ethnicity, temperament, cognitive abilities nor caregiver sensitivity distinguished between secure and disorganized infants in the institutionalized group.

Another purpose of the current study is to determine if patterns of attachment between institutionalized young children and their caregivers can be assessed using the Strange Situation in Romanian institutions. This is an important question, because the Strange Situation traditionally has assumed that an attachment exists and has been used to determine the quality of that attachment. Although it was used in a study of attachment among institutionalized children in Greece, more favorable caregiving ratios there (1 : 4–6 [Vorria et al., 2003]) made it more likely that discriminated attachment relationships would exist in Greek institutions than in Romanian institutions where the ratio of caregivers to children is typically 1 : 12 (Smyke et al., 2002; Zeanah et al., 2003).

In addition to ratios of caregivers to children, the question of the quality of caregiving that children receive in institutions is important. Although previous studies of children adopted out of institutions (Chisholm, 1998; O'Connor et al., 2003) and of children living in institutions (Smyke et al., 2002; Tizard & Rees, 1975) have demonstrated significant individual differences in the children's attachment behaviors, only one previous study has attempted to demonstrate an association with individual differences in caregiver behavior. In particular, it seems important to know if, within the context of a relatively depriving social environment, individual differences in caregiving behavior are related to children's attachment. Vorria et al. (2003) found no relationship between caregiver sensitivity and security of attachment. Nevertheless, they assessed caregiver sensitivity from only 20 min of free play rather than from more naturalistic interactions. Another purpose of the present study is to examine quality of caregiver behavior observed naturalistically in relation to children's attachment in the institutional setting.

In order to address the aforementioned questions, we used baseline data drawn from the Bucharest Early Intervention Project (BEIP), a randomized controlled trial of foster care, as an alternative to institutionalization that is being conducted in Bucharest, Romania. The study included all institutionalized children in Bucharest who were not scheduled for imminent international adoption or who had severely handicapping conditions (see Zeanah et al., 2003, for details).

In the current investigation, we addressed the following questions: (1) Are there more signs of both indiscriminately social/disinhibited and emotionally withdrawn/inhibited RAD in institutionalized children compared with community children? Based upon previous findings about young children in institutions (Smyke et al., 2002; Tizard & Rees, 1975), and findings regarding children adopted out of institutions (Chisholm, 1998; O'Connor et al., 2000, 2003), we predicted that both types of RAD would be more common in the institutionalized group. (2) Is it possible to identify patterns of attachment between young children living in institutions and their "favorite" caregivers? We believed that it should be possible to demonstrate attachments between young children and caregivers by the use of the Strange Situation and by caregiver report. (3) Are disorganized attachments the predominate classification, and are there proportionately fewer organized patterns of attachment in institutionalized children compared with community children in Bucharest? Based on the Vorria et al. (2003) results, and the less optimal ratio of caregivers to children in Romanian institutions, we predicted that the answers to both questions would be "yes." (4) Is there convergence between Strange Situation Procedure classifications of attachment and caregiver reports of signs of RAD? We predicted that there would be convergence, although the two previous studies that have addressed this question in post-institutionalized children have yielded mixed results (Chisholm, 1998; O'Connor et al., 2003). (5) Is the quality of caregiving related to classifications of attachment and/or to signs of RAD? We predicted that young children with organized attachments would have more sensitive/responsive caregivers than those who did not have organized attachments, in both institutionalized and community groups. We also predicted lower quality of caregiving would be associated with increased signs of both emotionally withdrawn/inhibited and indiscriminately social/disinhibited RAD. (6) Does cognitive impairment and/or perceived competence explain children's attachment in the institutional setting? We predicted that although both cognitive level and perceived competence would be related to attachment, neither would be sufficient to explain it.

## Method

### *Participants*

Two groups of children participated in this study. Each was drawn from children participating in the BEIP (Zeanah et al., 2003), an investigation of foster

care as an alternative intervention for young children in institutions. The first group was 136 children (Institutionalized Group) who had spent on average 90% of their lives in institutions in Bucharest, Romania. The second was a group of 72 Romanian children who had never been institutionalized and who were recruited from pediatric clinics affiliated with the Institute of Maternal and Child Health in Bucharest. These 72 children served as a never institutionalized community comparison group (Never Institutionalized Group or Community Group). Because we wanted to include children who were cognitively capable of forming attachments, for this study, we selected children from the total BEIP sample who were at least 12 months of age and who had a cognitive age of at least 11 months (derived from Bayley scores). Thus, the current sample comprises 95 children in the institutional group and 50 children living with their parents in the community (proportionately more of the community group were chronologically younger at baseline—see Zeanah et al., 2003). There were 52 boys and 43 girls in the Institutionalized Group, and their age ranged from 12 to 31 months ($M = 23.85$, $SD = 4.85$). The Never Institutionalized Group comprised 25 boys and 25 girls, who also ranged from 12 to 31 months of age ($M = 22.25$, $SD = 5.01$). Demographic data for the sample, presented in Table 1, demonstrate that only an overrepresentation of children of Rroma ethnicity in the Institutionalized Group distinguished the groups.

