Published in final edited form as:

Infant Ment Health J. 2012 ; 33(2): 187–196. doi:10.1002/imhj.20336.

INDISCRIMINATE BEHAVIOR OBSERVED IN THE STRANGE SITUATION AMONG INSTITUTIONALIZED TODDLERS: RELATIONS TO CAREGIVER REPORT AND TO EARLY FAMILY RISK

Paula S. Oliveira,
University of Minho

Isabel Soares,
University of Minho

Carla Martins,
University of Minho

Joana R. Silva,
University of Minho

Sofia Marques,
University of Minho

Joana Baptista, and
University of Minho

Karlen Lyons-Ruth
Harvard Medical School

Abstract

Socially disinhibited or indiscriminate behavior (IB) has traditionally been investigated using caregiver reports. More recently, an observational measure based on the Strange Situation Procedure (M. Ainsworth, M. Blehar, E. Waters, & S. Wall, 1978), the Rating of Infant and Stranger Engagement (RISE; C. Riley, A. Atlas-Corbett, & K. Lyons-Ruth, 2005), was validated in home-reared at-risk children. The present study aimed to validate the RISE in an institutionally reared sample using the caregiver report, to assess whether IB assessed with the RISE was elevated among the institutionalized children, and to explore potential risk factors associated with IB. The study was conducted among 74 institutionalized toddlers aged 11 to 30 months. Sociodemographic questionnaires were used to assess pre-admission experiences, and aspects of institutional placement were coded from the children's files in the institution and staff's report. Institutionalized children displayed high frequencies of IB as assessed on the RISE, and this instrument was validated against caregiver report. Pre-admission experiences of the

institutionalized children in their biological families—namely, prenatal risk and maternal emotional neglect risk—predicted IB. Results suggest that the RISE is adequate to use among institutionally reared toddlers and point to aspects of the early familial environment that may be implicated in IB.

The broadly used nosology systems for psychiatric disorders—the *Diagnostic and Statistical Manual for Mental Disorders, 4th ed., text revision (DSM-IV-TR)* (American Psychiatric Association, 2000) and the International Statistical Classification of Diseases and Related Health Problems, 10th revision (ICD-10; World Health Organization, 2007)—describe reactive attachment disorder (RAD) as a persistent disturbance in the child's social relatedness that begins before 5 years of age and is related to pathogenic parental care (but see Stafford, Zeanah, & Scheeringa, 2003). Both the *DSM-IV* and the ICD-10 offer a conceptualization of attachment disorders organized in two forms: one characterized by disinhibited behavior and another by inhibited behavior. The disinhibited or indiscriminate type is the one focused in the current study. There is a greater attention to the indiscriminate type in the literature mainly because it is thought to be more common than is the inhibited type and has stronger evidence of validity as an independent construct.

From an attachment theory perspective and empirical findings over the last 40 years, indiscriminate behavior (IB) signals a violation of the normative organization of the attachment behavioral system, in that healthy infants show a discriminating preference for familiar caregivers as the recipients of their attachment overtures; for example, seeking proximity and physical contact, especially when disturbed (Bowlby, 1969/1982; Greenberg & Marvin, 1982; O'Connor, Bredenkamp, Rutter, & the ERA Study Team, 1999).

The behavioral pattern of indiscriminate social approach and lack of selective proximity and comfort-seeking to adults has been noted both by clinical observers and researchers of institutionalized children for over 60 years (e.g., Goldfarb, 1945; Provence & Lipton, 1962; Tizard & Rees, 1975). It also has been reported in children placed in foster care (e.g., Oosterman & Schuengel, 2008; Zeanah et al., 2004). Recently, studies with risk samples have described IBs among children reared with their biological families (Boris et al., 2004; Lyons-Ruth, Bureau, Riley, & Atlas-Corbett, 2009).

This atypical pattern of behavior has shown consistency across studies as well as persistence over time (e.g., Chisholm, 1998; O'Connor, Rutter, & the ERA Study Team, 2000; Tizard & Hodges, 1978). However, the etiological factors involved in its development are still far from understood.

The prevalence of this phenomenon among institutionally reared children initially led researchers to evaluate whether the overall degree or duration of deprivation imposed by institutional rearing could explain it. In a recent study (Bruce, Tarullo, & Gunnar, 2009), disinhibited social behavior was related to time in institutional care, but this relation appeared to have been mediated by children's inhibitory control. In two important studies, children adopted from the institution early in the first year (Chisholm, Carter, Ames, & Morison, 1995; O'Connor et al., 2000) displayed less disinhibited social behavior than did those adopted later (i.e., after 4 or 6 months, respectively). However, it is important to

mention that IB was unrelated to parent's reports of the degree of general deprivation (Bruce et al., 2009), and it has not been associated with physical growth or general cognitive abilities at adoption, which are thought to index nutritional and global deprivation, respectively (Bruce et al., 2009; O'Connor et al., 1999; O'Connor et al., 2000).

In addition, many children who spent their first months or even years in institutional care were still able to form selective attachment relationships with their adoptive parents. Thus, it may be that although infants usually form selective attachment relationships during the first 2 years of life, the ability to form such selective attachments may be extendable under some conditions (Thompson, 2001). The establishment of new attachment relationships to the adoptive parents was verified not only among children coming from high-quality institutions (Hodges & Tizard, 1989; Tizard & Hodges, 1978) but also by children exposed to extremely negative institutional conditions (Chisholm, 1998).

Indeed, IBs have been described in children reared in institutions that provided adequate medical care, nutrition, and general stimulation, but did not provide consistent, responsive, and individualized caregiving figures (Roy, Rutter, & Pickles, 2004; Tizard & Rees, 1975; Vorria, Rutter, Pickles, Wolkind, & Hobsbaum, 1998). In addition, in a Romanian institution, disinhibited behavior was diminished in a "pilot unit" designed to reduce the number of adults caring for each child, as compared to the "typical unit" in which more adults were involved in the child's care (Smyke, Dumitrescu, & Zeanah, 2002). These findings have suggested that the absence of a consistent caregiver, which is of major importance to children's emotional learning and social bonding (Bowlby, 1969/1982; Gunnar, 2001), may play a crucial role in the origin of IB (O'Connor & Zeanah, 2003).

