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Autism, Attachment and Parenting: A Comparison of Children with Autism Spectrum Disorder, Mental Retardation, Language Disorder, and Non-clinical Children

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Abstract Children with Autism Spectrum Disorder (ASD) have severe and pervasive impairments in the development of social interaction, which may affect the attachment relationship with their parents and may have an impact on parenting. In the current investigation 89 families with young children (mean age 26.5 months) were involved, who were diagnosed as ASD, mentally retarded (MR), or language delayed (LD), or part of a non-clinical comparison group. Attachment security was observed with the Brief Attachment Screening Questionnaire, and several parental self-report questionnaires assessed the parenting style, parental efficacy, parental experiences of daily hassles, social support, and psychological problems. Children with ASD were rated as less secure compared to the other clinical and normal comparison groups. Parents of non-clinical children reported higher levels of authoritative parenting than parents in the ASD group and in the total clinical group, and they also received less social support. Parents of children with ASD coped remarkably well with the challenges of raising a child with ASD.

Keywords Autism · Attachment · Parenting · Preschool children

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Attachment and Autism

Attachment is conceptualized as the affectional bond or tie that infants develop with their attachment figure during the first year of life (Ainsworth et al. 1978; Bowlby 1969, 1982). Patterns of attachment behavior reflect the child's anticipations about parental reactions to bids for comfort. These anticipations, in turn, guide child strategies for regulating negative emotions and managing stress. Children with Autism Spectrum Disorder (ASD) are able to show secure attachment behaviors to their parents, in spite of their impairments in social interactions (e.g., Dissanayake and Crossley 1996, 1997; Rogers et al. 1993). For example, Buitelaar (1995) concluded that children with autism and comparison children tended to react similarly to a separation from the parent with increased proximity-seeking behavior (Bernabei et al. 1998; Pantone and Rogers 1984; Sigman and Mundy 1989; Sigman et al. 1986; Sigman and Ungerer 1984). A crucial question is, however, whether children with a diagnosis of autism show attachment security to a lesser degree than non-clinical comparisons or children with clinical disorders that imply a less disturbed capacity for social relatedness.

A recent meta-analysis of ten studies on attachment in children with autism (N=287; Rutgers et al. 2004) showed that children with autism were significantly less securely attached to their parents than children without autism (moderate combined effect size across studies; Cohen's d= 0.50, r=0.24). Children with autism are able to form secure attachment relationships, but the parent–child relationship reflects less flexible, sensitive, and synchronous interactive behaviors as a result of the social impairment of children with autism. Mental development, and not chronological age (see Rogers et al. 1993), was an important moderator in explaining different study outcomes. In samples including children with autism with a higher mental development, autism was not associated with less attachment security. Children with autism and comorbid mental retardation, however, appeared to be less secure than their comparisons without autism (see Rutgers et al. 2004; Yirmiya and Sigman 2001). Furthermore, the meta-analysis of attachment and autism showed that the more strictly autism was defined, the larger were the effects on attachment. Children with more strictly defined autism were less securely attached and showed less responsiveness in their contact with the caregivers. This may indicate that parents of children with autism are less able to establish a secure attachment relationship with their child because of the severity of the impairment in reciprocal social interaction of their child. It should be noted that studies on autism and attachment have mainly been conducted in preschoolers as the diagnosis for autism becomes more valid with growing age (Charman and Baird 2002; Rogers 2001). At the same time, the assessment of attachment security in older children is more complicated and less well-validated than in infants (Ainsworth et al. 1978; George and Solomon 1999). Our purpose was therefore to study attachment in young children who at a later stage in their development would be diagnosed with autism.

The majority of the studies on attachment in children with autism that are conducted so far used (an adaptation of) the Strange Situation Procedure (SSP; Ainsworth et al. 1978) to assess the quality of attachment. The SSP is validated for children between 12 and 24 months of age, whereas the children with autism in the meta-analysis were chronologically (and often also mentally) older than 24 months. Waters and Deane (1985) introduced the Attachment Q-Sort (AQS; Waters 1987) as an alternative to the Strange Situation procedure for assessing attachment security in infants and toddlers. An advantage is that the AQS can be used in children up to 48 months of age. Also, whereas the SSP measures attachment in a stressful situation, the AQS assesses attachment on the basis of naturalistic observations of parent–child interactions (Vaughn and Waters 1990). This approach may be particularly interesting for children with autism, since they might be more affected by a somewhat stressful context than normal children. Pechous (2001) was the first to study the quality of attachment in children with autism using the AQS. She found a significantly lower mean security score compared to the mean security score that was found in a large sample of normal children (for the normative AQS mean value, see Van IJzendoorn et al. 2004). In the current investigation psychiatric assistants, who worked with the children and their parents during their visits to the toddler unit, completed the Brief Attachment Screening Questionnaire (BASQ; Bakermans-Kranenburg et al. 2003), which is based on the AQS, to assess attachment security.

Parenting and Autism

Parenting children with autism can be highly stressful (e.g. Koegel et al. 1992; Dunn et al. 2001). Impairments in social interaction may have their impact on parental interactive behavior (Hoppes and Harris 1990; Kasari and Sigman 1997; Sigman et al. 1986). Noh et al. (1989) suggested that parenting is particularly affected by the child's *lack of adaptability* (e.g., the child's inability to adjust to changes in the social environment), *acceptability* (e.g., the parent's perception of the child as less intelligent), and *demandingness* (e.g., the frequency and severity of the child's minor behavioral problems such as crying, disobeying, seeking attention and requesting help).

Koegel et al. (1992) suggested that there is a characteristic stress pattern of parents of children with autism. The profile suggests that concerns about the child's dependency and about limited family opportunities are the primary contributors to maternal stress. For example, reluctance to take their child with autism out in public—because of too many frustrations resulting from the child's behavior—can lead to isolation (Blacher 1984). Furthermore, Moes et al. (1992) reported on parents' concerns about the child's acceptance in the community and about the child's future. An important question, however, is whether these parental concerns and stresses are specific to parents of children with Autism Spectrum Disorder.

The greater intensity of problems generated by children with autism compared to children with Down syndrome may reveal higher levels of parenting stress in parents of the children with autism (Fisman et al. 2000; Noh et al. 1989). Furthermore, Rodrigue et al. (1990) reported lower parenting competence of parents of children with autism in comparison with parents of children with Down syndrome, but both groups reported disrupted planning, and parental and familial stress. Although Belchic (1996) found no group differences on perceived stress when children with autism, Down syndrome and normally developing children were compared (see also Cox et al. 1975; Wishart et al.

