

CORRELATES OF SECURE ATTACHMENT IN
CHILDREN WITH INTELLECTUAL DISABILITIES IN
URBAN INDIA

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MANUSCRIPT

Secure Attachment among Children with Intellectual Disabilities

Attachment security or children's ability to use their primary caregiver as a safe haven during times of distress (Ainsworth, Blehar, Waters, & Wall, 1978; Bowlby 1969/1972; Bowlby, 1988) is associated with a number of positive developmental outcomes in typically developing children (e.g., Belsky & Fearon, 2002; Berlin, Cassidy, & Belsky, 1995; Granot & Mayseless, 2001; Madigan, Moran, Schuengel, Pederson, & Otten, 2007; NICHD Early Child Care Research Network, 2006; Steele, Steele, & Croft, 2008; Steele, Steele, Croft, & Fonagy, 1999; Ziv, Oppenheim, & Sagi-Schwartz, 2004). Although relatively limited, evidence points to the specific benefits of attachment security for the adjustment of children with intellectual disabilities as well (e.g., Capps, Sigman, & Mundy, 1994; Naber et al., 2008; Willemsen-Swinkels, Bakermans-Kranenburg, Buitelaar, van IJzendoorn, & van Engeland, 2000). Considering that children with intellectual disabilities often face adjustment problems in social, emotional, and behavioral domains (e.g., Dekker, Koot, van der Ende, & Verhulst, 2002; see Kolaitis, 2008 for a review; Taanila, Ebeling, Heikura, & Jarvelin, 2003), it is imperative to examine the quality of their attachment and the factors associated with their attachment patterns. According to some findings, children with intellectual disabilities are at a greater risk of forming insecure attachments as compared to children with typical development (e.g., Ganiban, Barnett, & Cicchetti, 2000).

Furthermore, maternal sensitivity, a central construct in the attachment framework, has failed to reliably predict attachment security in children with intellectual disabilities and low levels of functioning (e.g., Capps et al., 1994; Ganiban, Barnett, & Cicchetti, 2000; van IJzendoorn et al, 2007). Some experts suggest that these children's limited ability to participate in

dyadic interactions perhaps puts them at an enhanced risk of forming insecure attachments (e.g., Atkinson et al., 1999; Ganiban et al., 2000; van IJzendoorn et al., 2007; Vaughn, Goldberg, Atkinson, & Marcovitch, 1994). In line with this perspective, the current research examined the contributions of maternal and child interaction behaviors as well as child functioning to the quality of attachment in children with intellectual disabilities.

The study was carried out in India to derive findings based on a unique socio-cultural context. Despite the high prevalence rate of intellectual disabilities in India (Srinath et al., 2005), few studies have been carried out with families of children with intellectual disabilities. Moreover, past research in India has tended to examine broader socio-cultural processes such as disability beliefs, inclusive education, social construction of disability (e.g., Parasuram, 2006; Singal, 2006; Sharma, Moore, and Sonawane, 2009) or family-level processes such as help-seeking, parental attributions, or adaptation (Dhar, 2009; Rao, 2006). Whereas these cultural and family processes have indirect implications for the well-being of children with intellectual disabilities, almost no published studies to date have gathered data directly from children or generated findings on proximal processes such as mother-child interaction and relationships in India. To address this gap and those previously mentioned, the study focused on interrelations among child functioning, mother-child emotional availability, and attachment security in three to six year old children with intellectual disabilities in urban India.

Why Is Secure Attachment Important?

Substantial attachment research points to long-term benefits of attachment security. For example, in a longitudinal study by Schieche and Spangler (2005), securely attached infants demonstrated greater task orientation and were more likely to seek constructive help from their mother during a problem-solving task at the age of two. In another study, children's attachment style assessed at infancy moderated the effects of stressful family events (e.g., parents' divorce, incarceration) on children's teacher-rated anxiety level in first grade. Specifically, even after controlling for prior anxiety level, as compared to insecurely attached infants, securely attached

infants showed less anxiety at the age of 4.5-years in response to stressful events (Dallaire & Weinraub, 2007). Several other longitudinal assessments have also found infant attachment security to be a robust predictor of children's socio-behavioral adjustment during early and middle childhood (e.g., Belsky & Fearon, 2002; Berlin et al., 1995; NICHD Early Child Care Research Network, 2006; Steele et al., 2008).

The quality of attachment is linked to benefits for children with intellectual disabilities as well. Securely attached children with intellectual disabilities have demonstrated superior social interaction skills (Willemsen-Swinkels et al., 2000), joint attention (Capps, et al., 1994), and symbolic play (Naber et al., 2008) as compared to their insecurely attached counterparts, even after controlling for level of functioning. As such, positive parent-child relationships have been linked longitudinally to the overall functioning of children with Down syndrome (Hauser-Cram, Warfield, Shonkoff, Krauss, Upshur, & Sayer, 1999). Furthermore, case studies of participants in an attachment-based intervention demonstrated that enhancing secure attachments among children and adolescents with intellectual disabilities led to a significant decrease in their problem behaviors (Sterkenburg, Janssen, & Schuengel, 2008).

Attachment among Children with Intellectual Disabilities

Past research indicates that children with intellectual disabilities are able to form attachments in much the same way as children with typical development. Initial descriptions of the attachment framework emphasized normative development as a precondition for the development of attachment relationships (Bowlby 1969/1982). However, subsequent studies of children with autism (e.g., Sigman & Ungerer, 1984) and Down syndrome (Cicchetti & Serafica, 1981; Dissanayake & Crossley, 1996; Thompson, Cicchetti, Lamb, & Malkin, 1985) demonstrated that children with intellectual disabilities can exhibit attachment behaviors such as proximity seeking and contact maintenance when reunited with their caregiver. In other words, children with intellectual disabilities are able to develop a preference for a primary attachment figure and seek comfort from this individual during stressful times, which is indicative of an

attachment relationship. Unfortunately though, a number of studies have found that children with intellectual disabilities are less likely to develop secure attachments as compared to typically developing children (Capps et al., 1994; Naber et al., 2007; Rutgers, Bakermans-Kranenburg, van IJzendoorn, & van Berckelaer-Onnes, 2004; van IJzendoorn, Goldberg, Kroonenberg, & Frenkel, 1992; Willemsen-Swinkels et al., 2000). Taken together, these findings raise the question as to what puts children with intellectual disabilities at an increased risk of forming insecure attachments. In response, the current study examined the variables, maternal emotional availability, child emotional availability, and child functioning to account for (in)secure attachment among children with intellectual disabilities.

Predicting Secure Attachments in Children with Intellectual Disabilities

Maternal and child emotional availability. Historically, attachment researchers have considered parental sensitivity as the primary factor to account for secure attachments in children (Ainsworth et al., 1978; Bowlby, 1969). Attachment theory posits that when primary caregivers respond consistently and sensitively to their children's cues, children are more likely to be securely attached. The security-sensitivity link has been verified and supported by a number of studies with typically developing children (see De Wolff & van IJzendoorn, 1997, for a meta-analysis). However, the results have been mixed for children with intellectual disabilities (e.g., Capps et al., 1994; Ganiban et al., 2000; van IJzendoorn et al., 2007). Some experts suggest that these children's limited ability to produce appropriate emotional signals to elicit caregiver response undermines the quality of dyadic interaction and leads to higher likelihood of non-secure attachment (Atkinson et al., 1999; Ganiban et al., 2000; van IJzendoorn et al., 2007; Vaughn, et al., 1994). For example, Koren-Karie, Oppenheim, Dolev, and Yirmiya (2009) found in their sample of children with autism that although maternal sensitivity predicted children's attachment security even after controlling for children's level of functioning, maternal sensitivity was linked to children's responsiveness in the dyadic interactions. van IJzendoorn and colleagues

(2007) found a similar association between involvement of children with autism in dyadic interactions and maternal sensitivity.

Children's etiology-related behaviors also perhaps mediate the association between maternal behaviors and attachment quality. For example, among children with autism, deficits in social responsiveness may mask the children's attachment needs (Hoppes & Harris, 1990; Rutgers, van IJzendoorn, Bakersmans-Kranenburg, & Swinkels, 2007) and among children with Down syndrome, the low distress level perhaps makes their cues for comfort difficult for mothers to see (Serafica & Cichetti, 1976). Thus, it is possible that even though mothers are aware of children's attachment needs, they are unable to respond appropriately and consistently in the absence of clear cues.

Prior studies have found that on average, mothers of children with intellectual disabilities receive lower scores on sensitivity (Clements & Barnett, 2002; Moran, Pederson, Pettit, & Krupka, 1992) and authoritative parenting (Rutgers et al., 2007) than mothers of children with typical development. Compelling findings were derived from a longitudinal study comparing interaction behavior of mothers of infants with Down syndrome and mothers of children with typical development. Whereas the mothers in the Down syndrome group did not differ significantly on sensitivity from mothers in the typical development group when their infants were 8 weeks old, the former group received significantly lower ratings when the infants were 20 weeks old (Slonims, Cox, & McConachie, 2006). These findings suggest an indirect effects model indicating that children's inability to participate in dyadic interactions perhaps mediates the association between maternal sensitivity and poor attachment quality. Collectively, these findings underscore the need to examine the complex nature of transactional influences among parent and child vulnerabilities in shaping the child's attachment style (Howe, 2006). Although parents conceivably lead the dance in the formation of an attachment relationship, child's responsiveness and involvement (or lack thereof) is perhaps the key mechanism through which parental interaction behaviors are linked to their child's attachment security.

To assess the maternal and child contributions to the quality of interaction, the emotional availability (EA) construct was utilized. EA draws from the emotions (Emde, 1980) and attachment theoretical frameworks (Ainsworth et al., 1978; Bowlby, 1969) and pertains to the affective quality of caregiver-child interaction. An important feature of the framework is the emphasis on the emotional quality of the dyadic interaction rather than just prompt and contingent caregiver responses. In addition, the construct is conceptualized as relational and dyadic. In other words, emotional availability is not an individual trait that is assumed to be uniform regardless of the interacting partner (Biringen, 2008). Rather, the mother's emotional availability is viewed in the context of the child's responses to the mother's bids. According to Biringen (2008), a mother "cannot look good without the child" (p.8). By the same token, a caregiver is not considered intrusive, unless the child responds negatively to caregiver's initiatives. Viewing maternal behaviors in a relational context may be particularly important for dyads with a child with an intellectual disability as some parenting styles (e.g., directive) that are considered non-optimal for typically developing children may be seen as sensitive when the child has an intellectual disability (Doussard-Roosevelt, Joe, Bazhenova, & Porges, 2003).

To capture the contributions of both the mother and the child to the quality of the dyadic interaction, the EA framework includes four dimensions pertaining to maternal interaction behaviors and two dimensions pertaining to child interaction behaviors. The maternal emotional availability includes sensitivity, structuring, intrusiveness, and hostility. Children's emotional availability includes their responsiveness and involvement during interactions. The methods section includes information about how each dimension is defined and operationalized for research.

Child functioning and child emotional availability. Some findings suggest that children's level of functioning is associated with their ability to form attachments. For instance, in a study involving children with autism, the children who had superior verbal skills displayed more distinct reunion behaviors, thereby increasing their chances of being classified as secure

(Dissanayake & Crossley, 1997). In another study, severity of autistic symptoms was predictive of attachment insecurity (Naber et al., 2007). Similarly, Shapiro, Sherman, Calamari, and Koch (1987) found that children with autism who had better social functioning were more likely to be classified as securely attached. Findings from other studies illustrate a more complex picture. For example, in a study of children with Down syndrome, children's intellectual functioning interacted with maternal sensitivity to influence the child's attachment type such that maternal sensitivity predicted attachment security only in children with higher levels of functioning (Atkinson et al., 1999). Atkinson and colleagues speculate that lower functioning children are less likely to be classified as secure, not because of their behavioral inability to display attachment behaviors, but because of their limited ability to participate in a co-regulated dyadic interaction necessary for intimacy and attachment relationships. In other words, children's level of functioning is perhaps indirectly linked to secure attachment through their emotional availability in dyadic interactions.

In the current study, children's functioning was assessed through the construct of adaptive behavior. Adaptive behavior is conceptualized as, "the performance of daily activities required for personal and social sufficiency" (Sparrow, Cicchetti, & Balla, 2005, p.5). Among children with low level of functioning, measures of adaptive skills yield findings that are correlated to cognitive assessment results (e.g., Liss et al., 2001). However, unlike cognitive ability, adaptive functioning is not a stable trait; rather, it can improve with appropriate intervention or deteriorate in an unfavorable environment. Further, adaptive behavior is assessed based on performance rather than ability; children can attain positive ratings only by consistently carrying out the described behavior and not for merely having the ability to do the activity. For children with disabilities, the emphasis has shifted in the past few years from traditional IQ tests to skills assessed by adaptive behavior measures (Kraijer, 2000).

Predicting Secure Attachments in Children with Intellectual Disabilities in India

Children with Intellectual Disabilities in India

Reliable data are not available on the prevalence of intellectual disabilities in India, but the 58th Round of National Sample Survey Organization (NSSO, 2002) estimated 0.009% of the population to have mental retardation. Based on these estimates, out of the Indian population of 1.5 billion people, approximately one million individuals live with an intellectual disability. However, in an epidemiological study by the Indian Council of Medical Research, approximately 2% children in the 0-16 year age group were diagnosed with an intellectual disability (Srinath et al., 2005), indicating that the number of children with an intellectual disability may be much higher (approx. 4 million) than estimated by NSSO. Despite these numbers, few studies have examined the socio-emotional well-being of Indian children and their families. Moreover, though the services to these families have shown some improvement in recent years, there are very few evidence-based family interventions (Girimaji & Srinath, 2010). Considering the benefits of secure attachment for children and enhanced risks of insecure attachment for children with intellectual disabilities, the current study aimed to identify maternal and child factors associated with attachment quality among these children in India.

