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BRIEF REPORT: Attachment Security in Infants At-Risk for Autism Spectrum Disorders (ASDs)

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Abstract

Little is known about attachment security and disorganization in children who are at genetic risk for an ASD prior to a possible diagnosis. The present study examined distributions of attachment security and disorganization at 15-months of age in a sample of younger siblings of older children with (ASD-sibs; $n = 50$) or without (COMP-sibs; $n = 31$) an ASD. ASD-sibs were not more or less likely to evince attachment insecurity or disorganization than COMP-sibs. ASD-sibs, however, were over-represented in the B1-B2 secure attachment subgroup whereas COMP-sibs were over-represented in the B3-B4 secure attachment subgroup. Results suggest that ASD-sibs are able to form secure affectional bonds with their caregivers, but may differ from COMP-sibs in their expression of that security.

Keywords

Attachment; Autism; Infant-Sibling; Risk; Strange-Situation Procedure

Autism Spectrum Disorders (ASDs) are neurodevelopmental disorders involving core impairments in social functioning and communication (Landa et al., 2007; Mundy & Hogan, 1994; Sigman & Ruskin, 1999). ASDs are highly heritable and there is evidence that a common set of genetic susceptibility factors are responsible for the broad severity continuum observed in these disorders (Constantino et al., 2006; Pickles et al., 2000). Early descriptions (cf. Kanner, 1943; 1949) suggested autism was a developmental disorder characterized by a failure to form affectional bonds with others. Since these early descriptions however, research has repeatedly shown that children with ASDs do, in fact, show a preference for directing attachment behaviors (e.g., proximity seeking, contact maintenance) towards their parent (Dissanayake & Crossley, 1989; 1996) although they may

do so to a lesser degree and intensity compared to comparison children without ASDs (Dissanayake & Crossley, 1989; Sigman & Mundy, 1989). Additionally, children with ASDs are able to develop secure attachments to their parents, although this ability is qualified by the level of cognitive development and degree of ASD impairment in the affected child (Capps, Sigman, & Mundy, 1994; Naber et al., 2007; Rutgers et al., 2004, Yirmiya & Sigman, 2001).

Although children with ASDs are able to form secure attachments to their caregivers, they do show higher levels of attachment insecurity and disorganization than do children without ASDs (Naber et al., 2007; Rutgers et al., 2004; Van IJzendoorn et al., 2007). No studies to date, however, have prospectively examined attachment security and disorganization in the *infant siblings* of children with ASDs. These infants are at increased risk for the development of ASDs as well as milder, or subclinical, deficits in the same core areas affected in ASDs—social responsiveness, communication, and limited interests/stereotyped behavior (Cassel et al., 2007; Merin et al., 2007; Rogers, 2009; Yirmiya et al., 2006). Several studies have examined attachment security and ASDs in children 2 years of age or older (Rutgers et al., 2004; van IJzendoorn et al., 2007), but there is only modest stability in individual differences in attachment behavior over time (Thompson, 2008). Consequently, it is imperative to consider the dynamic emergence and development of the attachment relationship from infancy forward in samples at-risk for neurodevelopmental impairment such as ASDs (Buitelaar, 1995; Green & Goldwyn, 2002). Here we report preliminary data regarding the distributions of 15-month attachment security and disorganization from our prospective investigation of infants at-risk for ASDs (ASD-sibs).

Ainsworth first classified infants' attachment patterns empirically, based on a structured series of separations and reunions between the infant and caregiver, using the Strange Situation Procedure (SSP; Ainsworth & Wittig, 1969; Ainsworth et al., 1978). Ainsworth originally identified three organized attachment patterns. Secure (B) infants readily greet and seek contact with the caregiver upon reunion, openly display emotional communication, and demonstrate engaged exploration and play in the presence of the caregiver. Resistant (C) infants are characterized by displays of ambivalence with the caregiver, particularly during reunion, often seeking contact and comfort from the caregiver while simultaneously demonstrating signs of resistance including squirming to get down (if held), angry crying, and generalized petulance. Avoidant (A) infants openly avoid the caregiver upon reunion and show little or no distress during her absence. A fourth attachment pattern, the disorganized-disoriented (D) pattern was subsequently identified by Main and Solomon (1986, 1990) to account for the lack of--or momentary breakdowns--in one of the organized behavioral strategies (i.e., A, B, or C).

