Attachment and Autism: Parental Attachment Representations and Relational Behaviors in the Parent-Child Dyad

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Published online: 5 May 2010 © Springer Science+Business Media, LLC 2010

Abstract While attachment research has demonstrated that parents' internal working models of attachment relationships tend to be transmitted to their children, affecting children's developmental trajectories, this study specifically examines associations between adult attachment status and observable parent, child, and dyadic behaviors among children with autism and associated neurodevelopmental disorders of relating and communicating. The Adult Attachment Interview (AAI) was employed to derive parental working models of attachment relationships. The Functional Emotional Assessment Scale (FEAS) was used to determine the quality of relational and functional behaviors in parents and their children. The sample included parents and their 4- to 16-year-old children with autism and associated neurodevelopmental disorders.

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A. Yasik e-mail: ayasik@pace.edu Hypothesized relationships between AAI classifications and FEAS scores were supported. Significant correlations were found between AAI classification and FEAS scores, indicating that children with autism spectrum disorders whose parents demonstrated secure attachment representations were better able to initiate and respond in two-way pre-symbolic gestural communication; organize two-way social problem-solving communication; and engage in imaginative thinking, symbolic play, and verbal communication. These findings lend support to the relevance of the parent's state of mind pertaining to attachment status to child and parent relational behavior in cases wherein the child has been diagnosed with autism or an associated neurodevelopmental disorder of relating and communicating. A model emerges from these findings of conceptualizing relationships between parental internal models of attachment relationships and parent-child relational and functional levels that may aid in differentiating interventions.

Keywords Attachment · Autism · FEAS · AAI · DIR

Attachment and Autism

Attachment is defined as a specific affectional tie that one person forms to another. Once formed, patterns of attachment behavior endure across space and time (Bowlby 1969). Secure attachment in children has been associated with positive emotional and social development in nonclinical (Becker-Stoll et al. 2001; Sroufe 1983; Steele et al. 2002) and clinical populations (Main and Hesse 1991; Oyen et al. 2000).

John Bowlby (1940) proposed that intergenerational transmission of attachment patterns should be studied in

order to help children by helping their parents. Empirical support for Bowlby's work was spearheaded by the work of Ainsworth, Blehar, Waters, and Wall with the Strange Situation Procedure (1978), an eight-step separation and reunion laboratory paradigm used to assess attachment style in 12- to 18-month-old babies toward their parental figures. Attachment classification is based on the child's behaviors during reunion episodes with the parent. The Strange Situation identifies a child's attachment style as *Secure* (B); *Insecure-Avoidant* (A); or *Insecure-Resistant-Ambivalent* (C). Main and Solomon (1986) later added a fourth classification of *Insecure-Disorganized* for children who display disorganized, disoriented, and confused behaviors during reunions.

Main and colleagues later found concordance between children's Strange Situation classifications and their parents' classifications, as derived from the Adult Attachment Interview (AAI; George et al. 1996), a semi-structured interview from which the individual's current state of mind with regard to attachment is assessed according to the thoughtfulness and coherency of the individual's descriptions and evaluations of childhood experiences and their effects. Adapted from the Strange Situation classifications, AAI participants are identified as Autonomous-Secure (F), characterized by coherent narratives valuing of attachment with non-defensive reporting of positive and negative memories; Insecure-Dismissing (Ds), characterized by devaluing of attachment, idealizing parents without providing concrete examples, and poor memory of childhood experiences; or Insecure-Preoccupied (E), characterized by incoherent narratives that are over involved and preoccupied with early attachment experiences. Unresolved (U) adults display lapses in their discourse when discussing traumatic events, such as the loss of or abuse by an attachment figure. This classification is superimposed on the primary classification (Main and Goldwyn 1991) and considered least optimal. Cannot Classify is assigned to a small percentage of adults who do not fit any of the categories.

AAI classifications have been found to be independent of non-attachment-related memory, verbal and performance intelligence, and social desirability (Bakermans-Kranenburg and Van IJzendoorn 1993; Sagi et al. 1994). Van IJzendoorn's (1995) meta-analysis reported powerful correlations between parental AAI classifications and their children's Strange Situation classifications, and concluded that the validity of the AAI as a powerful predictor of the attachment patterns of the children is a replicated finding.

A growing body of research has utilized attachment research methodology to study relational behaviors in children with autism and their parents. The *Diagnostic* and Statistical Manual of Mental Disorders, Fourth Edition, Text Revision (DSM-IV-TR; American Psychiatric Association 2000) diagnostic criteria for autistic disorder include qualitative impairments in social interaction and communication. Despite the bleak implications of theoretical models assuming children with autism and associated disorders are unable to form secure attachment relationships (Baron-Cohen 1989; Cohen et al. 1987; Dawson and Lewy 1989; Rogers and Pennington 1991), a number of studies have reported secure attachment behaviors toward their mothers in children with autism (Rutgers et al. 2004).