Attachment in the Indian Context

As attachment theory is grounded in the ethological framework, secure attachment is conceptualized as species specific and universal. Bowlby hypothesized that children's attachment needs as well as the parental instinct to provide comfort are biologically based. Thus, across cultures, children develop trust in their caregiver and derive comfort and security from their attachment figure during stressful times. Some experts, however, have criticized attachment theory's emphasis on exploration and proximity as based on Western values of autonomy. Cross-cultural researchers such as Rogoff (2003) and Weisner (2005) argue that although the need for secure base is biological, the behavioral manifestation is likely to differ across cultures based on

differences in caregiving and caregiver expectations. Therefore, it was important in the current study to examine the validity and relevance of the secure base construct in the Indian context.

There are no published studies on attachment among mother-child dyads in India, but some parenting research carried out with families in New Delhi, India indicates that maternal socialization goals in urban India are somewhat similar to the socialization goals of parents in Western countries (Kärtner, Keller, Lamm, Abels, Yovsi, & Chaudhary, 2007). Keller and colleagues (2006) suggest the prevalent cultural model in India is *autonomous related* (a combination of independent and interdependent models). The autonomous related cultural model is common among societies that have a heritage of relatedness but are moving towards autonomy on account of socioeconomic changes. Specifically, parents in such societies would place emphasis on children's independence and autonomy, but at the same time encourage their children to maintain close ties with immediate and extended family. As such, these goals are consistent with the exploration-attachment balance represented by the secure base construct. Notably, Kärtner and colleagues found that the mothers in their sample from Delhi, India, did not differ significantly from the Los Angeles mothers in their sample with respect to the value they placed on relational goals and received only slightly lower scores on the autonomous socialization goals.

Moreover, the argument that secure base behavior would be different across cultures on account of culture-specific maternal socialization goals was not supported by findings from a cross national study by Posada and colleagues (1995) covering seven countries. Although the study did not include an Indian sample, it had samples from two other Asian countries—Japan and China—which share cultural similarities to India with respect to collectivist family values and parenting styles (Chao & Tseng, 2002). The study aimed to examine the universality of the secure-base phenomenon using the Attachment Q-Sort procedure (Waters, 1987). To achieve this objective, attachment experts and group of mothers from the seven countries were asked to sort the Q-set items based on their ideas of secure base behavior. In addition, a different group of

mothers was asked to sort the attachment Q-set to describe the attachment behavior of their own child. One of the key study findings was that experts across the seven countries described secure base behavior in a similar way. However, there were cross country differences in mothers' preferences for specific behaviors in the hypothetical "ideal" child. But despite these cross-cultural differences in behavioral expectations, children's secure-base behaviors were by and large uniform across cultures and were fairly represented by the behavior descriptors in the Attachment Q-sort items. These findings implied that the maternal preferences did not translate into actual changes in children's secure base behavior and provided support to the universality hypothesis.

Theoretical Model and Hypotheses

Given that there are no published studies on attachment among children with intellectual disabilities living in India, the present study was to a large extent exploratory. However, a few tentative hypotheses were formulated based on the patterns evident from studies in other countries (e.g., the United States, Israel, and Netherlands). First, I hypothesized positive associations among children's functioning, mother and child emotional availability, and children's attachment security. Second, I posited that when examining the combined effects of all assessed variables on children's attachment security, children's emotional availability would be the most robust predictor of children's attachment security. Third, I expected that both maternal emotional availability and child adaptive behavior would independently predict children's emotional availability. Finally, I hypothesized two mediation pathways: the first from maternal emotional availability to children's attachment security through children's emotional availability (see Figure 1) and the second (see Figure 2) from child functioning to children's attachment security through children's emotional availability. In addition to testing these hypotheses, I was also interested in the overall patterns of emotional availability and attachment security among families of children with intellectual disabilities in India.

The choice of mediation model rather than a moderation model was driven both by the theoretical framework and the study purpose. First, attachment theory maintains that the link between maternal emotional availability and children's attachment security is important for all children; this association does not differ as a function of children's own interaction behaviors (Bowlby, 1988). Rather children's interaction behaviors perhaps serve as a mechanism through which maternal behaviors account for children's secure attachment. Although the emotional availability framework considers children's contribution to dyadic interactions, children's interaction behavior is conceptualized as closely related to and as resulting from maternal interaction behaviors (Biringen, 2008). Thus, a model hypothesizing an indirect association between maternal emotional availability and children's attachment security through their emotional availability was consistent with the conceptual framework. Similarly, the mediation hypothesis was in line with the study purpose, which was to delineate the process through which children's adaptive behavior puts them at risk for lower attachment security.

The choice of the two mediation pathways was consistent also with my interest in the clinical applications of the study findings. A better understanding of the processes that account for children's attachment security has important implications for developing attachment based interventions. For example, significant findings would suggest that interventions should focus specifically on parental behaviors that promote children's emotional availability and on adaptive behaviors that help children participate more effectively in dyadic interactions.

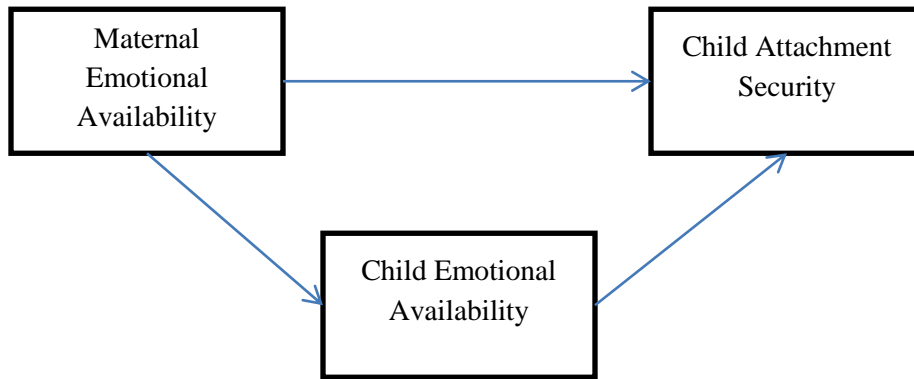


Figure 1. Hypothetical model illustrating the mediation path from maternal emotional availability to child attachment security through child emotional availability.

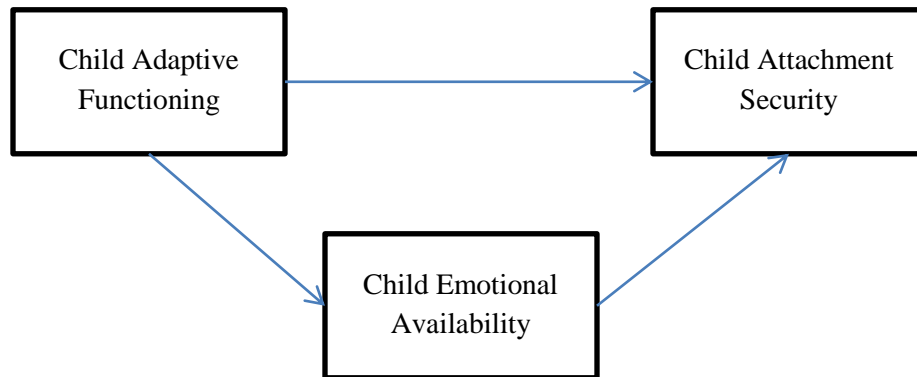


Figure 2. Hypothetical model illustrating the mediation path from child adaptive behavior to attachment security through child emotional availability.

Method

Participants

Forty-seven three to six year old children (19% 3-year olds; 10% 4-year olds; 17% 5-year olds, and 54% 6-year olds), their mothers, and teachers ($N = 22$) participated in the study. Sixty two percent ($n = 29$) of the sample consisted of boys. All children had a diagnosis of mental retardation either based on a clinical assessment by a clinical psychologist or based on a functional assessment by the school counselor. Whereas for some children ($n = 21$) the etiology

was unknown, the remaining children had an associated condition such as Down syndrome ($n = 2$); autism ($n = 9$); cerebral palsy ($n = 10$); epilepsy ($n = 2$); syndrome disorders ($n = 3$). See Table 1 for the distribution of boys and girls across etiological groups and levels of adaptive functioning.

The children came from families belonging to middle socio-economic class and the mean family income reported for the participants was approximately 187,000 rupees (equivalent to USD 4100). The education level of the mothers ranged from elementary education to Master's degree; twenty-nine mothers (62%) in the sample had lower than high-school level education, 13 mothers (28%) had a bachelor's degree, and five mothers (10%) had a master's degree. Majority of the mothers ($n = 40$) were homemakers. Fourteen children (30%) lived in nuclear family households and the remaining 33 children (70%) lived in a joint family setting with the grandparents and/or aunt(s), uncle(s), and cousin(s) in the house. Forty four children lived with both biological parents; one mother was widowed and two mothers reported that their spouse had abandoned them on account of the child's disability.

Table 1

<i>Etiological and Adaptive Behavior Information by Gender (N = 47)</i>		
Descriptor	Girls ($n = 18$)	Boys ($n = 29$)
Etiology		
Down syndrome	0 (0%)	2 (7%)
Autism	4 (22%)	5 (17%)
Cerebral Palsy	5 (28%)	5 (17%)
Other disorders (e.g., epilepsy, syndrome disorders)	2 (11%)	3 (10%)
Unknown etiology	7 (39%)	14 (49%)
Adaptive Behavior		
Mild deficits	3 (17%)	8 (28%)
Moderate deficits	9 (50%)	12 (41%)
Severe deficits	6 (33%)	9 (31%)

Teachers ($N = 22$) across seven research sites participated in the study to report on children's functioning. The research site coordinator nominated the teachers that worked most closely with the target child either in an individual or a group setting. Four teachers had a master's level degree in either psychology or occupational therapy, 15 teachers (68%) held a bachelor's degree, and three teachers had high school education. Out of the 14 teachers with a bachelor's degree, five teachers also had a diploma in special education and three teachers were working on an additional degree in special education. Out of the three teachers who had completed only high school, one had a diploma in special education, another teacher had a teaching certification, and one was working on a Bachelor's degree in occupational therapy. Teachers' experience ranged from less than one year to 18 years in the field and from less than a year to 12 years at the current organization. Their average experience was approximately five years in the field of education and three years in their current organization.

Procedure

Following a protocol approved by the university Institutional Review Board, the data collection activities were carried out in December 2009 at seven research sites located in three mid to large-sized Indian cities. Earlier that year, the researcher had approached several schools and centers that provided early intervention services to children with intellectual disabilities and had provided them with a research proposal detailing the research objectives, sample profile, and data collection procedure. Data collection was carried out at the centers that had given a written approval and had agreed to facilitate recruitment. Per the protocol, a coordinator at each research site sent home flyers to families that met the sample requirements. The flyers included brief information about the research, research procedure, as well as a day and time when the data collection would be carried out at the specific site. On the designated day and time, the mothers interested in participating in the study came to their child's school and were provided with more information about the research. They were informed that their participation was voluntary and the

services they received from their child's school would be unaffected whether or not they participated in the study. Consent was also sought from the mothers to collect information about their child from their child's teacher/therapist.

After mothers provided an informed consent to participate in the study, they completed a survey packet; the measures were translated from English into Hindi and Gujarati by professional translation companies in India and back-translated to English by the researcher. In addition, both the Hindi and Gujarati translations were piloted on two individuals conversant with the two languages. Terms that were difficult to interpret were revised. Next, the mothers participated in a 10-minute videotaped structured observation with their child. The videotaped observations were either carried out in a separate room or in an area separated from other data collection activities by a makeshift divider.

The observation duration and setting were identical to that described by de Falco, Venuti, Esposito, and Bornstein (2009) in their study with children with Down syndrome and their parents. A standard set of toys and activities including blocks, play dough, soap bubble bottles with a wand, art book, and reading book were provided to the mother-child dyad. Mothers were told that they could play with their child as they normally would and were welcome to use the toys that were provided. Data collection was scheduled during school time; the children came out of their classroom for the 10-minute observation and then returned to their classroom. Upon completion of all data collection activities, the participants were given Rs. 200 (approx. \$5) and a toy for their child.

After completing data collection activities with children and mothers, teacher packets were distributed to children's homeroom teachers at each site. Teachers were informed that their participation was voluntary and the information they provided would be kept confidential. Teachers were given Rs. 200 (approx. \$5) per survey and on average, each teacher completed two surveys.

Measures

Child adaptive behavior. Children's adaptive functioning was assessed through teacher reports on the Vineland Adaptive Behavior Scales, 2nd Edition (Vineland II; Sparrow, et al., 2005). The instrument has four higher order factors; the first three factors have three sub-domains each, and the fourth factor has two sub domains (see Table 2 for sub-domains and sample items). Items in each domain are placed in developmental order and have to be rated on a scale of 0-2 where 2 is for behavior usually or habitually performed, 1 for sometimes or partly performed and 0 for a behavior never performed. The overall adaptive behavior score represents the sum of standard scores from the four domains. The complete procedure for deriving the standard scores can be found in the Vineland manual (Sparrow et al., 2005). Adaptive behavior scores two standard deviations below the mean score represent significant limitations in adaptive functioning. According to the classification by Sparrow and colleagues a standard score between 55 and 70 indicates mild deficits; between 35 and 55 indicates moderate deficit; between 25 and 40 suggest severe deficits, and a score below 25 is indicative of profound deficits in adaptive behavior.