However, research also has shown that children display signs of the indiscriminate type of RAD even if they have a selective caregiver—either an institutional caregiver, an adoptive parent, or a biological parent (Boris et al., 2004; Chisholm, 1998; Lyons-Ruth et al., 2009; O'Connor et al., 2000; Smyke et al., 2002; Zeanah et al., 2004). Accordingly, it has been hypothesized that the indiscriminate type of RAD may be independent from an established attachment relationship (O'Connor & Zeanah, 2003; Zeanah, Smyke, Koga, & Carlson, 2005).

The findings of IB in noninstitutionalized children who were exposed to caregiver inadequacy raise the question of what role the pre-institutionalization experiences in the family of origin might play in the development of this disorder. In general, high-risk samples are at increased risk for psychopathology as a result of low socioeconomic status (exposing children to stressors associated with poverty) or parental adjustment problems (including depressive symptoms, lower levels of social support, teen parenting, and substance abuse, which also covary with poverty; Kobak, Cassidy, Lyons-Ruth, & Ziv, 2006). Indeed, research has been linking disruptive family events or experiences (e.g., imprisoned mothers or interparental aggression) with problematic attachment relationships (Grych, Wachsmuth-Schlaefler, & Klockow, 2002; Poehlmann, 2005; Vondra, Hommerding, & Shaw, 1999).

Vorria et al.'s (1998) study of children placed in Greek orphanages first demonstrated the importance of pre-institutionalization experiences. The children who had been admitted as a result of family disruption had an increased risk for emotional/behavioral difficulties while children admitted into care for financial reasons, with no serious adversities, did not differ from controls. Consistent with this finding, in a study of ex-institutionalized adolescents, Hodges and Tizard (1989) reported that the subsequent development of strong attachments to parents was much more common among those who were adopted into new families than it was in those who were returned to a biological parent, suggesting an important role for quality of the family environment.

However, research data relating children's pre-institutionalization experiences with IB specifically are still scarce. One exception is the study undertaken by Bruce et al. (2009), which took into account parent's report of the quality of prenatal care (i.e., prenatal exposure to alcohol or other substances, prenatal malnourishment, premature birth) and early care (i.e., three or more different placements prior to adoption, sexual or physical abuse, physical or emotional neglect, etc.) of 6- to 7-year-old postinstitutionalized children. No association of these experiences with IB at age 6 to 7 years was found. However, Boris et al. (2004) reported that maternal psychiatric disorder was a correlate of infant IB among children reared with their families. Similarly, in a study by Zeanah et al. (2004) of maltreated toddlers placed in foster care, while maternal variables such as maternal education, teen parent, partner violence, criminal history, depressed mood, and maltreatment as a child did not predict IB, mother's psychiatric history and substance abuse were predictive of this behavior. Taken together, these results point to a greater role for the quality of emotional care than for general deprivation in the development of IB, and suggest that quality of care prior to institutional placement also may play a role in its etiology.

The assessment of IB has traditionally been carried out by interviewing the caregiver most familiar with the child. To standardize their assessment, Smyke and Zeanah (1999) developed the Disturbances of Attachment Interview. Until recently, no standardized direct observational measure had been developed. Bruce et al. (2009) created one observational measure for studying 6- to 7-year-old Romanian postinstitutionalized children who had been adopted into the United States prior to the age of 36 months. This measure assesses the children's tendency to initiate interactions with an unfamiliar adult, in a testing room, while the adoptive mother remained seated at the back of the room. The coder recorded the latency of the child's first verbal initiation and the frequency of verbal initiations to the unfamiliar adult. They also used a semistructured parent interview designed to evaluate children's behavior with unfamiliar adults. The scores from these two measures were significantly correlated, and a composite measure of disinhibited social behavior that included the scores from both measures distinguished the institutional care and foster care groups (which scored significantly higher) from the nonadopted children at age 7 years.

To assess IB in younger children, Riley, Atlas-Corbett, and Lyons-Ruth (2005) developed an observational measure, the Rating of Infant and Stranger Engagement (RISE), based on the Strange Situation Procedure (SSP; Ainsworth, Blehar, Waters, & Wall, 1978). The SSP was originally developed to assess security of attachment by assessing variations in the way the child related to the parent after separation. In relation to the assessment of IB, O'Connor and

Zeanah (2003) argued that the underlying assumptions and traditional coding methods for assessing security of attachment are not adequate to capture disorders of attachment. Zeanah and Smyke (2005) found that 21% of children who were rated as secure on the SSP did not show fully developed attachments behaviors. This illustrates the likely inappropriateness of the traditional SSP coding scheme among children with attachment disorders since those coding schemes assume the existence of a selective relationship and focus mostly on behavior toward the parent. However, repeated qualitative and clinical observations of forms of IB appearing in the SSP (Chisholm, 1998; O'Connor et al., 2003; Zeanah et al., 2005) have suggested that there may be additional aspects of the child's behavior toward the stranger in the SSP that are not captured by the traditional attachment coding.

In an initial validity study, Lyons-Ruth et al. (2009) found that the degree of attachment behavior directed toward the stranger of at-risk, home-reared youth in the SSP at 18 months was significantly related to serious maternal psychosocial risk and to maternal disrupted communication with the child. These findings remained significant even after controlling for other types of insecure attachment behavior. The RISE scores at age 18 months also independently predicted teacher ratings of hostility and hyperactivity in the classroom at age 5 years, after controlling for other types of insecure attachment. However, this study could not establish whether the RISE would prove equally appropriate to assessing the behavior of children in institutional care.