Studies using the Strange Situation (Ainsworth et al. 1978) and adaptations thereof found that, though the number of securely-classified children with autism was lower than that of children without autism (Rutgers et al. 2004), children with autism displayed secure attachment behaviors toward their mothers when distressed (Dissanayake and Crossley 1996, 1997); discriminated between their mothers and strangers, and tended to increase their proximity-seeking behaviors when reunited with their mothers after separation, similar to children in control groups (e.g., Bernabei et al. 1998; Sigman and Mundy 1989; Sigman and Ungerer 1984; Stahlecker and Cohen 1985). It was further noted that the children with autism demonstrating secure attachment patterns responded more frequently to bids for joint attention (Charman 2003); made more frequent requests (Capps et al. 1994); and displayed greater ability in their receptive language than did the children demonstrating insecure attachment patterns (Capps et al. 1994; Rogers and Dilalla 1990; Rogers et al. 1991, 1993).

Parental Factors and Attachment in Children with Autism

In keeping with the progression in the larger attachment literature, autism and attachment research has expanded its focus to include examination of parental factors and children's attachment behaviors. Positive correlations were found between maternal sensitivity and infant security in a study of 6- to 12-month-old developmentally delayed babies and their mothers (Moran et al. 1992). Capps et al. (1994) also reported higher levels of sensitivity in mothers of children with autism demonstrating secure attachment patterns. A more recent study by Van IJzendoorn et al. (2007) of children with autism at 2 years old and again at 4 years old, on the other hand, revealed no significant concordance between parental sensitivity and attachment security in children with autism, while for children without autism, sensitive parenting was correlated with attachment security.

Van IJzendoorn et al. (2007) attributed their contradictory findings to possible restrictions in the power of their analysis due to the small subgroup of eight children with autism spectrum disorder in their cognitively diverse sample, which also included children with mental retardation, language delays, and typically developing children. The authors further discussed the possibility that two subscales of the 3rd edition of the Emotional Availability Scales (EA; Biringen et al. 1998), which served as their measure of parental sensitivity when the children were 4 years old, may not have adequately captured the unique interactions between parents and their children with autism. They suggested that, compared to typically developing children, children with autism may require stronger and more explicit sensory stimulation from their parents. More intense affective parental behavior on the EA Scales may be coded as intrusive, and thus insensitive, while, it was suggested that, what may be coded as sensitive parental behaviors would likely be too subtle for children on the autism spectrum to register. In addition, the authors suggested that attachment security may look different in children with autism compared with their typically developing peers; that attachment behaviors, such as seeking contact with and proximity to caregivers, may serve different functions for this population.

Van IJzendoorn et al. (2007) suggested studying a larger group of low- and high-functioning children with autism. Also, in order to control for constitutional/biological constraints in communicative and relational functioning on the intergenerational transmission of attachment in children with autism, the authors recommended that parents participate in the AAI to determine their attachment representations and to compare AAI classifications with their children's Strange Situation classifications. The authors indicated that a correlational study of this kind would be most helpful in clarifying the compatibility of autism and attachment theory by identifying the existence of attachment transmission in cases of children with autism. Following from their speculation regarding their use of the EA Scales (Biringen et al. 1998), the authors further suggested that future research employ a measure of parental sensitivity tailored to the unique dyadic interactions occurring between parents and their relationally challenged children. Finally, based on the authors' findings, the study of attachment-based interventions was suggested to examine the authors' speculation that attachment styles of children with autism may be influenced more by their biologically based communicative and relational constraints than by environmental factors, and that parents may be unable to prevail over these constitutional limitations.

While Bowlby's attachment theory assumes that appropriate and consistent parental emotional and physical availability and responsiveness are essential to a child's optimal development (1969, 1973, 1980), and despite findings of attachment behaviors in children with autism toward their mothers (Bernabei et al. 1998; Capps et al. 1994; Charman 2003; Dissanayake and Crossley 1996, 1997; Rogers and Dilalla 1990; Rogers et al. 1991, 1993; Sigman and Mundy 1989; Sigman and Ungerer 1984;

Stahlecker and Cohen 1985), constitutionally based shortfalls in joint attention (Charman 2003), theory of mind, empathy, affective reciprocity (Baron-Cohen 1989, 1991), and mirror neuron functions (Dapretto et al. 2006) in children with autism and associated neurological disorders of relating and communicating place great demands on their parents in cultivating secure attachments and fostering their development (Rutgers et al. 2007).

As parents are considered the central organizers for children with autism (Greenspan and Wieder 1997; Ingersoll et al. 2005; Mahoney and Perales 2005), they are faced with the daunting task of reaching far deeper into themselves than parents of typically developing children for the internal resources needed to emotionally engage their relationally challenged children. It is therefore important for clinicians and educators to be aware of the strengths and vulnerabilities that not only the child, but also the parent, brings to the relationship in the design and delivery of therapeutic interventions. Identifying parents at risk may lead to more finely attuned support for those parents who may be carrying troubled attachment representations into dyadic interactions with their children.