In the standardization study (Sparrow et al., 2005) the internal-consistency reliability coefficients were higher than .85 for the individual domains and sub-domains and .98 for overall adaptive behavior. The test-retest reliability was tested with a subsample ($N = 135$) drawn from the standardization sample. For children in the 3-6 years age group, the domain and sub-domain scores from the two assessments were strongly correlated. In a study with preschoolers in rehabilitation day treatment setting, the Vineland Teacher Survey demonstrated sound validity with respect to Diagnostic Inventory for Screening Children as well as good reliability with the Vineland Parent Survey Interview (Voelker, Johnston, Agar, Gragg, & Menna, 2007). In the present study, the internal consistency of the overall adaptive behavior scale was high ($\alpha = .90$).

Table 2

Domain, Sub-domain, and Item Information for Vineland Adaptive Behavior Rating Scales – Teacher Edition

Domains	Sub-domains	Sample Items	# of items
Communication	Receptive, expressive, and written	(a) Turns eyes and head toward sound, (b) Cries or fusses when hungry or wet, (c) Identifies one or more alphabet letters as letters and distinguishes them from numbers.	65
Daily living skills	Personal, domestic, and community	(a) Opens mouth when food is offered, (b) Is careful around hot objects, (c) Demonstrates understanding of function of telephone (for example, pretends to talk on the phone, etc.).	87
Socialization	Interpersonal relationships, play and leisure time, and coping skills	(a) Looks at face of parent or caregiver, (b) Responds when parent or caregiver is playful (for example, smiles, laughs, claps hands, etc.), and (c) Changes easily from one at home activity to another.	66
Motor skills	Gross and fine	(a) Reaches for toy or object (b) Walks across room; may be unsteady and fall occasionally.	24

Mother and child emotional availability. The videotaped interactions were coded using the infancy-childhood version of the Emotional Availability coding system (EA, 4th ed.; Biringen, 2008). The rating descriptions under the guidelines for children with disabilities were utilized for scoring interactions. The framework is operationalized for research through six 7-point rating scales, which consist of four dimensions related to parental behaviors and two dimensions related to child behavior. The six scales are linear and range from *low* to *high*, where 1 represents *low* and 7 represents *high*.

The parent rating scales include sensitivity, structuring, non-intrusiveness, and non-hostility; the child scales include responsiveness and involvement. The **Sensitivity** dimension is the most complex and takes into account factors such as maternal positive affect, perception of and responses to child's cues, amount of interaction, creative and novel play, and ability to resolve conflicts with the child. The **Structuring** dimension pertains to the adult's attempts to guide or scaffold the child's play activity and judgments are based on how the child responds to the adult's structuring efforts, appropriateness of adult inputs, and proactive limit setting. In the **Non-intrusiveness** dimension, the focus is primarily on whether the mother follows the child's lead or whether she dominates the interaction. The coding guidelines direct attention to the child's responses in order to make a judgment about the mother's intrusiveness. Among children with disabilities, maternal behaviors aimed at promoting autonomy rather than learned helplessness get an optimal rating. The **Non-hostility** dimension encompasses overt and covert signs of negativity. Medium ratings (i.e., 3s) are given when the mother seems frustrated, bored, or impatient and low ratings are given when the mother displays anger through action or words.

There are two child behavior scales. The **Responsiveness** scale encompasses the child's positive affect, eagerness to engage in interaction with the mother, and willingness to respond to the mother's suggestions. The **Child involvement** scale focuses on initiatives by the child to draw the mother into interaction. The ratings are not based on discrete behaviors, but rather they are global ratings of the overall affective quality of the interaction.

Past studies have demonstrated links between emotional availability and children's attachment style (Easterbrooks & Biringen, 2000, 2005). In the 4th edition of the EA coding system, each dimension includes a brief description of how the ratings can be adapted for children with disabilities; these descriptions aim to ensure that the child's level of functioning and etiology-related behaviors do not have an undue influence on the ratings. The coding system has been effectively utilized by some recent studies with samples consisting of children with Down syndrome and autism (de Falco et al., 2009; Dolev, Oppenheim, Koren-Karie, & Yirmiya, 2009).

The scales have demonstrated validity in multiple cultural contexts as well. Once again, the relational aspect and the component to emotional connection are useful in avoiding cultural biases. Caregivers may have different interaction styles stemming from cultural beliefs and norms. By judging caregiver behaviors from the emotional availability perspective, the researcher takes into account the child's responses to these culturally shaped behaviors. If they result in a warm, positive interaction, they are assessed as optimal. In contrast, parental behaviors are viewed as non-optimal when they result in children disengaging themselves from the interaction. Biringen (2008) stresses "practice is not excused because of its prevalence" (p.11) and negative parental behaviors (e.g., shaming or spanking) cannot be given optimal ratings because they are culturally normative.

In the present study, all the tapes were coded by the first author, who underwent extensive training in the use of the coding system and was certified as reliable by Biringen after successfully completing a post-training exam. Biringen recommends coding of maternal and child behaviors by different individuals blind to each other's ratings, but this was not possible in the current study due to language constraints. However, maternal and child behaviors were coded in two separate passes, with a six month interval between the two passes; maternal behaviors were coded in June 2010 and child behaviors in January 2011. A Ph.D. student at University of California, Irvine, who is also trained and certified by Biringen, coded 11 observations (23%) for reliability. Interrater reliability was examined through Pearson's r , Spearman's Rho, and

intraclass correlation coefficient (ICC). All three methods yielded significant results, indicating adequate interrater reliability. The descriptive statistics and interrater reliability data for the EA scales are summarized in Table 3.

Table 3

Descriptive Statistics and Interrater Agreement for Emotional Availability (EA) Scales

Variables	M	SD	Range	Pearson's r	Spearman's Rho	Intraclass Correlation (Absolute Agreement)
EA Mother Scales						
Sensitivity	4.14	1.55	2-7	.84**	.91***	.81**
Structuring	4.12	1.43	1-6.5	.65*	.51	.65*
Nonintrusiveness	4.06	1.37	1.5-6.5	.79**	.75**	.80**
Non-hostility	5.43	1.53	2-7	.83**	.74**	.84***
EA Child Scales						
Responsiveness	4.30	1.77	1-7	.82**	.87**	.81**
Involvement	3.45	1.78	1-6.5	.83**	.85**	.82**

Note. The interrater agreement is based on 11 double coded observations and the descriptive information is based on ratings by the main coder.

* $p < .05$.; ** $p < .01$; *** $p < .001$

Secure attachment. Attachment security was assessed through maternal responses to the Attachment Q-list (Newland, Coyl, & Freeman, 2008; AQS; Waters & Deane 1985). Given children's etiological conditions and the short observation period, I decided mothers' reports rather than observer reports would provide a more valid assessment of children's attachment security. Also, as Posada and colleagues (1995) have demonstrated, mothers in different cultures are able to provide valid descriptions of their children's attachment quality.

Attachment Q-list is a survey based on Attachment Q-Set (AQS; Waters & Deane, 1985; Waters, 1987). The Q-Set has been used in a number of studies to assess child-parent attachment in children ages one—five (e.g., Brown, McBride, Shin, & Bost, 2007; Caldera, 2004; Lundy,

2002). Parents or observers sort 90 attachment behaviors such as “*My child readily shares with me or lets me hold things if I ask her/him to*” and “*When my child returns to me after playing, he is sometimes fussy for no clear reason*” into nine piles based on the attachment qualities that are “least like” to “most like” the child (Waters & Deane, 1985/1987). Pile 1 represents *least like the child* and Pile 9 represents *most like the child*. The items have to be sorted such that they are equally distributed in each pile (i.e., each pile has 10 items). The validity of AQS for children with disabilities has been documented by some recent studies (e.g., Rutgers et al., 2007). Some experts even suggest that AQS might be more effective in differentiating between etiology-related behaviors and attachment behaviors as compared to laboratory procedures and thereby have better ecological validity (Rutgers et al., 2007).

The Attachment Q-list, which was used in the current study, is a survey with 62 items from the Attachment Q-set (AQS; Waters & Deane, 1985/1987) and participants rate the items on a three point response scale ranging from 1 = *not like my child* to 3 = *like my child*. The Q-set items in the center piles in the criterion sort representing ‘neutral’ categories are excluded from the Q-list. Typically, the Q-list is sent to parents to help them get ready to carry out a Q-sort. However, Roggman, Coyl, Newland, and Cook (2001) utilized the Q-list in the survey format to gather maternal reports on child’s attachment behavior. In the same study they also used the Attachment Q-sort to assess children’s attachment behavior. The correlation between the security scores obtained through both sources provided evidence that mothers reports on Attachment Q-list is a reliable method for assessing children’s attachment security. In subsequent studies, children’s security score obtained through mother reports on the Attachment Q-list were found to be associated with specific parenting behaviors (Coyle, Newland, & Freeman, 2010; Newland, Coyle, & Freeman, 2008).

To arrive at the final security score, first the items representing non-secure attachment behaviors (e.g., *When my child returns to me after playing, he is sometimes fussy for no clear reason; When my child is near me and sees something she/he wants to play with, she/he fusses or*

tries to drag me over to it) were reverse coded. These are the items in piles 1-3 in the criterion sort of the Attachment Q-sort; next, the ratings of the 62 items were totaled to obtain children's attachment security scores. Higher scores indicated greater security. In the current study, the internal consistency of the 62 items was adequate, as indicated by a Cronbach's alpha of .77.

Results

Overview of the Analyses

Prior to analyses, scales were computed and descriptive statistics were derived for the key variables. Next, with an exploratory aim, gender differences on key variables were examined through independent samples *t*-tests and age differences were assessed through bivariate correlational analyses. Correlational analyses were also utilized to examine associations among child adaptive behavior, maternal emotional availability, child emotional availability, and attachment security. To assess the hypothesized mediational models Baron and Kenny's (1986) procedure was utilized. First, the outcome variable (child attachment security) was regressed on the specific predictor variable (maternal emotional availability or child adaptive behaviour). Next, the mediator (child emotional availability) was regressed on the specific predictor variable (child adaptive behavior or maternal emotional availability). Finally, the outcome variable was regressed simultaneously on the predictor (maternal emotional availability or child adaptive behaviour) and mediator (child emotional availability). The significance of both mediation paths was tested using the formula recommended by Sobel (1982).

Descriptive Statistics

The descriptive information for the key variables is summarized in Table 4. The average adaptive composite score for children based on teacher reports was 45 and fell in the moderate deficits range (Sparrow et al., 2005). According to the ranges specified in the Vineland II manual (Sparrow et al., 2005), 15 (32%) children were in the severe deficits group; 21 (45%) children had moderate deficits in adaptive functioning, and 11 (23%) had mild deficits in adaptive functioning. The average score for maternal and child emotional availability was 17.75 and 7.75,

respectively. The subscale scores (see Table 3) indicated that on average the mothers' interaction behaviors ($M = 4.14$; $SD = 1.55$) were non-hostile during the 10-minute observation and 72% of mothers received a score of 5 and above on the 7-point scale for non-hostility. The mean scores for the remaining three dimensions—sensitivity, structuring, non-intrusiveness—were close to 4 on the 7-point rating scales, where 7 represented *high*. The sample was similarly distributed on the three scales; on the sensitivity dimension, 23% mothers had a rating of 5 and above and 43% mothers had a rating below 3(*low*); on structuring, 25% mothers were rated above 5 and 36% mothers were rated below 3; and on non-intrusiveness, 23% were rated above 5 and 49% mothers had a rating below 3 points. The mean score of the two children's subscales indicated that on average children demonstrated moderate responsiveness ($M = 4.30$; $SD = 1.77$) and low involvement ($M = 3.45$; $SD = 1.73$) during the observation. Whereas 40% of children had a rating of 5 and above on responsiveness, only 25% had a rating above 5 points on involvement. Finally, the mean score of children's mother reported attachment security was at a mid-point (2) on the continuum of 1 = *insecure attachment* to 3 = *secure attachment*. Fifty-three percent children were closer to the *insecure* end of the continuum with scores lower than 2 and 47% were closer to the *secure* end with scores higher than 2.

Correlational Analyses

The results of the correlational analyses indicated weak to moderate correlations among all variable pairs except between child adaptive behavior and mothers' emotional availability. Threats to validity of findings arising from shared methods were minimized by utilizing diverse methods (survey, observation) and multiple respondents (teachers, parents) to assess the variables. Specifically, teacher reported child adaptive behavior was positively correlated to both observed child emotional availability and mother reported attachment security. The observed maternal emotional availability shared significant and moderate positive correlations with observed child emotional availability and mother reported attachment security. The associations between child emotional availability and the other variables of interest were significant and in the

moderate range ($r = .44$ to $.50$).

The correlational analyses also included age and gender to examine their links with the variables of interest. The negative correlation ($r = -.33$, $p = .03$) between age and adaptive behavior was counterintuitive and possibly on account of the skewed age distribution of the sample. Twenty-six children (55%) in the sample were 6-years old and out of that, 21 children had moderate to severe deficits in adaptive functioning. The correlational analyses and results of the independent samples t -test indicated significant gender differences on the outcome variable scores. Based on mothers' reports, girls' scores on attachment security were significantly lower than that of the boys ($t = 2.417$, $p = .04$). No gender differences, however, were found for the two predictor variables (child adaptive behavior and maternal emotional availability) or the mediator (children's emotional availability).