Table 1
*Demographics of Study Sample*

| Child characteristics | Institution Group ($n = 95$) | Never Institutionalized Group ($n = 50$) | Significance |
|---|---|---|---|
| Age in months (*SD*) | 23.85 (4.85) | 22.25 (5.01) | *ns* |
| Ethnicity | | | |
| Romanian | 53.5% | 90.0% | $\chi^2(3) = 24.56$ |
| Rroma (Gypsy) | 32.3% | 6.0% | $p < .001$, $w = .41$ |
| Unknown/Other | 14.1% | 4.0% | |
| Gender | | | |
| Female | 47.5% | 50.0% | *ns* |
| Male | 52.5% | 50.0% | |

*Note. ns*, nonsignificant.

### *Measures*

*Attachment*. Attachment quality was assessed using the Strange Situation Procedure (Ainsworth et al., 1978). Community children were assessed with their mothers. Institutionalized children were assessed with their ''favorite'' caregivers, as determined by consensus of the staff. If no favorite caregiver could be identified, the child was seen with a caregiver who worked regularly with the child and knew the child well. Procedures for all participants were conducted in standard laboratory settings. Markers distinguishing group status were eliminated (e.g., all caregivers dressed in street clothes). Videotaped assessments were coded by expert raters (Elizabeth Carlson and Alan Sroufe) unaware of children's group status.

Based on the patterning of infant behavior across assessment episodes, dyads were assigned to one of four major classifications: secure (B), anxious avoidant (A), anxious resistant (C), and disorganized/disoriented (D) (Ainsworth et al., 1978; Main & Solomon, 1990). Interrater reliability for classifications was adequate ($\kappa = .78$). Differences were resolved by conferencing.

A 5-point rating scale (see Appendix A) was developed in order to document the range of child behavior exhibited in the assessment that did not fit the traditional classification scheme, but appeared to reflect the degree of, or stages in, attachment formation (Ainsworth, 1967) (see Appendix A). Ratings of ''5'' indicated attachment behavioral organization consistent with traditional A, B, C, and D classifications. Ratings of ''4'' indicated evidence of attachment behavioral organization and the presence of extreme or pervasive behavioral anomalies (beyond the scope of traditional disorganization coding). Ratings of ''3,'' ''2,'' and ''1'' were assigned for behavioral displays ranging from fragmented or incomplete sequences of attachment behavior differentially directed toward the caregiver, to isolated attachment signals and responses, to no evidence of attachment behavior. Because the attachment formation rating was developed for use with the current sample, external measures of validity were not available. Intraclass correlation coefficient for interrater reliability was .96 ($n = 45$).

In summary, all participants were assigned traditional attachment classifications and attachment formation ratings. Categorical attachment distinctions (ABCD), however, were meaningful (interpretable in relation to attachment literature) only within subsamples of children receiving ratings of ''4'' or ''5.'' Categorical distinctions associated with lower ratings represented ''forced'' classifications assigned to minimal displays of behavior.

*Attachment disorder*. The Disturbances of Attachment Interview (Smyke & Zeanah, 1999), a semi-structured interview, was used to assess signs of clinical disturbances of attachment. The interview has been shown to distinguish between institutionalized and never institutionalized children in Romania (Smyke et al., 2002; Zeanah, Smyke, & Dumitrescu, 2002) and to identify signs of RAD reliably in young, maltreated children (Zeanah et al., 2004). In previous research (Smyke et al., 2002; Zeanah et al., 2002), it has been shown to converge with similar measures used in other studies of signs of RAD (Chisholm, 1998; O'Connor & Rutter, 2000), and it diverged from measures of aggression, stereotypies, and language development. It includes 12 items, each of which is explored through a series of probes. Trained interviewers probed sufficiently to be able to rate each item as "0" = "none or never," "1" = "somewhat or sometimes," and "2" = "considerable or frequently." Each interview was coded by two native Romanian coders, and discrepancies were resolved by conferencing, leading to a consensus code for each item.

The first five items of the interview assess signs of emotionally withdrawn/inhibited RAD, with scores ranging from 0 to 10. The next three items assess signs of indiscriminately social/disinhibited RAD, with scores ranging from 0 to 6. There are four additional items, assessing self-endangering behavior, clinging/inhibited behavior, vigilant/hypercompliant behavior, and role-reversed behavior, that were not included in this study.

*Caregiving environment*. The Observational Record of the Caregiving Environment (ORCE; NICHD Child Care Research Network, 1996, 1997, 2003) was adapted and used to assess a specific child's caregiving environment in either the institution or the home setting.