Indeed, there appears to be no published data addressing this specific question, and it remains to be seen if parental internal models of attachment relationships are correlated with functional, emotional, and relational aspects of parent-child relationship in cases of children with autism and associated neurological disorders of relating and communicating. Individually tailored therapeutic interventions, based on such information, may help parents to acquire alternative strategies toward developing mutually satisfying relationships that constitute the foundation upon which they are empowered to facilitate optimal development of their relationally challenged children.

In sum, this study examined associations among parents' internal working models of attachment relationships with the AAI and parents' and children's functional and relational behaviors with a measure specifically developed for this population that assessed a sample of parents and their children with autism and associated neurological disorders of relating and communicating. It was anticipated that secure parental models of attachment relationships would be associated with higher relational and functional levels in and between parents and their children.

Materials and Methods

Participants and Procedure

The sample for this study included 40 parent-child dyads recruited from an urban independent therapeutic day school in the Northeastern U.S. for children with neurodevelopmental disorders of relating and communicating, including PDD and autism.

Among the parents, 87.5% were female and 12.5% male. Most of the parents (53%) ranged in age from 32–40, followed by 35% in the 41–50 range, 13% in the 51–63 range. Most parents were married or partnered (85%), while 7.5% were separated. The remaining parents were single or divorced. Seventy percent of the parents reported their ethnicity as European-American/Caucasian, 15% Hispanic/ Latino, 12.5% African-American/Black, and 2.5% Other/ Multi-Ethnic. The primary language spoken at home was English (92.5%); 2.5% Spanish, and 5% other language. All parents graduated high school and attended at least some college. Over 50% reported holding a graduate/ professional degree and 22.5% a bachelor's degree. Just over half (52.5%) of the parents reported being employed.

The children ranged in age from 4–16 years. Forty percent were 4–6 years, 32% 7–9 years, 20% 10–13 years, and 7.5% 14–16 years. Males outnumbered females 3 to 1. Chart review revealed that 45% carried primary diagnoses of pervasive developmental disorder, 40% autism spectrum disorder, 7.5% autistic disorder, 5% language disorder, and 2.5% Asperger's disorder.

This study obtained approval from the school's and university's IRBs. Recruitment of the participants began in spring of the school's first academic year of operation. Of the 77 families contacted, 40 families (52%) agreed to and did participate in the study; 28 families with children already attending the school and 12 families with children enrolled for the ensuing fall.

Parents signed an informed consent form and completed a demographics questionnaire. Interview sessions with the parents were conducted at the school. To ensure privacy and a welcoming environment, interviews took place in a comfortably furnished room supplied with fresh flowers and refreshments located on an unoccupied floor. A digital audio recorder and hard-drive video camera eliminated technical disruptions. The relatively brief 15-min Reaction to Diagnosis Interview (RDI; Pianta and Marvin 1993), used for a related study, was administered first. After a short break, the 1- to 2-h AAI (George et al. 1996) followed. Afterward, parents were debriefed and invited to speak about their experiences in raising and advocating for their children. A contact list was provided of the researchers and two psychotherapists familiar with the AAI. Arbitrary numbers assigned to each case served as the only identifying information. Data were kept under lock and key at the school.

Forty de-identified transcripts were generated from the AAI digital audio files and coded by three AAI coders trained under Mary Main's supervision. Twenty of the transcripts were assigned to the coder who had classified more transcripts over a longer period of time for previous research studies than the other two coders and was therefore designated as the primary coder. The remaining 20 transcripts were divided equally between the second and third coders. The degree of co-rater reliability for this sample, based on 22.5% of the independently derived primary classifications was 0.78 (k=0.53). Disagreement on 2 of the 9 transcripts was resolved by deferring to the classification assigned by the primary coder.

Two trained coders from the school independently calculated scores from the Functional Emotional Assessment Scale (FEAS; Greenspan et al. 2001) a measure of parent and child functioning assessed via videotapes of parent-child interactions. The degree of co-rater agreement, based on 45% of the independently derived scores, was 0.94 for total *Caregiver* score, 0.96 for total *Child* score, and 0.95 for total FEAS *Combined* score.

Instruments

Adult Attachment Interview (AAI; George et al. 1996)

The Adult Attachment Interview (AAI; George et al. 1996) was utilized to determine parents' internal working models of their primary attachment relationships. The AAI is a semi-structured interview that probes for general descriptions of relationships, specific supportive or contradicting memories, and descriptions of current relationships with parents or other primary caregivers. Adults are asked to retrieve attachment related autobiographical memories from early childhood and to evaluate these memories from their current perspective. The AAI transcripts are rated for security of attachment as derived from the subjects' present discussion of their attachment biographies.

The coding of transcripts is based primarily on the coherency with which the adult is able to describe and evaluate their childhood experiences and their effects (Main and Hesse 1991). Classification is determined by a battery of nine-point scales used to code transcripts. The Experience scales represent the participant's probable attachment experiences as judged by the coder, who uses both participant report and an estimate of participant believability to assign a rating. The State of Mind scales represent aspects of the participant's discourse that may be affected by attachment-related feelings. Final classification on the AAI is derived from ratings on the State of Mind scales, the most important of which are Coherence of Transcript and Coherence of Mind. Ratings of coherence are guided by linguistic philosopher Grice (1975, 1989) and his four maxims: (1) Quality-be truthful, and, have evidence for what you say; (2) *Quantity*—be succinct, yet complete; (3) Relation-be relevant and discerning; and (4) Manner-be clear and orderly.

