



HHS Public Access

Author manuscript

Infant Ment Health J. Author manuscript; available in PMC 2016 April 26.

Published in final edited form as:

Infant Ment Health J. 2013 ; 34(5): 435–445. doi:10.1002/imhj.21401.

Attachment Security in Three-Year-Olds who Entered Substitute Care in Infancy

Shannon Altenhofen¹, Robert Clyman², Christina Little², Megan Baker³, and Zeynep Biringen³

¹University of Colorado Denver

²University of Colorado Denver-Anschutz Medical Campus

³Colorado State University

Abstract

This study assessed relations among number of out-of-home placement changes, time in caregivers' care, caregiver type (i.e., foster parent, adoptive parent, kinship relation, and biological parent), child gender, and caregiver-child Emotional Availability (EA) as predictive of child attachment security when children were 3 years old in a sample of 104 caregivers and children. Children entered court-ordered care by six months of age. On average, children at the age of three spent 30 months with their caregivers, and nearly half of them were adopted by that time. Child attachment was assessed using the Attachment Q-set (Waters & Deane, 1985), and caregiver-child EA was assessed using the EA Scales, 4th edition (Biringen, 2008). Sixty-six percent of children at age 3 showed secure attachments with caregivers, and EA subscale scores were also relatively high on average. The study predictor variables of EA Caregiver Sensitivity, Child Responsiveness, and Child Involvement predicted attachment security, with girls more likely to be securely attached to their substitute caregivers at age three than boys. Study limitations and directions for future research are discussed.

Keywords

child welfare; attachment; caregiver-child relationships

Introduction

Approximately 899,000 children were estimated to be victims of maltreatment in the U.S. in 2005 (U.S. Department of Health and Human Services, 2007). Of these children, those under one year of age make up the largest group of maltreatment victims. Maltreated infants have high rates of insecure attachment (Barnett, Ganiban, & Cicchetti, 1999; Carlson, 1998; Cicchetti & Barnett, 1991; Carlson, Cicchetti, Barnett, & Braunwald, 1989) and **subsequent** psychopathology than non-maltreated infants (Cicchetti & Toth, 1995). Also, children under one year of age are overrepresented in substitute care (i.e., foster, kinship, adoptive; U.S., Department of Health and Human Services, 2000). Taken together, there is a large group of maltreated infants in substitute care. Research indicates these infants experience multiple relationship-based risks due to the combination of maltreatment and the experience of

substitute care, a foundation that complicates the developmental tasks of attachment formation and emotional health (Sroufe, Duggal, Weinfield, & Carlson, 2000).

Attachment is considered one of the most salient developmental tasks in infancy and sets the foundation from which many developmental outcomes are initially formed (Sroufe, 2005). In his book *Attachment and Loss*, John Bowlby (1969/1980) described the primary need of the human infant during the course of the entire first year of life to become attached, as well as to form a focused attachment with its caregiver. Specifically, although attachment emerges between six to nine months, it is a process and infants have a sense of relationships by six months of age, and even earlier. Bowlby posited that the attachment system, which provides a secure base to the infant, is supported not only by the caregiver's physical presence, but also by his or her emotional presence. One measure of emotional presence and health linked with attachment security is Emotional Availability (EA) (Biringen, Robinson, & Emde, 1998; Biringen, 2008). In addition to its prediction of attachment, EA is related to many positive developmental outcomes, including socio-emotional (e.g., positive peer and teacher relationships) and cognitive (e.g., academic performance) competence (Biringen, 2000; Biringen et al., 2005). However, infants separated from their birth parents as a result of maltreatment and placed in substitute care are at an increased risk for developing insecure and disorganized attachments (Barnett, Ganiban, & Cicchetti, 1999), which may possibly result from a combination of factors, including maltreatment, caregiver type (i.e., foster parent, adoptive parent, kinship relation, and biological parent), poor substitute caregiver-child interactions, placement instability, and placement duration.

Overall, there is limited research on attachment in maltreated infants in substitute care (Dozier, Higley, Albus, & Nutter, 2002; Dozier, Stovall, Albus, & Bates, 2001; Carlson, 1998; Barnett et al., 1999), and even less research on the emotional quality of substitute caregiver-infant relationships as antecedents for attachment security (Lawler, 2008). Although demographic characteristics (e.g., caregiver and placement type, duration, and number and age at initial placement) have been investigated, less attention has been paid to substitute caregivers' contribution to attachment security among young children in foster care. Moreover, even less research has assessed infants at later time points. Thus, the intent of this study was to identify targets for intervention to support attachment security in maltreated infants in substitute care by examining the contribution that placement changes, duration, type, child gender, and caregiver and child behaviors within their relationship make to child attachment security.

Attachment

Attachment is based on behavior that develops in the first year of life (e.g., proximity-seeking) that is organized around a primary caregiver in order to promote infant survival (Bowlby, 1969). Attachment quality is made up of patterns of organized behavior that are considered secure or insecure, specifically, anxious avoidant and anxious resistant (Ainsworth, Blehar, Waters, & Wall, 1978). Secure attachment stems from the availability of the caregiver to meet the child's needs (Ainsworth et al., 1978), while insecure attachment stems from a caregiver's contradictory affect messages, such as positive affect followed by negative affect or neglectful responses to a child's communication efforts (Lyons-Ruth,

Easterbrooks, & Cibelli, 1997; Main & Hesse, 1990). Insecure attachment is related to an increased **likelihood** of psychopathology in the general population (Sroufe et al., 2000). In addition to secure and insecure attachment strategies, some children show a disorganized pattern of attachment. Attachment disorganization reflects a lack of an organized attachment strategy and can be considered the most insecure form of attachment (Lyons-Ruth & Jacobvitz, 2008).

Maltreated infants are at an increased risk for the development of insecure and disorganized attachments (Barnett et al., 1999). Children who are at risk for developing insecure attachment relationships with their caregivers as a result of maltreatment and separation experiences are more likely to develop behavioral and emotional problems (Cicchetti & Toth, 1995). Bowlby (1969, 1982) asserted that infants become psychologically vulnerable at the loss of attachment figures. However, even following a disruption in care, children are capable of organizing their behavior around the availability and nurturance of new caregivers (Dozier, 2003; Dozier & Rutter, 2008; van IJzendoorn, Juffer, & Duyvesteyn, 1995). This suggests the importance of the caregiver-child relationship to maltreated children's behavioral and emotional outcomes (Toth & Cicchetti, 1996). In addition, past research suggests that factors associated with placement instability, caregiver type, and the infant's gender may be related to the development of attachment security (Gauthier, Fortin, & Jeliu, 2004; Lawler, 2008; Cole, 2006; Dozier & Rutter, 2008; Smyke, Zeanah, Nelson, Fox, & Guthrie, 2010).