We adapted the ORCE for our purposes in two key ways. First, we videotaped subjects in their environment, rather than using the "live coding" approach used in the NICHD study. Thus, a research assistant went to the institution or home in which the child resided and videotaped the "target child" with his or her favorite caregiver for $1\frac{1}{2}$ hr. In contrast to the original ORCE procedure, which consisted of live coding *in situ*, we felt that having coders blind to the hypotheses of the study able to code a given episode was an advantage. Secondly, we added qualitative items that we thought would be important in helping us to understand the child's experience in this particularly at-risk caregiving environment, such as marked dysregulation, stereotypical behavior, and communicative gesture.

Training for coding of the Adapted ORCE consisted first of a period of several months during which a thorough orientation to all items in the manual was conducted. In all, on the behavior scales, there were 55 items that assessed caregiver behavior (e.g., positive physical contact, asks questions of child) as well as child behavior (e.g., activity with objects, unoccupied/watching).

First, coders watched the tape for 10 min and then began to code items at the first even time (e.g., 12 : 20 : 00) that occurred after the initial observation. This rule was established to ensure that double coding would be feasible. Coders then watched for a 30 s observation period and proceeded to mark behavioral items as present or not present during the subsequent 30 s coding period. The observation/coding cycle was conducted for 10 min, followed by a 2 min observation/no coding episode, and then followed by two more observation/coding cycles, separated by another 2 min observation/no coding episode. At the end of these observation/coding cycles, another 10 min observation period took place.

Qualitative items were then rated on a scale ranging from 1 (*not at all characteristic*) to 4 (*highly characteristic*). Examples of qualitative items included caregiver detachment and sensitivity to child distress. Caregiver detachment was characterized by lack of emotional involvement and failure to respond contingently to the child's cues. Among other behaviors, coders looked for caregivers who did not make eye contact with the child and caregivers who provided instrumental care to the child in a mechanical way without talking or interacting with the child. Sensitivity to child distress was assessed by noting how long it took caregivers to respond when children exhibited distress, noting the number of times during which distress elicited a response, and finally, whether the caregiver used appropriate means to soothe the child.

After orientation and coding of practice tapes, coders completed 10 reliability tapes, which consisted of observations of children and caregivers from the New Orleans community and observations collected in institutional settings during the pilot/feasibility phase of the BEIP. Having established reliability, coders discussed differences in particular ratings. For the current sample, 40% of tapes were randomly selected for double coding to ensure the ongoing fidelity of the process (reliability = 95%).

*Cognitive abilities*. The Bayley Scales of Infant Development II (BSID-II; Bayley, 1993), a well-known measure of cognitive development, were used to assess

the developmental status of study participants. It was administered to all children at the baseline evaluation, with the exception of one child from the Institutionalized Group who was ill.

Training in the administration of the BSID II was conducted by an American psychologist who had extensive experience with its use. Romanian personnel were familiar with the original BSID and easily mastered the administration of the revised measure. The Mental Development Index (MDI) scaled score ranges from 50 to 150. Children who obtained raw scores that placed them below 50 for their chronological age were assigned a numeric score of 49. The number of children with scaled MDI scores less than 50 was 28, all of whom belonged to the Institutionalized Group. All raw scores also were assigned an extrapolated age equivalent score to enable analyses across the sample when scaled scores $<50$ were obtained (Lindsey & Brouwers, 1999). Extrapolated age scores were divided by chronological age and that amount was multiplied by 100 to produce a Developmental Quotient (DQ) for each participant.

*Child behavior problems and competence*. The Infant Toddler Social Emotional Assessment (ITSEA; Carter & Briggs-Gowan, 2000) is a 195-item questionnaire that was administered to caregivers to assess a variety of problem behaviors and competencies in children 12–48 months of age. For purposes of this report, we included only the competence score, derived from six subscales (Attention, Compliance, Imitation/Play, Mastery Motivation, Empathy, Prosocial Peer Relations). The convergent validity of this scale has been demonstrated (Carter, Briggs-Gowan, Jones, & Little, 2003).

The measure had not been used in Romania previously, and therefore it was translated into Romanian and back-translated into English to check for accuracy. Careful attention was paid in pilot testing to the meaning and cultural appropriateness of each item.

*T* scores were available from the original standardization sample in the United States and *T* scores were also generated for each subscale, using the mean and standard deviation information produced for each scale in the manual. Internal consistency assessment of this measure suggested appropriate reliability for the Competence scale ($\alpha = .92$).

### *Procedures*

Children from the Institutionalized Group were recruited with the assistance of the National Authority for Child Protection, and the Commissions for Child Protection in all five of the six sectors of Bucharest that have institutions for young children. Children from the Never Institutionalized Group were recruited from pediatric clinics administered by the Institute for Maternal and Child Health in Bucharest (see Zeanah et al., 2003). Assessments, including Strange Situation Procedures, and interviews were conducted at the BEIP laboratory in Bucharest. "Home" observations were made in the institutional settings of the Institutionalized Group and in the homes of the Never Institutionalized Group, where $1\frac{1}{2}$hr of "typical behavior" were videotaped and later coded.