Table 4

Descriptive Statistics and Correlations for Children's Adaptive Behavior, Maternal Emotional Availability, Child Emotional Availability, and Children's Attachment Security

Variables	M	SD	Range	2	3	4	5	6
1. Child age	5.10	1.20	3-6.6	-.05	-.33*	-.08	-.14	-.18
2. Child gender+	-	-	-		-.10	-.18	-.23	-.34*
3. Child adaptive behavior (T)	45.91	14.99	20-88			.27	.50**	.37*
4. Mother emotional availability (O)	17.75	4.63	7.5-27 (7-28) ^a				.45**	.31*
5. Child emotional availability (O)	7.75	3.39	2-13 (2-14) ^a					.44**
6. Children's attachment security (M)	124.70	13.14	104-155 (62-186) ^a					

Note. T = Teacher reports on Vineland II; O = Observational assessments; M = Mother reports on Attachment Q-list. +Boys=0, Girls=1. * $p < .05$. ** $p < .01$. ^a possible range for the scale

Regression and Mediation Analyses

The results of the regression analyses are summarized in Table 4. As noted previously, the steps recommended by Baron and Kenny (1986) were followed to test for mediation. In both models, the respective predictor variables (maternal emotional availability or child adaptive behavior) significantly accounted for child attachment security. Further, the predictors (observed maternal emotional availability or teacher reported child adaptive behavior) were significantly correlated to the mediator (observed child emotional availability) as well. However, the association between observed maternal emotional availability and mother reported children's attachment security became non-significant upon the inclusion of children's observed emotional availability in the regression model (see Figure 3). Similarly, the direct path linking teacher reported child adaptive behavior and mother reported children's attachment security became non-significant when children's observed emotional availability was entered into the model (see Figure 4).

Consistent regression findings were derived for the two pathways even when child gender was entered as a control variable. Specifically, maternal emotional availability predicted child emotional availability, $\beta = .43$, $t(44) = 3.24$, $p = .002$, as well as child attachment security, $\beta = .29$, $t(44) = 2.06$, $p = .05$ after controlling for child gender. When child gender, maternal emotional availability and child emotional availability were simultaneously entered in the regression equation, only child emotional availability ($\beta = .33$, $p = .03$) remained a significant predictor of child attachment security. In the second mediation model, after controlling for gender, child adaptive behavior continued to account for child emotional availability, $\beta = .49$, $t(44) = 3.73$, $p = .001$, and child attachment security, $\beta = .34$, $t(44) = 2.46$, $p = .02$. When both child adaptive behavior and child emotional availability were utilized to predict child attachment after controlling for gender, only child emotional availability approached significance ($\beta = .29$, $p = .08$).

As Sobel test (1982) is relatively conservative, it was carried out with unstandardized coefficients from regression analyses that did not include gender as a control variable. The test results (see Table 6) to examine the significance of indirect pathways were positive. Thus, the association between maternal emotional availability and children's attachment security was fully mediated by children's emotional availability. The association between child adaptive behavior and attachment security is fully mediated by children's emotional availability. The inclusion of observed child emotional availability in the respective models resulted in a significant increase in the effect size. In the first model, the results of the regression indicated that whereas observed maternal emotional availability accounted for only 11% of the variance, maternal and child emotional availability together accounted for 22% of the variance. In the second model, child adaptive behavior by itself accounted for only 14% of the variance, but when combined with child emotional availability the variance increased to 23%.

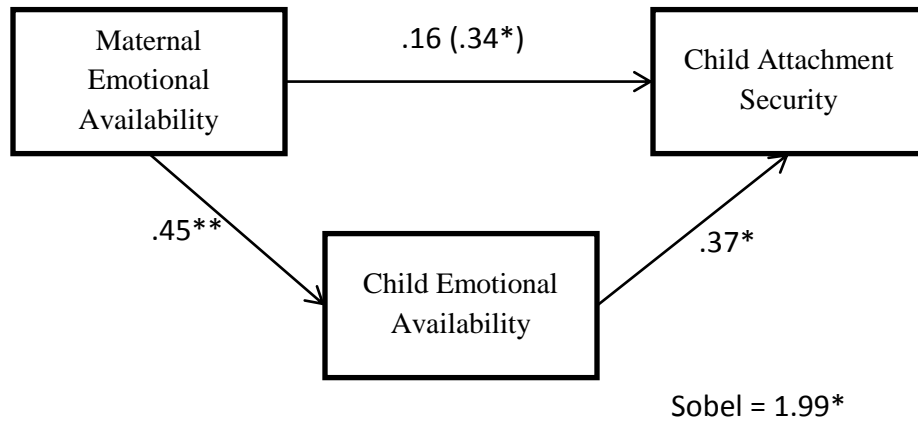


Figure 3. Model illustrating the mediation path from mothers' emotional availability to child attachment security through child emotional availability. Note. Betas in parentheses reflect relations between constructs prior to testing the mediation model. Note. * $p < .05$. ** $p < .01$

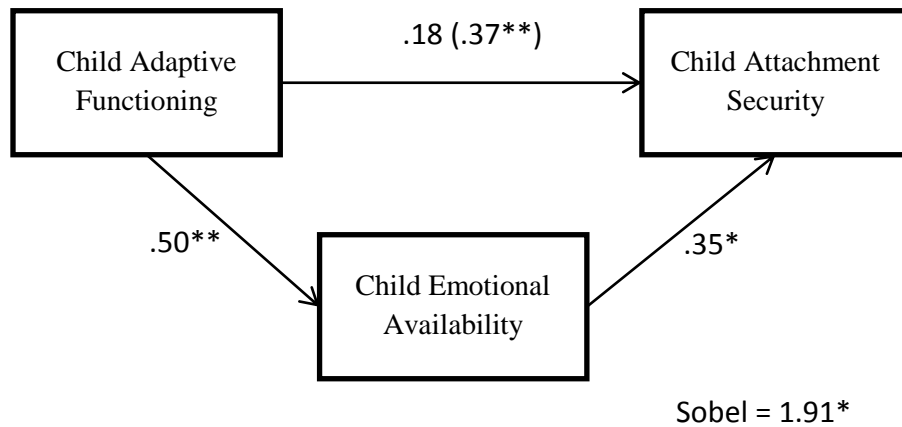


Figure 4. Model illustrating the mediation path from mothers' emotional availability to child attachment security through child emotional availability. Note. Betas in parentheses reflect relations between constructs prior to testing the mediation model. Note. * $p < .05$. ** $p < .01$

Table 5. *Summary of Regression Analyses to Predict Children's Attachment Security*

Model	<i>F</i>	<i>B</i>	SE(<i>B</i>)	β	<i>p</i>	R^2	ΔR^2
Model 1							
Step 1							
Maternal emotional availability ^a	5.66	.96	.40	.34	.02	.11	
Child attachment security ^b							
Step 2							
Maternal emotional availability ^a	12.06	.34	.10	.46	.00	.21	
Child emotional availability ^b							
Step 3	6.17					.22	.11 ⁺
Maternal emotional availability ^a		.46	.43	.16	.29		
Child emotional availability ^a		1.47	.60	.37	.02		
Child attachment security ^b							
Model 2							
Step 1							
Adaptive behavior ^a	6.70	.33	.13	.37	.01	.14	
Child attachment security ^b							
Step 2							
Adaptive behavior ^a	14.71	.12	.03	.51	.00	.26	
Child emotional availability ^b							
Step 3	6.02					.23	.09 ⁺
Adaptive behavior ^a		.17	.15	.18	.26		
Child emotional availability ^a		1.40	.64	.35	.04		
Child attachment security ^b							

Note. a = entered as predictor in the regression equation; b = entered as outcome in the regression equation; ⁺ increase from Step 1

Table 6

Sobel Test for the Magnitude and Significance of Indirect Effects.

Path	a	s_a	b	s_b	Sobel
1. Child Adaptive Behavior – Child Emotional Availability – Attachment Security	.12	.03	1.39	.64	1.91*
2. Mother Emotional Availability – Child Emotional Availability – Attachment Security	.34	.10	1.47	.60	1.99*

Note. a = raw (unstandardized) regression coefficient for the association between IV and mediator; s_a = standard error of a; b = raw coefficient for the association between the mediator and the DV (when the IV is also a predictor of the DV); s_b = standard error of b.

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

Discussion

The study findings illustrate two important pathways through which maternal and child factors account for the attachment security of children with intellectual disabilities in the sample. The first pathway demonstrates an indirect relationship between maternal emotional availability and children's attachment security through children's emotional availability, indicating that children's emotional availability may be an important mechanism through which parenting is linked with attachment security among children with intellectual disabilities. The second pathway indicates that children's functioning is associated with their attachment security indirectly through their emotional availability. Thus, children's emotional availability appears to be an important explanatory factor in understanding attachment security among children with disabilities.

More specifically, children's responsive and involving behaviors during dyadic interactions emerged as a salient mechanism linking positive maternal interaction behaviors and children's functioning to children's attachment security. Experts have proposed consistent *child effects* models with respect to attachment among children with intellectual disabilities (Atkinson et al., 1999; Ganiban et al., 2000; van IJzendoorn et al., 2007; Vaughn et al., 1994). Findings of

the current study not only confirm these hypotheses, but clarify the association between child interaction behaviors and the quality of attachment. Overall, these findings add to the growing body of literature documenting links between the emotional availability construct and children's attachment (e.g., Biringen et al., 2005; Swanson, Beckwith, & Howard, 2000; Ziv, Aviezer, Gini, Sagi, & Koren-Karie, 2000). At the same time, the findings are unique as they are based on a sample consisting of children with disabilities. Only two other studies have examined emotional availability with respect to attachment security among children with disabilities (Koren-Karie et al., 2009; van IJzendoorn et al., 2007). However, unlike the indirect association found in the current study between maternal emotional availability and children's attachment security, Koren-Karie and colleagues found a significant direct link between the two factors which was not accounted for by children's responsiveness. This discrepancy may stem from the fact that they did not utilize all emotional availability subscales; perhaps between the two child subscales, children's involvement in dyadic interactions shares a stronger association with their attachment security.

The path between children's functioning and children's attachment security through their emotional availability represents an important finding. Whereas some studies have found that children's ability to form attachments is not linked to their level of functioning (Koren-Karie et al., 2009), other research findings suggest that children's social and verbal skills (Dissanayake & Crossley, 1997; Shapiro et al., 1987) predict their chances of forming secure attachments. The current study demonstrates that children's functioning is associated with their attachment security as well as clarifies that children's low functioning level leads to low emotional availability in interactions, which in turn puts them at risk for insecure attachment. Notably, observed maternal emotional availability and teacher reported child functioning were not linked. Koren-Karie and colleagues (2009) as well as Dolev and colleagues (2009) report consistent findings: in their study of children with autism, the observed maternal sensitivity was not related to children's adaptive and cognitive functioning. This indeed is encouraging, as it implies that mothers can demonstrate

sensitivity regardless of their child's level of functioning.

As these findings were derived based on an Indian sample, they provide key information on the overall patterns of attachment and emotional availability among children with intellectual disabilities and their mothers in urban India. It is noteworthy that 53% of children scored lower than the mid-point on the scale. Because there are no published studies on attachment among families in India, it is difficult to interpret these attachment scores. However, compared to the average attachment Q-list scores of 2.39 (Newland et al., 2008) and 2.42 (Coyle et al., 2010) from the U.S. studies with typically developing preschoolers, the mean security score from the current study was significantly lower. This trend is consistent with other findings, which indicate that as compared to children with typical development, children with disabilities are less likely to be classified as secure and tend to have lower scores on attachment measures (e.g., Rutgers et al., 2007). The present study provides preliminary evidence that children with intellectual disabilities in India also are less likely to receive optimal security scores.

Similarly, the descriptive information for mother and child emotional availability indicates non-optimal patterns. Specifically, the average scores on the maternal emotional availability scales indicate that although the maternal interaction behavior was non-hostile, it was somewhat low on sensitivity and structuring, and high on intrusiveness. The percentage of mothers in the "good enough" range on various dimensions was quite a bit lower than the proportions reported by Dolev and colleagues' (2009) from their study of children with autism. In addition, the mothers in my sample, on average scored significantly lower on maternal structuring, non-intrusiveness, and non-hostility as compared to mothers of children with Down syndrome in de Falco and colleagues' (2009) study. It is particularly striking that although most mothers showed few signs of overt or covert hostility during the 10-minute interaction, they faced challenges in engaging the child in an interaction in a meaningful way. Many mothers seemed to have difficulties in taking and following child cues. Some mothers constantly changed activities and toys; in such instances, children appeared confused and after a while lost interest in the

interaction. Such maternal interaction patterns perhaps account for children's interaction behaviors, which were characterized by moderate responsiveness to their mother, but a relatively low ability to initiate dyadic interaction and engage the caregiver. An illustrative vignette from an observed interaction between a child with cerebral palsy and his mother is presented below. Given that this is the first study to utilize the emotional availability construct and apply the emotional availability coding system to interactions among dyads in India, these descriptive findings have important implications for designing parenting interventions.