Accordingly, the present study was undertaken with a sample of young children placed in residential institutions in North Portugal. According to a report written by Portuguese Social Services (2010) there were over 12,000 institutionalized children and youth in Portugal in 2009. These children were placed in long-term care, a type of institutional care that was housing about 67.0% of the institutionalized children in 2009 (The majority of them over 12 years old.); in temporary care, a type of care where 22.0% of children were placed (mainly infants and children younger than 11 years old); and in foster families, for 6.7% of children (mainly 12–17 years); the remaining were in institutions not specifically designed for children and youth. In 2009, 43.0% of children who were institutionalized were placed in that residential institution in the previous year, 20.0% were placed between 2 and 3 years prior, and 37.0% were placed 4 or more years before. The children and youth who left institutional care in 2009 were institutionalized for 3 years, on average. Children younger than 3 years are the ones who usually remain institutionalized for less than 1 year, and institutionalization periods of 6 or more years are characteristic of youth older than 15 years.

The sample used in the current study includes children in temporary care centers, a solution for young children who are abandoned or taken away from their families by social workers. This type of institutionalization is intended to last a maximum of 6 months while it is decided by the legal authorities what is going to be the so-called *life project* for that child: usually to go back to the biological family (parents or other members of the family) or to adoption. However, this decision process often takes longer than 6 months, and the children thus stay longer in the institution. On average, children placed in temporary care stay in the institution for 17 months.

The current study had two aims. The first aim was to assess the applicability of the new observational measure of IB, the RISE, for use with children reared in institutions, and to analyze its concurrent validity with caregiver reports of IB. The second aim was to explore etiological factors associated with IB in the institutionalized children, as assessed by the RISE. This is the first study to explore the applicability of an observational measure such as the RISE to the assessment of IB among young institutionalized children.

The first hypothesis is that the RISE will show concurrent validity with the disinhibited subscale of the Disturbances of Attachment Interview (DAI; Smyke & Zeanah, 1999), even though the assessments are quite different. The second hypothesis is that higher IB scores will be associated with a longer time in institutional care and with an earlier age of placement in the institution (in agreement with O'Connor et al., 2003; O'Connor et al., 2000). Conversely, children who lived for 12 months or longer with their families prior to institutionalization are expected to display less IB in the institution since by 12 months, they are developmentally expected to have established a discriminated attachment relationship with their biological parent (Zeanah & Fox, 2004). The following hypothesis was based on the empirical and theoretical link between IB and caregiving risk among home-reared children (Lyons-Ruth et al., 2009; Zeanah et al., 2004). Thus, it is expected that caregiving risk factors in the biological family will play a role in predicting higher levels of IB among children who lived with their families prior to institutionalization. In previous research (Smyke et al., 2002; Zeanah et al., 2004), having a selective caregiver in the institution identified by the staff was not related to the extent of IB. Accordingly, in the present study, we expect that IB will be unrelated to having an assigned caregiver. Age and sex differences in IB also were not expected since they have not been previously reported.

METHOD

Participants

The sample consists of 74 (40 male, 34 female) Portuguese children placed in temporary institutional care at ages 11 to 30 months ($M = 19.05$, $SD = 6.46$), the age range needed to administer the SSP (Ainsworth et al., 1978).

Data Collection

Data were collected at 17 different institutions, involving 63 different caregivers. Only 10 caregivers with more than one child participated in the study. These institutions were chosen due to geographic proximity, and the children were recruited based on their age. Exclusion criteria were the presence of severe physical or mental impairments or genetic syndromes.

All children in our study were in the institutions for at least 6 months by the time of assessment, so they were familiar with the setting and the caregiver. Moreover, as the minimum age was 11 months, the children were developmentally expected to be capable of having formed an attachment relationship. However, in terms of cognitive developmental age, 9.6% ($n = 7$) of the subjects were assessed as less than 11 months in cognitive development ($Mdn = 15.00$, $IQR = 10.00$). Exclusion of these 7 subjects in the analyses did

not make a difference in the results, however, so they were not excluded from the analyses reported later.

Descriptive data about child and biological family characteristics can be found in Table 1 (Risk composites will be explained later.) There could be more than one reason for the child's admission. Reasons for admission were the existence of previous risk events (e.g., maltreatment, neglect, or abandonment of other children) in the family ($n = 32$; 43.2%); neglect of target child ($n = 31$; 41.9%); lack of parental skills ($n = 30$; 40.5%); poor socioeconomic conditions ($n = 18$; 24.3%); parents' psychopathology or mental retardation ($n = 15$; 20.3%); abandonment of target child ($n = 13$; 17.6%), four of these cases at birth; target child's witnessing of family violence ($n = 12$; 16.2%); and physical abuse of target child ($n = 6$; 8.1%). Sexual abuse and psychological/emotional abuse were not indicated as a reason for institutionalization of any children in this sample.

Twenty-six percent of children ($n = 19$) came to the institution directly from the maternity ward, so they never lived with their biological families. Twenty-four percent of children ($n = 18$) were 5 months old or younger when they entered the institution. Twenty-three percent of children ($n = 17$) were institutionalized between 5 and 12 months of age, which means that the majority of children (73.0%, $n = 54$) were admitted when they were 1 year old or younger. Of the remaining sample, 16.2% ($n = 12$) were admitted before 18 months of age, and 10.8% ($n = 8$) entered the institution between 18 and 24 months of age.

Procedure

The sample was recruited from temporary institutional care homes. After approval by Portuguese Social Services and the National Commission for Data Protection, the study was presented to the staff at each institution. Written informed consents were obtained from the biological parent and the director of the institution. Consent to participate in the study also was obtained from the caregivers.

The SSP (Ainsworth et al., 1978) was carried out with the child's primary caregiver, in an available room in the institution that was strange to the child. This assessment had to take place in the institutions because the caretakers could not leave their workplace.

The DAI was administered by a trained researcher in a quiet room in the institution to the child's primary caregiver, close in time to the SSP.

The sociodemographic questionnaires about the institutionally reared children and their biological families were filled out from the information present in the child's files in the institution and were completed with the institutional staff's help. Case files had the reports provided by social workers, which were based on the information that was available to them; therefore, these files tended to comment on risk factors that were present and to omit mention of risk factors that were not present or were unknown.

Measures

Cognitive development—The cognitive subscale of the Bayley Scales of Infant and Toddler Development, third edition (Bayley, 2006) was used to index the child's cognitive developmental age.