1981), he found group differences on parental efficacy, with parents of normally developing children reporting more efficacy than parents of children with autism.

Noterdaeme et al. (2002) consider the deficits in communication skills and in social interaction as common features of children with autism and children with a receptive language disorder. They suggest that the complexity and severity of behavioral disturbances in children with autism are more profound than in children with specific developmental disorders. The concerns of parents of children with autism may increase with the severity of the impairments (Konstantareas and Homatidis 1989). Indeed, in some studies (e.g. Bristol and Schopler 1983) parents of children with autism reported more stress when their children performed worse on developmental measures, or were less responsive in social interaction with others (Kasari and Sigman 1997). Additionally, higher levels of stress were reported when mothers of children with autism felt less control over their situation, with perception of parenting mediating that relationship (Horowitz 2004). Parents of children with autism might be more susceptible to display authoritarian parenting styles instead of an authoritative style that is characterized by high demandingness *and* high responsiveness (Baumrind 1996).

The enduring stress—as a result of extraordinary parenting demands—may provoke depression, perceived lack of efficacy in parenting, and poor (mental) health in parents of children with autism (Noh et al. 1989). Regardless of level of stress, it may be expected that the diagnosis of Autism Spectrum Disorder also has its impact on parents' psychological functioning and feelings of efficacy in parenting. DeMyer's (1979) findings suggest guilt in two-third of the mothers of children with autism, and ambivalence and grief regarding the amount of time devoted to their child with autism at their own expense and that of the family. Mothers of children with autism described themselves as unable to pursue personal goals (Holroyd 1974; Milgram and Atzil 1988; Tunali and Power 2002). Again, it should be noted that these parental concerns and stresses may also be apparent in parents of children with other problems, such as mental retardation or language delays.

Social support may affect the stress that parents of children with autism experience (Bristol and Schopler 1983). Mothers of children with autism who perceived social support as available experienced significantly fewer stress-related somatic problems and fewer depressive symptoms than did mothers with less perceived social support (Wolf et al. 1989). There was no significant association between the actual use of social support and measures of parenting stress-related symptoms, corroborating the view that the critical variable in social support may be the perceived availability of support (Cohen and Wills 1985). In the same vein, perceived social support was related to feelings of efficacy and personal accomplishment in parenting (Weiss 2002).

In sum, we tested the following hypotheses in our investigation of children with ASD, mental retardation, language disorder, and non-clinical children. First, clinical and non-clinical children were compared on both attachment and parenting. We expected children with Autism Spectrum Disorder to show less attachment security than non-clinical children. However, since the children in the other clinical groups may also show impaired communication, our second set of hypotheses focused on the differences between children with Autism Spectrum Disorder (combined group of ASD children with and without MR) and other clinical children. Is less attachment security unique for children with ASD? Regarding parenting, we expected more parental difficulties in the clinical group in comparison with the group of non-clinical children. Specifically, parents of children with Autism Spectrum Disorder may feel more stressed and burdened than parents of non-clinical children, they may display a less flexible parenting style, and they may show more psychological problems. We explored whether other clinical groups differed in similar ways from the non-clinical comparisons. Lastly, we tested if social support acted as a buffer against the expected higher daily stresses of parents in the clinical groups, moderating the relationship between parental daily stresses and parents' feelings of efficacy in parenting.

Materials and Methods

Participants and Procedure

About 31,000 children of 14–15 months old in the province of Utrecht, the Netherlands, were pre-screened with the 4-item ESAT (Early Screening of Autistic Traits; Swinkels et al. 2006) at the well-baby offices. In addition, children referred by well-baby physicians because of possible autism spectrum disorder or related developmental problems, were seen for further investigations at the clinic of the Department of Child Psychiatry of Utrecht University. Both children who had a positive pre-screening and clinically referred children were further evaluated during a home visit using the 14-item screening instrument ESAT. Next, screen-positive children on the 14-item ESAT were invited for further investigations at the Department of Child Psychiatry (Dietz et al. 2006).

A series of five measurements (for details, see below) was scheduled within a period of 5 weeks, with psychiatric assistants' observations of the child's social and communicative behavior in a small group of very young children and their parents. On the basis of these observations the BASQ was completed. For the purpose of validation, a sub-sample

of 17 children scoring in the high range of the ESAT was observed with the Attachment Q-sort during (one or two) 90-min visit(s) to the toddler-unit. At the end of the first visit parents were given questionnaires focusing on parenting style and parenting stress, as well as questions regarding demographic information. Questionnaires were completed at home and were returned on a following visit to the clinic.

Thus, both children identified from the population by screening and clinically referred children participated in the present study. The diagnoses of the participating children were the following: (1) Autistic Disorder, (2) PDD-NOS, (3) mental retardation without Autism Spectrum Disorder, (4) language disorder, (5) Attention Deficit Hyperactivity Disorder (ADHD), (6) other DSM-IV disorders, and (7) no DSM-IV child disorders. Children diagnosed with 'ADHD' (5), 'other DSM-IV disorders' (6) and 'no DSM-IV child disorders' (7) were not included in this study because of small sample size or because they represented rather heterogeneous child or family problems. The diagnoses of all participants were confirmed at follow-up assessments at 4 years of age. Because of small sub-group sizes, the children with AD and PDD-NOS were combined into one ASD group. Within the ASD group, a high functioning (four children with AD and 12 children with PDD-NOS) and a low functioning (16 children with AD and 9 children with PDD-NOS) group were formed (cut-off score IQ=70).

The non-clinical comparison children were recruited through child care centers. The comparison children were matched on developmental level with the children with AD. Attachment security of comparison children was assessed during a two-hour home-visit observation. Both the AQS and the BASQ were completed independently by two observers directly after the home-visit. In the few exceptions in which there was one observer, the home-visit was videotaped so that the BASQ could be completed from video-tape. In the comparison group, the parenting questionnaires were completed by the parents after the home-visit and were returned by mail.

The current sample involved the 89 children. The sample included 65 boys and 24 girls, with a mean age of 26.5 months (SD=7.45, range 12 to 42 months). In Table 1 information about the background of the families is provided. The families were mainly from Dutch origin, with a traditional division of labor between the spouses. Average socio-economic status, defined by the parents' highest level of education, was lower- to upper-middle class.