Mother and child are sitting across from each other with a table between them. Mother is holding a bottle of bubbles. She takes up the bubble blower to her mouth and blows on it. Child watches Mother. His arms rest on the two chair handles. Mother blows some bubbles and exclaims with a smile on her face, "was that fun, go on catch the bubbles." Child looks at the bubbles but does not move to catch them. Mother dips the wand again in the soap solution and instructs the Child, "Look up! Here look up." Child looks up and Mother blows the bubbles. When the bubbles come out Mother says with a smile, "nice!" ...Mother turns back and puts the bottle away and asks the Child what he wants to play with now. Child does not reply...Pulling out a coloring book, Mother asks, "Does (child's name) want to color?" Child looks at what the Mother is holding up. Mother puts the book on the table. She asks Child, "(Child's name) want to color with Mother? Child looks down at the book on the table but does not stretch out his hand. Mother says "oh" looking at the marker. Then she holds out the marker to Child and tells Child "here pull out the cap for me, show mom how you can open this." Child looks up at the marker, slowly reaches out to the marker as Mother repeats, "open it for me." Mother sits back and looks at the Child as he pulls open the cap. When Child succeeds in pulling up the cap, Mother straightens up and claps congratulating Child. "Very good, (Child's name)! Child smiles. Then Mother reaches out and says "very good!" She leans towards the child and takes the marker from him. Mother helps Child hold the marker and says in a

sing-song voice, “now we will color and guides Child’s hand towards the book. Mother positions the book and Child bends over the book. ..Mother encourages Child to bring his hand forward to hold the marker and color with her. Child does not move. So Mother says, “I am going to put the cap back on, you open it for me.” Child looks away. Mother puts the coloring book and marker away and picks up a can of play dough. She opens the can and Child looks inside the can.

The analysis to examine gender differences on variables of interest yielded an interesting finding. The average security score for girls was significantly lower than that for the boys, but no significant gender differences were found for any of the predictor variables. One possible explanation for this difference is the patriarchal structure of the Indian society (Johri, 2010). Although no gender differences were detected in the maternal behaviors, perhaps the contextual factors put girls with a disability at a greater risk for developing insecure attachments. Past studies have noted that girls with disabilities are faced with a dual disadvantage arising from their impairment and their gender. According to the 2001 census, girls with disabilities were less likely to have access to educational services and therapeutic devices as compared to boys (Kalyanpur, 2008). The Asian Development Bank report (2002) documented that girls with disabilities are two to three times more likely to be victims of abuse as compared to boys with disabilities (as cited in Kalyanpur, 2008). Furthermore, Ittियerah and Kumar (2007) found that relative to men with disabilities, women with disabilities had lower self-esteem. The effect of the societal bias against girls is perhaps felt by the families as well. As Padencheri and Russell’s (2004) findings indicated, the parents of girls with intellectual disabilities reported higher marital conflict than the parents of boys. Future studies could include the contextual variables to examine how they interact with gender to account for children’s attachment security.

The negative association between age and children’s functioning was unexpected. It is perhaps because over half of the study sample consisted of 6-year-old children and the average age was 5.1 years. Another explanation, however, is that child’s functioning may be

compromised over time because of Indian parents' tendency to be overprotective towards their child with a disability (Pal, Chaudhury, Sengupta, & Das, 2002). Alternatively, it is perhaps the inaccessibility of therapeutic resources and early intervention services that puts these children at risk for reducing levels of functioning. Indeed, the developmental trajectory of children with intellectual disabilities in India is an important topic for future research.

The study had several methodological strengths. The use of multiple informants (children, mothers, and teachers) for each construct of interest and multiple methods (surveys, observation) greatly enhanced the validity of the findings (i.e., findings are not due to shared method variance). A significant strength of the study also lies in the age group of the children included in the sample. In general, diagnosis of disability and help-seeking happen at a much later age in developing countries as compared to the same in developed nations (e.g., Daley, 2004; Wilcox, Washburn, & Patel, 2007). This makes it extremely challenging to recruit families of very young children with intellectual disabilities. This is one of the few studies carried out in a developing nation and perhaps the first in India that examines these constructs in this specific age group. Given that early intervention services have significant benefits for the developmental outcomes of children with disabilities (see Guralnick, 2005 for a review; Shin, Nhan, Lee, Crittenden, Flory, & Hong, 2009), research with this age group is critical for planning effective interventions. By assessing parent-child interaction and attachment security of three to six year old children, the present study generated findings that can serve as a basis to design early intervention services for young children with intellectual disabilities and their families.

The study findings, although promising, need to be viewed in the context of some limitations. First, the findings are based on a relatively small sample size which might have somewhat inflated the effects. Second, due to the cross-sectional research design, no causal assumptions about the findings can be made. Thus, although the variables are linked, it cannot be said that children's adaptive behavior, maternal emotional availability, or children's emotional availability cause attachment security. Future research needs to examine these pathways

longitudinally. Based on the evidence from studies carried out with typically developing children, it is likely that longitudinal investigations would demonstrate bidirectional pathways.

Specifically, attachment security would predict positive interaction behaviors in children and child adaptive behavior at later developmental stages (e.g., middle childhood and adolescence) (e.g., Easterbrooks, Biesecker, & Lyons-Ruth, 2000; Kochanska, Woodard, Kim, Koenig, Yoon, & Barry, 2010; see Sroufe, 2005 for a review). For example, Easterbrooks and colleagues found that children classified as securely attached in infancy demonstrated better emotional availability in middle childhood as compared to children classified in the disorganized attachment category. In a longitudinal study by Kochanska and colleagues, whereas securely attached children's responsiveness towards the caregiver resulted in positive socialization outcomes, responsiveness on the part of insecurely attached children did not lead to similarly positive outcomes. These longitudinal associations may be because the positive emotional communication patterns that serve as antecedents for secure attachment continue through later developmental stages. Or because securely attached children feel confident that their caregiver would appropriately reciprocate their emotional responses and initiatives. Thus, longitudinal investigation of these variables can yield important information about direction of the effects.

The third limitation of the study is that although the sample was diverse, it represents only the families that access educational services for their children. Although the Indian legislation, *Persons with Disabilities Act*, outlines the provisions pertaining to free education for all children with disabilities, only 1-4% of individuals with disabilities ever attend a school (Mukhopadhyay & Mani, 2002; National Council of Educational Research and Training, 2005). Future studies can perhaps include families being served through Community-based Rehabilitation services (CBRs), which have a much wider reach (Dalal, 2006; Sen & Goldbart, 2005). Finally, the sample includes multiple disability groups such as autism, Down syndrome, and cerebral palsy. Each one of these etiological conditions raises unique challenges and requires unique approaches (Eisenhower, Baker, & Blacher, 2005; see Hodapp, Ly, Fidler, & Ricci, 2001,

for a review); future studies could focus on specific etiological conditions to derive more specific findings. Despite limitations, the findings have important implications for future interventions.

The evidence underscores the need for attachment-based interventions that focus on interaction needs of such dyads. Specifically, interventions targeting children's responsiveness and involvement rather than their overall functioning can yield more positive results with respect to their socio-emotional adjustment. Programs such as Girolametto and Weitzman's Hanen parent training program, where mothers are specifically asked to take their children's cues and discouraged from using directives or quizzing their children (as cited in Warren & Brady, 2007) can have long-term benefits for children's socio-emotional development. As such, children's attachment needs can be better served when mothers are trained to adopt an optimally structured approach (Warren & Brady, 2007). Future research-based interventions can also focus on helping parents meet the child's attachment needs despite the challenges raised by etiology-related behaviors or respond to children's needs consistently even in the absence of clear emotional and verbal cues. As Atkinson and colleagues (1995) found, mothers needed to be very observant in order to respond to the cues of their infants with Down syndrome. Indeed there is evidence that even children with very low levels of functioning can develop positive interaction behaviors in response to appropriate family interventions (e.g., Greenspan & Wieder, 2006). Dolev and colleagues (2009) describe an excellent vignette which illustrates how a mother's attempts to play with her son—a four year old boy with low level of functioning and a diagnosis of autism—are unsuccessful at first. But by taking child cues, she not only succeeds in getting the child to respond to her bids to pretend to cook, but gets to a point where the child asks for her help in separating blocks.

In sum, early family-based interventions can play an important role in children's socio-emotional functioning. Although parents in India have much better access to schools, information, and therapeutic resources now, than they did a few years ago (Agarwal & Verma, 1990; Russell, John, & Lakshmanan, 1999; Russell, John, Lakshmanan, & Lakshmidivi, 2004),

evidence-based programs that provide help in socio-emotional domains are non-existent (Girimaji & Srinath, 2010; Gupta & Singhal, 2005). Parents face significant challenges in these areas and report the need for formal support (N. Singhal, personal communication, July 20, 2009). Based on an informal evaluation of one of the few parent-child interaction programs offered in the country by Action for Autism, New Delhi, mothers feel more competent and comfortable in interacting with their children after going through the program (Action for Autism, India, n.d.). Findings from the current study suggest that programs designed to enhance maternal emotional availability, specifically the intrusiveness and structuring dimensions, have the potential to positively impact children's emotional availability and in turn improve children's chances of developing secure attachments. Similarly, focusing on children's emotional availability may mitigate some of the risks of low adaptive functioning for children's socio-emotional functioning.

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APPENDIX A

LITERATURE REVIEW

The positive association between a secure child-mother attachment relationship and children's socioemotional outcomes is well documented (e.g., Belsky & Fearon, 2002; Berlin & Cassidy, 2003; Berlin, Cassidy, & Belsky, 1995; Granot & Maysseless, 2001; Madigan, Moran, Schuengel, Pederson, & Otten, 2007; NICHD Early Child Care Research Network, 2006; Steele, Steele, & Croft, 2008; Steele, Steele, Croft, & Fonagy, 1999; Ziv, Oppenheim, & Sagi-Schwartz, 2004). Although relatively limited, there is evidence that points specifically to the benefits of secure attachments for children with intellectual disabilities. For example, securely attached children with intellectual disabilities demonstrate superior social interaction skills (Willemsen-Swinkels, Bakermans-Kranenburg, Buitelaar, van IJzendoorn, & van Engeland, 2000), joint attention (Capps, Sigman, & Mundy, 1994), and symbolic play (Naber et al., 2008) as compared to their insecurely attached counterparts, even after controlling for level of functioning. As such, positive parent-child relationships have been linked longitudinally to the overall functioning of children with Down syndrome (Hauser-Cram, Warfield, Shonkoff, Krauss, Upshur, & Sayer, 1999). Furthermore, case studies of participants in an attachment-based intervention demonstrated that enhancing secure attachments among children and adolescents with intellectual disabilities can lead to a significant decrease in their problem behaviors (Sterkenburg, Janssen, & Schuengel, 2008).

Findings remain inconclusive, however, with regard to the factors that reliably account for the quality of attachment in children with intellectual disabilities. Moreover, although there are some quantitative reviews on attachment in this population of children (e.g., Rutgers, Bakermans-Kranenburg, van IJzendoorn, & Van Berckelaer-Onnes, 2004; van IJzendoorn, Goldberg, Kroonenberg, & Frenkel, 1992), the literature base lacks a systematic qualitative review with a specific focus on the correlates of secure attachment. In response, the literature is reviewed to provide an insight into the direct and indirect influences on attachment relationships between children with intellectual disabilities and their mother.

The selection of articles in my review was guided by the American Association of Intellectual and Developmental Disabilities' (AAIDD) definition of intellectual disability, which states, "Intellectual disability is characterized by significant limitations both in intellectual functioning and in adaptive behavior as expressed in conceptual, social, and practical adaptive skills. This disability originates before age 18" (Schalock et al., 2007, p.118). Accordingly, most studies included in the review involved samples of children with low levels of intellectual and/or adaptive functioning as assessed by standardized measures (e.g., Bayley Scales of Infant Development; Bayley, 1969; Vineland Adaptive Behavior Scales; Sparrow, Balla & Cicchetti, 2005). For studies that had samples consisting of children with autism and cerebral palsy, findings were reported only if children with impaired intellectual functioning were present in the sample.

Theoretical Framework

Attachment theorists propose four stages in the development of attachment. In the first three stages, an infant gradually develops a preference for the primary caregiver and seeks comfort from the attachment figure in times of distress. In due course, the child develops trust in the availability of the caregiver and begins to explore the environment using the caregiver as a secure base. In the fourth stage of attachment, children are able to adapt their behavior based on their understanding of their caregivers' motivations and develop a mental representation or an

Internal Working Model (IWM) of close relationships. (Ainsworth, Blehar, Waters, & Wall, 1978; Bowlby 1969/1982). The quality of the child-mother attachment relationship is assessed based on attachment behaviors such as proximity seeking and contact maintenance that infants/children demonstrate, typically via the Strange Situation (see Ainsworth et al., 1978 for description). Empirically, children demonstrate behaviors that can be classified as either 'secure' or 'insecure.' However, there are children who are classified as disorganized because they display behaviors that do not conform to these organized categories (Main & Solomon, 1990). According to a meta-analysis, in normative samples, 62% of children are classified as 'secure,' 24% as 'insecure' and 15% as 'disorganized' (van IJzendoorn, Schuengel, & Bakermans-Kranenburg, 1999).

Attachment among Children with Intellectual Disabilities

Initial descriptions of the attachment framework emphasized normative development as a precondition for the development of attachment relationships. However, findings from numerous studies indicate that children with an intellectual disability are able to accomplish the first three stages of attachment (e.g., Dissanayake & Crossley, 1996; Sigman & Ungerer, 1984). For example, Sigman and Ungerer found that children with autistic tendencies who had a mental age of 24 months were able to demonstrate preference for caregivers during separation and reunion. Shapiro, Sherman, Calamari, and Koch (1987) derived consistent findings from their research with 36 children between the ages of 30 to 63 months. They used a modified Strange Situation procedure, in which the separations from the caregiver were shorter than in the original Strange Situation. When they compared the attachment behavior of children with autism to children with other developmental delays, there were no significant differences between groups with respect to behavioral changes at time of separation. However, they found that children's capacity to display emotion had a moderating effect on attachment classification. In other words, only in children with a greater capacity to express emotions, maternal variables were related to child attachment behavior. Findings from another study supported the role of children's social competence in their

attachment quality (Dissanayake & Crossley, 1997; Sigman & Mundy, 1989). All these studies utilized Strange Situation Procedure (SSP; Ainsworth & Wittig, 1969) with children between the ages of three to six years.