The RISE—Attachment-related forms of engagement with the stranger by the infant over all eight episodes of the SSP were coded from videotape with the newly developed RISE (Riley et al., 2005). The RISE evaluates both the extent of the infant's affective engagement with the stranger compared to the caregiver and the extent to which the infant displays nonnormative acceptance of physical contact or response to soothing by the stranger. Each subject is given an overall 9-point rating. Low scale scores represent children who show a clear preference for and greater engagement with the familiar caregiver, a score of 5 indicates at least equal engagement with the stranger compared with the caregiver, and higher scores indicate nonnormative forms of affective engagement and attachment behavior with the stranger. According to this definition, a score of 5 or above is considered to indicate that the child displays IBs. Coders were naïve to the criteria for coding attachment status according to Ainsworth et al. (1978) and Main and Solomon (1990). Reliability yielded an intraclass coefficient of $r_i = .93$ ($n = 10$).

The DAI (Smyke & Zeanah, 1999)—This instrument is a semistructured interview with 12 anchored items that explore the presence of signs of disordered attachment and are coded 0 (*none/little*), 1 (*sometimes/somewhat*), and 2 (*rarely/minimally*) according to the amount of evidence of disturbed or disordered attachment. Only the subscale of items regarding behaviors indicative of the disinhibited type of RAD was used for the present study (Items 6–8). Caregivers were asked whether the child checked back with the caregiver (particularly in an unfamiliar setting) or tended to wander off without purpose, whether the child showed initial reticence around strangers or readily approached unfamiliar persons, and whether the child would readily go off with an unfamiliar adult. Scores for these items were summed and so could range between 0 and 6. Reliability yielded a mean intraclass coefficient of $r_i = .93$. ($n = 53$). This interview demonstrated the ability to distinguish between institutionalized and noninstitutionalized children in Romania (Smyke et al., 2002; Zeanah, Smyke, & Dumitrescu, 2002) and to reliably identify signs of RAD in maltreated children (Zeanah et al., 2004).

Institutional context

Institutional placement—The date of admission and the birth date of the child were gathered from the child's case file in the institution. This allowed us to calculate the child's age at admission to the institution and the length of time in institutional care.

Assigned caregiver—The staff was asked whether there was a key staff member who had a closer relationship with the child, or who was more responsible for or more frequently looked after the child. This information was individually checked by a research team member through naturalistic observations of the daily routines. The term *assigned caregiver* was chosen in this article to highlight the fact that it is based on the reference provided by

the staff, as opposed to an attachment-based approach that would assess the existence of the child's preference for a particular caregiver.

Family context—Whether the child lived with the biological family prior to his or her institutionalization and for how long was calculated from the information in the case files. In addition, three theoretically oriented risk composites were created to capture sources of risk to the child in the biological-family context. Due to missing data in the case files, it was established that a minimum of 75% of the variables of a composite must be present for a subject to be included, and his or her cumulative score was divided by the number of existing variables. Thus, a score of 0 to 1 was given to each subject included in each risk composite, indexing the proportion of risk components present for a given composite, detailed next.

- *Prenatal risk composite*: maternal physical disease (e.g., AIDS, hepatitis), maternal substance abuse during pregnancy, pregnancy without medical surveillance, and prematurity
- *Family-relational risk composite*: government-aid recipient, domestic violence (to the children and/or between parents or other family members living in the house), family previous referral by the social workers as a risk family (based in conditions such as maltreatment, neglect, or abandonment of other children), and institutionalized or adopted siblings.
- *Emotional neglect risk composite*: neglect as the reason for admission to the institution, maternal prostitution, maternal substance abuse, and maternal psychopathology or mental retardation. This composite was created in an attempt to capture the likely unavailability of the maternal figure. This could not be adequately assessed by only the neglect variable since this variable only indicated whether neglect was a reason for admission to the institution. Moreover, as the occurrence of neglect, especially emotional neglect, appeared to be underreported in the reasons for admission based on the remaining information in the questionnaire, it seemed important to include other variables likely to capture the emotional unavailability of the mother.

Paternal risk conditions were not included in the composites because there was too much missing data regarding the fathers of the children.

Data Analysis Plan

Descriptive data were initially compiled, and exploratory data analyses were carried out to assess whether parametric tests could be used. Then, the correlation between the RISE and the DAI was tested. To analyze relations between children's IB and aspects of the family and institutional contexts, correlation coefficients or differences tests were used. Finally, a mediation model was tested to follow-up on the significant relations that emerged among prenatal risk, emotional neglect risk, and IB.

RESULTS

Descriptives and Control Variables: Age, Cognitive Developmental Age, and Gender

Using the classification point of 5 or greater, the prevalence of IB on the RISE was 51.4% ($n = 38$). The RISE scale scores were not correlated with child age $r_s = -.01$, n.s., or with the Bayley cognitive score, $r_s = -.05$, n.s. Similarly, there were no gender effects in the RISE scores, $t(72) = -1.66$, n.s.

IB: Concurrent Validity of Observation with Caregiver Report

Caregiver report of IB also was available for this sample. The RISE scores were significantly correlated with the scores obtained on the disinhibited-type subscale of the DAI, $r_s = .36$, $p < .01$. Thus, the RISE observational measure of IB showed concurrent validity in relation to the IB reported by the institutional caregiver.

IB: Institutional and Family Contexts

Institutional placement—Age at admission to the institution and length of time in institutional care (see Table 1) were not correlated with the RISE scores, $r_s = .09$, n.s. and $r_s = -.08$, n.s., respectively. Analyses using cutoff points also did not find differences between age at admission or length of time in the institution, in the RISE scores.

Assigned caregiver—Children who had an assigned caregiver in the institution as designated by the staff (see Table 1) did not differ in RISE scores from children who did not have one, $Z = -.69$, n.s.

Length of time in biological family—Children who lived with their biological families prior to admission to institutional care (see Table 1) did not differ in the RISE scores from children who did not, $t(71) = 1.12$, n.s. Differences in IB also did not occur when children who lived with their biological families for up to 6 months were compared to those living with them for more than 6 months, $t(65) = -.31$, n.s., or when those living with their families for up to 1 year were compared to those who lived with their families for more than 1 year, $Z = 1.12$, n.s.