The coding system of the AAI leads to adult attachment classifications in four main categories that parallel the

Strange Situation classifications (Ainsworth et al. 1978). Autonomous-Secure adults (F) tend to value attachment relationships and consider them important for their own personality. They are able to describe attachment-related experiences coherently, whether these experiences were negative (e.g., parental rejection or over involvement) or positive. Insecure-Dismissing adults (Ds) tend to devalue the importance of attachment relationships for their own lives or to idealize their parents without being able to illustrate their positive evaluations with concrete events demonstrating secure interaction. They often appeal to lack of memory when describing childhood experiences. Insecure-Preoccupied adults (E) are still very much involved and preoccupied with their past attachment experiences and are therefore not able to describe them coherently. They may express anger when discussing current relationships with their parents. Unresolved (U) adults engage in discourse that contains specific lapses in the monitoring of reasoning when discussing traumatic events, such as the loss of or abuse by an attachment figure. This designation is superimposed on the primary classification (Main and Goldwyn 1991) and considered least optimal. Cannot Classify is assigned to a small percentage of adults who do not fit any of the categories. The one Cannot Classify case in the current sample was not included in data analysis due to its insubstantial cell size.

Bakermans-Kranenburg and Van IJzendoorn (1993) reported 78% (k=0.63) test-retest reliability of AAI classifications on the three main categories after administration to 43 mothers 2 months apart by different interviewers. Sagi et al. (1994) administered the AAI to 31 female and 29 male Israeli students with different interviewers 3 months apart and reported test-retest reliability at 90% (k=0.79) and co-rater reliability at 98% (k=0.94).

AAI classifications were found to be independent of nonattachment-related memory, verbal and performance intelligence, and social desirability (Bakermans-Kranenburg and Van IJzendoorn 1993; Sagi et al. 1994). Correlational analysis of this sample's AAI *Secure-Insecure* classification and *Unresolved* designation revealed no significant association between the two (r=-0.04), indicating that internal working models of attachment relationships leading to classification are distinct from the presence of unresolved loss or trauma leading to an *Unresolved* designation.

Van IJzendoorn (1995) reported that predictive validity of the AAI with respect to the quality of the infant-parent relationship, as measured by the Strange Situation (Ainsworth et al. 1978), showed a combined effect size of 1.06 in the expected direction for the *Secure* vs. *Insecure* split. A combined effect size of 0.72 in the expected direction was found for the AAI's ability to predict parents' responsiveness to their infants' attachment signals. Van IJzendoorn concluded in his meta-analysis that the predictive validity of the AAI is a replicated fact.

In addition to its validity as a research instrument, the AAI has gained momentum as a clinical tool to identify problematic attachment patterns in caregivers or potential caregivers, opening the door to attachment-based interventions (Beebe 2003; Cohen and Beebe 2003; Crowell and Feldman 1989; Dozier et al. 1994; Marvin et al. 2002; Steele and Baradon 2004). There appears to be no published data on the AAI as an assessment tool for clinicians working with caregivers of children with autism and associated disorders.

In the current study, comparisons were examined between the total sample's AAI classification distribution and the AAI classification distribution of North American non-clinical mothers from a meta-analysis conducted by Bakermans-Kranenburg and Van IJzendoorn (2009). The current sample's AAI classification distribution is 65% *Secure*; 17.5% *Insecure-Dismissing*; 15% *Insecure-Preoccupied*; 2.5% *Cannot Classify*; and 25% additionally designated as Unresolved. The AAI classification distribution for non-clinical mothers reported by Bakermans-Kranenburg and Van IJzendoorn (2009) is 58% *Secure*, 23% *Insecure-Dismissing*, 19% *Insecure-Preoccupied*, and 18% additionally designated as *Unresolved/Cannot Classify*. A multinomial test confirmed no differences between the current sample's AAI distribution and the 10,000 normative distribution (p=0.71).

Functional Emotional Assessment Scale (FEAS; Greenspan et al. 2001)

Given the limitations of the Strange Situation, regarding its validation on children 12- to 18-months, its restricted laboratory paradigm, and its focus on reunion behaviors only to determine classification (Rutgers et al. 2004; Rutgers et al. 2007), and the suggestion of Van IJzendoorn et al. (2007) to employ a measure of parental sensitivity tailored to the unique dyadic interactions occurring in cases of children on the autism spectrum, the Functional Emotional Assessment Scale (FEAS; Greenspan et al. 2001), was utilized in this study.