Studies focused on behavioral systems of children with Down syndrome have yielded congruent findings. Although less responsive in the Strange Situation procedure, their behaviors directed at the mother and stranger were similar to those displayed among typically developing children (Cicchetti & Serafica, 1981; Thompson, Cicchetti, Lamb, & Malkin, 1985). A study comparing children with Down syndrome, autism, and typical development found that children in all three groups displayed similar attachment behaviors (Dissanayake & Crossley, 1996).

Collectively, these findings suggest that children with intellectual disabilities exhibit attachment behaviors similar to typically developing children in the Strange Situation setting, such as preference for caregiver as a secure base, differences in levels of explorations in the presence of caregiver versus that in the presence of a stranger, proximity seeking with a caregiver when she returns after a brief separation, and contact maintenance with the caregiver (e.g., Rogers, Ozonoff, & Maslin-Cole, 1991; Rutgers et al, 2004; Shapiro et al., 1987). In other words, children with intellectual disabilities are able to develop a preference for a primary attachment figure and seek comfort from this individual during stressful times, which is indicative of an attachment relationship.

Attachment Classification

Studies focused on attachment classification of children with intellectual disabilities have yielded mixed findings. Some research findings demonstrate that the distribution based on attachment style is not significantly different among children with intellectual disabilities than the distribution among children with typical development (e.g., Goldberg, 1988; see van IJzendoorn, et al., 1992, for meta-analysis; Shapiro et al., 1987). However, when the ‘disorganized’ attachment category is included in the attachment classification, children with lower intellectual functioning are more likely to be classified as ‘disorganized’ (e.g., Capps et al., 1994; Naber et

al., 2007; see Rutgers et al., 2004 for meta-analysis; see also van IJzendoorn et al., 1992 for meta-analysis; Willemsen-Swinkels et al., 2000). Research specifically focused on children with Down syndrome has produced similar findings, with a large proportion of the sample being classified as ‘insecure’ or ‘disorganized’ (Atkinson et al., 1999; Ganiban, Barnett, & Cicchetti, 2000; Vaughn, Goldberg, Atkinson, Markovitch, MacGregor, & Seifer, 1994).

Similarly, studies with children with autism have obtained distributions skewed towards ‘disorganized’ (e.g., Capps et al., 1994; Willemsen-Swikles et al., 2000). In a study by Naber and colleagues (2007), children with a mean chronological age of 30 months and belonging to various clinical groups (Pervasive Developmental Disorder, Autism, Mental Retardation, Language Developmental Disorder) were compared with a control group of typically developing children. The findings indicate children in clinical groups were more likely to be classified as ‘insecure’ and ‘disorganized’ than the control group. However, the study did not find significant differences in attachment classifications between the different clinical groups. Rutgers and colleagues (2007) utilized a survey–Brief Attachment Screening Questionnaire (BASQ) –which included eight items from the Attachment Q-sort and each item was rated on a 7-point scale ranging from *insecure* to *secure*. The average attachment score of children with autism and intellectual disabilities was 4.42 (equivalent to 1.89 on a 3-point scale) whereas children with typical development in the same study had an average security score of 5.27 (2.26 on a 3-point scale).

Inconsistencies in findings pertaining to attachment classification are sometimes attributed to the validity of assessment techniques for children with intellectual disabilities (e.g., Blacher & Meyers, 1983; Vaughn et al., 1994). However, for a sample of children with Down syndrome (Atkinson et al., 1999) their classification based on the Strange Situation Procedure was consistent with their attachment scores based on home observations using the Attachment Q-sort (AQS; Waters & Deane, 1985/1987). In another study with children with Down syndrome, the researchers found that across attachment classifications, children had similar levels of negative reactivity (Ganiban et al., 2000). Negative reactivity is children’s tendency to respond

with fear or anger to stressful situations (Rothbart & Ahadi, 1994) and on average children with Down syndrome are less prone to such negative reactions (Gartstein, Marmion, & Swanson, 2006). The finding by Ganiban and colleagues is important because it provides preliminary evidence that children's attachment behaviors and classification are not linked to their syndrome-related characteristics. Similarly, Naber and colleagues (2007) found children's developmental level was a better predictor of attachment disorganization as compared to autistic symptoms.

Experts have also recommended effective ways to adapt assessment techniques in order to enhance the validity of the Strange Situation Procedure for children with intellectual disabilities (Pipp-Siegel, Siegel, & Dean, 1999; Vaughn et al., 1994). For example, in the study by Willemsen-Swinkles and colleagues (2000), when the confounding influence of autistic behaviors was removed by differentiating between etiology-related behaviors and disorganized attachment behaviours, it became possible to classify children in *secure* category. Children with autism have occasional breakdowns in attachment systems, leading to their classification in disorganized categories. However, when base level of their behavior is assessed before the attachment assessment, they have a better chance of being classified in organized attachment categories (secure or insecure).

Rutgers, van IJzendoorn, Bakermans-Kranenburg, and Swinkels (2007) recently examined the validity of Attachment Q sort for assessing attachment in autistic populations and concluded that out of the 90 behavioral items, children with autism differed significantly from typically developing children on four items that referred to proximity seeking with mother. For example, children with autism cried more at separation from their caregiver and tracked the movements of their caregiver less as compared to typically developing children. Based on these differences Rutgers and colleagues adjusted the scale values for these items in the criterion sort for children with autism such that the relatively intense separation behaviors were assigned higher ratings and the low tracking behaviors were moved to lower scale values. The modified criterion sort has not been sufficiently tested, but overall, AQS seems to have ecological validity for

assessing attachment in children with disabilities. The naturalistic observation may show attachment behaviors that might not occur in the laboratory and might also make it easier to differentiate between the etiology-related behaviors and attachment behaviors (Rutgers et al., 2007). Given that children with intellectual disabilities are able to use their caregiver as an attachment figure and that valid tools are available in the field to assess their attachment behaviors, it is important to consider the question as to what factors can reliably predict a secure attachment relationship between children with intellectual disabilities and their mothers.

Predicting Attachment Security in Children with Intellectual Disabilities

Maternal sensitivity. Bowlby theorized that maternal responses to infants' biobehavioral needs lay the foundation for an individual's attachment style (Bowlby, 1969/1982). To validate Attachment theory, Ainsworth carried out home observations of maternal behaviors and interaction styles in relation to children's attachment style. The findings from this early attachment research indicate that when the caregiver responds with sensitivity, infants develop trust in the caregiver and explore their environment using the caregiver as a secure base. However, when the caregiver is inconsistent in responding to the child's proximity and comfort needs, the child feels insecure about the caregiver's availability (Bowlby, 1969/1982). Thus, caregiver sensitivity is a central construct in the prediction model for child attachment.

Although subsequent studies with non-clinical samples supported the sensitivity-security link (De Wolff & van IJzendoorn, 1997), maternal sensitivity has been inconsistent in predicting secure attachment in children with intellectual disabilities (e.g., Capps et al., 1994; Ganiban et al., 2000; van IJzendoorn et al, 2007). For example, van IJzendoorn and colleagues (2007) found that even when controlling for maternal sensitivity, children with autism are more likely to be classified as insecure as compared to typically developing children. Arguably, a more complex set of variables and indirect effects models are required to account for the quality of attachment among these children (Atkinson et al., 1999; Ganiban et al., 2000).

Dyadic influences. Attachment research with families of children with disabilities (e.g., Atkinson et al., 1999; van IJzendoorn, 2007) pinpoints a need for a transactional approach (Sameroff & MacKenzie, 2003). The transactional model of development emphasizes both the role of the parent and that of the child in shaping development (Sameroff & Mackenzie, 2003). In the context of attachment research, a child is a co-creator of an attachment system. Consistently, for children with intellectual disabilities, past research suggests complex pathways through which the child's disability potentially exerts influence on the mother-child attachment relationship.

Child etiology related behaviors and functioning. Among children with autism, deficits in social responsiveness perhaps masks their attachment needs, making appropriate and consistent responsiveness a challenge for the mothers (Hoppes & Harris, 1990; Rutgers et al., 2007). The mothers of children with Down syndrome might fail to respond sensitively, because the low distress level among these children perhaps makes their cues for comfort difficult for mothers to see (Serafica & Cichetti, 1976). Past findings have noted some links between the etiology and specific maternal behaviors. In one study, whereas mothers of children with sensory issues in their sample used more explanations, mothers of children with intellectual disabilities displayed a more directive style (Roskam & Schelstraete, 2007). In another study, mothers of children with Prader-Willi syndrome provided less help than mothers of children with Williams syndrome on a puzzle-solving task. Moreover, the help provided by mothers in the latter group was not negatively correlated with the level of children's puzzle solving ability perhaps because of the visuospatial deficits that children with Williams syndrome typically face (Ly & Hodapp, 2005). The differential effects of etiologies are also evident in research on maternal stress (e.g., Eisenhower, Baker, & Blacher, 2005; Hodapp, Ly, Fidler, & Ricci, 2001).

Some findings suggest that children's level of functioning and etiological behaviors is associated with their ability to form attachments. For instance, in a study involving children with autism, the children who had superior verbal skills displayed more distinct reunion behaviors, thereby increasing their chances of being classified as secure (Dissanayake & Crossley, 1997). In

another study, severity of autistic symptoms was predictive of attachment insecurity (Naber et al., 2007). Similarly, Shapiro and colleagues (1987) found that children with autism who had better social functioning were more likely to be classified as securely attached.

Child responsiveness and involvement. Whereas the findings reviewed in the previous section imply direct effects of functioning and etiological behaviors on the quality of attachment, some other evidence illustrates a more complex picture. For example, Atkinson and colleagues (1999) found that maternal sensitivity and children's intellectual functioning interacted to influence the attachment quality of the children with Down syndrome in their sample. Specifically, maternal sensitivity predicted attachment security only in children with higher levels of functioning. Koren-Karie, Oppenheim, Dolev, and Yirmiya (2009) found that although maternal sensitivity was linked to children's attachment security even after controlling for children's level of functioning, mothers displayed greater sensitivity when children were more responsive in the dyadic interactions. Van IJzendoorn and colleagues (2007) found a similar association between child involvement and maternal sensitivity. As can be expected, children with intellectual disabilities had significantly lower scores on involvement as compared to children with typical development.

Prior studies have found that on average, mothers of children with intellectual disabilities receive lower scores on sensitivity (Clements & Barnett, 2002; Moran, Pederson, Pettit, & Krupka, 1992) and authoritative parenting (Rutgers et al., 2007) than mothers of children with typical development. Compelling findings were derived from a longitudinal study comparing interaction behavior of mothers of infants with Down syndrome and mothers of children with typical development. Whereas the mothers in the Down syndrome group did not differ significantly on sensitivity from mothers in the typical development group when their infants were eight weeks old, the former group received significantly lower ratings when the infants were 20-weeks old (Slonims, Cox, & McConachie, 2006). These findings suggest an indirect effects

model indicating that children's inability to participate in dyadic interactions perhaps undermines maternal sensitivity and results in poor attachment quality.

Atkinson and colleagues (1999) propose that lower functioning children are less likely to be classified as secure, not because of their behavioral inability to display proximity seeking and separation behavior but because of their inability to produce appropriate emotional signals to elicit caregiver response. Van IJzendoorn and colleagues (2007) interpret their finding of a non-significant relationship between maternal sensitivity and attachment security in a similar way. They suggest the child's low developmental level might impede the parent-child interaction patterns that are essential for developing a secure attachment relationship. According to Ganiban and colleagues (2000), the interaction patterns characterized by intrusiveness and insensitivity established over the years may put children with developmental disabilities at higher risk for insecure attachments.

These perspectives indicate that the quality of dyadic interaction mediates the effects of positive maternal behaviors on attachment security (Atkinson et al., 1999; Ganiban et al., 2000; van IJzendoorn et al., 2007; Vaughn et al., 1994). They underscore the need to examine the transactional influences among parent and child vulnerabilities in shaping the child's attachment style (Howe, 2006). Although parents conceivably lead the dance in the formation of an attachment relationship, insight into the potential influence that a child's disability can have on the attachment quality can significantly reduce the risk of insecure and disorganized attachment patterns in this population.

Assessing dyadic influences

The dyadic or interactional predictors warrant measures that can effectively capture dyadic behavior. Although Ainsworth's sensitivity scales are dyadic to the extent that they take into account the mother's responses to the child's actions, the focus remains primarily on mothers. Measures such as the Emotional Availability Scales (Biringen, 2008; see Pipp-Siegel & Biringen, 1998 for description) enable attachment researchers to take into account a child's

contribution to dyadic interaction and attachment formation. In addition, maternal sensitivity is conceptualized based on Ainsworth's observations of interactions between children with typical development and their mothers. Sensitive parenting may have to be operationalized differently in research involving children diagnosed with intellectual disabilities. Maternal behaviors conceived as intrusive in research with typically-developing children may be considered adaptive in dyads that include children with intellectual disabilities (Marfo, Dedrick, & Barbour, 1998). A study with children with Down syndrome found that mothers' directive behavior and sensitivity shared a moderate correlation (Crawley & Spiker, 1983). Similarly, Kasari, Sigman, Mundy and Yirmiya (1988) found that although mothers of children with intellectual disabilities were relatively more controlling than mothers of children with typical development, they adapted their interaction style in response to their child's needs. The specific effects of different behavioral phenotypes on parent-child interactions also need to be examined through dyadic coding systems. Doussard-Roosevelt, Joe, Bazhenova, and Porges (2003) compared mothers' interactions with their child with a disability and a typically developing sibling. They found some qualitative differences between the mother's behavior towards her child with autism and her behavior towards a nonautistic sibling. For instance, mother's interaction style during a free play situation was characterized by more physical contact and less use of verbal request when interacting with her child with autism as compared to her interaction with the non-autistic sibling. Doussard-Roosevelt and colleagues also found that greater physical proximity between mother and child was linked to contingent responses from the child with autism.

