Autism and attachment security

Rutgers, A.H.

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Promotores

Prof. dr. M.H. van IJzendoorn
Prof. dr. I.A. van Berckelaer-Onnes

Co-promotor

Dr. M.J. Bakermans-Kranenburg

Referent

Prof. dr. H. Roeyers (Universiteit Gent, België)

Overige leden

Dr. S.H.N. Swinkels (UMC St. Radboud, Nijmegen)
Prof. dr. F. Juffer
Prof. dr. H. Swaab-Barneveld
Prof. dr. H.M. Koot (Vrije Universiteit, Amsterdam)

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1

Introduction

Are children with autism able to form attachment relationships with their parents or other caregivers? Kanner (1943) did not explicitly refer to attachment in his pioneering work on 'early infantile autism'. In 1943, he ascribed the extreme autistic aloneness of the children especially to biological features. In his discussion he concluded: "we must, then, assume that these children come into this world with an innate ability to form the usual, biologically provided affective contact with people, …" (p. 250). But he also noticed that the parents of these children showed limited real interest in people and generally had a high level of educational achievement. In 1949, influenced by psychoanalytic theories, Kanner indicated that: "most of the patients were exposed from the beginning to parental coldness, obsessiveness, and a mechanical kind of attention to material needs only" and "their withdrawal seems to be an act of turning away from such a situation to seek comfort in solitude" (p. 425). Bettelheim, a psychoanalytic theorist (1959), explicitly blamed the parents for their child having autism. According to Bettelheim (1959) the origin of autism lies in the " … extreme emotional deprivation combined with experiences which they interpreted as threatening them with utter destruction" (p. 467). The question is: Is autism an inborn affective disorder or is autism caused by the social environment?

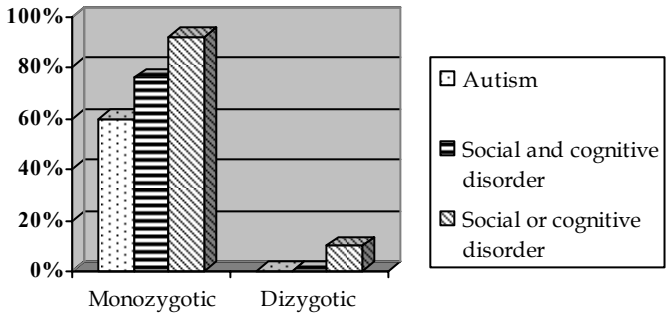
Autism and its origin

Both twin and family studies document the importance of genetic factors in autism. In the first twin study (Folstein & Rutter, 1977a, 1977b) two important results were found. First, a significant difference in concordance was found within monozygotic (MZ) as opposed to dizygotic (DZ) twins. Pair-wise concordance rates of respectively 36% and 0% were found, which implies a considerable hereditary component for autism. Subsequent studies replicated the findings of Folstein and Rutter (1977a, 1977b) (Bailey et al., 1995; Steffenberg et al., 1989). Steffenberg et al. (1989) found concordance rates of 91% for autism in MZ twins and 0% in DZ twins, while Bailey et al. (1995) subsequently found a concordance of respectively 69% (MZ) and 0% (DZ). Secondly, Folstein and Rutter (1977a, 1977b) hypothesised that concordance within MZ twins includes the broader phenotype of cognitive and social deficits, and not just the prototypic symptoms of autism. In their study, they found concordance rates of 82% for MZ twins versus 10% for DZ twins for cognitive disorder. In the majority of the children with a cognitive deficit, social problems were also found. Bailey et al. (1995) combined the results of Folstein and Rutter's (1977a, 1977b) twin

study with a new twin sample. The results confirmed the strong underlying genetic liability of both autism and the broader phenotype (see Figure 1). In a follow-up study of Folstein and Rutter's (1977a, 1977b) sample, Le Couteur et al. (1996) found that the individuals with the broader phenotype continued to have deficits in social functioning into adulthood. In contrast, Steffenburg's (1989) results on the broader phenotype suggest that the genetic liability is confined to autism. The concordance rate for autism and for both autism and cognitive disorder remained the same in MZ twins (both 91%), but not in DZ twins (respectively 0% and 30%).