Possible Factors Related to Attachment Security in Maltreated Infants

Placement instability and duration—An analysis of the National Survey of Child and Adolescent Wellbeing (Rubin, O'Reilly, Luan, & Localio, 2007) suggests that as many as 30% of children in substitute care experience multiple placement changes. Frequent placement changes undermine a child's ability to develop stable relationships (Gauthier, Fortin, & Jeliu, 2004), which is problematic because a consistent caregiver is known to support children's development of attachment relationships by limiting children's experience of emotional loss and of having to develop new primary relationships (Sroufe et al., 2000). Therefore, these children do not always have the opportunity to develop stable relationships and miss out on this important developmental task.

The relationship between child placement changes and attachment security is theoretically supported and implied in government policy on permanency for children (Adoption and Safe Families Act, 1997). Although placement change is central to attachment security, very little research has been done to identify the influences placement changes in infancy have on later attachment security. Most studies of child placement changes have focused on older children and, thus, emphasized age-relevant developmental outcomes. For example, one study suggests that multiple placement changes in infancy were associated with 5 to 6 year olds' inhibitory control and oppositional behavior (Lewis, Dozier, Ackerman, & Sepulveda-Kozakowski, 2007). Another study indicates placement instability was associated with 2–17 year olds' increased internalizing and externalizing behaviors compared to children with more stable placements (Newton, Litrownik, & Landsverk, 2000).

Although placement instability is an important construct to assess in relation to attachment security, the time it takes for an attachment to form for children separated from their biological parents is also important to examine. However, studies examining placement duration as related to attachment security in infants placed in substitute care have produced mixed findings. For example, Cole (2005) found that infants placed before three months, and who were in their initial foster homes for at least six months were likely to be securely attached to their caregivers, as long as the caregivers were responsive to the infants' needs. Alternatively, Stovall & Dozier (2000) found that infants placed before 12 months and who had only been in their initial foster homes for 2 weeks developed stable attachment patterns, as long as the caregivers were autonomous and responsive to the infants' needs.

Despite this inconsistency, the underlying theme throughout studies examining placement duration in relation to attachment security is that consistently responsive and available caregiving promotes attachment security (Dozier et al., 2001; Stovall & Dozier, 2000). Also, children who are adopted from foster care are more likely to experience placement stability than children who remain in the foster care system (Wulczyn, Hislop, & Harden, 2002).

Caregiver type—Foster caregivers' parenting quality is related to attachment security and children show quicker adjustment and greater attachment security the younger they are (Stovall & Dozier, 2000). Studies of kin and non-kin caregivers focus on variables related to attachment, such as emotional availability, showing no difference by caregiver type (Lawler, 2008). For example, in one study examining the attachment relationships of 46 infants with their kin and unrelated foster caregivers, secure attachment relationships were found in about equal percentages in kin and unrelated caregiver-infant dyads (67–68%; Cole, 2006), similar to the percentage of secure attachment relationships found in birth and adoptive caregiver-infant dyads in previous studies (van den Dries, Juffer, van IJzendoorn, & Bakermans-Kranenberg, 2009).

Adoptive caregiver-child attachment research for early adopted children is somewhat spurious, with mixed findings showing high levels of security at one analysis and insecurity at a subsample analysis (Juffer & Rosenboom, 1997; Singer, Brodzinsky, Ramsay, Steir, & Waters, 1985; Juffer, Stams, Bakermans-Kranenburg, & van IJzendoorn, 1999). In general, the child's age at adoption, number of placements prior to adoption, maltreatment history (Brodzinsky & Pinderhughes, 2002; Rushton, 2004), and the presence of child characteristics, such as special needs (Palacios & Sanchez-Sandoval, 2005), constrain the adoptive parent-child relationship by adding additional stressors, and thus, may contribute to the formation of insecure or disorganized attachment (Dozier & Rutter, 2008). However, sensitive and responsive parenting has been consistently linked to attachment security in adopted children (Juffer, Bakermans-Kranenburg, & van IJzendoorn, 2008).

Gender—Even more inconsistent results remain in the literature pertaining to gender and attachment security in infant foster care samples. In general, gender has no effect on infants' placements in terms of duration and disruption (Wulczyn et al., 2002; Wulczyn, Kogan, & Harden, 2003; Zeanah et al., 2001). However, few studies have examined gender differences in infant substitute care samples as related to attachment security. Indeed, most studies examine gender differences in school-age foster care samples in regard to cognitive domains,

with somewhat consistent findings that boys score lower than girls on assessments of cognition and developmental delay (Moe & Slinning, 2001; Stahmer et al., 2009).

Studies examining attachment organization in foster care samples generally do not show gender differences (Bernier & Dozier, 2003). However, the pattern of boys in high risk samples showing greater incidence of disorganized attachment than girls has become increasingly recognized (David & Lyons-Ruth, 2005; Vondra, Hommerding, & Shaw, 1999), and whether such gender differences are due to socialization or unique gender contributions is largely unknown. For example, one study comparing institutionalized children, previously institutionalized children who had been placed in foster care, and family-reared children, found that the previously institutionalized children were able to form secure attachments to foster caregivers, and girls in the foster care group were more often secure in their attachment behaviors than boys (Smyke, Zeanah, Nelson, Fox, & Guthrie, 2010). Gender also seemed to moderate the effects of the intervention, with girls showing more response to the foster care intervention than boys (Smyke et al., 2010). However, the specific mechanisms that allowed for sensitivity to change were not investigated. One explanation may be that the specific caregiver-child interactions, which are considered the context for reorganization or initial formation of attachment behaviors, were emotionally responsive and available in order that secure attachment behaviors were able to form.

Emotional availability—Emotional Availability (EA) is a construct that describes the dyadic interactions within a caregiver-child relationship. The EA framework involves the integration of attachment theory (Bowlby, 1969, 1980) and emotional perspectives (Emde, 1980; Mahler, Pine, and Bergman, 1975). The EA framework is also influenced by systemic theories (e.g., Guttman, 1991) and the transactional perspective (Sameroff & Fiese, 2000). As a construct, EA refers to the capacity of a dyad to reciprocally form an emotional connection that is affectively healthy and advantageous (Biringen, 2000). EA is related to and predictive of attachment security in the general population (Aviezer, Sagi, Joels, & Ziv, 1999; Biringen et al., 2005; Ziv, Aviezer, Gini, Sagi, & Koren-Karie, 2000). In terms of its use with at-risk populations, EA has been correlated with young children's diagnoses, such as attachment disorders, externalizing disorders, regulation disorders, and feeding disorders (Wiefel et al., 2005), and predictive of children's internalizing and externalizing behaviors (Kang, 2005).