Table 1 Background variables of the families

	Total	ASD + MR	ASD	MR	LD	C
	N=89	*N*=25	*N*=16	*N*=12	*N*=11	*N*=25
Marital status % Married	96[a]	96	100[a]	92	82	100
Place of birth % Netherlands	89[a]	92	93[a]	67	82	96
Housing conditions % Family house	77[b]	80	67[a]	75	55	92[a]
Work % Paid work	61[a]	48	40[a]	67	55	88
Work partner % Paid work	88[c]	84	87[a]	90[b]	89[b]	92

[a] 1 missing
[b] 2 missing
[c] 5 missing

Instruments

Autism Five measurements took place within a period of 5 weeks. At each weekly visit, the social and communicative behavior of the child was observed in a small group of very young children and their parents. The assessments included questions regarding developmental history, the Vineland Social-emotional Early Childhood Scales (Sparrow et al. 1997), standardized behavior observation (Autism Diagnostic Observation Schedule (ADOS-G); DiLavore et al. 1995), and pediatric examination and medical work-up. On the basis of all available information, an experienced child psychiatrist reached a predicted diagnosis on the basis of clinical judgment (cf. Lord 1995). At the follow-up, at around 4 years of age, all measurements were repeated, but instead of the Social-emotional Early Childhood Scales (Sparrow et al. 1997), the Autistic Diagnostic Instrument Revised (ADI-R; Lord et al. 1994) was administered. More details on the psychiatric diagnoses are reported elsewhere (Van Daalen et al. in preparation).

The inter-rater reliability for the clinical diagnosis among three child psychiatrists (HE, JB, ED) was calculated first for two diagnostic categories; ASD or other than ASD. Agreement was reached on 92% of 38 cases. Agreement corrected for chance was 0.74 (Cohen's Kappa). Second, the inter-rater reliability was measured for all diagnostic categories. Agreement was reached on 79% of 38 cases. Agreement corrected for chance was 0.67 (Cohen's Kappa). Diagnostic discrepancies were resolved at a consensus meeting.

Attachment The Brief Attachment Screening Questionnaire (BASQ; Bakermans-Kranenburg et al. 2003) is based on the Attachment Q-Sort (AQS; Waters 1995). Waters and Deane (1985) introduced the AQS as an alternative to the Strange Situation procedure for assessing attachment security in infants and toddlers. The AQS consists of 90 cards (Vaughn and Waters 1990) with specific behavioral descriptions of children between 12 and 48 months of age. The cards are used to describe the behavior of a child in the natural setting, with special emphasis on secure-base

behavior. The BASQ contains twelve AQS items with high loadings on the security scale (Waters 1995), e.g., 'Child is demanding and impatient with mother. Fusses and persists unless she does what he wants right away'. The psychiatric assistants at the toddler unit scored the twelve items of the BASQ on a 7-point rating scale after observation of the child–parent dyad. One question ("When something upsets the child, he stays where he is and cries") was not applicable because in many cases this did not happen. A principal component analysis was performed on the remaining 11 items. Three items were excluded from the analyses because they did not fit within a one factor-structure. The remaining eight questions loaded all above 0.50, explaining 41% of the variance. The Cronbach's alpha for internal consistency of the *BASQ security* score was 0.79 (n=89). In order to validate the BASQ security score, 44 children and their parents (25 comparison children, 19 clinical subjects) were also observed with the AQS (Waters 1995) by an independent observer during at least 90 min of observation, either at the toddler unit playroom (n=18) or at home (n=26). The correlation between the AQS security score and the BASQ security score for these children was r=0.68 (n=44), showing evidence for the validity of the BASQ (for details, see Bakermans-Kranenburg et al. 2003).

Parenting Five questionnaires were administered measuring parenting style and parenting stress. First, the Parental Efficacy Questionnaire (PEQ; inspired by Caprara 1998, The parental efficacy questionnaire, personal communication; see for details, Van IJzendoorn et al. 1999) assessed parents' feelings of competence in child rearing, in particular parents' ability to empathize with the child's feelings and the way they act when under stress, e.g., "Even when I am visiting other people, I can prevent my child from arguing over a toy." The 22-item questionnaire was developed on the basis of Bandura's (1997) general theory of personal efficacy, and made suitable for parents of young children. Answers to the *Parental Efficacy* items were provided on a 6-point rating-scale. One item about toilet-training was not applicable in the current sample, because a large number of children were still wearing diapers. Principal component analysis was performed on the 21 remaining questions. One factor was extracted that explained 29% of the variance. Cronbach's alpha for internal consistency was 0.87 (n=89).

Second, the Child Rearing Practice Report (CRPR; Deković et al. 1991) was administered. The CRPR measures authoritative and authoritarian styles of child-rearing. It consists of 29 Likert-type items with 6-point rating-scales. The *Authoritative style* indexes rational guiding of the child, encouraging independence and open expression of affect, while the *Authoritarian style* is defined as authoritarian control and supervision of the child, and control through anxiety induction. The Cronbach's alpha for Authoritarian style was 0.53. Therefore, the Authoritarian style was excluded from further analyses. Cronbach's alpha for Authoritative style (16 items; n=76) was satisfactory (0.74).

Third, the Parenting Daily Hassles questionnaire (PDH; Crnic and Greenberg 1990) was used to assess the strains and stresses accompanying child rearing. The PDH is a 20-item questionnaire with descriptions of typical everyday life events in parent–child interactions, e.g., the difficulties that parents may experience in leaving kids for a night out or at school or at day-care. For each item, the parent rated the frequency of occurrence and the intensity of the hassle on a 5-point rating-scale. The Cronbach's alpha for the frequency was 0.86 (n=51) and for the intensity 0.86 (n=48). Because the correlation between frequency and intensity variables was high (r=0.59, n=88) both sets of items were combined—forming a single *Parenting Daily Hassles* score.

Fourth, the Social Provision Scale (SPS; Cutrona and Russell 1987) was administered to assess the *Social Support* parents experienced in the emotional domain as well as in the instrumental domain. The 8-item questionnaire measures social support (on a 6-point rating-scale) as the degree to which social relationships are perceived as currently supplying emotional and instrumental support. It includes two sub-scales, emotional support and instrumental support. In this study the two sub-scales were highly correlated (r=0.67). In a principal components analysis, the items were included in a one-factor solution, explaining 47% of the variance. We therefore combined all items into one scale for social support. The internal consistency of the scale (Cronbach's alpha) was 0.83 (n=78).

Fifth, parental psychological functioning was assessed with the SCL-90 (Arrindell and Ettema 1986). The SCL-90 was designed as a measure of agoraphobia, anxiety, depression, somatic complaints, insufficiency in thinking and acting, distrust and interpersonal sensitivity, hostility, sleeping problems, and a rest category. It consists of 90 items that are rated on a 6-point rating scale. We used the total scores on the SCL-90 as indicative of the degree to which parents suffered from various psychological problems and complaints. The total scale was reliable (Cronbach's alpha was 0.98, n=70).