Figure 1

Pair-wise concordance for autism, social and/or cognitive disorder (based on combined data from Folstein & Rutter (1977a, 1977b) and Bailey et al. (1995); figure adapted from Rutter (2000))



Evidence for genetic liability is also evidenced in family studies. For example, Bolton et al. (1994) found that 3% of the siblings of the children with autism had been diagnosed with autism as well, while 6% was diagnosed with a pervasive developmental disorder (PDD). Excluding the siblings with PDD, between 12% and 20% (depending on the stringency of the definition) of the siblings exhibited milder forms of social and communication deficits. Furthermore, Piven et al. (1990) found similar results in a study of adult siblings of individuals with autism (3% of the siblings were diagnosed with autism, 4% showed severe social deficits). On the basis of twin and family research, Rutter (2000) concluded that several interacting genes should be involved in autism. Between 2 and 10 seemed most likely (Pickles et al., 1995). Genome screens have indicated several chromosomal regions of interest for autism. Suggestive linkages have been identified, for example, on the chromosomes 2, 7, and 16 (International Molecular Genetic Study of Autism Consortium, 2001). Nowadays, it is generally accepted that genetic factors prevail in the aetiology of autism.

The possible aetiological effects of familial risk factors have been studied from around 1960. Family research focussed particularly on three aspects: 'severe family stress', 'deviant parental personality', and 'deviant parent-child communication and

interaction patterns' (Cantwell & Baker, 1984). While the earliest literature found evidence of early stress explaining the ontogeny of autism, associations between autism and frequency of stress experiences including quality of upbringing are no longer reported (see Bailey, Phillips, & Rutter, 1996). Secondly, studies reporting on a positive link between parental psychopathology and autism were apparently published before 1970 (Cantwell & Baker, 1984). Recent literature does not confirm the idea of extreme personality traits in parents of children with autism (for example coldness or obsessiveness; McAdoo & Demyer, 1977). Thirdly, although Cantwell and Baker (1984) did not support the hypothesis of deviant family communication and interaction as a possible aetiological factor, they recognized that familial communication factors might be of significance in the course of autism. In addition, they referred to the possible existence of a parental communication deficit, but this might rather be a genetic than an environmental factor. We may conclude that familial psychosocial environmental factors appear not to be influential in the origins of autism (Bailey et al., 1996).

Description of autism

In the DSM-IV-TR (APA, 2000) the diagnostic criteria of pervasive developmental disorders (PDD) are elaborated in threefold. Children with PDD are characterized by impairments in several areas of development: reciprocal social interaction skills, communication skills, and the presence of stereotyped behaviour, interest, and activities. Within PDD, the most prototypic form is Autistic Disorder (AD). In children with AD impairments in all three developmental areas are present. In approximately three-quarters of these children, the disorder coexists with mental retardation. Children with Pervasive Developmental Disorder Not Otherwise Specified (PDD-NOS) show impairments in the development of reciprocal social interaction in combination with either impairments in communication skills or with the presence of stereotyped behaviour, interest, and activities (DSM-IV-TR; APA, 2000). Scoring rules for optimally distinguishing PDD-NOS from non-PDD have been formulated by Buitelaar and Van der Gaag (1998). Although autism is much more common in boys than in girls (with a ratio of about 3.5 or 4 to 1), male: female ratios are lowest in individuals with autism and comorbid mental retardation (Lord, Schopler, & Revicki, 1982). In a review based on 32 epidemiological studies, Fombonne (2003) obtained prevalence rates of 27.5/10,000 for PDD, more specifically 10/10,000 for the autistic disorder and 15/10,000 for PDD-NOS. Surprisingly, in recent studies (e.g. Baird et al., 2000) rates as high as 60 to 70/10,000 were found for PDD. Wing and Potter (2002) discussed possible explanations for the increase in prevalence rates. They concluded that changes in diagnostic criteria and improved awareness and recognition of PDD seemed most likely to be the cause of the increased prevalence rate. Whether there is a genuine rise in prevalence rates remains unresolved (Wing & Potter, 2002).

In recent literature, there is a tendency to use Autism Spectrum Disorders (ASD) instead of PDD (Wing, 1993). Herewith, the focus is on the triad of impairments of social interaction, communication, and imagination (which in turn is associated with a restricted repertoire of activities and interests) (Wing, 1993).