The dyadic construct of EA has been measured by the EA Scales (4th ed.; Biringen, 2008), which are used to measure the multiple dimensions of each partner's contributions to a relationship (Biringen, 2000; Biringen & Robinson, 1991; Biringen, Robinson, & Emde, 1998). The four caregiver dimensions include sensitivity, structuring, nonintrusiveness, and nonhostility. Similarly, two dimensions measure the child's responsiveness to the caregiver and involvement of the caregiver (Biringen, 2008).

The quality of emotional availability in a substitute caregiver-infant relationship post-placement may affect the likelihood of attachment security. Caregiver-child relationships that have optimal EA also tend to be securely attached. Interestingly, foster parents tend to report attachment-related difficulties (e.g., resistance toward parent, avoidance of physical contact, and inability to be soothed by the parent) with infants in foster care (Tyrrell &

Dozier, 1999). This suggests that an appropriate level of emotional scaffolding and availability by the substitute caregivers in response to such insecure attachment behaviors may be crucial for the development of secure attachment relationships for infants in foster care.

Caregiver sensitivity is a skill that has long been established as being linked to attachment security in typical populations (Ainsworth et al., 1978). One caregiver dimension of the EA Scales, Caregiver Sensitivity, includes responsiveness to a child's signals and communications, in addition to taking into consideration the role of caregiver emotion and conflict regulation with the child (Biringen, 2000). In the general population, meta-analyses in attachment indicate the importance of caregiver sensitivity as a principal mechanism by which secure attachment is fostered, with more sensitive care being associated with attachment security (van Ijzendoorn et al., 1995). The infants' responses to being separated from their biological caregivers and placed into substitute care may affect both the caregiver and child sides of EA (e.g., child pushes caregiver away and does not involve the caregiver, which leads the caregiver to walk away instead of using sensitive responsiveness and trying a different tactic). Maltreated children also tend to have problems with using a caregiver to help modulate the intensity of their emotions (Clyman & Harden, 2002). However, attachment research has shown that infants in foster care eventually organize their attachment behavior around the availability of their new caregivers, most often noticed by the child's increased involvement of the caregiver (Dozier et al., 2001), which implies the need for assessment of the substitute caregiver-child relationship at different time points.

Nonetheless, caregiver and child relationship skills in terms of EA have not been specifically assessed with young children in substitute care. Therefore, the present study was designed to fill the gap in this line of research in order to better understand, through quantitative data, the impact of placement changes, caregiver type, child gender, and substitute caregiver-child EA in order to identify targets for intervention to facilitate attachment security.

Research Questions and Hypothesis

In this study of infants placed in substitute care by six months of age, we quantitatively measure the contribution that placement changes and EA make to child attachment security when children are three years old, using child out-of-home placement history, the EA Scales (4th ed.; Biringen, 2008), and the Attachment Q-set (Waters & Deane, 1985). We predict that placement changes since birth and concurrent substitute caregiver-child EA will be associated with and predict child attachment security at three years of age.

Method

Overview

Quantitative data from the longitudinal *Infants in Foster care (IFC)* study was analyzed. The *IFC* study's goal is to assess predictors of problematic emotional and behavioral symptoms in infants in substitute care. Enrolled study participants are infants placed in court-ordered care. Enrolled infants with their primary caregiver are evaluated at 5 follow-up time points in the home: at 1, 5, 9, 15, and 36 months after initial placement. Study variable data have been

collected across all time points. The current study analyzed data at study end point (i.e., time point five), when children were three years old.

Participants

The sample of children consists of 57 (55%) boys and 47 (45%) girls who are three years old (36–47 mos.). Initial data included 275 infants placed in court-ordered care before six months old. The AQS measure was added to the *IFC* study while concluding final visits. Those data include 137 three year-old children. While the attachment measure was chosen later in the study, resulting in a smaller sample, it was systematically administered across participants at final visit. Additionally, 12 children at final visits shared a substitute caregiver with another study child. To eliminate shared variance within caregiving scenarios and to maintain a sample of all first-placed children, we excluded subsequently placed child(ren)'s data. Additionally, 13 children participated in a pilot intervention at the time of final visit. One child was in both of these exclusionary categories. Last, seven study tapes were damaged and two participants did not have videotapes. Thus, the final sample of children in the current study is 104. The majority of children are Spanish/Hispanic/Latino/a (56%). Remaining children are Black (22%), White (18%), American Indian/Alaskan Native (1%), and mixed race (3%).

The sample of caregivers at study endpoint, when children were three years old, consisted mostly of females (99%) who are White (50%). The remaining caregivers are multi-racial (23%), Black (18%), American Indian/Alaskan Native (7%), Asian (1%), and Spanish/Hispanic/Latino/a (1%). Additionally, the majority (77%) of caregivers have a high school, plus some college education ($M = 1$ year college). More specifically, 40% had some college education, 27% had a high school education, 16% had a bachelor's degree, 11% had less than a high school education, and 6% had a master's degree. While all study children were initially removed from their biological parent(s), some parent(s) regained physical or legal custody of their child(ren) during the course of the study. At study endpoint, almost half (49%) of caregivers were adoptive. Kinship relatives represented 23%, biological parents represented 14%, and foster parents represented 14%.

Procedure

The *IFC* study protocol involves videotaping caregivers and children in the following procedures. First, caregiver and child are asked to play together for at least 5 minutes. For older children, the caregiver asks the child to help clean up the toys. Next, all caregivers and children have a snack that lasts up to 5 minutes. Finally, while the child plays or relaxes, the caregiver fills out a series of questionnaires regarding the child, the caregiver's thoughts and feelings about him/herself, the family environment, and his/her and the child's own health and history. The protocol averages approximately 1–3 hours.

Measures

Attachment security—Attachment security was assessed using Waters' Attachment Q-Set (AQS; Waters & Deane, 1985). Child Attachment behaviors were observed and scored by experimenters during a two-hour study procedure where the caregiver and child are together in the home setting. The task is to sort cards along a continuum that is most to least

characteristic of the child, with scores of nine and one, respectively. The card placement in the sort determines the final score of the measure and conforms to a symmetrical, unimodal distribution.

The AQS Security score shows modest convergent validity with the Strange Situation Procedure (De Wolff & van Ijzendoorn, 1997; Van Bakel & Ricksen-Walraven, 2004). The AQS Security score has been shown to be related to parental sensitivity, socio-emotional development (van Ijzendoorn, Vereijken, Bakermans-Kranenburg, & Ricksen-Walraven, 2004), and disorganized attachment (van Ijzendoorn et al., 2004; National Institute for Child Health and Development [NICHD] study of early childcare, 1997). The AQS has been used with vulnerable populations (Easterbrooks & Graham, 1999; Rutgers, van Ijzendoorn, Bakermans-Kranenburg, & Swinkels, 2007). Additionally, in the NICHD study of early childcare (1997), the AQS showed reliability of .73.