The FEAS is based on the Developmental, Individual-Difference, Relationship-Based (DIR; Greenspan et al. 2001; Greenspan and Wieder 1998) model. Central to the DIR model is the concept that a secure attachment between the parent and child is the organizing construct through which the child is helped to overcome primary biological challenges in connecting emotions to motor planning and verbal communications. The FEAS measures developmentally relevant parent, child, and dyadic behaviors framed by a developmental model that considers six developmental domains in the context of the parent-child relationship and parents' capacity to support their children's emotional and social development. There is a Clinical and Research FEAS (Greenspan et al. 2001). The Research FEAS is based on the Clinical version, and includes cutoff scores to assist with interpretation of results. The Research FEAS was adapted for the older children and their parents in this sample. In both versions, parents are instructed to play with their children as they might at home. During the15-min videotaped interaction, developmentally appropriate symbolic toys, tactile toys, and toys involving large movement activities are introduced to the dyad. The examiner may also engage the child in play to elicit behaviors not observed during the parent-child play interaction.

Individual and interactive behaviors in the dyad are scored from the video across six sequential domains of the child's emotional development, functionalized by the following scales:

- 1. Self-Regulation and Interest in the World—Attending to multi-sensory affective experience while organizing a regulated state, such as looking at, listening to, and following movement of a caregiver.
- Forming Relationships, Attachment, and Engagement— Demonstrating obvious preference for a primary caregiver, such as crying at the caregiver's departure and greeting the caregiver with joyful smiles and affection upon reunion.
- 3. Intentional Two-Way Communication—Developmentally appropriate or inappropriate relationship and affective interaction patterns are assessed in the child and in caregiver's demonstration of facilitating the child's initiation and response in two-way pre-symbolic gestural communication, such as interacting with the caregiver through back-and-forth smiles and turntaking vocalizations.
- 4. Behavioral Organization, Problem-Solving, and Internalization (Complex Sense of Self)—Organizing circles of communication, meaning two-way social problemsolving communication that integrates emerging prerepresentational organization of self and other, such as taking a caregiver by the hand toward the refrigerator for juice.
- Representational Capacity (Elaboration)—Creating and using ideas for the purpose of creative or imaginative thinking, and giving meaning to symbols, such as pretend play or using words to communicate needs.
- 6. Representational Differentiation (Building Bridges between Ideas and Emotional Thinking)—Linking ideas to form logical constructs, reality testing, thinking, and judgment, such as engaging in opinion-oriented conversations, or discussing anticipated feelings connected with future events or hypothetical situations.

The Research FEAS rates both the caregiver and the child on their mastery of each skill as follows: 0 = capacity

not present, 1 = capacity fleetingly present, 2 = capacityintermittently present, 3 = capacity present most of the time, 4 = capacity present all the time in all circumstances, and NA = no opportunity to observe the presence or absence of capacity. Scores are provided for symbolic and sensory play and when the examiner facilitates play with the child. In this study, scores were obtained for symbolic play only. The ratings are summed to obtain category and subtest scores for the caregiver and category and subtest scores for the child, as well as a combined Total Caregiver score and a combined Total Child score. Total Caregiver scores ranging from 42-54 are considered Normal, 40-41 At Risk, and 0-39 Deficient. Total Child scores ranging from 48-66 are considered Normal, 46-47 At Risk, and 0-45 Deficient. It is important to repeat that these classifications are based on studies of children 4 years old and younger (Greenspan and Wieder 1997).

Regarding co-rater reliability, Greenspan et al. (2001) reported that alpha coefficients between pairs of observers viewing between 15 and 46 videotaped caregiver-child interactions ranged from 0.90 to 0.92 for the *Caregiver* scale and 0.90 to 0.98 for the *Child* scale. The alphas between a pair of observers viewing 15 interactions, one coding the interactions live and the other a videotape of the interactions, were 0.83 for the caregiver scale and 0.89 for the *Child* scale.

Greenspan et al. (2001) validated the FEAS on samples of 7-month to 4-year-old children that included multiproblem children and children with pervasive developmental disorders and regulatory disorders, closely reflecting this study's sample. To test validity, the following nonnationally representative samples of children ages 7 months to 48 months, were used: 197 typically developing children; 190 children with regulatory disorder; 41 children 19 to 48 months with pervasive developmental disorder; and 40 children with multiple difficulties. Each group was comprised of white middle-class children with a larger proportion of boys. In examining the accuracy of cutoff scores (ranges for the different age groups), false normal errors for the child and caregiver total scale ranged from 0.5 to 0.28, and false delay errors ranged from 0.26 to 0.63. The probability of correctly identifying a normal child (specificity) ranged from 0.37 to 0.74. The probability of correctly identifying a delayed child (sensitivity) ranged from 0.74 to 0.95. Intercorrelations between the FEAS scores during symbolic and sensory play and the Test of Sensory Functions in Infants (DeGangi and Greenspan 1989) and the Test of Attention in Infants (DeGangi 1995) were not significant and interpreted to signify that the FEAS provides unique information.