Family risk composites—To explore more fine-grained family processes, the relations between IB and indices of caregiving risk in the biological family also were examined (for descriptive statistics of the risk composites, see Table 1). Assuming that only children who lived with their families prior to institutionalization were exposed to the two family risk composite conditions, the family risk analyses were conducted only for those children who had lived with their families for any period of time prior to institutionalization (see Table 1). The RISE scores were significantly correlated with the prenatal risk composite, $r_s = .26$, $p < .05$. Therefore, children exposed to higher prenatal risk exhibited more IB. RISE scores also were significantly correlated with the emotional neglect risk composite, $r_s = .34$, $p < .05$. Thus, for those who lived with their families prior to institutionalization, children whose families represented a higher risk for emotional neglect exhibited greater IB. The RISE scores were not related to the family relational risk composite, $r_s = -.15$, n.s.

Having identified a significant link between emotional neglect risk and IB, and between prenatal risk and IB, we then addressed the issue of whether the emotional neglect risk may have mediated the association between prenatal risk and IB. The method suggested by Baron and Kenny (1986) was used to examine mediation. To determine if mediation had occurred, four linear regressions were computed to test if the four necessary conditions were met (see Figure 1). The first condition, which specifies that a linear relationship must exist between the independent variable (prenatal risk) and the dependent variable (IB), was met, Path c; $\beta = .30, p < .05$. The second and third conditions were satisfied, demonstrating a relationship between the independent variable (prenatal risk) and the mediator variable (emotional neglect risk), Path a; $\beta = .29, p = .05$, and between the mediator variable and the outcome variable (IB), Path b; $\beta = .37, p < .01$. Finally, in the fourth regression analysis, the relationship between the independent variable and the dependent variable was reexamined while statistically controlling for the mediator variable. Mediation is thought to occur when there is a reduction in the strength of the beta weight associated with the independent variable when variance explained by the mediator variable is parceled out. The effect of prenatal risk on IB was indeed reduced and became statistically nonsignificant when controlled for the effect of emotional neglect risk, Path c'; $\beta = .22, n.s.$ These associations are shown in Figure 1. Thus, emotional neglect was identified as a mediator of the effect of prenatal risk on the RISE.

It has been recommended to perform a formal significance test of the indirect effect even if the Baron and Kenny (1986) criteria have been met (e.g., to reduce the likelihood of Type I error; Holmbeck, 2002; Preacher & Hayes, 2004). Hence, this simple mediation was tested using Preacher and Hayes' (2004) bootstrapping methodology on 5,000 bootstrap resamples. This approach allowed us to identify the confidence intervals of indirect effects without making assumptions of the shape of the variables' distribution. The true indirect effect was estimated to lie between $-.10$ and 1.90 with 95% confidence. Because zero is in the 95% confidence interval, we conclude that the indirect effect is not significantly different from zero at $p < .05$ (two-tailed). Therefore, results for simple mediation did not support the emotional neglect as a simple mediator. The inconsistency between the causal steps test and the bootstrapping test indicates that we cannot assume that mediation is reliable, given the current sample size. Further work is needed to examine this question.

DISCUSSION

The first purpose of the current study was to apply an observational measure of IB (the RISE) to an institutionalized sample and to assess whether the RISE captured elevated levels of IB in that sample. Indeed, 51.4% of children displayed elevated RISE scores, and scores on the RISE were significantly correlated with the caregiver's report of the child's IB. Thus, the direct observational assessment shows promising validity as a measure of IB for children in institutions as well as those reared at home.

Because the RISE had previously been used in a home-reared sample, it also was of interest to compare rates of IB among home- and institutionally reared children. Rates of IB among low- and high-risk, home-reared infants at 18 months of age in the Lyons-Ruth et al. (2009) study were 11 and 59%, respectively. Thus, rates among high-risk, home-reared children

were comparable to the 51% prevalence observed here among children in institutions. In the Lyons-Ruth et al. (2009) study, risk factors for IB included maternal history of psychiatric hospitalization or child maltreatment and high maternal disorientation in interaction with the infant.¹

The second aim was to explore possible etiological factors that may account for the high scores in IB among the institutionalized children. First, prenatal risk was predictive of higher levels of IB. For the institutionalized children who had lived with their biological families prior to institutionalization, family risk for emotional neglect also predicted IB. Finally, prenatal risk was related to subsequent risk for emotional neglect in the family, but the mediation analysis was equivocal regarding whether subsequent emotional neglect risk could account for the independent effect of prenatal risk on IB. The implications of these results are considered below.

The current study is an addition to the growing body of evidence that IB is frequent among children who have experienced institutional rearing. The use of the RISE in the present study rather than caregiver report alone further extends the literature to show that such behavior can be reliably coded from direct observation over the age range from 11 to 30 months.

This study also extends the literature in examining a variety of family risk factors that also may contribute to the development of IB. Data on the families of origin have often not been available in studies of postinstitutionally adopted children and have not been included in those reports.

Both the prenatal risk composite and the maternal emotional neglect risk composite (for those who had lived with their biological families prior to institutionalization) predicted IB. This emotional neglect risk composite included items that were likely to be associated with marked maternal emotional unavailability. Note that the maternal psychopathology variable in this composite likely reflects severe psychopathology; otherwise, it would not be reported in the case record. This is in agreement with previous studies which have found that maternal psychiatric disorder was a correlate of IB among home-reared or foster-cared children (Boris et al., 2004; Lyons-Ruth et al., 2009; Zeanah et al., 2004). Given these findings, further research on the contribution of maternal psychopathology to emotionally neglectful caregiving is needed.