Child out-of-home placements—Denver Department of Health and Human Services (DHHS) charts were reviewed to collect placement data. These charts were reviewed for any errors in final calculation of number of out-of-home placements, after which a final calculation of number of out-of-home placements was entered into a study database. The placement database includes variables such as target child's entry and exit dates, placement type, number of days in a placement, cumulative number of days in placement (through study end point), and total number of placements (through study end point).

Emotional availability—Emotional Availability (EA) was assessed using the Infancy/Early Childhood Version of the EA Scales, 4th edition (Biringen, 2008). Conceptualized as a dyadic measure, EA uses caregiver-child interactions to assess caregiver emotional competence. In this study, caregiver and child were given a bag of age-appropriate toys and asked to interact as they normally would. Caregiver-child interactions were videotaped for 17 minutes to be coded after the fact for caregiver sensitivity and structuring behavior, using observational video coding.

EA includes caregiver and child scales. The four caregiver scales are: Sensitivity, Structuring, Non-intrusiveness, and Non-hostility. The two child scales are: Responsiveness to the Caregiver and Involvement of the Caregiver. Scales are rated on a 7-point scale that is continuous and rated from low to high. The construct of emotional availability has been found to predict attachment security, as assessed in the Strange Situation, as well as the AQS (Shivers, 2006). Studies document the construct validity of EA (Kogan & Carter, 1996; Zimmerman & McDonald, 1995). Kogan and Carter (1996) found EA Caregiver Sensitivity to be related to insecure attachment. Howes, Guerra, and Zucker (2007) showed the relationship between EA Caregiver Structuring and attachment outcomes. In addition, Zimmerman and McDonald (1995) found that EA adequately measured child-non-parental caregiver relationships, such as is the case in the current study. EA is also applicable to the age range of the current study (Biringen, Emde, Campos, & Appelbaum, 1995; Easterbrooks & Biringen, 2000; Little & Carter, 2005). EA has a test-retest and inter-rater reliability of .80 (Biringen et al., 1998).

Covariates

Standard, theoretical, and empirical covariates include child's gender, type of maltreatment (i.e., physical abuse, lack of supervision, failure to provide; Manly, Cicchetti, & Barnett, 1994), length of time in current placement (Bowlby, 1969), and substitute caregiver type (Dozier et al., 2001; Pecora, LaProhn, & Nasuti, 1999; Juffer et al., 1999).

Results

Descriptive Statistics of Predictor, Covariate, and Outcome Variables

The mean number of out-of-home placements ($M = 1.79$, $SD = 1.058$, range=1–7) was approximately two, which included the initial removal, with a small standard deviation that limited the opportunity to review children's experience across a range of placement changes. To further illustrate this, at study end point, when children were three years old, adoptive parents represented 49% of the study caregivers. Further, at study endpoint, when children were three years old, they had spent an average of 32 months with adoptive parents ($M = 32.39$, $SD = 6.49$), 30 months with kinship relatives ($M = 30.58$, $SD = 8.03$), 27 months with foster caregivers ($M = 27.36$, $SD = 11.43$), and 23 months with biological parents ($M = 23.27$, $SD = 10.09$).

EA subscales of Sensitivity ($M = 21.77$, $SD = 4.27$), Structuring ($M = 21.31$, $SD = 4.23$), Non-intrusiveness ($M = 25$, $SD = 3.88$), Non-hostility ($M = 27.32$, $SD = 1.64$), all scored on a 29-point scale, were relatively high on average. EA child scales of Child Responsiveness ($M = 21.68$, $SD = 4.13$) and Child Involvement ($M = 20.52$, $SD = 4.16$), also scored on 29-point scale, were relatively high on average, too.

In regard to covariates, the mean number of months in the caregiver's care at the end of the study, when the child was three years old, was 30 months ($M = 29.98$, $SD = 8.70$) for the total sample, approximately 34 months ($M = 33.51$, $SD = 5.03$) for children with one out-of-home placement, and approximately 26 months ($M = 25.78$, $SD = 8.80$) for children with two or more out-of-home placements. On average, girls spent slightly less time ($M = 28.13$, $SD = 9.59$) in their caregiver's care at three years old than boys ($M = 31.51$, $SD = 7.64$). This provides some additional information to the out-of-home placement data.

In relation to the outcome variable of AQS Security, the mean scores ($M = .31$, $SD = .24$) were somewhat average. Based on collection of AQS data in normative samples, 67% of sorts have been shown to have AQS scores of .33 or above and so this is used as a cutoff for security (Kerns, Klepac, & Cole, 1996; Park & Waters, 1989; Teti & Ablard, 1989). In this sample of children placed in out of home care prior to six months old, 66% of children showed a secure attachment with their caregiver at three years old. Fifty-seven percent of children with one out-of-home placement ($M = .31$, $SD = .24$) and approximately 62% of children with two or more out-of-home placements ($M = .31$, $SD = .25$) showed a secure attachment with their caregivers at three years old. In relation to AQS Security by caregiver type, approximately 50% of children placed with kinship caregivers ($M = .31$, $SD = .22$), 50% of children placed with foster caregivers ($M = .27$, $SD = .25$), 70% of children placed with adoptive caregivers ($M = .35$, $SD = .24$), and 47% of children placed with biological caregivers ($M = .21$, $SD = .28$) were in the secure attachment range.

Zer,o-order Correlations among Predictor Variables

Relations among predictor variables were analyzed. No significant relations were found between the number of out-of-home placements and the EA subscales. However, significant relations were observed between EA subscales.

Zero-order Correlations between Covariates and Outcome Variable

Relations between covariates (child gender, caregiver type at study endpoint, and child's length of time in the caregiver's care at study endpoint) and the AQS Security outcome were analyzed. Significant relations were found between gender and AQS Security ($r = -.32, p = .001$). This indicates that girls were more likely to be securely attached with their caregiver at study endpoint. All other relations between covariates and the outcome measure were non-significant.

Predictor Variable Relations with AQS Security

Relations between predictor variables and the outcome measure of AQS Security were analyzed. These variables included total number of out-of-home placements, and EA. The relation between Child Responsiveness and AQS Security was significant, $r(104) = .267, p = .006$, indicating that children who were emotionally responsive to their caregivers in the free play interaction were more securely attached to them. The relation between Child Involvement and AQS Security was significant, $r(104) = .229, p = .020$, indicating that children who involved their mothers more in the free play interaction physically, cognitively, and emotionally were more securely attached to them. As well, the relation between Caregiver Sensitivity and AQS Security was significant, $r(104) = .220, p = .025$, indicating that children with sensitive caregivers were more securely attached to them. All other relations between predictor variables and the outcome measure were non-significant.