The FEAS *Total Child* and *Total Caregiver* scores for this sample were significantly correlated (r=0.71, p<0.001). FEAS mean scores and standard deviations for the current

sample are presented in Table 1. The mean FEAS *Total Child* and *Total Caregiver* scores are in the *Deficient* range, indicating that the families in this sample are challenged with significant functional and social impairments in their children.

The current application of the FEAS extends the agerange of this developmental instrument beyond its prior use and norms. While this is presumed to be justifiable based on the FEAS' ability to differentiate developmental levels among the children studied in this sample, this study is also, de facto, studying the utility of the FEAS methodology among children ages 4–16.

Data from the demographics questionnaire were entered into SPSS for descriptive and statistical analyses with AAI classifications and FEAS raw scores. Following earlier research, the AAI was treated in the present study as independent variable having two levels (i.e., 1 = Autonomous-Secure and 0 = Insecure-Dismissing/Preoccupied). Caregiver, Child, and Combined FEAS raw subscale and total scores were entered as continuous variables. Descriptive statistics, derived from chart review, the demographics questionnaire, AAI classifications, and FEAS scores, were calculated. T-tests were conducted between AAI Secure-Insecure classifications and FEAS total scores and subscale scores to test whether or not parental attachment representations correspond with the quality of parent-child functional and relational behaviors. A one-way ANOVA was also calculated to compare the FEAS mean scores of the Insecure-Dismissing and the Insecure-Preoccupied groups.

Two cases were eliminated from the data analysis; one *Cannot Classify* case and the second case due to missing FEAS data. Thus, the statistical analysis was conducted on a total of 38 cases. Because in some comparisons heterogeneity of variance was detected (Levene's statistic, p < 0.05), separate variance estimates were used to compute *t*-tests. In addition, two different measures of effect size were calculated: When the variances were equal, Cohen's *d* was used; otherwise, when the variances were unequal, Glass' delta (Δ) was used (Glass 1976). As a guide in interpreting these effect sizes, Cohen (1988) proposed that effect sizes between 0.20 and 0.49 are small, effect sizes 0.80 and greater are large.

Results

The hypothesis that secure parental models of attachment relationships would be associated with higher relational and functional levels in and between parents and their children than insecure parental models was supported. The means and standard deviations for FEAS subscales by AAI *Secure-Insecure* classification are shown in Table 1. *T*-tests revealed significant associations in the predicted direction between AAI classification and the FEAS Total Combined score, t (35.06)=2.18, p=0.036, $\Delta=0.57$ and the FEAS *Total Child* score, t (35.89)=2.38, p=0.023, $\Delta=0.59$. There was no significant AAI Secure-Insecure difference on FEAS Total Caregiver scores, t (34.11)=1.60, p=0.118, Δ =0.43. The results further revealed a positive association between AAI classification and FEAS Child scores on the following subscales: Two-Way, Purposeful Communication, t (36)=2.03, p=0.05, d=0.98; Behavioral Organization, Problem-Solving, and Internalization, t(36)=2.33, p=0.026, d=0.86; and Representational Capacity, t (28.93)=3.36, p=0.002, $\Delta=0.71$. These findings indicate that, within these domains, children of parents demonstrating secure attachment representations performed at higher functional and relational levels than did those of parents demonstrating insecure attachment representations. In addition, a significant positive relationship was found between AAI classification and the FEAS Representational Capacity (Elaboration)-Caregiver subscale, t (28.56)=2.76, $p=0.010, \Delta=0.58,$ indicating that parents demonstrating secure attachment representations showed a greater capacity for facilitating the development of their children's reflective functions and symbolic play than parents demonstrating insecure attachment representations.

The findings prompted an examination into whether the two insecure AAI classifications corresponded to distinct FEAS scores. A one-way ANOVA comparing the FEAS mean scores of the Insecure-Dismissing and the Insecure-Preoccupied groups revealed that the Insecure-Preoccupied group attained significantly higher scores on the following scales: Forming Relationships, Attachment, and Engagement—Child, F (1, 12)=5.73, p<0.05; Two-Way Purposeful Communication—Child, F (1, 12)=5.11, p<0.05; Total *Child*, *F* (1, 12)=7.15, *p*<0.05; *Total Caregiver*, *F* (1, 12)= 5.10, p < 0.05; and Combined, F (1, 12)=7.40, p < 0.05. Though the remaining differences did not reach statistical significance, the Insecure-Preoccupied group's scores were higher than those of the Insecure-Dismissing group on 13 of the 15 scales. Table 2 presents group means and standard deviations of FEAS scores for the two Insecure groups.