In sum, these findings demonstrate the need to look at the quality of the dyadic interaction and contributions of both partners, rather than just maternal behavior. The relevance of the dyadic construct is consistent with past meta-analytic findings. De Wolff and van Ijzendoorn (1997) found that constructs akin to synchrony (reciprocity and mutuality) were the strongest predictors of attachment security. Nievar and Becker (2008) confirmed these findings in their secondary analysis of the same set of studies. By conceptualizing maternal sensitivity as

synchrony and mutuality, the researchers derived a strong correlation between the sensitivity and attachment security. Consistently, Isabella and Belsky (1991) assessed synchrony in relation to child attachment and they found that dyads with a securely attached child differed significantly from dyads where the child was insecurely attached, on the measure of synchronous interaction (as cited in Harrist & Waugh, 2002). Blehar, Lieberman and Ainsworth (1977) too considered interactional variables in their study and found distinct differences in interactional styles of children with secure versus insecure attachment.

Clinical Implications

The literature illustrates that the reciprocal effects of child-related and maternal factors put synchronous interaction patterns at risk among dyads with children with intellectual disabilities. These trends underscore the need for attachment-based interventions that focus on interaction needs of such dyads. Children's attachment needs can be better served when mothers are trained to adopt a less structured approach and take their children's cues (Warren & Brady, 2007). Interventions can also focus on helping parents meet the child's attachment needs despite the challenges raised by etiology-related behaviors or respond to children's needs consistently even in the absence of clear emotional and verbal cues. As Atkinson and colleagues (1995) found, mothers needed to be very observant in order to respond to the cues of their infants with Down syndrome. Hodapp, DesJardin, and Ricci (2003) propose that when interventions are planned around etiology-specific behaviors, they tend to be more effective. Furthermore, future attachment-based parenting interventions should consider the role of maternal mental health and try to alleviate maternal stress and depression.

Second, from an attachment perspective it is important that families receive significant support during critical phases (e.g., birth of the child, child's diagnosis), as the system is most fluid and vulnerable at these times. As such, formal and informal social support during critical periods is linked to dramatic decreases in parents' concurrent (Crnic, Greenberg, & Slough, 1986) and subsequent stress levels (Guralnick, Hammond, Neville, & Connor, 2008). Barnett, Clements,

Kaplan-Estrin, and Fialka (2003) also emphasize the importance of timing for the intervention process; they propose a group intervention program for parents of toddlers and preschoolers rather than newborns in order to give parents time to process their child's diagnosis and fully grasp the etiology-related developmental issues. Using an attachment perspective, Barnett and colleagues delineate an evidence-based intervention to promote adaptation, which in turn would promote secure mother-child attachment. Indeed, to provide effective help to families during such acute stages, practitioners have at their disposal a rich body of knowledge regarding the factors that help and hinder effective adaptations. Gray, Msall, and Msall (2008) illustrate the effective use of evidence to design supportive services; rooted in developmental and behavioral perspectives, their model suggests ways that primary healthcare providers can provide support to parents going through their child's autism diagnostic process. The benefits of services geared toward family adaptation would extend to secure mother-child attachment relationships.

Third, the findings pertaining to the importance of a supportive context for families to develop accommodations and sustain routines have implications for planning early intervention services for young children with intellectual disabilities and their families (Bernheimer & Weisner, 2007). Indeed, past findings have shown that interventions demonstrate better child and family outcomes when they take family routines into account (Dunst, Bruder, Trivette, & Hamby, 2006) and maintain an overall goal of family wellbeing rather than merely child functioning (Guralnick, 2005). Specifically, positive intervention strategies are linked to parental feelings of efficacy (see Dunst, Trivette, and Hamby, 2007 for a meta-analysis). In contrast, the programs that narrowly focus on children's cognitive development, neglecting the overall family needs, sometimes undermine parental well-being (Schwichtenberg & Poehlmann, 2007) and perhaps even secure mother-child attachment. Unfortunately, the positive intervention practices are not always implemented (see Espe-Sherwindt, 2008 for a review) and intervention practitioners continue to report a preference for center-based services as opposed to services in child's naturalistic environments (Campbell & Halbert, 2002).

Attachment in a Non-Western Context

Attachment theory was first validated by Ainsworth with mother-child dyads in Uganda—a non-western context (Karen, 1994). Moreover, as Attachment theory is grounded in the ethological framework, secure attachment is conceptualized as species specific and universal. Bowlby hypothesized that children's attachment needs as well as the parental instinct to provide comfort are biologically based. Thus, across cultures, children develop trust in their caregiver and derive comfort and security from their attachment figure during stressful times. Some experts, however, have criticized attachment theory's emphasis on exploration and proximity as based on western values of autonomy. Cross-cultural researchers such as Rogoff (2003) and Weisner (2005) argue that although the need for secure base is biological, the behavioral manifestation is likely to differ across cultures based on differences in caregiving and caregiver expectations. Based on Rogoff's (2003) perspective, cross cultural differences in caregiving may influence a child's level of exploration and proximity seeking in the three key situations in the Strange Situation procedure—separation from caregiver, reaction to stranger and reunion with caregiver. For example, the early independence training in Germany and multiple caregivers in the African American community may result in children acting unconcerned when the caregiver leaves the room. By coding these behaviors as insecure, attachment researchers ignore the cultural influences on the exhibition of secure base behavior. The disparate expectations in regard with attachment behavior across cultures are evident from the comparison of Anglo and Puerto Rican mothers (Harwood, 1992). While Anglo mothers emphasized self-maximization and personal competence in the Strange Situation setting, the Puerto Rican mothers referenced *proper demeanor* (Respectfulness) and close bond with mother as desirable attachment behaviors.

There are no published studies on attachment among mother-child dyads in India, but some parenting research carried out with families in New Delhi, India, indicates that maternal socialization goals in urban India are somewhat similar to the socialization goals of parents in Western countries (Kärtner, Keller, Lamm, Abels, Yovsi, & Chaudhary, 2007). For example,

Kärtner and colleagues found that the mothers from Delhi, India in their sample did not differ significantly from the Los Angeles mothers in their sample with respect to the value they placed on relational goals. In fact, mothers from both cities placed equal emphasis on autonomous goals. These findings are consistent with the results from an earlier study by Keller and colleagues (2006). The study included nine cultural communities from six different countries and the socialization goals of the mothers from these different communities were assessed through interviews and surveys. It is noteworthy that the mothers in the two Indian samples, one from rural India and the other from urban India, scored very high on autonomous goals.

The argument pertaining to cross-cultural differences, however, was refuted by findings from a cross national study by Posada and colleagues (1995) covering seven countries. The main focus of the study was to examine the universality of the secure-base phenomenon using the Attachment Q-sort (Waters, 1987). To achieve this objective, attachment experts and group of mothers from the seven countries were asked to sort the Q-set items based on their ideas of secure base behavior. In addition, a different group of mothers was asked to sort the Attachment Q-set to describe the attachment behavior of their own child. One of the key study findings was that experts across the seven countries described secure base behavior in a similar way. However, there were cross country differences in mothers' preferences for specific behaviors in the hypothetical "ideal" child. Mothers from USA and Japan placed greater emphasis on positive affect during interactions as compared to Israeli caregivers. For Colombian mothers, it was relatively more important that the child track her location and seek her help when bored or upset. Similarly, there were differences in the value placed by mothers across cultures on behavioral domains such as comfort derived by child from physical contact and child's readiness to interact. Despite these cross-cultural differences in behavioral expectations, children's secure-base behaviors were by and large uniform across cultures and were fairly represented by the behavior descriptors in the Attachment Q-sort items. These findings implied that the maternal preferences did not translate into actual changes in children's secure base behavior and provided support to

the universality hypothesis. Although the study did not include an Indian sample, it had samples from two other Asian countries—Japan and China—which bear cultural similarities to India with respect to collectivist family values and parenting styles (Chao & Tseng, 2002).

Children with Intellectual Disabilities in India

In this section, findings are reviewed to provide an understanding of the social, economic, and cultural contexts of children with intellectual disabilities and their families. Estimates from different sources lack consensus regarding the prevalence of intellectual disabilities in India. The 58th Round of National Sample Survey Organization (NSSO, 2002) estimated 0.009% of the population to have an intellectual disability (Narayan, 2008). Based on these estimates, out of the Indian population of 1.5 billion people, approximately 1.5 million individuals live with an intellectual disability. However, in an epidemiological study by the Indian Council of Medical Research, 0.9% to 1.4% children in the 0-16 year age group were diagnosed with an intellectual disability (Srinath et al., 2005), indicating that the number of children with an intellectual disability may be much higher (approx. 4 million) than estimated by NSSO.

In India, disability is intricately connected to a number of social issues. In addition to the overall greater rate of poverty in these nations, individuals with intellectual disabilities are at an increased risk of living in poverty (as cited in Fujiura, Park, & Rutkowski-Kmitta, 2005). Poverty is not only the context for many children with developmental disabilities in India, but is also a major cause of developmental delays. Fujiura et al. (2005) report that people in developing nations are at eight times greater risk for intellectual disability due to iodine deficiency as compared to those in developed nations.

Moreover, the Indian society is characterized as patriarchal and girls with disabilities are faced with a dual disadvantage arising from their impairment and their gender. According to the 2001, census girls with disabilities are less likely to have access to educational services and therapeutic devices as compared to boys (Kalyanpur, 2008). In one study, families of girls with orthopaedic disabilities reported that they were forced to stop sending their daughters to school

because of inadequate transportation services and inaccessible school infrastructure. The families also expressed fear of violence and sexual abuse against their daughters (Halder, 2009).

Consistently, the Asian Development Bank report (2002) documented that girls with disabilities are two to three times more likely to be victims of abuse as compared to girls without disabilities (as cited in Kalyanpur, 2008). Furthermore, Ittiyerah and Kumar (2007) found that relative to men with disabilities, women with disabilities had lower self-esteem. The effect of the societal bias against girls is perhaps felt by the families as well. As Padencheri and Russell's (2004) findings indicated, the parents of girls with intellectual disabilities reported higher marital conflict than the parents of boys.

In general, families of children with disabilities have a limited to access to services. Peshawaria (1999) reports based on disability index ratings by 95 Indian disability-related organizations that India has made minor progress towards implementing the United Nations standard rules for rights of individuals with disabilities. This is especially true for inclusive education, one of the most important rights for children with disabilities. The Chapter 5 of the *Persons with Disabilities Act* outlines the provisions pertaining to free education for all children with disabilities either through integration in mainstream schools or establishment of special schools. Unfortunately though, after a decade of the passing of the law, only 1-4% of individuals with disabilities ever attend a school (Mukhopadhyay & Mani, 2002; National Council of Educational Research and Training, 2005). Out of that, the number of children integrated in mainstream schools is abysmally low. Conversely, community based rehabilitation services (CBRs) has proved to be an important resource for rehabilitation of individuals with disabilities in India. Given that a large percentage of the disabled population lives in rural areas and slums, CBR has proved to be an effective means to reach out to these individuals and has yielded a number of benefits (Dalal, 2006; Russell, John, & Lakshmanan, 1999; Russell, John, Lakshmanan, & Lakshmidivi, 2004; Sen & Goldbart, 2005).

Socially, a number of study findings reflect the stress and conflict that the societal notions of disability create for children with disabilities and their families. For example, families of children with developmental disabilities in Dhar's (2009) study reported feeling a constant sense of anxiety about the well-being and long-term care of the child. They felt stigmatised and embarrassed by the societal labels and people's reactions. Additionally, it is evident from some studies that families often undermine their children's independence. Durgamba, Parthasarathi, and Murty (2004) found that although the parents of children with hearing impairment in their study had positive feelings towards their children, they doubted their children could ever become self-sufficient. Similarly, in Pal, Chaudhury, Sengupta, and Das' (2002) study, parents of children with epilepsy were overprotective and entrusted their child with significantly fewer responsibilities as compared to parents of children with typical development. As a result, these children had a level of functioning that was lower than could be accounted for by their neurological impairment. On the other hand, Pal, Chaudhury, Das, and Sengupta (2002) found that parents that have greater social support are able to adapt more effectively to their child's disability. Consistently, the longer families get formal support, the more positive their outlook becomes towards their child's potential (Narayan, Madhavan & Prakasam, 1993).

In sum, even though accurate information is not available for the prevalence rate of intellectual disability in India, the number of children living with an intellectual disability is estimated to be in millions. A large number of these children live in poverty; their families have limited access to educational and rehabilitation services. Various sociocultural factors such as prevalent disability beliefs pose additional risks to children with intellectual disabilities and their families. Often, parental beliefs also result in negative outcomes for children, but at the same time social support results in child and family well-being. Overall, these findings have implications for planning interventions and services that would benefit children with intellectual disabilities and their families.