When infants are assigned to an organized (i.e., A, B, C) attachment pattern they are also generally assigned to one of several subclassifications within each group that reflect the emotional affective nature of how attachment security is expressed. Of particular importance to the current report, secure infants can be assigned to one of four subcategories. B1 and B2 infants are rarely distressed during separation and tend to demonstrate their attachment security upon reunion in a more reserved manner, with less proximity seeking and contact-maintaining behavior than B3 and B4 infants. B3 and B4 infants, in contrast, generally are

more distressed during separation and seek proximity to and contact with their caregiver upon return from the separations. There is evidence that these different emotional expressions of attachment security (Frodi & Thompson, 1985; Thompson & Lamb, 1984) may reflect temperamental or neuropsychological aspects of the individual (Belsky & Rovine, 1987). The affective tenor of how attachment security is expressed may be particularly important in the study of ASDs as there is some evidence to suggest that ASD-sibs who are *later diagnosed* with ASDs show characteristic patterns of early temperament that include extreme distress reactions and decreased expressions of positive affect and higher negative affect (Garon et al., 2009; Zwaigenbaum, Bryson, Rogers, Roberts, Brian, & Szatmari; 2005).

To our knowledge no information exists regarding attachment security in ASD-sibs who are not yet of diagnosable age. Exploring attachment security in this sample of 15-month-old ASD-sibs offers the advantage of implementing the original Strange Situation Procedure (Ainsworth et al., 1978) with no modifications for older children or those already diagnosed with an ASD (e.g., Rogers, Ozonoff, & Maslin-Cole, 1991; Shapiro et al., 1987). Further, as first suggested by Shapiro and colleagues (1987) over two decades ago, in their study of attachment and autism, it also presents a valuable opportunity to assess the emergence of attachment security and “the nature of affective display” (p. 483) of attachment in infants at risk for ASDs and related deficits.

Method

Participants

Data were drawn from the 15-month assessment of a longitudinal study examining the development of infants with or without an older sibling diagnosed with an ASD. COMP-sibs ($n = 31$) were classified as such if their older sibling(s) were not diagnosed with an ASD and there was no research evidence of heightened ASD symptomatology. ASD-sibs ($n = 50$) were so classified if at least one of their sibling(s) was diagnosed with Autism, Asperger's Disorder, or Pervasive Developmental Disorder – Not Otherwise Specified (PDD-NOS). Independent community diagnoses for the older siblings with ASD were confirmed using DSM-IV-TR criteria (American Psychiatric Association, 2000) via record review of previous evaluations in conjunction with clinical assessment using the Autism Diagnostic Observation Schedule (ADOS; Lord et al., 2000). The COMP-sibs were White/Caucasian (41.9%), Hispanic (45.2%), and African American/Other (12.9 %). There were 13 males and 18 females. The ASD-sibs were White/Caucasian (38 %), Hispanic (48 %), and African American/Other (14 %). Thirty-four were males and 16 were females.

Strange Situation Procedure (SSP)

Security of attachment was assessed using the traditional Strange Situation Procedure (SSP; Ainsworth and Wittig, 1963; Ainsworth et al., 1978). Seventy-seven infants and their mothers and four infants and their fathers completed the SSP at the 15-month assessment. Classification of infants into attachment categories was determined using the standard Ainsworth et al., (1978) scoring system for the traditional classifications of secure (B) avoidant (A) and resistant (C) and their subcategories as well as Main and Solomon's (1990)

scoring system for attachment disorganization (D). In addition identification of behavioral markers of disorganization potentially overlapping with neurological impairment (as opposed to the attachment relationship itself) were made using the coding system developed by Pipp-Siegel et al. (1999).

Strange situations were coded blind to ASD-risk status by an experienced coder who was trained by L. Alan Sroufe and successfully passed the attachment reliability test (Minnesota tapes). Twenty-four percent of the sample was double-coded by an expert attachment coder. Satisfactory interrater agreement was reached on four-way attachment classifications (A, B, C, & D; 80% agreement, $\kappa = .63$) and secure subclassifications (B1 and B2 versus B3 and B4 classifications: 93% agreement, $\kappa = .86$).

Results

Attachment classifications for ASD-sibs and COMP-sibs

Attachment classifications did not differ between ASD-sibs and COMP-sibs whether considered at the 2-way (secure-insecure), 3-way (secure, resistant, avoidant), or 4-way (secure, resistant, avoidant, disorganized) levels (see Table 1). In addition, the distribution of disorganized versus non disorganized infants was not different between the two groups. To further explore potential neurological aspects of attachment disorganization, we examined whether ASD-sibs showed higher levels of disorganized indicators that have been identified as potentially attributable to neurological impairment. The amount of neurological indices of disorganization identified using the Pipp-Siegel et al. (1999) taxonomy did not differ between the two groups. We next compared the frequencies of B1 and B2 vs. B3 and B4 secure subclassifications between the two groups. The frequencies were significantly different, $\chi^2(1, N=60) = 3.95, p < .05$ (see Table 2). ASD-sibs were over-represented in the B1 and B2 secure attachment subgroups. COMP-sibs were over-represented in the B3 and B4 attachment subgroups.