Discussion

Significant associations found between AAI classification and FEAS scores on the *Total Combined* and *Total Child* scores, the *Child Two-Way, Purposeful Communication; Behavioral Organization, Problem-Solving, and Internalization;* and *Representational Capacity (Elaboration)* subscales, and the *Caregiver Representational Capacity* subscale lend support to the relevance of parental attachment in cases of autism spectrum disorders and associated disorders of relating and communicating. The children of parents who demonstrated Table 1Means, StandardDeviations, and t Ratios forFEAS Scales

FEAS Subscales	Secure (<i>n</i> =25)		Insecure (n=13)		$t (df)^a$	d	р
	Self-regulation & interest	st in the wo	orld				
Child	10.80	1.61	10.46	0.97	0.69(36)	0.30	0.492
Caregiver	5.24	1.01	5.23	1.17	0.02(36)	0.01	0.980
Forming relationships, a	uttachment &	& engageme	ent				
Child	10.40	3.85	9.54	4.05	0.64(36)	0.45	0.524
Caregiver	6.88	1.27	6.77	1.24	0.26(36)	0.10	0.798
Two-way purposeful con	mmunicatio	n					
Child	5.08	2.04	3.77	1.54	2.03(36)	0.98	0.050
Caregiver	7.88	1.48	7.15	2.15	1.22(36)	0.57	0.229
Behavioral organization	, problem-so	olving					
Child	1.24	1.17	0.38	0.87	2.33(36)	0.86	0.026
Caregiver	8.92	3.07	7.92	2.43	1.02(36)	0.61	0.317
Representational capacit	ty						
Child	3.12	3.64	0.54	0.88	3.36(28.93)	0.71	0.002
Caregiver	3.12	2.86	1.46	0.66	2.76(28.56)	0.58	0.010
Representational differen	ntiation						
Child	0.76	1.62	0.00	0.00^{b}	_	_	_
Caregiver	0.52	1.05	0.08	0.28	1.99(29.84)	0.42	0.056
Total score							
Child	31.40	11.30	24.69	6.10	2.38(35.89)	0.59	0.023
Caregiver	32.48	8.99	28.62	5.80	1.60(34.11)	0.43	0.118
Total combined score	63.88	18.59	53.31	11.18	2.18(35.06)	0.57	0.036

N=38

^a Fractional dfs indicate ts where heterogenity of variance was present; Separate variance estimates were used to compute t, and Glass's Δ were used to compute associated effect sizes

^b t test was not computed for this subscale

secure attachment representations evidenced a greater capacity to engage in developmentally appropriate social interactions. The children were better able to initiate communication with their parents by using such gestures as reciprocal smiles and turn-taking vocalizations. They were also better able to integrate their perceptions of self and other into social problem solving with their parents.

The higher scores on the Representational Capacity (Elaboration) subscale for the children of parents demonstrating secure attachment representations may be related to higher levels of reflective functioning (RF) found in such parents (Fonagy and Target 1997; Fonagy et al. 1998). RF is the capacity to perceive, understand, and reason about one's own mental states, and is closely related to theory of mind, the capacity to imagine the mental states of others, an identified deficiency in children with autism (Baron-Cohen 1989, 1991; Leslie and Frith 1988). Other constructs closely related to RF are emotional availability (Biringen et al. 1998) and parental sensitivity. The current findings may be interpreted as supporting the Capps et al. study (1994), which reported higher levels of sensitivity in parents demonstrating secure attachment representations toward their children with autism and associated disorders.

Given the distinct natures of the dismissing and preoccupied groups within the general sphere of insecure attachment patterns, the significant differences in FEAS scores between the two groups are not surprising. The *Insecure-Dismissing* classification is defined by a devaluing of attachment, a state not conducive to the extraordinary demands placed on parents to engage developmentally challenged children. The *Insecure-Preoccupied* classification, on the other hand, is characterized by an abiding preoccupation with attachment figures. Though counterintuitive, the higher FEAS scores earned by the preoccupied group may suggest that this pattern seems adaptive to the unique demands of caring for children with autism.

The similarity between this sample's AAI classification distribution and that of population estimates drawn from cumulative studies (Bakermans-Kranenburg and Van IJzendoorn 2009) supports the notion that there is no distinction in attachment-related predisposing factors between parents of children with autism spectrum and associated disorders of communicating and relating and parents of other children.

With regard to limitations, the sample of parents and children recruited for this study was self-selected and from

 Table 2 Means and Standard Deviations of AAI Dismissing-Preoccupied Classification and FEAS Scores

FEAS subscales	Dismissi	ng	$\frac{\text{Preoccupied}}{(n=6)}$		
	(<i>n</i> =7)				
	М	SD	М	SD	
Self-regulation & interes	t in the worl	d			
Child	10.00	1.00	11.00	0.63	
Caregiver	4.86	1.35	5.67	0.82	
Forming relationships, at	ttachment &	engagemer	nt		
Child	7.43	2.82	12.00	4.05	
Caregiver	6.29	1.25	7.33	1.03	
Two-way purposeful con	nmunication				
Child	3.00	0.82	4.67	1.75	
Caregiver	6.71	1.98	7.67	2.42	
Behavioral organization,	problem-sol	ving			
Child	0.14	0.38	0.67	1.21	
Caregiver	6.29	1.70	9.83	1.60	
Representational capacity	y				
Child	0.71	0.95	0.33	0.82	
Caregiver	1.43	0.79	1.50	0.55	
Representational differen	itiation				
Child	0.00	0.00	0.00	0.00	
Caregiver	0.14	0.38	0.00	0.00	
Total score					
Child	21.29	3.73	28.67	6.12	
Caregiver	25.71	4.23	32.00	5.80	
Total combined score	47.00	6.90	60.67	11.06	

N = 13

a private day program using the DIR-model in an urban northeastern US setting; this demographic homogeneity may inherently limit the findings' universal applicability to all families raising children with autism and associated disorders. It is also important to note that some of the parents were familiar with the DIR intervention model, which may further limit the generalizability of the sample.