Because missing values were randomly scattered across items and subjects, the mean scores within the diagnostic groups were imputed in order to uniformly include the total set of 89 children in the analyses.

Statistical Analysis

First, the correlations between the predictor variables were computed for both the total group (the clinical groups and

the non-clinical comparison group taken together) and the group of children with Autism Spectrum Disorder (both high and low functioning). Second, we tested with one-way analyses of variance and a priori contrasts whether the clinical groups differed from the non-clinical comparison group for the background, attachment, and parental variables included in our study. Also, one-way analyses of variance were performed to test the contrasts between the ASD groups and both the non-clinical comparison group and the other clinical groups. Third, post-hoc analyses were executed to explore the contrasts between the separate clinical subgroups. Fourth, discriminant function analyses were performed with the attachment and parenting variables to distinguish between the clinical and the non-clinical group. Also, discriminant function analyses were performed between the ASD groups and the other clinical groups and the non-clinical group. Fifth, a regression analysis was performed to test if social support moderated the relation between parental daily hassles and parents' feelings of efficacy in parenting.

Results

Correlations Between Background, Parenting, and Attachment Variables The correlations between the variables are presented in Table 2. From Table 2 it can be concluded that higher socio-economic status was associated with higher age of parents, lower child age, and more social support. Older children showed less attachment security. The parents of more securely attached children reported fewer daily hassles. Higher parental efficacy was associated with a more authoritative parenting style, fewer daily hassles, and fewer psychological problems. Lastly, less social support was associated with more parenting daily hassles and more psychological problems. The same trends were observed in the subgroup of children with Autism Spectrum Disorder (n=41).

Differences Between Groups In Table 3 the means and standard deviations of the background, parenting, and attachment variables in the diagnostic groups are presented. A priori contrasts between the combined clinical groups and the non-clinical comparison group showed that the following differences were significant: differences in socio-economic status, in child age, in BASQ security score, in authoritative parenting style and in social support (see Table 3). The parents of the clinical children had a lower socio-economic status than the parents of the non-clinical comparison children. Also, the clinical children were significantly older than the non-clinical comparison children. Furthermore, significant differences were found on the BASQ security score. Children in the clinical group were significantly less securely attached to their parents than non-clinical children. Parents of clinical children reported a less authoritative parenting style and less social support when compared with parents of non-clinical children.

Our next step was to compare the ASD group (combining the high and low functioning groups) with the non-clinical comparison group. A priori contrasts showed a similar pattern. In particular, parents of children with ASD had a lower socio-economic status in comparison with parents of non-clinical children, and children with ASD were older. Furthermore, the combined group of children with ASD showed significantly less attachment security than the non-clinical comparison children, and parents of the children with ASD were less likely to show an

Table 2 Correlations between predictors for the total sample and the group of children with Autism Spectrum Disorder

	1	2	3	4	5	6	7	8	9
Background									
1. SES	–	0.29**	−0.23*	0.15	−0.16	0.20	−0.02	0.25*	−0.06
2. Age parent	0.18	–	0.02	0.19	−0.06	0.10	−0.15	0.18	0.05
3. Age child	0.26	0.20	–	−0.36**	−0.08	−0.11	0.07	0.07	0.03
Attachment									
4. BASQ security	−0.05	−0.05	−0.13	–	0.01	0.19	−0.22*	0.04	−0.01
Parenting									
5. Parental efficacy	−0.31*	0.10	0.00	0.07	–	0.29**	−0.32**	0.16	−0.28**
6. Authoritative parenting	0.11	0.20	0.05	0.01	0.29	–	−0.03	0.08	−0.20
7. Parental daily hassles	0.28	−0.23	0.02	−0.28	−0.43**	0.02	–	−0.27**	0.09
8. Social support	0.11	0.39**	0.36**	0.01	0.21	0.04	−0.02	–	−0.38**
9. Psychological problems	0.11	−0.16	−0.01	−0.08	−0.03	−0.07	0.08	−0.29	–

Note: The correlations of the total sample (N=89) are presented in the upper triangle; the correlations for the ASD subgroup (n=41) are presented in the lower triangle of the table.
*p<0.05
**p<0.01.

Table 3 Means and standard deviations of the background, parenting, and attachment variables in the clinical groups and the non-clinical comparison group

	Total	ASD + MR	ASD	MR	LD	C	Clin vs C[a]	ASD vs C[b]	ASD vs other Clin[c]	Contrasts *d*
	N=89	*N*=25	*N*=16	*N*=12	*N*=11	*N*=25	*t*(87)	*t*(64)	*t*(62)	
Background										
SES										
M	5.22	4.85	4.20	4.96	4.45	6.72	5.81**[e]	5.26**[e]	0.24	ASD+MR, ASD, MR, LD < C
SD	1.97	1.96	1.82	1.98	1.72	1.35				
Age parent										
M	34.2	33.7	33.9	34.7	33.5	35.1	1.31	1.63	0.31[e]	–
SD	3.87	3.36	2.97	6.17	4.53	3.26				
Age child										
M	26.5	29.9	31.2	27.3	27.9	19.1	−7.48**	−7.97**	−1.79	C < ASD+ MR, ASD, MR, LD
SD	7.45	5.97	6.23	6.40	6.27	4.81				
IQ										
Low %	42.7	100.0	0.0	100.0	9.1	0.0				
Gender										
Male %	73.0	80.0	68.8	58.3	81.8	72.0				
Attachment										
BASQ security										
M	4.64	4.42	3.50	5.12	4.86	5.27	3.58**	5.17**	3.53**	ASD + MR < MR, C; ASD < ASD+MR, MR, LD, C
SD	1.10	1.00	0.60	0.50	1.52	0.84				
Parenting										
Parental efficacy										
M	8.09	8.00	8.43	8.10	7.65	8.15	0.41[e]	−0.07	−0.98	–
SD	1.00	1.12	0.81	1.25	1.13	0.77				
Authoritative parenting style										
M	4.81	4.71	4.73	4.87	4.67	4.99	2.26*	2.32*	0.42	ASD + MR < C
SD	0.49	0.52	0.47	0.53	0.51	0.42				
Parenting daily hassles										
M	2.12	2.15	2.30	1.82	2.28	2.04	−0.81	−1.19	−1.08	MR < ASD
SD	0.56	0.54	0.71	0.51	0.59	0.47				
Social support										
M	5.21	5.09	5.56	5.00	4.59	5.48	1.99*	1.17	−2.19*	LD < ASD, C
SD	0.80	0.76	0.56	1.22	0.63	0.60				
Psychological problems										
M	1.36	1.38	1.26	1.52	1.43	1.31	−0.78	−0.33	1.00[e]	–
SD	0.43	0.42	0.15	0.83	0.36	0.31				

*$p<0.05$
**$p<0.01$
[a] One-way a priori contrasts of the clinical groups versus the non-clinical comparison group
[b] One-way a priori contrasts of the ASD groups versus the non-clinical comparison group
[c] One-way a priori contrasts of the ASD groups versus the other clinical groups
[d] Post-hoc contrasts between all groups
[e] unequal variances

authoritative parenting style. Lastly, we compared the combined ASD group with the children from the other clinical groups ('other clinical'). The ASD children showed significantly lower BASQ attachment security than the other clinical groups, and their parents felt more supported (see Table 3).