Discussion

We examined 15-month attachment security among ASD and COMP-sibs. To our knowledge, this is the first study to date to examine attachment security in ASD-sibs before they reach two years of age. The ASD and COMP-sib groups did not differ with respect to security of attachment. There were no group differences in 2-way (secure-insecure), 3-way (secure, resistant, avoidant), or 4-way (secure, resistant, avoidant, and disorganized) classifications. Additionally, there were no group differences in 2-way disorganized versus non-disorganized classifications nor in the amount of disorganized indices identified in Pipp-Siegel et al.'s (1999) system as potentially overlapping with neurological impairment. Taken together, these findings are partially in accord with the meta-analysis by Rutgers et al., (2004), which suggested that children with ASDs are able to form secure attachments to their caregivers. However, a group difference emerged in how secure attachment was expressed in the two groups. ASD-sibs accounted for the majority of B1 and B2 secure attachment subclassifications while COMP-sibs were more often judged to belong to the B3 and B4 secure subclassifications.

These results present the intriguing possibility that ASD-sibs are not more or less likely to be securely attached than typically developing children at fifteen months of age but rather differ in the manner (i.e., less affectively salient displays upon reunion) in which their attachment security is expressed. This possibility may relate to the idea of the ‘broad phenotype of autism’ (Dawson, 2002; Pickles et al., 2000; Piven et al., 1994; Yirmiya et al., 2006) which suggests that infants possess behavioral and emotional features associated with ASDs, which may or may not forecast diagnosable impairments.

These findings are somewhat at odds with the early temperamental profile of infants and children with ASD-sibs who later go on to clinical ASD-diagnoses (Garon et al., 2009; Zwaigenbaum et al., 2005). Findings from this group suggest an early temperamental profile of eventual ASD-diagnosed children more consonant with the emotional profile of resistant (C) infants (i.e., more negative affect, less positive affect). There is some evidence, however, to suggest that ASD-sibs may be less emotionally reactive (Chow, Haltigan, Messinger, 2009) or less affectively salient in their display of emotional positivity than COMP-sibs, albeit earlier in infancy (Baker, Haltigan, Brewster, Jaccard, & Messinger, in press; Yirmiya et al., 2006). Further, the findings reported here are generally consonant with the findings of Sigman and Mundy (1989) who found more involvement of typically developing children with their caregivers upon reunion in a separation and reunion procedure than autistic or intellectually disabled children.

In sum, the current findings suggest ASD-sibs were no more or less likely to evince insecurity or disorganization of attachment than COMP-sibs. Rather, ASD-sibs showed a preponderance of B1-B2 secure attachment subclassifications compared to COMP-sibs. These findings are, of course, preliminary and we await eventual diagnostic outcome of our infant siblings to shed further light on the meaning of the reported difference in secure attachment subclassifications. In addition, a limitation of the current report is that the developmental level of the infants was not assessed at or prior to 15 months. Consequently, we were not able to determine whether rates of security or disorganization between the two groups differed based on their level of intellectual functioning. Nevertheless, this preliminary finding suggests follow-up in additional independent samples. It calls attention to the need to consider not only attachment security versus insecurity in ASD research, but also how security of attachment is expressed within the Ainsworth et al. (1978) classificatory system. The idea that the categorical attachment subclassifications may be indicative of temperamental or emotional dispositions characteristic of individual infants may provide a promising area of inquiry in research examining attachment development and functioning in ASD-sibs, and in children with ASDs and other developmental disorders (Mundy et al., 2007; Schwartz et al., 2009).

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Table 1

Frequencies of 15-Month Attachment Classifications by Risk Group

ABCD Attachment Group			
	ASD-sibs	COMP-sibs	Totals
A	1 (2%)	4 (13%)	5 (6%)
B	34 (68%)	19 (61%)	53 (65%)
C	7 (14%)	2 (7%)	9 (11%)
D	8 (16%)	6 (19%)	14 (17%)
Totals	50	31	81
ABC Attachment Group			
A	5 (16%)	4 (13%)	12 (15%)
B	37 (74%)	23 (74%)	60 (74%)
C	8 (10%)	4 (13%)	9 (11%)
Totals	50	31	81

Note. A - Avoidant, B - Secure, C - Resistant, D – Disorganized. Of the 8 disorganized ASD-sibs, secondary organized classifications were as follows: 4 avoidant, 3 secure, and 1 resistant. Of the 6 disorganized COMP-sibs, secondary organized classifications were as follows: 4 secure and 2 resistant.

Table 2

Frequencies of Secure Subclassifications for ASD-sib and COMP-sibs

Secure Attachment Subclassification			
	ASD-sibs	COMP-sibs	Totals
B1 and B2	21 (57%)	7 (30%)	28
B3 and B4	16 (43%)	16 (70%)	32
Totals	37	23	60