In addition, the sample's gender composition underrepresented fathers compared with mothers by 1 to 7.

The findings are further limited by exclusive reliance on a chart review rather than independently derived diagnoses. It also important to note that, though challenges in communicating and relating are common to all the children's diagnoses, their diagnoses were distributed across pervasive developmental disorder, autism spectrum disorder, autistic disorder, language disorder, and Asperger's disorder.

In addition, the children's age range of 4–16 years poses further limitations to these findings. Finally, though co-rater reliability was impressive, contributing to further consideration of the utility of this measure with older children, the FEAS has not yet been validated with children with autism spectrum and associated disorders beyond the age of 4 years.

Regarding treatment implications, consistent with the emerging literature on the AAI's utility as a clinical tool in designing and implementing individualized therapeutic interventions (Beebe 2003; Cohen and Beebe 2003; Crowell and Feldman 1989; Dozier et al. 1994; Marvin et al. 2002; Steele and Baradon 2004), these findings indicate that the attachment security of the parent may be a pertinent factor in considering potential therapeutic interventions for parents who are encouraged to take on key roles in influencing their children's behaviors.

The ability to differentiate parental attachment representations carries particularly important implications for treatment targeting at-risk families. As clinical advice to parents does not typically take parental individual differences into account, further inquiry into such differences will likely prove valuable in designing and delivering treatment interventions. Understanding the variability in parental attachment representations may help to identify parents of children with autism and associated disorders who are struggling with insecure attachment representations, and who might benefit from more individualized therapeutic support, thus increasing their capacity to help their children.

Given the differences found between parents classified as *Insecure-Dismissive* and *Insecure-Preoccupied*, for example, a higher degree of support may be indicated in helping those parents interpret and meet their children's attachment needs. In their study of a parental intervention with video feedback and attachment discussions, for example, Bakermans-Kranenburg et al. (1998) found that mothers classified as *Insecure-Dismissing* were more likely to benefit from video feedback alone, while mothers classified as *Insecure-Preoccupied* tended to benefit more with video feedback and discussions of their early attachment experiences. These along with the current findings may further help to fine tune, not only attachment-based, but other therapeutic interventions.

Regarding suggestions for future research, in addition to the implications of the current findings regarding treatment, parental attachment patterns may also be relevant in understanding how parents manage the stress of raising a child with autism. An extensive body of literature examines associations between parental stress and such environmental factors as those related to the child's disability or levels of parent support (i.e., Benson 2006; Lecavalier et al. 2006; Rao and Beidel 2009; Plant and Sanders 2007; Schieve et al. 2007). Future studies exploring associations among parental stress, parental attachment patterns, and the quality of parentchild interactions in this population may help to broaden our understanding of the role of parental attachment representations may play regarding the stress levels parents experience in raising children with autism.

Given the distinct natures of the Dismissing and Preoccupied groups within the general sphere of insecure attachment patterns, examination of FEAS scores between larger groups might shed some light on more individualized treatment approaches. Closer examination of the AAI-FEAS relationship, with larger, gender-balanced samples is also indicated. Standardization studies of the FEAS with older children would foster further understanding of later development in children with autism and associated disorders of relating and communicating. Pre- and post-treatment studies of individualized attachment-based interventions with this population would provide useful data to develop clinically useful techniques. In addition, exploratory research on the development of educational models conducive to attachment-based clinical interventions would address the need for relationally challenged children to adapt to and join the larger community.

In conclusion, this study provides support for the AAI as a clinical and research tool to provide information about adaptive and potentially problematic parent-child relations (Van IJzendoorn 1995). Regardless of the deficits in social functions and communication cited as the defining features of autism and associated disorders of relating and communicating, these findings lend support to previous reports of maternal sensitivity and infant security in cases of children with autism (Capps et al. 1994; Moran et al. 1992). The current findings also address the question posed by Van IJzendoorn et al. (2007) as to whether or not autism challenges the validity of attachment theory. These results indicate that addressing differences in parental mental states as they influence their dyadic behaviors are indeed pertinent to the nature of parentchild interaction, and even to differences in child behavior, if the child falls in the autism spectrum or is challenged with associated disorders of relating and communicating.

A possible model emerges in which parents' attachment security in some way influences their own behaviors and, in turn, their children's behavioral competencies. This study underscores the notion that professionals assisting parents of children with autism and associated disorders need to differentiate their interventions in light of parental internal resources, with attachment representations highlighted as one of those resources. Interventions that address attachment security hold promise in assisting parents with their children's development.

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