Post-hoc Analyses Between Groups In Table 3, significant contrasts between groups are presented in the last column. The standardized scores of the attachment and parenting variables, based on the mean scores of each measurement, are presented in Fig. 1. Socio-economic status of the control group was higher than socio-economic status of the other groups, and the children in the control group were younger than the children in the other groups, due to matching on developmental level. ASD children with mental retardation showed significantly lower BASQ security scores than children with mental retardation and non-clinical children.

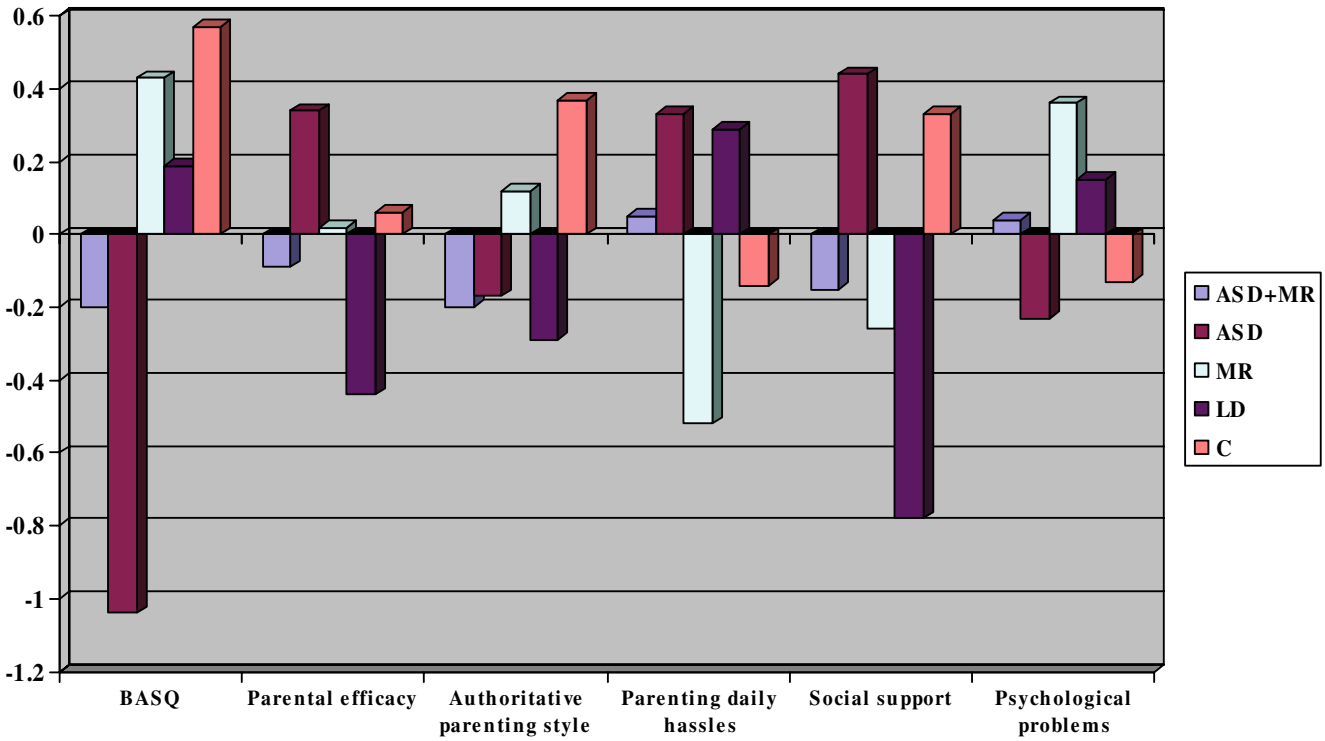

Fig. 1 Standardized mean scores of the attachment and parenting variables

High functioning children with ASD were observed to be less secure than the children in the other groups, including the LD children. Parents of high functioning ASD children and parents of non-clinical children reported more social support than parents of LD children. More parenting hassles were reported by the parents of the high functioning ASD children compared to parents of children with mental retardation. Lastly, the parents of ASD children with mental retardation were less authoritative than the control group parents.

Discriminant Function Analyses Discriminant function analysis was performed using the attachment and parenting variables as predictors of membership of the clinical versus the non-clinical comparison group. Predictors were the BASQ attachment security, parental efficacy, authoritative parenting, parental daily hassles, psychological problems, and social support. One discriminant function was calculated, with a combined χ^2 (6, N=89)=17.99, p<0.01. The loading matrix of correlations between predictors and the discriminant function, as presented in Table 4, suggested that the best predictors for distinguishing between clinical and non-clinical children were the BASQ security score, authoritative parenting and social support. Clinical children were less secure, their parents were less authoritative, and they received less adequate social support.

Second, discriminant function analysis was performed predicting the membership of the Autism Spectrum Disorder group versus the non-clinical comparison group. The predictors were again the five parenting variables and the BASQ attachment security. Similarly, one discriminant function was calculated, χ^2 (6, N=66)=24.12, p<0.01. Two significant predictors could be extracted. The BASQ attachment security and authoritative parenting were significant predictors for distinguishing between the Autism Spectrum Disorder group and the non-clinical comparison group. Comparison children were more secure, and their parents were more authoritative.

Third, discriminant function analysis was conducted predicting ASD groups versus other clinical groups, on the basis of the five parenting variables and BASQ security. One discriminant function was calculated, χ^2 (6, N=64)= 17.75, p=0.01. Two significant predictors emerged, namely BASQ security and social support. ASD children again scored lower on the BASQ, and their parents reported more social support (see Table 4).