## Results

There were no associations between age, gender or ethnicity of children, and measures of attachment.

### *Signs of RAD*

Institutionalized children ($M = 1.92$, $SD = 2.04$) had significantly higher levels of RAD emotionally withdrawn/inhibited ratings than Never Institutionalized children ($M = .26$, $SD = 0.57$), $t$ (135) = 5.3, $p < .001$, $d = .91$. Institutionalized children ($M = 2.17$, $SD = 1.71$) also received higher ratings of RAD indiscriminately social/disinhibited than children in the Never Institutionalized comparison group ($M = 1.39$, $SD = 1.27$), $t$ (138) = 2.85, $p < 01$, $df = .49$. Figures 1 and 2 illustrate differences in the distribution of scores in the Institutionalized Group and the Never Institutionalized Group. These differences also were significant, RAD emotionally withdrawn/inhibited, $\chi^2(2) = 42.74$, $p < .001$, $w = .51$, and RAD indiscriminately social/disinhibited, $\chi^2(2) = 10.86$, $p < .01$, $w = .47$.

Within the Institutionalized Group, there was no apparent relationship between length of institutionalization and signs of either RAD emotionally withdrawn/inhibited ($r = -.05$, $p > .05$) or RAD indiscriminately social/disinhibited ($r = -.074$, $p > .05$).

### *Strange Situation Classifications*

Distributions of Strange Situation Procedure classifications are shown in Table 2. Of note, only 22% of young children in institutions had organized attachment strategies in interactions with their "favorite" caregivers, whereas 78% of children living with their parents had organized attachments to their mothers. These distributions were significantly different, $\chi^2(1) = 43.283$, $p < .001$, $w = .54$. Fully 12.6% of the institutionalized group had so little attachment behavior that it could not even be classified disorganized and instead received a designation of unclassifiable.

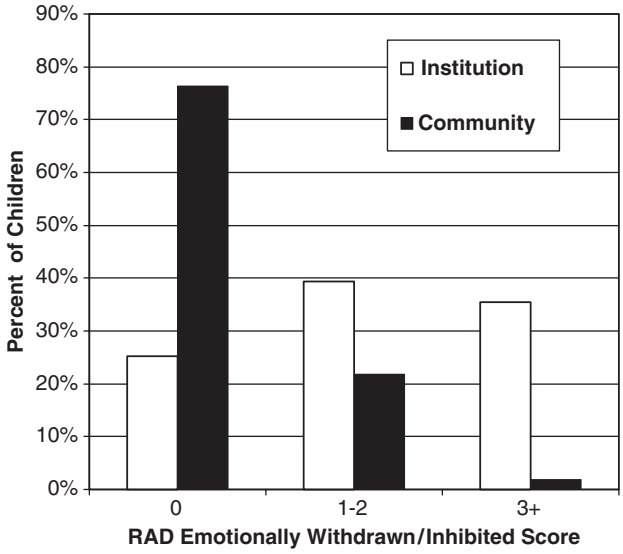


*Figure 1*. Distribution of scores on the Reactive Attachment Disorder (RAD) emotionally withdrawn/inhibited scale (possible range: 0–10).

### *Continuous Ratings of Strange Situation Procedure Attachment Behavior*

Table 3 shows the distribution of continuous 5-point ratings of attachment behavior in the Strange Situation Procedure in children in the Institutionalized Group and Never Institutionalized Group. Remarkably, every community child living with parents had an attachment rating of "5," whereas only 3/95 children living in institutions had such a rating. Furthermore, except for one child rated as securely attached, all of the other organized attachment classifications in the Institutionalized Group were rated as less than a "5." There was also a notable difference in the distribution of disorganized attachments, which were all rated as "5" in the Never Institutionalized Group but which ranged from "2" to "5" in the Institutionalized Group.

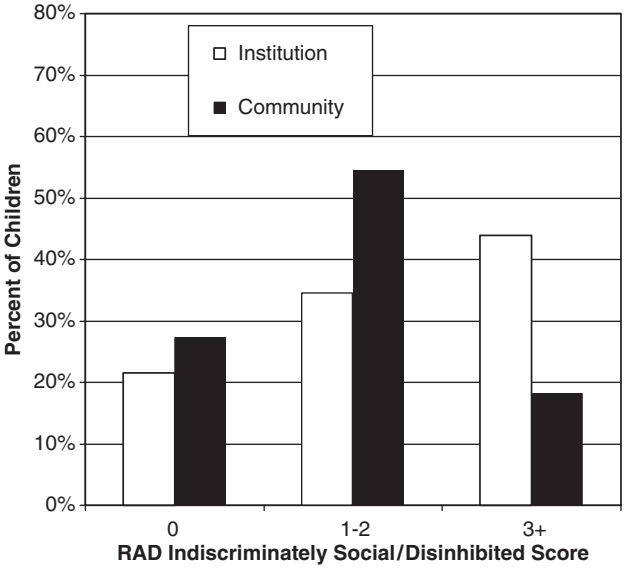


*Figure 2*. Distribution of scores on the Reactive Attachment Disorder (RAD) indiscriminately social/disinhibited scale (possible range: 0–6).