EA Sensitivity, Gender, EA Child Involvement, and EA Child Responsiveness as Predictors of AQS Security

Multiple regression was conducted to determine the best linear combination of EA Sensitivity, gender, EA Child Involvement, and EA Child Responsiveness for predicting AQS Security. This combination of variables significantly predicted AQS Security, $F(4, 99) = 5.94, p < .001$. The adjusted R squared value was .16. This indicates that 16% of the variance in AQS Security was explained by the model. According to Cohen (1988), this is a small effect. However, the beta weights, presented in Table 1, suggest that child gender mainly contributed to predicting AQS Security. This likely indicates some problems with multicollinearity among the EA variables. In fact, the tolerance levels for these EA variables were low.

Discussion

The overall purpose of the present study was to determine the contribution that number of placement changes and caregiver-child EA make to child attachment security when children who entered court-ordered foster or kin care are 3 years old. It was hypothesized that placement changes since birth and concurrent substitute caregiver-child EA would be associated with and predict child attachment security when the child was 3 years old.

Strikingly, findings showed that approximately 66% of participating children were securely attached to their substitute caregivers at 3 years old, which is comparable to 67% in normative populations using the AQS (Kerns, Klepac, & Cole, 1996; Park & Waters, 1989; Teti & Ablard, 1989). This near-normative rate of attachment security in this sample may be partially explained by the limited number of out-of-home placements ($M = 1.79$, $SD = 1.058$) experienced. Additionally, children were removed from their biological parents' care by 6 months of age, which may also explain the near-normative rate of attachment security. Studies examining infant attachment security with substitute caregivers have found similar rates of attachment security as the present study (Dozier et al., 2001; Stovall & Dozier, 2000) and have implicated age at removal as a possible contributor (Dozier et al., 2001). For example, Dozier et al. (2001) found infants removed from their biological parents and placed into foster care between birth and 20 months old to have similar rates of attachment security as biologically intact dyads. Alternatively, later-placed children older than 20 months are less likely to develop secure attachments to their substitute caregivers (Dozier et al., 2001). These findings show that the presence of out-of-home placements does not necessarily act as a negative predictor of attachment security as long as children are placed with substitute caregivers at a relatively young age.

Interestingly, approximately 49% of children were adopted by study end point, and of these children, approximately 70% had secure attachments. Although adequate comparisons across caregiver type were limited, the near normative rate of attachment security and high rate of adoptive caregivers found are important to note. Without studying these variables longitudinally, it is hard to discern whether adoption acted as a protective factor.

It may be that the average length of time in a substitute caregiver's care was the contributing mechanism within the adoptive caregiver type. The average length of time in a substitute caregiver's care by study endpoint was 30 months for the entire sample, and children adopted by study end point spent an average of 32 months in their adoptive caregiver's care. Bowlby (1969) posited that consistent interactions with a primary attachment figure over time decrease the likelihood of internal working models to change. Of course, in order for interactions to become consistent, an adequate length of time is needed. Perhaps 30 months was ample time to develop a secure attachment relationship for this sample. However, adequate comparisons across caregiver type were limited given the high rate of adoptive caregivers by study endpoint. Never the less, these findings suggest that despite out-of-home placements, children can organize their attachment behaviors securely around the nurturance and availability of substitute caregivers.

The EA subscales of Child Involvement, Child Responsiveness, and Caregiver Sensitivity were significantly related to child attachment security at 3 years old. This suggests that children were more responsive and involving of caregivers who were sensitive, and thus were more likely to be securely attached to such caregivers. However, none of these EA subscales individually predicted child attachment security significantly, but the combination of Child Involvement, Child Responsiveness, Caregiver Sensitivity, and gender predicted and explained 16% of the variance in AQS security. Thus, the main study hypotheses were not supported. It was posited that the lack of predictive power by the EA subscales might be explained by multicollinearity, evidenced by their low tolerance within the tested regression

model. However, upon closer investigation, the EA subscales, while not significant, made unique contributions to the variance explained in AQS Security.

Interestingly, child gender predicted child attachment security at 3 years old and explained most of the variance in AQS security, suggesting that girls in this sample were more likely to be securely attached to their substitute caregivers than boys. The mechanisms contributing to the relationship between gender and attachment security have yet to be fully understood (Carlson et al., 1989; David & Lyons-Ruth, 2005). However, although mixed findings have been found with regard to gender differences in attachment security, such a relationship is hardly a novel finding. For example, one study that used randomized control trials to examine whether gender was predictive of attachment security in children with a history of institutionalization found that girls tended to be more securely attached to their foster caregivers and benefited more from the foster care intervention provided than boys (Smyke et al., 2010). In addition, boys were more likely to have disorganized attached with their foster caregivers (Smyke et al.).

Similarly, studies examining children in contexts of risk (e.g., low socioeconomic status, neglect, and maltreatment) still in the care of their biological caregivers found higher rates of disorganized attachment in boys than girls (Carlson et al., 1989; David & Lyons-Ruth, 2005). It has been suggested that gender-based differences in attachment security exist in the context of risk (Lyons-Ruth, Easterbrooks, & Cibelli, 1997). Thus, boys in the present study may have been more sensitive to the effect of out-of-home placement and maltreatment than girls. Such sensitivity may have complicated the development of secure attachment behaviors toward their substitute caregivers by making them less involving of their caregivers or less responsive toward their caregivers. This, in turn, may have negatively impacted caregiver sensitivity. However, due to the study design, causal inferences cannot be made.

Limitations

The small sample size, particularly for caregiver subgroups given the large number of adoptive caregivers at study end point, made it difficult to determine the role caregiver type played in child attachment organization. Additionally, there was a limited range in the number of out-of-home placements experienced by this sample. Last, only children whose attachment behaviors were measured using the AQS at time point five were included in the study.

Implications and Future Directions

Children's development while in the child welfare system, such as attachment to caregivers, is important and has begun to receive more attention in recent years. The present study brings to light the importance of substitute caregiver-child relations for child attachment security, and thus, contributes to the child welfare literature, policy, and practice.

It is still unclear what role attachment organization plays for children who experience out-of-home placements. However, the present study showed that children with out-of-home placements are still able to form secure attachments around the nurturance of substitute

caregivers, which may reroute developmental outcomes. Of course, longitudinal studies of children with out-of-home placements are needed to confirm this assertion.

Future studies should garner larger samples of each of the four types of caregivers in order to ascertain the role caregiver type plays in attachment organization for children placed in court-ordered kinship or foster care. In addition, to assess the impact placement changes have on attachment security future work should include greater variability in the number of placement changes experienced by participating children.

In summary, despite experiences of maltreatment and out-of-home placements, children who were placed in substitute care by 6 months of age were typically securely attached to their substitute caregivers at 3 years old. While we believe these findings illustrate attachment as a robust phenomenon that can securely develop in the context of nurturing substitute care even when confronted with risk, it is still unclear what role attachment organization plays for children who experienced out-of-home placements.