To test the moderator role of social support we conducted a hierarchical regression on parental efficacy, with social support and daily hassles included in the first step, and their product term in the second step. The regression was performed for both the total sample and for the clinical groups. In none of the three regression-

Table 4 Discriminant function analyses of attachment and parenting variables

	Clinical versus non-clinical		ASD versus non-clinical		ASD versus other clinical	
	Correlations between Predictor and Discriminant function	$F(1,87)$	Correlations between Predictor and Discriminant function	$F(1,64)$	Correlations between Predictor and Discriminant function	$F(1,62)$
BASQ	0.79	12.81**	0.93	26.73**	−0.76	12.49**
Parental efficacy	0.08	0.12	−0.01	0.00	0.21	0.95
Authoritative parenting	0.50	5.12*	0.42	5.36*	−0.09	0.18
Parental daily hassles	−0.18	0.66	−0.21	1.41	0.23	1.16
Social support	0.44	3.95*	0.21	1.36	0.47	4.79*
Psychological problems	−0.17	0.61	−0.06	0.11	−0.25	1.37

*$p<0.05$
**$p<0.01$

analyses the interaction term was significant (total: $t(1, 85)=-1.87$, $p=0.07$; clinical groups: $t(1, 60)=-1.77$, $p=0.08$; ASD groups: $t(1, 37)=-0.21$, $p=0.83$).

Discussion

Children with ASD were rated as least secure compared to the other clinical and normal comparison groups. More specifically, ASD children with mental retardation were less secure than children with mental retardation, and the ASD children without mental retardation were less secure than children with LD. In our study, therefore, autistic disorder instead of mental retardation explained their lower attachment security. Pertaining to parenting, authoritative parenting style was the important factor in distinguishing between the clinical groups and the non-clinical comparison group, and between the ASD group and the non-clinical group. Parents of non-clinical children reported higher levels of authoritative parenting in comparison with the ASD group and the total clinical groups. Social support was another factor in distinguishing between groups. The clinical groups perceived significantly less social support than the non-clinical group, but the ASD group perceived more social support when compared with the other clinical groups. We could not confirm the role of social support as a moderator of the effects of daily hassles on parent's feelings of efficacy.

Our study has some limitations. First, the clinical groups are rather small. Absence of differences between the groups may be caused by lack of statistical power. However, regardless of small sample size we did find significant differences on attachment security, authoritative parenting, and parenting stresses. Second, the attachment security measure used in the current investigation, the BASQ, has been developed only recently. The BASQ was administered by the psychiatric assistants, based on their observations at the toddler unit. The BASQ was developed on the basis of the observer Attachment Q-Sort for which the psychometrics and validity have extensively been documented (Vaughn and Waters 1990; Waters 1995; Van IJzendoorn et al. 2004). The BASQ was validated against the AQS, and it proved to be rather strongly correlated to the AQS. Nevertheless, the BASQ should be further validated in other samples. Third, as our purpose was to match the non-clinical children on developmental age with the ASD children, the non-clinical children were younger in comparison with the ASD group and the total clinical group. Furthermore, parents of non-clinical children came from higher socio-economic backgrounds compared to parents of the total group of clinical children and compared to parents of ASD children. Although we controlled for such differences where appropriate, a more precise matching would have made the comparisons of attachment and parenting more precise.

The children with Autism Spectrum Disorders were less secure compared to the non-clinical children and compared to the other clinical children. However, within this overall diagnostic group, the outcomes for the ASD subgroups (combined group of ASD children with and without MR) were not in line with the results of previous studies, as presented in a recent meta-analysis on attachment and autism (Rutgers et al. 2004). In the meta-analysis the role of mental retardation in combination with autistic symptoms in the development of insecure attachments was documented. In fact, only autistic children with mental retardation appeared to be less secure than non-clinical comparisons. In the current study, however, we found that especially the high functioning ASD children showed low

security in comparison with non-clinical children. Severity of the autistic disorder (more strictly defined autism) was the other significant moderator in the meta-analysis. Since the majority of the high-functioning ASD children in our study were diagnosed with PDD-NOS, one might have expected that they would show more attachment security than children in the low functioning ASD group. In contrast with the current study however, the meta-analytic results were mainly based on investigations using the Strange Situation Procedure to assess attachment security, and in only one study the AQS was used for the assessment of attachment (Pechous 2001). Also the different observational setting may have influenced the results. Attachment behaviors of children with ASD may be more context-dependent than attachment behaviors of other children. Therefore, a replication of the current outcomes in a study using the AQS in the home setting, as well as the Strange Situation in the lab, is needed to settle this issue.

In terms of parenting, we did not find large differences for the ASD children. Parents of ASD children perceived themselves as rather healthy and balanced, and they reported even more social support than the other clinical groups. Although parents of ASD children displayed less authoritative parenting, they did report parental efficacy to the same degree as the other groups, including the non-clinical controls. We can only speculate about the reasons for the unexpected outcome with regard to parenting. Although the social and emotional impairments arising from ASD may be a burden for the parents, making them feel less competent and more stressed, the impact may only become visible at a later stage in the children's lives. The current assessments of parenting were completed at the early age of 27–32 months age of the clinical children, and the incapacitating effects of ASD on the children's social relationships may not yet have become fully clear to the parents (see Bristol and Schopler 1983; Konstantareas and Homatidis 1989). Furthermore, parents of these young ASD children may not perceive parenting as a larger burden than parents of non-clinical children or other clinical children, as parenting is not anymore considered to be a causal factor in the emergence of autism. It has become universally accepted that genetic factors play an important role in the causation of ASD (Rutter et al. 1997). Nevertheless, parenting may play a decisive role in the further development and the symptomatology of children with ASD.

Longitudinal studies on parenting, attachment and autism are important to address the question of whether the absence of differences between the parents of the various clinical groups will persist when the children are older. The differences between children with Autism Spectrum Disorder and their normal counterparts may develop with age, and their parents may thus be increasingly confronted with the strains and stresses that go with parenting a child with severe social impairments. Observational studies in the home setting with the validated AQS may reveal more information about the subtle patterns of attachment behaviors in a natural setting that are specific to the group of children with Autism Spectrum Disorders. Such observational studies may also reveal subtle but important differences in parenting style between the parents of children diagnosed with different problems. Lastly, the absence of clear self-reported differences in parenting stress and feelings of efficacy by parents of children within the ASD group may be further tested with observational and physiological assessments.