In addition, prenatal risk was predictive of IB in the institution. While Bruce et al. (2009) did not find a relation between socially disinhibited behavior and the adoptive parent report of prenatal risk in postinstitutionalized children, the children in that study were 6 to 7 years old, and the adoptive parents' information regarding their prenatal experiences was likely to be incomplete. In studies of at-risk families, toddlers prenatally exposed to drugs, for

¹In response to this inquiry for prevalence figures, Lyons-Ruth et al. (2009) followed up on their previously published results by creating a high-risk group consisting of mothers with a history of psychiatric hospitalization, a history of maltreating a child, or a frequency of three or more disoriented behaviors in observed interaction with the child, as coded on the AMBIANCE scales. (Lyons-Ruth, Bronfman, & Parsons, 1999). The low-risk group consisted of mothers with none of the aforementioned risk factors. An ANOVA with follow-up post hoc tests demonstrated that the low-risk, home-reared group had significantly lower RISE scores than did both the high-risk, home-reared group and the institutionally reared group of the current study, $F(2, 128) = 7.63, p < .01$.

example, have been shown to be at subsequent risk for problematic attachments (Rodning, Beckwith, & Howard, 1991; Swanson, Beckwith, & Howard, 2000). Furthermore, mothers who use drugs during their pregnancies are likely to use drugs postpartum, and that was also true in the current sample, where pre- and postnatal drug use were highly correlated. Accordingly, the children of substance-using mothers were exposed not only to prenatal biological risk but also to postnatal environmental risk. Thus, a correlated constellation of both pre- and postnatal risk factors were predictive of higher rates of IB in this sample. Because previous studies have rarely examined information on the families of origin of institutionalized children, this finding sheds important new light on factors potentially important in pathways toward IB and deserves replication attempts in other samples.

The high level of IB found among the children in the present study occurred despite the good-quality medical, nutritional, and general care offered by the institutions from which this sample was obtained, which is consistent with the literature (Chisholm, 1998; Hodges & Tizard, 1989; Tizard & Hodges, 1978). In addition, length of time in institutional care and general cognitive ability, which have been considered measures of duration of deprivation and an index of global deprivation, respectively, were not related to the extent of IB. These results replicate previous findings (e.g., Bruce et al., 2009; Lyons-Ruth et al., 2009; Zeanah et al., 2005; but see Chisholm, 1998; O'Connor et al., 2000) and support the growing evidence that IB is not a simple function of neglect and lack of stimulation.

Children's age when they started experiencing rotating shifts of caregivers (age at admission to the institution) or changing residence from the biological family to institutional care at 6 or at 12 months, for example, did not make a difference in their IB. Note that children were included in this study only if they were developmentally expected to be capable of forming an attachment relationship. In addition, living for 6 months in the institution appears to be sufficient time for an infant to develop an attachment relationship with a new caregiver (for data on attachment formation among infants in foster care, see Stovall & Dozier, 2000).

In the present study, and in agreement with the literature (Chisholm, 1998; Chisholm et al., 1995; O'Connor et al., 1999; O'Connor et al., 2000; Smyke et al., 2002; Zeanah et al., 2004), having an assigned caregiver (i.e., a key worker referenced by the staff as more present in the child's caregiving experiences) was not related to IB. The failure to find an empirical link between the existence of a selective attachment figure and IB (Zeanah et al., 2002) may be explained by the inconsistency of care provided at institutions. Even if a child develops a selective relationship with a particular institutional caregiver, given the high ratios of children to staff, the frequent staff turnover, and the strict regimentation of the routines, that child cannot selectively seek protection and comfort from a particular caregiver. Smyke et al. (2002) proposed that these characteristics of the institutional settings make it difficult for the child to predict when their preferred caregiver will be present, and even when present, the child must share him or her with large numbers of other children.

The current results add to the evidence that IB may result from emotionally and behaviorally distant caregiving, including that received in the biological family of origin as well as from rotating and overburdened institutional staff, rather than from physical neglect or rotating caregivers, per se. When reviewing the videotapes of the institutionalized children who were

rated high in IB, a common behavior was observed. Indiscriminate children often tried to ask for comfort (from both the caregiver and the stranger), but they were hesitant, appearing not to know how to ask or what to expect from the adult. This may, indeed, result from the inconsistent availability of the caregivers, who often may not respond to their overtures.

In sum, what seems to tie together institutional rearing and other types of caregiving risk sufficient to produce IB is the absence of needed caregiver behaviors, which provide the child key experiences, rather than the presence of undesirable caregiver behaviors. Future research is needed to further explore this hypothesis.

Limitations

First, note that this study had reduced statistical power. Another limitation was the impossibility to analyze discriminant validity of the RISE in relation to other aspects of attachment behavior, such as security of attachment.

In addition, information on the families of origin was coded from case reports. Such reports typically have much missing information, particularly if a problem was not observed, leaving coders unable to be sure that a given problem was indeed absent. However, the significant relations found between two of the three family risk composites and independently observed child IB suggest that these reports are not unreliable and contain important predictive information. In future studies, researchers should work with institutional staff to develop a more comprehensive screen for the child's familial experiences prior to coming to the institution.

Clinical Implications

Diagnostic criteria for disturbances of attachment proposed by the standard nosology systems (*DSM-IV-TR* and the *ICD-10*) provide a limited picture of the clinical phenomenology reported from more intensive research. Further research is essential to build a consistent knowledge base concerning the disinhibited type of RAD that might lead to a more evidence-based description of the disorder and its risk factors. Given the long-term impairments in social functioning associated with this disorder (e.g., Hodges & Tizard, 1989; Tizard & Hodges, 1978), further understanding can guide more effective prevention and intervention efforts, including establishing evidence-based criteria for how out-of-home care for young children should be structured. Additional research into IB also can help clinicians arrive at evidence-based evaluation guidelines for assessing when a young child should or should not be diagnosed with an attachment disorder.

Future Research

This study provides evidence that the use of a standardized laboratory measure to assess IB may be reliably used not only with home-reared children but also among those who are brought up in institutions. Concurrent validity of the RISE with the DAI report by the caregiver also supports the validity of this standardized observational assessment. Observational assessments appropriate to the age of the child should be added to future studies to offset the problems with caregiver report measures.