Acknowledgments

Dr. Altenhofen was funded on NIMH grant T32 MH015442-30-31, Randy Ross PI; This work was supported by a grant to Dr. Altenhofen from the Developmental Psychobiology Research Group Endowment Fund of the University of Colorado Denver

References

- Adoption and Safe Families Act of 1997. 1997. Pub. L. No. 105–89, 111 Stat. 2115 Available at <http://frwebgate.access.gpo.gov>
- Ainsworth, MS.; Blehar, MC.; Waters, E.; Wall, S. Patterns of attachment: A psychological study of the strange situation. Oxford; Lawrence: 1978.
- Aviezer O, Sagi A, Joels T, Ziv Y. Emotional availability and attachment representations in kibbutz infants and their mothers. *Developmental Psychology*. 1999; 35:811–821.10.1037/0012-1649.35.3.811 [PubMed: 10380871]
- Barnett D, Ganiban J, Cicchetti D. Maltreatment, negative expressivity, and the development of Type D attachments from 12 to 24 months of age. *Monographs of the Society for Research in Child Development*. 1999; 64:97–118.10.1111/1540-5834.00035 [PubMed: 10597544]
- Bernier A, Dozier M. Bridging the attachment transmission gap: The role of maternal mind-mindedness. *International Journal of Behavioral Development*. 2003; 27:355–365.10.1080/01650250244000399
- Biringen Z. Emotional availability: Conceptualization and research findings. *American Journal of Orthopsychiatry*. 2000; 70:104–114.10.1037/h0087711 [PubMed: 10702855]
- Biringen, Z. The Emotional Availability Scales Manual. 4th2008. Retrieved from www.emotionalavailability.com
- Biringen Z, Damon J, Grigg W, Mone J, Pipp-Siegel S, Skillern S, Stratton J. Emotional Availability: Differential predictions to infant attachment and kindergarten adjustment based on observation time and context. *Infant Mental Health Journal*. 2005; 26:295–308.10.1002/imhj.20054
- Biringen Z, Emde RN, Campos JJ, Appelbaum MI. Affective reorganization in the infant, the mother, and the dyad: The role of upright locomotion and its timing. *Child Development*. 1995; 66:499–514.10.2307/1131593 [PubMed: 7750380]
- Biringen Z, Robinson J. Emotional availability in mother-child interactions: A reconceptualization for research. *American Journal of Orthopsychiatry*. 1991; 61:258–271.10.1037/h0079238 [PubMed: 2048641]
- Biringen, Z.; Robinson, J.; Emde, R. The Emotional Availability Scales. 3rd1998. Retrieved from www.emotionalavailability.com

- Bowlby, J. Attachment and loss. Vol. 1. New York: Basic; 1969.
- Bowlby, J. Attachment and loss. Vol. 2. New York: Basic; 1980.
- Bowlby J. Attachment and loss: Retrospect and prospect. *American Journal of Orthopsychiatry*. 1982; 52:664–678. [PubMed: 7148988]
- Brodzinsky, DM.; Pinderhughes, E. Parenting and child development in adoptive families. In: Bornstein, M., editor. *Handbook of parenting: Children and parenting*. 3rd. Hillsdale, NJ: Erlbaum; 2002. p. 279-312.
- Carlson EA. A prospective longitudinal study of attachment disorganization/disorientation. *Child Development*. 1998; 69:1107–1128.10.2307/1132365 [PubMed: 9768489]
- Carlson V, Cicchetti D, Barnett D, Braunwald K. Disorganized/disoriented attachment relationships in maltreated infants. *Developmental Psychology*. 1989; 25:525–531.10.1037/0012-1649.25.4.525
- Cicchetti D, Barnett D. Attachment organization in maltreated preschoolers. *Development and Psychopathology*. 1991; 3:397–411.10.1017/S0954579400005009
- Cicchetti, D.; Toth, SL. Child maltreatment and attachment organization: Implications for intervention. In: Goldberg, S.; Muir, R.; Kerr, J.; Muir, R.; Kerr, J., editors. *Attachment theory: Social, developmental, and clinical perspectives*. Hillsdale, NJ: Analytic; 1995. p. 279-308.
- Clyman RB, Harden BJ. Infants in foster and kinship care. *Infant Mental Health Journal*. 2002; 23:433–434.10.1002/imhj
- Cohen, J. *Statistical power for the behavioral sciences*. 2nd. Hillsdale, NJ: Erlbaum; 1988.
- Cole SA. Infants in foster care: Relational and environmental factors affecting attachment. *Journal of Reproductive and Infant Psychology*. 2005; 23(1):43–61.10.1080/02646830512331330947
- Cole SA. Building secure relationships: Attachment in kin and unrelated foster caregiver-infant relationships. *Families in Society*. 2006; 87(4):497–508.
- David DH, Lyons-Ruth K. Differential attachment responses of male and female infants to frightening maternal behavior: Tend or befriend versus fight or flight? *Infant Mental Health Journal*. 2005; 26:1–18.10.1002/imhj.20033 [PubMed: 17464362]
- De Wolff M, van IJzendoorn MH. Sensitivity and attachment: A meta-analysis on parental antecedents of infant attachment. *Child Development*. 1997; 68:571–591.10.2307/1132107 [PubMed: 9306636]
- Dozier M. Attachment-based treatment for vulnerable children. *Attachment & Human Development*. 2003; 5:253–257.10.1080/14616730310001596151 [PubMed: 12944219]
- Dozier M, Higley E, Albus KE, Nutter A. Intervening with foster infants' caregivers: Targeting three critical needs. *Infant Mental Health Journal*. 2002; 23:541–554.10.1002/imhj.10032
- Dozier, M.; Rutter, M. Challenges to the development of attachment relationships faced by young children in foster and adoptive care. In: J Cassidy, PR.; Shaver, J., editors. *Handbook of attachment: Theory, research, and clinical applications*. 2nd. New York: Guilford; 2008. p. 698-717.
- Dozier M, Stovall K, Albus KE, Bates B. Attachment for infants in foster care: The role of caregiver state of mind. *Child Development*. 2001; 72:1467–1477.10.1111/1467-8624.00360 [PubMed: 11699682]
- Easterbrooks M, Biringen Z. Guest editors' introduction to the special issue: Mapping the terrain of emotional availability and attachment. *Attachment & Human Development*. 2000; 2:123–129. of security in the child-mother relationship. *Developmental Psychology*, 32, 457–466. doi: 10.1037/0012-1649.32.3.457. 10.1080/14616730050085518 [PubMed: 11707906]
- Easterbrooks M, Graham CA. Security of attachment and parenting: Homeless and low-income housed mothers and infants. *American Journal of Orthopsychiatry*. 1999; 69:337–346.10.1037/h0080408 [PubMed: 10439848]
- Emde, R. Emotional availability: A reciprocal reward system for infants and parents with implications for prevention of psychosocial disorders. In: Taylor, PM., editor. *Parent-infant relationships*. Orlando: Grune & Stratton; 1980. p. 101-130.
- Gauthier Y, Fortin G, Jéliu G. Clinical application of attachment theory in permanency planning for children in foster care: The importance of continuity of care. *Infant Mental Health Journal*. 2004; 25:379–396.10.1002/imhj.20012