The current investigation documents the socio-emotional potential of children with Autism Spectrum Disorders, as well as the remarkable resilience of their parents. Our findings indicate that parents of children with autism appear to cope with parenting their child at this early age. Nevertheless, they might benefit from parent training that focusses particularly on promoting parental sensitivity. As children with autism are impaired in reciprocal interaction skills, some parents may have problems interpreting their child's attachment needs and signals. The VIPP (Video-feedback Intervention to promote Positive Parenting (VIPP) protocol; Juffer et al. 2007) has been developed to promote sensitive parenting through four to six sessions with parent and child in the home setting. This intervention has already been successfully applied to special groups, for example to families with an adopted child, and families with a child with a chronic illness (asthma, dermatitis; Juffer et al. 2007). Improved reciprocal interaction between parents and their children with autism may support the parents in their challenging childrearing tasks, and may also influence the children's overall communicative functioning.

References

Ainsworth, M. D. S., Blehar, M. C., Waters, E., & Wall, S. (1978). *Patterns of attachment*. Hillsdale, NJ: Erlbaum.

Arrindell, W. A., & Ettema, J. H. M. (1986). *SCL-90*. Lisse: Swets & Zeitlinger.

Bakermans-Kranenburg, M. J., Willemsen-Swinkels, S. H. N., & Van IJzendoorn, M. H. (2003). *Brief Attachment Screening Questionnaire.* Leiden University, Centre for Child and Family Studies (Unpublished Manuscript).

Bandura, A. (1997). *Self-efficacy: The exercise of control*. New York: Freeman.

Baumrind, D. (1996). The discipline controversy revisited. *Family Relations, 45*, 405–414.

Belchic, J. K. (1996). Stress, social support, and sense of parenting competence: A comparison of mothers and fathers of children with autism, Down syndrome, and normal development across the family life cycle. *Dissertation Abstracts International Section A: Humanities and Social Sciences, 57*, 0574.

Bernabei, P., Camaioni, L., & Levi, G. (1998). An evaluation of early development in children with autism and pervasive developmental disorders from home movies: Preliminary findings. *Autism, 2*, 243–258.

Blacher, J. (1984). A dynamic perspective on the impact of a severely handicapped child on the family. In J. Blacher (Ed.), *Severely handicapped children and their families.* New York: Academic.

Bowlby, J. (1969). *Attachment and loss. Vol. I. Attachment*. London, UK: Hogarth.

Bowlby, J. (1982). Attachment and loss: Retrospect and prospect. *American Journal of Orthopsychiatry, 52*, 664–678.

Bristol, M. M., & Schopler, E. (1983). Stress and coping in families with autistic adolescents. In E. Schopler & G. B. Mesibov (Eds.), *Autism in adolescents and adults* (pp. 251–278). New York: Plenum.

Buitelaar, J. (1995). Attachment and social withdrawal in autism: Hypotheses and findings. *Behaviour, 132*, 319–350.

Charman, T., & Baird, G. (2002). Practitioner Review: Diagnosis of autism spectrum disorder in 2- and 3-year-old children. *Journal of Child Psychology and Psychiatry, 43*, 289–305.

Cohen, S., & Wills, T. A. (1985). Stress, social support, and the buffering hypothesis. *Psychological Bulletin, 98*, 310–357.

Cox, A., Rutter, M., Newman, S., & Bartak, L. (1975). A comparative study of infantile autism and specific developmental receptive language disorder. II. Parental characteristics. *The British Journal of Psychiatry, 126*, 146–159.

Crnic, K. A., & Greenberg, M. T. (1990). Minor parenting stresses with young children. *Child Development, 61*, 1628–1637.

Cutrona, C. E., & Russell, D. W. (1987). The provisions of social relationships and adaptation to stress. *Advances in Personal Relationships, 1*, 37–67.

Deković, M., Janssen, J. M., & Gerris, J. R. (1991). Factor structure and construct validity of the Block Child Rearing Practices Report (CRPR). *Psychological Assessment, 3*, 182–187.

DeMyer, M. K. (1979). *Parents and children with autism*. New York: Wiley.

Dietz, C., Swinkels, S.H.N., Daalen, van E., Kerkhof, I., Engeland, van H., & Buitelaar, J.K. (2006). Screening for autism spectrum disorders in children aged 14 to 15 months. II. Population screening with the Early Screening of Autistic Traits. Design and general findings. *Journal of Autism and Developmental Disorders, 36*, 713–722.

DiLavore, P. C., Lord, C., & Rutter, M. (1995). Pre-linguistic autism diagnostic observation schedule. *Journal of Autism and Developmental Disorders, 25*, 355–379.

Dissanayake, C., & Crossley, S. A. (1996). Proximity and sociable behaviours in autism: Evidence for attachment. *Journal of Child Psychology and Psychiatry, 37*, 149–156.

Dissanayake, C., & Crossley, S. A. (1997). Autistic children's responses to separation and reunion with their mothers. *Journal of Autism and Developmental Disorders, 27*, 295–312.

Dunn, M. E., Burbine, T., Bowers, C. A., & Tantleff-Dunn, S. (2001). Moderators of stress in parents of children with autism. *Community Mental Health Journal, 37*, 39–52.

Fisman, S., Wolf, L., Ellison, D., & Freeman, T. (2000). A longitudinal study of siblings of children with chronic disabilities. *Canadian Journal of Psychiatry, 45*, 369–375.

George, C., & Solomon, J. (1999). Attachment and caregiving: The caregiving behavioural system. In P. R. Shaver & J. Cassidy (Eds.), *Handbook of attachment: Theory, research and clinical applications* (pp. 649–670). New York: Guilford.

Holroyd, J. (1974). The questionnaire on resources and stress: An instrument to measure family response to a handicapped family member. *Journal of Community Psychology, 2*, 92–94.

Hoppes, K., & Harris, S. L. (1990). Perceptions of child attachment and maternal gratification in mothers of children with autism and Down syndrome. *Journal of Clinical Child Psychology, 19*, 365–370.

Horowitz, A. (2004). The mediating effects of perceptions and coping strategies between personal resources and emotional well-being: A study of mothers of children with autism. *Dissertation Abstracts International Section B: The Sciences and Engineering, 64*, 6009.

Juffer, F., Bakermans-Kranenburg, M. J., Van IJzendoorn, M. H. (2007). *Promoting positive parenting: An attachment-based intervention.* Mahwah, NJ: Lawrence Erlbaum (in press).

Kasari, C., & Sigman, M. (1997). Linking parental perceptions to interactions in young children with autism. *Journal of Autism and Developmental Disorders, 27*, 39–57.