The current study is the first to demonstrate a relation between specific risk factors in the families of origin and IB among institutionally reared toddlers. These findings indicate that focusing exclusively on the children's institutionalization and adoption experiences may not be enough to understand the socioemotional difficulties of post- or currently institutionalized children. Instead, early pre-institutionalization experiences related to the kinds of pre- and postnatal disturbances in their families of origin also should be taken into account in future work.

Acknowledgments

This research was supported in part by Grant 13/06 from the BIAL Foundation and by Grant PTDC/PSI-PCL/101506/008 from Fundação para a Ciência e Tecnologia (FCT). We acknowledge the special contributions of Ana Mesquita and Elizabeth Miller.

REFERENCES

- Ainsworth, M.; Blehar, M.; Waters, E.; Wall, S. Patterns of attachment: A psychological study of the Strange Situation. Hillsdale, NJ: Erlbaum; 1978.
- American Psychiatric Association. Diagnostic and statistical manual of mental disorders. 4th ed., Text rev.. Washington, DC: Author; 2000.
- Baron R, Kenny D. The moderator–mediator variable distinction in social psychological research: Conceptual, strategic and statistical considerations. *Journal of Personality and Social Psychology*. 1986; 51:1173–1182. [PubMed: 3806354]
- Bayley, N. Bayley Scales of Infant and Toddler Development. 3rd ed.. San Antonio, TX: Psychological Corporation; 2006.
- Boris N, Hinshaw-Fuselier S, Smyke A, Sheeringa M, Heller S, Zeanah C. Comparing criteria for attachment disorders: Establishing reliability and validity in high-risk samples. *Journal of the American Academy of Child and Adolescent Psychiatry*. 2004; 43:568–577. [PubMed: 15100563]
- Bowlby, J. Attachment and loss: Vol. 1. Attachment. New York: Basic Books; 1969/1982.
- Bruce J, Tarullo A, Gunnar M. Disinhibited social behavior among internationally adopted children. *Developmental Psychopathology*. 2009; 21:157–171.
- Chisholm K. A three year follow-up of attachment and indiscriminate friendliness in children adopted from Romanian orphanages. *Child Development*. 1998; 69:1092–1106. [PubMed: 9768488]
- Chisholm K, Carter M, Ames E, Morison S. Attachment security and indiscriminately friendly behavior in children adopted from Romanian orphanages. *Development and Psychopathology*. 1995; 7:283–294.
- Goldfarb W. Psychological privation in infancy and subsequent adjustment. *American Journal of Orthopsychiatry*. 1945; 15:247–255.
- Greenberg M, Marvin R. Reactions of preschool children to an adult stranger: A behavioral systems approach. *Child Development*. 1982; 53:481–490.
- Grych J, Wachsmuth-Schlaefler, Klockow L. Interparental aggression and young children's representations of family relationships. *Journal of Family Psychology*. 2002; 16:259–272. [PubMed: 12238409]
- Gunnar, M. Effects of early deprivation: Findings from orphanage-reared infants and children. In: Nelson, C.; Luciana, M., editors. *Handbook of developmental cognitive neuroscience*. Cambridge, MA: MIT Press; 2001. p. 617–629.
- Hodges J, Tizard B. Social and family relationships of ex-institutional adolescents. *Journal of Child Psychology and Psychiatry*. 1989; 30:77–97. [PubMed: 2925822]
- Holmbeck GN. Post-hoc probing of significant moderational and mediational effects in studies of pediatric populations. *Journal of Pediatric Psychology*. 2002; 27:87–96. [PubMed: 11726683]

- Instituto de Segurança Social, I.P. Plano de Intervenção Imediata: Relatório de Caracterização das Crianças e jovens em Situação de Acolhimento em 2009. 2010. Available from <http://www.casapia.pt>
- Kobak, R.; Cassidy, J.; Lyons-Ruth, K.; Ziv, Y. Attachment, stress, and psychopathology: A developmental pathways model. In: Cicchetti, D.; Cohen, D., editors. Developmental psychopathology. 2nd ed.. New York: Wiley; 2006. p. 333-369.
- Lyons-Ruth, K.; Bronfman, E.; Parsons, E. Frightened, frightening, and atypical maternal behavior and disorganized infant attachment strategies. In: Vondra, J.; Barnett, D., editors. Atypical attachment in infancy and early childhood among children at developmental risk. Monographs of the Society for Research in Child Development. Vol. 64. 1999. p. 67-96.258
- Lyons-Ruth K, Bureau J, Riley C, Atlas-Corbett A. Socially indiscriminate attachment behavior in the Strange Situation: Convergent and discriminant validity in relation to caregiving risk, behavior problems, and attachment insecurity. Development and Psychopathology. 2009; 21:355–372. [PubMed: 19338688]
- Main, M.; Solomon, J. Procedures for identifying infants as disorganized/disoriented during the Ainsworth strange situation. In: Greenberg, M.; Cicchetti, D.; Cummings, E., editors. Attachment in the preschool years: Theory, research and intervention. Chicago: University of Chicago Press; 1990. p. 121-160.
- O'Connor T, Bredenkamp D, Rutter M. the ERA Study Team. Attachment disturbances and disorders in children exposed to early severe deprivation. Infant Mental Health Journal. 1999; 20:10–29.
- O'Connor T, Marvin R, Rutter M, Olrick J, Britner P. the ERA Study Team. Child-parent attachment following early institutional deprivation. Development and Psychopathology. 2003; 15:19–38. [PubMed: 12848433]
- O'Connor T, Rutter M. the ERA Study Team. Attachment disorder behavior following early severe deprivation: Extension and longitudinal follow-up. Journal of the American Academy of Child and Adolescent Psychiatry. 2000; 39:703–712. [PubMed: 10846304]
- O'Connor T, Zeanah C. Attachment disorders: Assessment strategies and treatment approaches. Attachment and Human Development. 2003; 5:223–244. [PubMed: 12944216]
- Oosterman M, Schuengel C. Attachment in foster children associated with caregivers' sensitivity and behavioral problems. Infant Mental Health Journal. 2008; 29:609–623.
- Poehlmann J. Representations of attachment relationships in children of incarcerated mothers. Child Development. 2005; 76:679–696. [PubMed: 15892786]
- Preacher KJ, Hayes AF. SPSS and SAS procedures for estimating indirect effects in simple mediation models. Behavior Research Methods, Instruments, and Computers. 2004; 36:717–731.
- Provence, S.; Lipton, R. Infants reared in institutions. New York: International Universities Press; 1962.
- Riley, C.; Atlas-Corbett, A.; Lyons-Ruth, K. Rating of Infant–Stranger Engagement (RISE) coding system. Cambridge, MA: Unpublished manual, Harvard Medical School at the Cambridge Hospital, Department of Psychiatry; 2005.
- Rodning C, Beckwith L, Howard J. Quality of attachment and home environments in children prenatally exposed to PCP and cocaine. Development and Psychopathology. 1991; 3:351–366.
- Roy P, Rutter M, Pickles A. Institutional care: Associations between overactivity and lack of selectivity in social relationships. Journal of Child Psychology and Psychiatry and Allied Disciplines. 2004; 45:866–873.
- Smyke A, Dumitrescu A, Zeanah C. Attachment disturbances in young children: I. The continuum of caretaking casualty. Journal of the American Academy of Child and Adolescent Psychiatry. 2002; 41:972–982. [PubMed: 12162633]
- Smyke, A.; Zeanah, C. Disturbances of attachment interview. Available on the Journal of the American Academy of Child and Adolescent Psychiatry. 1999. website at www.jaacap.com via Article Plus
- Stafford B, Zeanah C, Scheeringa M. Exploring psychopathology in early childhood: PTSD and attachment disorders in DC: 0–3 and DSM-IV. Infant Mental Health Journal. 2003; 24:398–409.
- Stovall K, Dozier M. The development of attachment in new relationships: Single subject analyses for 10 foster infants. Development and Psychopathology. 2000; 12:133–156. [PubMed: 10847621]