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APPENDIX B

QUESTIONNAIRES

ID #: _____

Date _____

Background Information

1. Child's age: _____

2. Child's gender:

Male

Female

3. Participant's relationship to child:

Mother

Father

4. Number of years the child has been enrolled at the current institution: _____

5. Child's diagnosis

a. Down Syndrome

b. Autism

c. Mental Retardation

d. Cerebral Palsy

e. Other _____

6. Number of people in the home: _____

a. How many adults? _____

b. How many children? _____

7. How many siblings does the child have? _____

8. Education

	High School	Bachelors	Masters	PhD
Self	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Spouse	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

9. Age

Self : _____ years

Spouse : _____ years

10. Employment

	Salaried employee	Self employed	Professional with private practice	Home maker
Self	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Spouse	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

11. Income (Approx.)

Self : Rs. _____

Spouse : Rs. _____

Attachment Q-list

For the first set of items, read each description of how preschool-age children act. Think about whether they are “like” or “not like” your child. Even if you don’t like some of these things your child does, please tell us what she or he is really like. These things are typical of many children this age and will change as they get older.

For each item rate your child using a 1, 2, or 3.

1 = NOT LIKE your child **2 = NEITHER** like or unlike your child **3 = LIKE** your child

Rating	
	1. Child shares easily with you or lets you hold things if you ask.
R	2. Child is sometimes fussy, for no clear reason, when s/he returns to you after playing
R	3. If you are near something the child wants to play with, s/he fusses or tries to drag you over to it.
R	4. When child cries, s/he cries hard.
	5. Child is lighthearted and playful most of the time.
R	6. Child often cries or resists when you take him/her to bed for naps or at night.
	7. Child often hugs or cuddles against you without your asking him/her to.
	8. Child quickly gets used to people or things that at first made him/her shy or frightened.
	9. When your child finds something new to play with, s/he carries it to you or shows it to you from across the room.
	10. Child will talk to new people, show them toys, or show them what s/he can do if you ask him/her to.
R	11. Child quickly loses interest in new adults if they do anything that annoys him/her.
	12. Child follows your suggestions easily, even when they are suggestions instead of orders.

	13. When you tell your child to bring or give something, s/he obeys. (Do not count refusals that are playful or part of a game unless they clearly are disobedient).
	14. Child keeps track of where you are when s/he plays around the house; calls to you now and then; notices when you go from room to room; notices if you change activities.
	15. Child acts like a loving parent to dolls, pets, or other babies.
R	16. Child tries to get your attention when you sit with or are affectionate to other family members.
R	17. Child is easy to lose track of when s/he is playing out of your sight.
R	18. Child cries when you leave him/her at home with a babysitter, other parent, or grandparent.
	19. Child enjoys relaxing in your lap.
R	20. Child easily becomes angry with his/her toys.
R	21. Child wants to be the center of your attention. If you are busy or talking to someone, s/he interrupts.
	22. When you say "No" or get after him/her, child stops misbehaving (at least at that time). S/he doesn't have to be told twice.
R	23. Child sometimes acts like s/he wants to be put down, and then fusses or wants to be picked right back up.
R	24. When child is about you leaving him/her, s/he sits rights where s/he is and cries. S/he doesn't go after you.
	25. Child clearly shows a pattern of using you as a base from which to explore. Moves out to play; returns to play near you; moves out to play again, etc.
R	26. Child is demanding and impatient with you. S/he fusses and persists unless you do what s/he wants right away.
R	27. When child plays away from you or alone with his/her toys, s/he is often serious and businesslike.
	28. Child carefully looks over new objects or toys. S/he tries to use them in different ways or to take them apart.
	29. Child follows you when you tell him/her to. (Do not count refusals or delays that are playful or part of a game unless they clearly become disobedient).
	30. Child can tell when you are upset.

	31. Child asks for and enjoys having you hold, hug, and cuddle him/her.
	32. Child will accept and enjoy loud sounds or being bounced around in play, if you smile and show that it is supposed to be fun.
R	33. Child's first reaction when people visit the home is to ignore or avoid them, even if s/he eventually warms up to them.
R	34. Child has trouble handling small objects or putting small things together.
	35. Child puts his/her arms around you or puts his/her hand on your shoulder when you pick him/her up.
R	36. Child acts like s/he expects you to interfere with his/her activities when you are simply trying to help him/her with something.
	37. Child copies what you do and the way you do things.
R	38. Child becomes shy or loses interest with something difficult.
R	39. Child usually ignores adults who visit your home. S/he finds his/her own activities more interesting.
R	40. When child finishes with an activity or toy, s/he generally finds something else to do without returning to you between activities.
	41. If you reassure him/her by saying "It's OK" or "It won't hurt you" your child will approach or play with things that at first made him/her cautious or afraid.
R	42. Child plays roughly with you. Bumps, scratches, or bits during active play. (May not mean to hurt you).
R	43. Even before trying things himself/herself, child tries to get someone to help him/her.
	44. Child enjoys climbing all over you when you play together.
R	45. Child is easily upset when you make him/her change from one activity to another.
	46. Child easily grows fond of adults who visit your home and are friendly to him/her.
R	47. Child doesn't usually ask you for help.
	48. Child quickly greets you with a big smile when you enter the room.

	49. If held in your arms, child stops crying and quickly recovers after being scared or upset.
R	50. When you don't do what your child wants right away, s/he acts like you were not going to do it at all. (Fusses, gets angry, walks off to other activities, etc.).
R	51. At home, child gets upset or cries when you walk out of the room.
R	52. When given a choice, child would rather play with toys than with adults.
	53. When you ask your child to do something, s/he understands what you want right away. (May or may not obey).
R	54. Child easily becomes angry at you.
	55. Child uses your facial expressions to decide whether something is risky or scary.
R	56. Child cries as a way of getting you to do what s/he wants.
	57. When child is bored, s/he goes to you looking for something to do.
	58. Child is strongly attracted to new activities and new toys.
	59. Child tries to get you imitate him/her, or quickly notices and enjoys it when you imitate him/her on your own.
R	60. If something upsets your child, s/he stays where s/he is and cries.
	61. Child's facial expressions are strong and clear when s/he is playing with something.
	62. If you move far away, child follows along and keeps playing in the area near you. (Doesn't have to be called or carried along; doesn't stop play or get upset).

Newland, Coyl and Freeman, 2008; AQS; Waters & Deane, 1985/87

R= Items that describe insecure behaviors and were reverse coded to compute children's security score. In the AQS criterion sort these items are placed in piles 1-3 representing behaviors that are less characteristic of a hypothetically secure child.

Teacher ID #: _____

Date: _____

1. Education

High School Bachelors Masters PhD

2. Number of years of teaching experience : _____ years

3. For how long have you worked at the current organization? _____ years

4. Briefly describe the education and training relevant to this setting (e.g., teachers' training, special education workshops, etc):

APPENDIX C

INSTITUTIONAL REVIEW BOARD APPROVAL

Oklahoma State University Institutional Review Board

Date: Friday, February 13, 2009
IRB Application No HE0879
Proposal Title: Correlates of Attachment Security for Children with Autism in Urban India:
An Exploratory Study
Reviewed and Processed as: Expedited (Spec Pop)

Status Recommended by Reviewer(s): Approved Protocol Expires: 2/12/2010

Principal Investigator(s):

Aesha John	Amanda S Morris
2403 MH 700 N. Greenwood	700 N. Greenwood
Tulsa, OK 74106	Tulsa, OK 741060700

The IRB application referenced above has been approved. It is the judgment of the reviewers that the rights and welfare of individuals who may be asked to participate in this study will be respected, and that the research will be conducted in a manner consistent with the IRB requirements as outlined in section 45 CFR 46.

The final versions of any printed recruitment, consent and assent documents bearing the IRB approval stamp are attached to this letter. These are the versions that must be used during the study.

As Principal Investigator, it is your responsibility to do the following:

1. Conduct this study exactly as it has been approved. Any modifications to the research protocol must be submitted with the appropriate signatures for IRB approval.
2. Submit a request for continuation if the study extends beyond the approval period of one calendar year. This continuation must receive IRB review and approval before the research can continue.
3. Report any adverse events to the IRB Chair promptly. Adverse events are those which are unanticipated and impact the subjects during the course of this research; and
4. Notify the IRB office in writing when your research project is complete.

Please note that approved protocols are subject to monitoring by the IRB and that the IRB office has the authority to inspect research records associated with this protocol at any time. If you have questions about the IRB procedures or need any assistance from the Board, please contact Beth McTernan in 219 Cordell North (phone: 405-744-5700, beth.mcternan@okstate.edu).

Sincerely,



Shelia Kennison, Chair
Institutional Review Board

Oklahoma State University Institutional Review Board

Date Friday, October 23, 2009 Protocol Expires: 2/12/2010
IRB Application HE0879
Proposal Title: Correlates of Attachment Security for Children with Autism in Urban India: An Exploratory Study
Reviewed and Processed as: Expedited (Spec Pop)
Modification

Status Recommended by Reviewer(s) **Approved**

Principal Investigator(s) :

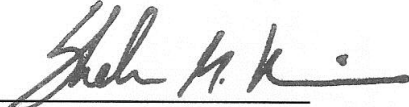
Aesha John
15366 E. 91st N.
Owasso, OK 74055

Amanda S Morris
700 N. Greenwood
Tulsa, OK 741060700

The requested modification to this IRB protocol has been approved. Please note that the original expiration date of the protocol has not changed. The IRB office MUST be notified in writing when a project is complete. All approved projects are subject to monitoring by the IRB

- The final versions of any printed recruitment, consent and assent documents bearing the IRB approval stamp are attached to this letter. These are the versions that must be used during the study.

Signature :


Shelia Kennison, Chair, OSU Institutional Review Board

Friday, October 23, 2009
Date

Oklahoma State University Institutional Review Board

Date Thursday, January 21, 2010 Protocol Expires: 1/20/2011

IRB Application No: HE0879

Proposal Title: Correlates of Attachment Security for Children with Intellectual Disabilities in Urban India

Reviewed and Processed as: Expedited (Spec Pop) Continuation

Status Recommended by Reviewer(s): Approved

Principal Investigator(s) :

Aesha John
15366 E. 91st N.
Owasso, OK 74055

Amanda S Morris
700 N. Greenwood
Tulsa, OK 741060700

Approvals are valid for one calendar year, after which time a request for continuation must be submitted. Any modifications to the research project approved by the IRB must be submitted for approval with the advisor's signature. The IRB office MUST be notified in writing when a project is complete. Approved projects are subject to monitoring by the IRB. Expedited and exempt projects may be reviewed by the full Institutional Review Board.

X The final versions of any printed recruitment, consent and assent documents bearing the IRB approval stamp are attached to this letter. These are the versions that must be used during the study.

Signature :

Handwritten signature of Sheila Kennison, Chair, Institutional Review Board

Thursday, January 21, 2010
Date

VITA

Aesha James John

Candidate for the Degree of

Doctor of Philosophy

Thesis: CORRELATES OF SECURE ATTACHMENT IN CHILDREN WITH
INTELLECTUAL DISABILITIES IN URBAN INDIA

Major Field: Human Environmental Science

Biographical:

Education:

Completed the requirements for the Doctor of Philosophy in Human Development and Family Science at Oklahoma State University, Stillwater, Oklahoma in July, 2011.

Completed the requirements for the Master of Social Work at Maharaja Sayajirao University/Faculty of Social Work, Vadodara, Gujarat/India in 1995.

Completed the requirements for the Bachelor of Arts in Psychology at Gujarat University/ St. Xavier's College, Ahmedabad, Gujarat/India in 1992.

Experience:

Manager - Human Resources at Larsen & Toubro Engineering Company, Hazira, India (1995-98); Program manager at the Society for Remedial Education, Assessment and Counseling of the Handicapped, Surat, India (1998 – 2002); Facilitator – Total Quality Management at Larsen & Toubro Engineering Company, Hazira, India (2002-2005); Research assistant and Instructor in the Human Development and Family Science Department at Oklahoma State University (2006-2011)

Professional Memberships:

Society for Research in Child Development
American Association of Intellectual and Developmental Disabilities.

Name: Aesha John

Date of Degree: July, 2011

Institution: Oklahoma State University

Location: Stillwater, Oklahoma

Title of Study: CORRELATES OF SECURE ATTACHMENT IN CHILDREN WITH
INTELLECTUAL DISABILITIES IN URBAN INDIA

Pages in Study: 91

Candidate for the Degree of Doctor of Philosophy

Major Field: Human Development and Family Science

Scope and Method of Study: The study aimed at identifying the correlates of attachment security among children with intellectual disabilities residing in urban India. To this end, survey and observational data were collected from 47 children, their mothers ($n = 47$) and their teachers ($n = 22$). Mothers completed surveys to describe children's secure-base behavior and teachers reported on children's functioning through the Vineland adaptive behavior scales. The mother-child dyads participated in a semi-structured observation; the dyadic observations were subsequently coded for maternal and child emotional availability. The data were analyzed to test an indirect effects model hypothesizing an indirect association between (a) maternal emotional availability and child attachment security through child emotional availability and (b) child functioning and child attachment security through child emotional availability. Age and gender differences were explored for all the variables in the model.

Findings and Conclusions: With the exception of one variable pair—maternal emotional availability and child functioning—all variables of interest were significantly correlated. Findings of mediation analyses indicate that children's emotional availability mediates the association between maternal emotional availability and child attachment security as well as the link between children's level of functioning and their attachment security. The examination of gender differences indicate that the girls in the sample were at a greater risk of insecure attachment as compared to the boys. Analyses of age differences indicate lower levels of functioning among the older children. Overall, the findings underscore the salience of children's emotional availability for secure attachment among children with intellectual disabilities. The study findings generated through data from multiple informants and multiple methodologies make an important contribution to the extant literature on socio-emotional development among children with intellectual disabilities.

ADVISER'S APPROVAL: Amanda Sheffield Morris, Ph.D.