- Guttman, HA. Systems theory, cybernetics, and epistemology. In: Gurman, AS.; Kniskern, DP.; Gurman, AS.; Kniskern, DP., editors. Handbook of family therapy. Vol. 2. Philadelphia: Brunner/Mazel; 1991. p. 41-62.
- Howes C, Guerra A, Zucker E. Cultural communities and parenting in Mexican-heritage families. *Parenting: Science and Practice*. 2007; 7:235–270.
- Juffer, F.; Bakermans-Kranenburg, MJ.; van IJzendoorn, MH. Promoting positive parenting: An introduction. In: Juffer, F.; Bakermans-Kranenburg, MJ.; van IJzendoorn, MH., editors. Promoting positive parenting: An attachment-based intervention. New York: Taylor & Francis; 2008. p. 1-9.
- Juffer F, Rosenboom LG. Infant–mother attachment of internationally adopted children in the Netherlands. *International Journal of Behavioral Development*. 1997; 20:93–107.10.1080/016502597385469
- Juffer, F.; Stams, GJJM.; Bakermans-Kranenburg, MJ.; van IJzendoorn, MH. In search of the origins of adopted children’s behavior problems. Paper presented at biennial meeting of the Society for Research in Child Development; Albuquerque, NM. 1999 Apr.
- Kang, MJ. Ph D dissertation. The Ohio State University; 2005. Quality of mother-child interaction assessed by the Emotional Availability Scale: Associations with maternal psychological well-being, child behavior problems, and child cognitive functioning.
- Kerns KA, Klepac L, Cole A. Peer relationships and preadolescents’ perceptions of security in the child-mother relationship. *Developmental Psychology*. 1996; 32:457–466.10.1037/0012-1649.32.3.457
- Kogan N, Carter AS. Mother–infant reengagement following the still-face: The role of maternal emotional availability in infant affect regulation. *Infant Behavior & Development*. 1996; 19:359–370.10.1016/S0163-6383(96)90034-X
- Lawler MJ. Maltreated children’s emotional availability with kin and non-kin foster mothers: A sociobiological perspective. *Children and Youth Services Review*. 2008; 30:1131–1143.10.1016/j.chilyouth.2008.02.007
- Lewis EE, Dozier M, Ackerman J, Sepulveda-Kozakowski S. The effect of placement instability on adopted children’s inhibitory control abilities and oppositional behavior. *Developmental Psychology*. 2007; 43:1415–1427.10.1037/0012-1649.43.6.1415 [PubMed: 18020821]
- Little C, Carter AS. Negative emotional reactivity and regulation in 12-month-olds following emotional challenge: Contributions of maternal-infant emotional availability in a low-income sample. *Infant Mental Health Journal*. 2005; 26:354–368.10.1002/imhj.20055
- Lyons-Ruth K, Easterbrooks M, Cibelli C. Infant attachment strategies, infant mental lag, and maternal depressive symptoms: Predictors of internalizing and externalizing problems at age 7. *Developmental Psychology*. 1997; 33:681–692.10.1037/0012-1649.33.4.681 [PubMed: 9232383]
- Lyons-Ruth, K.; Jacobvitz, D. Attachment disorganization: Genetic factors, parenting contexts, and developmental transformation from infancy to adulthood. In: Cassidy, J.; Shaver, PR., editors. Handbook of attachment: Theory, research, and clinical applications. 2nd. New York: Guilford; 2008. p. 666-697.
- Mahler, M.; Pine, F.; Bergman, A. The psychological birth of the human infant. New York: Basic; 1975.
- Main, M.; Hesse, E. Parents’ unresolved traumatic experiences are related to infant disorganized attachment status: Is frightened and/or frightening parental behavior the linking mechanism?. In: Greenberg, MT.; Cicchetti, D.; Cummings, E., editors. Attachment in the preschool years: Theory, research, and intervention. Chicago: University of Chicago; 1990. p. 161-182.
- Manly JT, Cicchetti D, Barnett D. The impact of subtype, severity, chronicity, and frequency of child maltreatment on social competence and behavior problems. *Development and Psychopathology*. 1994; 6:121–143.
- Moe V, Slinning K. Children prenatally exposed to substances: Gender-related differences in outcome from infancy to 3 years of age. *Infant Mental Health Journal*. 2001; 22:334–350.10.1002/imhj.1005
- Newton RR, Litrownik AJ, Landsverk JA. Children and youth in foster care: Disentangling the relationship between problem behaviors and number of placements. *Child Abuse & Neglect*. 2000; 24:1363–1374.10.1016/S0145-2134(00)00189-7 [PubMed: 11075702]