Table 2
*Distribution of Strange Situation Procedure Classifications*

| Strange Situation Procedure Classification | Institution Group (%) ($n = 95$) | Never Institutionalized Group (%) ($n = 50$) |
|---|---|---|
| Secure | 18.9 (18) | 74.0 (37) |
| Avoidant | 3.2 (3) | 4.0 (2) |
| Resistant | 0.0 (0) | 0.0 (0) |
| Disorganized | 65.3 (62) | 22.0 (11) |
| Unclassifiable | 12.6 (12) | 0.0 (0) |

### *Convergence of Attachment Measures*

Within the institutionalized group, continuous ratings of attachment were moderately correlated with caregiver ratings of RAD emotionally withdrawn/inhibited, $r = -.44$, $p < .01$, but they were unrelated to ratings of RAD indiscriminately social/disinhibited behavior, $r = -.16$, $p = .07$. In addition, we examined caregiver ratings in Organized vs. Not Organized Strange Situation Procedure classifications in the Institutionalized Group and the Never Institutionalized Group. Regardless of the rearing environment, having an organized attachment was not significantly related to caregiver ratings of signs of either type of RAD.

### *Quality of Caregiving and Classifications of Attachment*

Within the Institutionalized Group, analysis of variance (ANOVA) was used with attachment status (organized vs. disorganized vs. unclassified) as the grouping variable to examine quality of caregiving. Scores of children who fell in the Organized and Disorganized groups ($M = 15.43$, $SD = 3.16$; $M = 14.41$, $SD = 3.59$, respectively) were not different from one another but were greater than those of children in the Unclassified group ($M = 11.54$, $SD = 2.55$), $F(1, 92) = 5.107$, $p < .01$. *Post hoc* Tukey's testing indicated that the quality of caregiving received by the children in the Unclassified group was

Table 3
*Distribution of Continuous Ratings of Attachment*

| Attachment rating | Never Institutionalized Group (%) | Institution group (%) | Strange Situation Procedure Classifications Institution Group |
|---|---|---|---|
| 1 = No attachment behavior | 0 | 9.5 | Unclassifiable: 9 |
| 2 = Some differentiation | 0 | 25.3 | Secure: 7 Avoidant: 3 Disorganized: 11 Unclassifiable: 3 |
| 3 = Preference but passive expression | 0 | 30.5 | Secure: 7 Disorganized: 22 |
| 4 = Attachment with anomalies | 0 | 31.6 | Secure: 3 Disorganized: 27 |
| 5 = Clear ABCD attachment patterns | 100 | 3.2 | Secure: 1 Disorganized: 2 |

poorer than that received by the Organized group ($p = .006$) and by the Disorganized group ($p = .024$).

Within the Institutionalized Group, multiple linear regression was used to examine possible relationships between the continuous ratings of attachment and quality of caregiving, cognitive level, and competence measures. Only institutionalized children were considered in these regressions because all the children who had never been institutionalized had attachment ratings of "5."

After controlling for the effects of cognitive development, quantitative aspects of caregiver–child interaction, and competence score, the only measure that significantly predicted attachment rating in institutionalized children was quality of caregiving, $F(4, 77) = 3.942$, $p = .006$ (see Table 4). Each unit increase in the quality of caregiving was associated with an increase in attachment rating of .119.

For purposes of determining the likelihood that a child in the institution had an organized attachment (as opposed to disorganized, with unclassified excluded), logistic regression was used with attachment rating, cognitive development, competence score, quantitative aspects of caregiver–child interaction, and quality of caregiving as possible factors. After controlling for the effects of the aforementioned factors, attachment rating (Wald = 6.793, $p = .009$, $df = 1$) and quality of caregiving (Wald = 3.951, $p = .047$, $df = 1$) were the only significant factors. Table 5 lists the odds ratio, 95% confidence interval, and significance level for each factor. An increase of 1 unit in attachment rating was associated with an increase in the odds of an institutionalized child having an organized attachment by a factor of .379. An increase of 1 unit in quality of caregiving was associated with an increase in the odds of an institutionalized child having an organized attachment by a factor of 1.292. When children from the Unclassified group were included in the disorganized group, and the same factors were used in the logistic regression, quality of caregiving was the only significant factor (Wald = 4.409, $p = .036$, $df = 1$). Table 6 lists the odds ratio, 95% confidence interval, and significance level for this analysis. An increase of one unit in quality of caregiving was associated with a 30% increase in the odds of an institutionalized child having an organized attachment.