- Swanson K, Beckwith L, Howard J. Intrusive caregiving and quality of attachment in prenatally drug-exposed toddlers and their primary caregivers. *Attachment and Human Development*. 2000; 2:130–148. [PubMed: 11707907]
- Thompson, R. Sensitive periods in attachment?. In: Bailey, D.; Bruner, J.; Symons, F.; Lichtman, J., editors. *Critical thinking about critical periods*. Baltimore: Brookes; 2001. p. 83-105.
- Tizard B, Hodges J. The effect of early institutional rearing on the development of eight-year-old children. *Journal of Child Psychology and Psychiatry*. 1978; 19:99–118. [PubMed: 670339]
- Tizard B, Rees J. The effects of early institutional rearing on the behaviour problems and affectional relationships of four-year-old children. *Journal of Child Psychology and Psychiatry*. 1975; 16:61–73. [PubMed: 1123417]
- Vondra J, Hommerding K, Shaw D. Stability and change in infant attachment style in a low-income sample. *Monographs of the Society for Research in Child Development*. 1999; 64(Serial no):119–144. 258. [PubMed: 10597545]
- Vorria P, Rutter M, Pickles A, Wolkind S, Hobsbaum A. A comparative study of Greek children in long-term residential group care and in two-parent families: I. Social, emotional, and behavioral differences. *Journal of Child Psychology and Psychiatry and Allied Disciplines*. 1998; 39:225–236.
- World Health Organization. *International Statistical Classification of Diseases and Related Health Problems (10th rev.) (ICD-10)*. 2007. Available on the WHO website at <http://apps.who.int/classifications/icd10/browse/2010/en>
- Zeanah C, Fox N. Temperament and attachment disorders. *Journal of Clinical Child and Adolescent Psychology*. 2004; 33:32–41. [PubMed: 15028539]
- Zeanah, C.; Smyke, A. Building attachment relationships following maltreatment and severe deprivation. In: Berlin, L.; Ziv, Y.; Amaya-Jackson, L.; Greenberg, M., editors. *Enhancing early attachments: Theory, research, interventions, and policy*. New York: Guilford Press; 2005. p. 195-216.
- Zeanah C, Scheeringa M, Boris N, Heller S, Smyke A, Trapani J. Reactive attachment disorder in maltreated toddlers. *Child Abuse and Neglect*. 2004; 28:877–888. [PubMed: 15350771]
- Zeanah C, Smyke A, Dumitrescu A. Attachment disturbances in young children: II. Indiscriminate behavior and institutional care. *Journal of the American Academy of Child and Adolescent Psychiatry*. 2002; 41:983–989. [PubMed: 12162634]
- Zeanah C, Smyke A, Koga S, Carlson E. Attachment in institutionalized and community children in Romania. *Child Development*. 2005; 76:1015–1028. [PubMed: 16149999]

Figure 1.

Family emotional neglect risk as a mediator of the relationship between prenatal risk and child indiscriminate behavior. Values are standardized regression coefficients (β). R^2 change when prenatal risk is added to the model is 4.5%. * $p < .05$ ** $p < .01$ $n = 54$.

TABLE 1

Descriptive Statistics for Child and Family Characteristics (N = 74)

	<i>M (SD)</i>	Range
Age at assessment (months)	19.05 (6.46)	11–30
Developmental age (months)	17.41 (7.05)	4–33
Age at admission to the institution (months)	7.31 (7.28)	0–24
Length of time in institutional care (months)	11.23 (4.42)	6–29
Length of time with biological family (months)	6.54 (7.05)	0–24
Prenatal risk composite (<i>n</i> = 66)	.29 (.24)	0–.75
Emotional neglect risk composite (<i>n</i> = 69)	.36 (.24)	0–1
Emotional neglect risk: only children who lived with family (<i>n</i> = 50)	.36 (.24)	0–1
Family-relational risk composite (<i>n</i> = 73)	.46 (.26)	0–1
Family-relational risk: only children who lived with family (<i>n</i> = 53)	.45 (.27)	Frequencies 0–1
Child lived with biological family prior to institutionalization	Yes: 54 (74%) No: 19 (26%)	
Child had an institutional caregiver of reference	Yes: 43 (58%) No: 31 (42%)	