- NICHD Early Child Care Research N. The effects of infant child care on infant-mother attachment security: Results of the NICHD study of early child care. *Child Development*. 1997; 68(5):860–879.10.1111/j.1467-8624.1997.tb01967.x
- Palacios, J.; Sánchez-Sandoval, Y. Beyond adopted/nonadopted comparisons. In: Brodzinsky, DM.; Palacios, J., editors. *Psychological issues in adoption: Research and practice*. Westport, CT: Praeger; 2005. p. 117-144.
- Park KA, Waters E. Security of attachment and preschool friendships. *Child Development*. 1989; 60:1076–1081.10.2307/1130781 [PubMed: 2805885]
- Pecora, P.; LeProhn, N.; Nasuti, J. Role perceptions of kinship and other foster parents in family foster care. In: Hegar, R.; Scannapieco, M., editors. *Kinship foster care: Policy, practice, and research*. Oxford: Oxford University Press, Inc; 1999. p. 155-178.
- Rubin DM, O'Reilly AL, Luan X, Localio AR. The impact of placement stability on behavioral well-being for children in foster care. *Pediatrics*. 2007; 119:336–344. [PubMed: 17272624]
- Rushton A. A scoping and scanning review of research on the adoption of children placed from public care. *Clinical Child Psychology and Psychiatry*. 2004; 9:89–106.10.1177/1359104504039768
- Rutgers AH, van Ijzendoorn MH, Bakermans-Kranenburg MJ, Swinkels SN. Autism and attachment: The Attachment Q-Sort. *Autism*. 2007; 11:187–200.10.1177/1362361307075713 [PubMed: 17353218]
- Sameroff, AJ.; Fiese, BH. Transactional regulation: The developmental ecology of early intervention. In: Shonkoff, JP.; Meisels, SJ., editors. *Handbook of early childhood intervention*. 2nd. New York: Cambridge; 2000. p. 135-159.
- Shivers E. A closer look at kith and kin care: Exploring variability of quality within family, friend and neighbor care. *Journal of Applied Developmental Psychology*. 2006; 27:411–426.10.1016/j.appdev.2006.06.007
- Singer LM, Brodzinsky DM, Ramsay D, Steir M, Waters E. Mother-infant attachment in adoptive families. *Child Development*. 1985; 56:1543–51. [PubMed: 4075872]
- Smyke AT, Zeanah CH, Nelson CA, Fox NA, Guthrie D. Placement in foster care enhances quality of attachment among young institutionalized children. *Child Development*. 2010; 81(1):212–223.10.1111/j.1467-8624.2009.01390.x [PubMed: 20331663]
- Sroufe L. Attachment and development: A prospective, longitudinal study from birth to adulthood. *Attachment & Human Development*. 2005; 7:349–367.10.1080/14616730500365928 [PubMed: 16332580]
- Sroufe, L.; Duggal, S.; Weinfield, N.; Carlson, E. Relationships, development, and psychopathology. In: Sameroff, AJ.; Lewis, M.; Miller, SM., editors. *Handbook of developmental psychopathology*. 2nd. Dordrecht Netherlands: Kluwer Academic Publishers; 2000. p. 75-91.
- Stovall K, Dozier M. The development of attachment in new relationships: Single subject analyses for 10 foster infants. *Development and Psychopathology*. 2000; 12:133–156.10.1017/S0954579400002029 [PubMed: 10847621]
- Teti DM, Ablard KE. Security of attachment and infant-sibling relationships: A laboratory study. *Child Development*. 1989; 60:1519–1528.10.2307/1130940 [PubMed: 2612257]
- Toth SL, Cicchetti D. Patterns of relatedness, depressive symptomatology, and perceived competence in maltreated children. *Journal of Consulting and Clinical Psychology*. 1996; 64:32–41.10.1037/0022-006X.64.1.32 [PubMed: 8907082]
- Tyrrell C, Dozier M. Foster parents' understanding of children's problematic attachment strategies: The need for therapeutic responsiveness. *Adoption Quarterly*. 1999; 2:49–64.
- U.S. Department of Health and Human Services, Administration on Children, Youth and Families. *Child Maltreatment 2005*. Washington, D.C.: U.S. Government Printing Office; 2007.
- U.S. Department of Health and Human Services Administration for Children and Families. *Child maltreatment 1998: Reports from the states to the National Child Abuse and Neglect Data System*. Washington, D.C.: U.S. Government Printing Office; 2000.
- Van Bakel HA, Riksen-Walraven J. AQS security scores: What do they represent? A study in construct validation. *Infant Mental Health Journal*. 2004; 25:175–193.10.1002/imhj.20001

- van den Dries L, Juffer F, van IJzendoorn MH, Bakermans-Kranenburg MJ. Fostering security? A meta-analysis of attachment in adopted children. *Children and Youth Services Review*. 2009; 31:410–421.10.1016/j.childyouth.2008.09.008
- van IJzendoorn MH, Juffer F, Duyvesteyn MC. Breaking the intergenerational cycle of insecure attachment: A review of the effects of attachment-based interventions on maternal sensitivity and infant security. *Journal of Child Psychology and Psychiatry*. 1995; 36:225–248.10.1111/j.1469-7610.1995.tb01822. [PubMed: 7759588]
- van IJzendoorn MH, Vereijken CL, Bakermans-Kranenburg MJ, Riksen-Walraven J. Assessing attachment security with the Attachment Q Sort: Meta-analytic evidence for the validity of the observer AQS. *Child Development*. 2004; 75:1188–1213.10.1111/j.1467-8624.2004.00733.x [PubMed: 15260872]
- Vondra JI, Hommerding K, Shaw DS. Stability and change in infant attachment style in a low-income sample. *Monographs of the Society for Research in Child Development*. 1999; 64:119–144.10.1111/1540-5834.00036 [PubMed: 10597545]
- Waters, EE.; Deane, K. Unpublished manual. Dept. of Psychology, SUNY-Stony Brook; 1985. The Attachment Q-Set.
- Wiefel A, Wollenweber S, Oepen G, Lenz K, Lehmkuhl U, Biringen Z. Emotional Availability in infant psychiatry. *Infant Mental Health Journal*. 2005; 26:392–403.10.1002/imhj.20059
- Wulczyn F, Hislop K, Harden B. The placement of infants in foster care. *Infant Mental Health Journal*. 2002; 23:454–475.10.1002/imhj.10028
- Wulczyn F, Kogan J, Harden B. Placement Stability and Movement Trajectories. *Social Service Review*. 2003; 77(2):212–236.10.1086/373906
- Zeanah CH, Larrieu JA, Heller S, Valliere J, Hinshaw-Fuselier S, Aoki Y, Drilling M. Evaluation of a preventive intervention for maltreated infants and toddlers in foster care. *Journal of the American Academy of Child & Adolescent Psychiatry*. 2001; 40(2):214–221.10.1097/00004583-200102000-00016 [PubMed: 11211370]
- Zimmerman L, McDonald L. Emotional availability in infants' relationships with multiple caregivers. *American Journal of Orthopsychiatry*. 1995; 65(1):147–152.10.1037/h0079586 [PubMed: 7733210]
- Ziv Y, Aviezer O, Gini M, Sagi A, Koren-Karie N. Emotional availability in the mother–infant dyad as related to the quality of infant–mother attachment relationship. *Attachment & Human Development*. 2000; 2:149–169.10.1080/14616730050085536 [PubMed: 11707908]

Table

Correlations (N=104)

	Gender	EA Responsiveness	EA Child Involvement	EA Sensitivity
AQS Security	-.318**	.267**	.229*	.220*
Gender		.090	.081	-.008
EA Responsiveness			.896**	.834**
EA Child Involvement				.753**

p< .05;

**
p< .01

Author Manuscript

Author Manuscript

Author Manuscript

Author Manuscript

Table

Simultaneous Multiple Regression Analysis Summary for Variables Predicting AQS Security (N = 104)

Variable	<i>B</i>	<i>SEB</i>	β
Constant	.043	.123	
Gender	-.173	.045	.35**
EA Child Responsiveness	.026	.014	.43
EA Child involvement	-.003	.012	-.05
EA Sensitivity	-.006	.009	-.11

*
p< .05;**
p< .01

Author Manuscript

Author Manuscript

Author Manuscript

Author Manuscript