Similar logistic regressions performed on the Never Institutionalized Group revealed that there appeared to be no differences in the odds of a child developing an organized attachment based on attachment rating, cognitive development, competence

Table 4
*Regression on Strange Situation Procedure Attachment Continuous Ratings in Institutionalized Children*

| | *R* | *B* | *SEB* | β |
|---|---|---|---|---|
| Cognitive development | .26 | .01 | .01 | .13 |
| Competence score | .25 | .01 | .01 | .10 |
| Quantitative aspects of caregiver–child interaction | .10 | −.09 | .06 | −.20 |
| Quality of caregiving | .34 | .12 | .05 | .39** |
| Constant | | .37 | .77 | |
| Model $R^2$ | .17 | | | |

**$p < .01$.

Table 5
*Logistic Regression on Organized vs. Not Organized Attachment in Institutionalized Children*

| | OR | 95% CI | *p* value |
|---|---|---|---|
| Attachment rating | 0.379 | 0.183 – 0.786 | .009** |
| Cognitive development | 1.041 | 0.979 – 1.106 | .204 |
| Competence score | 0.961 | 0.911 – 1.014 | .145 |
| Quantitative aspects of caregiver – child interaction | 0.861 | 0.627 – 1.182 | .353 |
| Quality of caregiving | 1.292 | 1.004 – 1.663 | .047* |
| Constant | 0.076 | | .248 |
| Model $\chi^2$ (*df*) | 74.608 (5)*** | | |

*Note*. Nagelkerke Pseudo $R^2 = .213$; OR, odds ratio; CI, confidence interval.
*$p < .05$; *$p < .01$; ***$p < .001$.

score, quantitative aspects of caregiver – child interaction, or quality of caregiving.

In the Institutionalized Group only, quality of caregiving was related to RAD emotionally withdrawn/inhibited scores, $r = -.32$, $p = .001$, but unrelated to RAD indiscriminately social/disinhibited scores, $r = -.14$, $p = .16$.

## Discussion

This is the largest and most comprehensive study of attachment conducted to date in institutionalized children, and it replicated and extended findings of previous studies in a number of ways. As predicted by attachment theory, serious disturbances of attachment are the rule rather than the exception in children raised in the relatively socially deprived context of contemporary institutions for young children in Romania. We studied disturbances of attachment using three different approaches, and in each case, differences between children raised in institutions and children raised in families were substantial.

From the clinical perspective of RAD, institutionalized children clearly demonstrated more signs of both emotionally withdrawn/inhibited RAD and indiscriminately social/disinhibited RAD than never institutionalized children from the community. This replicates the findings of Smyke et al. (2002) but with a larger and more representative sample of children, who were drawn, in fact, from all of the institutions for young children in Bucharest. Interestingly, within the ages studied, 11 – 31 months of age, there was no relationship between length of institutionalization and signs of RAD emotionally withdrawn/inhibited and RAD indiscriminately social/disinhibited. Findings relating length of institutionalization to signs of RAD have come from adoption studies (e.g., O'Connor & Rutter, 2000), that is, studies in which a presumed dramatic improvement in the environment has occurred. In this sample, the lack of relationship likely results from the fact that the children are still in the adverse caregiving environment.

Findings about signs of RAD in this sample were amplified by assessments of attachment from the developmental perspective using the Strange Situation Procedure. Assessed with their ''favorite'' care-

Table 6
*Logistic Regression on Organized vs. Not Organized Attachment in Institutionalized Children (includes Unclassified)*

| | OR | 95% CI | *p* value |
|---|---|---|---|
| Attachment rating | 0.69 | 0.39 – 1.22 | .199 |
| Cognitive development | 1.024 | 0.97 – 1.08 | .405 |
| Competence score | 0.98 | 0.93 – 1.03 | .453 |
| Quantitative aspects of caregiver – child interaction | 0.86 | 0.63 – 1.19 | .366 |
| Quality of caregiving | 1.295 | 1.02 – 1.65 | .036* |
| Constant | 0.013 | | .035* |
| Model $\chi^2$ (*df*) | 79.68 (5)*** | | |

*Note*. Nagelkerke Pseudo $R^2 = .12$; OR, odds ratio; CI, confidence interval.
*$p < .05$; ***$p < 0.001$.

givers, most institutionalized children had failed to organize an attachment to that caregiver. The levels of unclassifiable and disorganized attachment in this investigation are comparable with the only other study of institutionalized children using the Strange Situation Procedure (Vorria et al., 2003) and to a study of maltreated toddlers and their caregivers (Carlson, Cicchetti, Barnett, & Braunwald, 1989).