Koegel, R. L., Schreibman, L., Loos, L. M., Dirlich-Wilhelm, H., Dunlap, G., Robbins, F. R., et al. (1992). Consitent stress profiles in mothers of children with autism. *Journal of Autism and Developmental Disorders, 22*, 205–216.

Konstantareas, M. M., & Homatidis, S. (1989). Assessing child symptom severity and stress in parents of autistic children. *Journal of Child Psychology and Psychiatry, 30*, 459–470.

Lord, C. (1995). Follow-up of two year olds referred for possible autism. *Journal of Child Psychology and Psychiatry, 36*, 1365–1382.

Lord, C., Rutter, M., & LeCouteur, A. (1994). Autism Diagnostic Interview—Revised: A revised version of a diagnostic interview for caregivers of individuals with possible pervasive developmental disorders. *Journal of Autism and Developmental Disorders, 24*, 659–685.

Milgram, N. A., & Atzil, M. (1988). Parenting stress in raising autistic children. *Journal of Autism and Pervasive Developmental Disorders, 19*, 415–424.

Moes, D., Koegel, R. L., Schreibman, L., & Loos, L. M. (1992). Stress profiles for mothers and fathers of children with autism. *Psychological Reports, 71*, 1272–1274.

Noh, S., Dumas, J. E., Wolf, C., & Fisman, S. N. (1989). Delineating sources of stress in parents of exceptional children. *Family Relations, 38*, 456–461.

Noterdaeme, M., Mildenberger, K., Sitter, S., & Amorosa, H. (2002). Parent information and direct observation in the diagnosis of pervasive and specific developmental disorders. *Autism, 6*, 159–168.

Pantone, J. L., & Rogers, S. J. (1984). *Attachment characteristics of autistic and PDD preschool-aged children*. Presented at the third Biennial DPRG Retreat, Estes Park, CO.

Pechous, E. A. (2001) Young children with autism and intensive behavioral programs: Effects on the primary attachment relationship. *Dissertation Abstracts International Section B: The Sciences and Engineering, 61*, 6145.

Rodrigue, J. R., Morgan, S. B., & Geffken, G. (1990). Families of autistic children: psychosocial functioning of mothers. *Journal of Clinical Child Psychology, 19*, 371–379.

Rogers, S. (2001). Diagnosis of autism before the age of 3. In L. M. Glidden (Ed.), *International Review of Research in Mental Retardation: Autism* (pp. 1–31). San Diego: Academic.

Rogers, S. J., Ozonoff, S., & Maslin-Cole, C. (1993). Developmental aspects of attachment behaviour in young children with pervasive developmental disorders. *Journal of the American Academy of Child and Adolescent Psychiatry, 32*, 1274–1282.

Rutgers, A. H., Bakermans-Kranenburg, M. J., Van IJzendoorn, M. H., & Van Berckelaer-Onnes, I. A. (2004). Autism and attachment: A meta-analytic review. *Journal of Child Psychology and Psychiatry, 45*, 1123–1134.

Rutter, M., & Bailey, A., Simonoff, E., & Pickles, A. (1997). Genetic influences and autism. In D. J. Cohen & F. R. Volkmar (Eds.), *Handbook of Autism and Pervasive Developmental Disorders* (pp. 370–387). New York: Wiley.

Sigman, M., & Mundy, P. (1989). Social attachments in autistic children. *Journal of the American Academy of Child and Adolescent Psychiatry, 28*, 74–81.

Sigman, M., & Ungerer, J. (1984). Attachment behaviors in autistic children. *Journal of Autism and Developmental Disorders, 14*, 231–244.

Sigman, M., Mundy, P., Sherman, T., & Ungerer, J. (1986). Social interactions of autistic, mentally retarded, and normal children with their caregivers. *Journal of Child Psychology and Psychiatry, 27*, 647–656.

Sparrow, S. S., Balla, D. A., & Ciccetti, D. V. (1997). *Vineland Social-Emotional Early Childhood Scales: Manual 1997*. Circle Pines MC, American Guidance Service.

Swinkels, S.H.N., Dietz, C., Daalen, van E., Kerkhof, I., Engeland, van H., & Buitelaar, J.K. (2006). Screening for autistic spectrum disorders in children aged 14 to 15 months. I. The development of the Early Screening of Autistic Traits Questionnaire. *Journal of Autism and Developmental Disorders, 36*, 723–732.

Tunali, B., & Power, T. G. (2002). Coping by redefinition: Cognitive appraisals in mothers of children with autism and children without autism. *Journal of Autism and Developmental Disorders, 32*, 25–34.

Van IJzendoorn, M. H., Bakermans-Kranenburg, M. J., & Juffer, F. (1999). *The parental efficacy questionnaire*. Leiden University, Center for Child and Family Studies (Unpublished Manuscript).

Van IJzendoorn, M. H., Vereijken, C. M. J. L., Bakermans-Kranenburg, M. J., & Riksen-Walraven, J. M. A. (2004). Is the Attachment Q-Sort a valid measure of attachment security in young children? *Child Development, 75*, 1188–1213.

Vaughn, B. E., & Waters, E. (1990). Attachment behavior at home and in the laboratory: Q-sort observations and Strange Situation classifications of one-year-olds. *Child Development, 61*, 1965–1973.

Waters, E. (1987). *Attachment Behavior Q-set (version 3.0)*. State University of New York at Stony Brook, Stony Brook, NY (Unpublished instrument).

Waters, E. (1995). The Attachment Q-set. In E. Waters, B. E. Vaughn, G. Posada, & K. Kondo-Ikemura (Eds.), Caregiving, cultural, and cognitive perspectives on secure-base behavior and working models. *Monographs of the Society for Research in Child Development, 60*, 247–254.

Waters, E., & Deane, K. E. (1985) Defining and assessing individual differences in attachment relationships: Q- methodology and the organization of behavior in infancy and early childhood. *Monographs of the Society for Research in Child Development, 50*, 41–65.

Weiss, M. J. (2002). Hardiness and social support as predictors of stress in mothers of typical children, children with autism, and children with mental retardation. *Autism, 6*, 115–130.

Wishart, M. C., Bidder, R. T., & Gray, O. P. (1981). Parents' report of family life with a developmentally delayed child. *Child Care, Health and Development, 7*, 267–279.

Wolf, L. C., Noh, S., Fisman, S. N., & Speechley, M. (1989). Brief report. Psychological effects of parenting stress on parents of autistic children. *Journal of Autism and Developmental Disorders, 19*, 157–166.

Yirmiya, C. & Sigman, M. (2001). Attachment in autism. In J. Richer & S. Coates (Eds.), *Autism: putting together the pieces*. London: Kingsley Publishers.