One of the most important findings of the study was that even when the children had discernible attachment patterns, the patterns appeared to be anomalous or incompletely developed. This was reflected in the enormous discrepancy between the Never Institutionalized Group, all of whom had attachment behavior in the Strange Situation Procedure rated at the highest level (''5''), and the Institutionalized Group where only 3% had their attachment at the same level. In fact, 14/18 (78%) institutionalized children who had attachments classified as ''secure'' were rated as ''3'' or lower on the continuous rating of level of attachment formation. These results strongly suggest that secure attachments in the Institutionalized Group are not comparable with secure attachment in the Never Institutionalized Group, where 100% of the secure attachments were rated as a ''5'' on the continuous rating. Similarly, even disorganized attachment in the Institutionalized Group and the Never Institutionalized Group was different, as all of the disorganized attachments in the Never Institutionalized Group were rated as ''5,'' but only 2/62 children in the Institutionalized Group who had disorganized attachments were rated as ''5.'' Thus, even though the distributions are strikingly different in institutionalized and community children, a simple comparison of the distributions of attachment classifications underestimates the magnitude of the differences in attachment. Clearly, the meaning of secure and disorganized classifications of attachment in the community and institutionalized groups are different.

To put these findings into perspective, it is worth recalling that Stovall and Dozier's (2000) diary data suggested that young children begin to organize attachment patterns to new caregivers, that is, foster parents, within days of placement. On the other hand, these patterns were quite easily disrupted by separations such as respite care, implying a lack of robustness. The continuous ratings of attachment behavior in the Strange Situation Procedure in the institutionalized children we studied also seem to reflect a lack of completeness or fullness compared with the attachment behaviors of young children living with their families. The difference, of course, is that in the Stovall and Dozier sample, the children were in the early stages of constructing a relationship with a new caregiver, so that we would anticipate the behaviors becoming more robust over time. In contrast, the institutionalized children we studied were in a chronic state of deprivation in which the amount and quality of contact that they received was unlikely to change significantly, barring some unusual development.

Although it may be premature to derive firm conclusions from an initial study, nevertheless, these results suggest that the majority of institutionalized children in this study were not able to form selective attachments to their caregivers. Tentatively, we suggest that Levels 4 and 5 are compatible with selected attachments, but Levels 3 and below are not. The clear implication of these findings is that, in high-risk samples (e.g., maltreated children), in addition to classifications of attachment, the degree of attachment formation also needs to be assessed. Failure to examine this additional perspective may obscure important differences. Longitudinal data are needed to determine the course and outcome of level of attachment formation.

The moderate association between caregiver reports of signs of emotionally withdrawn/inhibited RAD and ratings of the child's behavior with the caregiver in the Strange Situation Procedure provides evidence of cross-validation for both the interview measure and the continuous rating of attachment behavior. The fact that the convergence was only moderate also demonstrates that they provide somewhat different indices of attachment disturbance. Furthermore, the convergence between *ratings* of attachment in the Strange Situation Procedure and reports of signs of RAD emotionally withdrawn/inhibited vs. the lack of convergence between Strange Situation Procedure *classifications* of attachment and signs of RAD provides some insight into the relationship between clinical and developmental perspectives on attachment. That is, these results suggest that clinical disturbances, as reflected in signs of RAD, are related to how fully developed and expressed attachment behaviors are, but not necessarily to the organization of any particular pattern of attachment (see also Ainsworth, 1990 and Marvin & Britner, 1999, for a fuller discussion of this issue).

Interestingly, there was no relationship between caregiver ratings of indiscriminately social/disinhibited RAD and Strange Situation Procedure ratings of attachment behavior. This fails to replicate the O'Connor et al. (2003) findings, which showed that aberrant patterns of attachment were more common in children who had high ratings of indiscriminate

behavior. A study of young, maltreated and homeless children in the US also failed to demonstrate a clear association between RAD and Strange Situation Procedure classifications (Boris et al., 2004). Differences between these findings and those of O'Connor and colleagues may be because of the different ages of the children, the fact that Strange Situation Procedures in the O'Connor sample were conducted in the home rather than in the lab, problems with the interview itself, or differences in children living in institutions rather than with families.

Another important contribution of this study was the demonstration that the quality of the caregiving that the child received in the institutional setting was significantly related both to the continuous rating of attachment and to the child's organization of attachment. Impressively, these results held even when other variables, such as cognitive level, perceived competence, and quantitative interaction ratings, were controlled for. In contrast, there was no relationship between caregiving quality and attachment in the community setting. Previous studies suggest a consistent if modest effect of sensitive caregiving and secure attachment (DeWolff & van IJzendoorn, 1997; NICHD Early Child Care Research Network, 1997). The difference between institutionalized and community children observed here suggest that individual differences in caregiving may matter more in an environment of severe deprivation. Variability in caregiving quality within the community sample may have been too limited to capture differences that related to attachment (particularly given that the sample is so skewed toward secure).

This study does have some limitations that are important to acknowledge. First, Romanian institutions, which are characterized for the most part with particularly poor caregiver to child ratios, may not be representative of some institutions in other countries. Both in Greece (Vorria et al., 2003) and in older studies from the UK (Tizard & Hodges, 1978; Tizard & Rees, 1975), DQs in institutionalized children were within the normal range, whereas in this sample the average Bayley MDI score was 65 (see Zeanah, Smyke, & Koga, 2003). Nevertheless, the fact that the distributions of Strange Situation Procedure classifications in this sample were almost identical to those of Vorria et al. (2003) despite the large differences in cognitive performance suggests that attachment in toddlers is particularly vulnerable to disturbance in residential group care settings.

Second, these data are cross sectional, and a number of important questions await longitudinal follow-up. For example, the direction of effects of quality of care and patterns of attachment is unclear in a cross-sectional analysis. The answer to the direction of effects question has important implications for considerations of resilience. That is, although many have concurred that resilience to adversity in early childhood is associated with a supportive caregiving relationship at some point in development (Werner, 1971), it remains unclear whether child characteristics elicit the attention and affection of an adult caregiver, or whether resilient children were merely fortunate that a supportive and involved adult took an interest in them. Longitudinal follow-up of this sample, which includes random assignment of half of the Institutionalized Group to foster care, may provide important data on this question.

Third, differences in institutional caregiver reports of children's attachment behaviors and parent reports of community children's attachment behaviors may be because of differences in relationships between adults and children rather than to true differences in the children's behavior. This seems less likely as an explanation as the interview measure was also moderately related to the child's behavior in the Strange Situation and has been previously validated with institutionalized children in Romania (Smyke et al., 2002; Zeanah et al., 2002).

Coders of interviews (DAIs) and ORCE coders could not be completely blind to children's group status, although they were unaware of the design or hypotheses of the study. This could have led to bias in exaggerating differences between institutionalized and community children, although it should not have had an effect on within-group ratings. Additionally, these coders were not aware of any other characteristics of the children as determined by other measures. Strange Situation coders were, however, blind to children's group status.

Finally, assessment of Strange Situation Procedure classifications in children between 20 and 30 months poses challenges. Although many of the Institutionalized Group were significantly cognitively delayed, few of the Never Institutionalized Group were, and there may have been some children for whom either the MacArthur Preschool Attachment System (Cassidy & Marvin, 1992) or the Preschool Assessment of Attachment (Crittenden, 1994) might have been more appropriate. We chose to use the traditional Ainsworth et al. (1978) system, in part to use a uniform system for all children in the sample (as this was clearly applicable to the vast majority of the children) and in part because there is no clear gold standard for coding attachment classifications in children between 20 and 30 months of age.

Taken together with previous research on attachment and institutionalization, it is clear that attachment is a severely compromised developmental domain in young, institutionalized children. The importance of quality caregiving for young children in extreme conditions of social deprivation is clear. In the stark environments of institutions, a positive relationship with a caregiver is possible, although unlikely. Caregiver's sensitive responsiveness to children's distress and active engagement with the children enhances the probability of formation of a more developed and more organized attachment.

Essential questions about the potential for recovery of attachment, how timing of intervention relates to recovery, and which factors enhance or impede recovery, remain to be addressed in future research. Having a sample of children whose attachment behaviors in the institution were systematically and thoroughly characterized, means that follow-up of these children over time may provide a unique opportunity to address these questions in a way that has not been possible previously in studies of children adopted out of institutions.

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## Appendix

### *Attachment Formation Rating (Carlson, 2002)*

5—Child exhibits behavior consistent with one of four traditional attachment classification patterns (secure, anxious avoidant, anxious resistant, disorganized/disoriented) (Ainsworth et al., 1978; Main & Solomon, 1990). The child demonstrates a clearly recognizable pattern of attachment and exploratory behavior in relation to the caregiver.

4—A traditional attachment pattern is discernible, but attachment behaviors are associated with unusual behavioral anomalies. Attachment exploratory behavioral patterns are evident (e.g., child searched or showed caregiver-related distress on separation and initiated a response to the caregiver on reunion). Anomalous behaviors (distinct from those characteristic of disorganization) are pronounced, including vigorous or prolonged rocking when distressed, and extreme arousal/excitability in relation to the caregiver.

3—Child demonstrates a clear preference for the familiar caregiver over the stranger, but expresses this preference passively. The child may exhibit some caregiver-related distress (e.g., crying, rocking) during separation, and rarely, some search behavior. Caregiver–child interaction is still largely orchestrated by the caregiver; the

child may respond to caregiver initiatives with weak initiatives and/or limited change in affect.

2—Child demonstrates a discernible discrimination of familiar and unfamiliar adults, with a slight preference for the familiar caregiver. The child exhibits little change in behavior or affect in relation to caregiver presence or initiative. Activity is largely orchestrated by the caregiver.

1—Child demonstrates no attachment behavior and no differentiation between familiar and unfamiliar adults. At this level, child attention and activity (if any) are directed primarily toward objects. The child exhibits flat or minimal change in affect and little behavioral interaction with adults. The child shows little or no sign of distress on separation and no recognition of the caregiver on reunion.