Cognitive psychological models of autism concentrate around three theories: 'theory of mind' (ToM), 'executive functions' (EF), and 'central coherence' (CC). Whereas ToM is more restricted to social cognitive theories, EF and CC are more general cognitive theories (Volkmar, Lord, Bailey, Schultz, & Klin, 2004). The 'Theory of Mind' hypothesis specifically attributes the social deficits in children with autism to an inability to create a social world that is directed by intentions, desires and beliefs of self and others (Baron-Cohen, Tager-Flusberg, & Cohen, 2000). Children with autism seem to have difficulties in attributing mental states to the self and others. More specifically, these children seem to be characterized by an inability to 'mind-read' (Baron-Cohen, Leslie, & Frith, 1985). Studies on children with autism evidenced that impairments in ToM are not universal (Happé & Frith, 1995) and, at the same time, these problems are not specific to children with autism (Yirmiya, Erel, Shaked, & Solomonica-Levi, 1998). False belief tasks (Wimmer & Perner, 1983) were developed to detect ToM skills. Begeer, Rieffe, Meerum Terwogt, and Stockmann (2003) stress that research should not focus on the lack of ToM knowledge in children with autism, but on external factors (for example rewarding) that encourage the expression of ToM competence in these children. Bailey et al. (1996) suggested that further research should focus on more naturalistic tasks, as there appears to be no clear relationship between laboratory testing and real-life situations.

The 'Executive Function' hypothesis focuses on the abilities that are involved in the planning of action sequences, inhibition of irrelevant responses, and the development of mental representations of a task. All are necessary for appropriate problem-solving (Welsh & Pennington, 1988). In autism, these processes are characterised by persistence and inadequate self-regulation, resulting in difficulties with change, reduced ability of forward planning and ineffective problem-solving skills (Ozonoff, 1997). Hill (2004) suggested that at least some of these areas are impaired in autism. Bailey and colleagues (1996) carefully concluded that executive dysfunction may be universal to autism. At the same time, they argued that the link with impaired reciprocal social interactions is not completely clear. Furthermore, the EF theory has been criticized for not being specific to autism (Pennington & Ozonoff, 1996). Nevertheless, there are studies available that identified a particular pattern of executive dysfunction that can distinguish autism from other disorders (e.g. Geurts, Verté, Oosterlaan, Roeyers, & Sergeant, 2004). Bailey et al. (1996) referred to the executive functions description as '… an umbrella term for a constellation of mental operations' (p.102). Therefore, Pennington and Ozonoff (1996) emphasized the need for theoretically well specified fine-grained measures in EF theory.

The 'Central Coherence hypothesis' refers to the tendency of people to interpret stimuli globally (Frith & Happé, 1994). The theory proposes that individuals with autism do not process the social world in a coherent social context and meaning but in a fragmented way (Happé & Frith, 1996). Research on weak CC in autism merely focused on the explanation of non-triad characteristics of autism (Noens & Van Berckelaer-Onnes, 2005), for example single-word reading for meaning (Frith & Snowling, 1983). Furthermore, Noens and Van Berckelaer-Onnes (2005) noted that, since the focus of studies on CC is especially on high-functioning and not on low-

functioning children, it is difficult to evaluate whether the theory is universal for all varieties of autism. This also concerns the specificity of CC in autism, as high-functioning children with autism are usually compared with normally developing children. The reliability and validity of the measurements to assess central coherence are currently under debate.

Research seems to benefit from the various focuses provided by each theory; several cognitive theories may be needed to explain autism (Bailey et al., 1996). Different combinations of theories have already been explored (e.g. Frith & Happé, 1994).

Early diagnosis of autism

In recent years there has been considerable interest in early identification and early diagnosis of autism (see e.g. Charman & Baird, 2002). In particular, participation in early intervention programs is enabled by early screening of children with autism (see e.g. McGee, Morrier, & Daly, 1999). Early signs of autism (e.g. 'poor social interaction' or 'no social smile', Adrien et al., 1993; 'response to name', Baranek, 1999; Werner, Dawson, Osterling, & Dinno, 2000) can be detected, although these 'impairments' are subtle and are usually not labelled as problematic at an early age (Charman & Baird, 2002). As development becomes more differentiated, more developmental areas and more specific behaviours are involved in the disorder (Rogers, 2001). Several studies showed stability of diagnosis from the second year of life in children referred for possible autism (e.g. Gillberg et al., 1990; Stone et al., 1999).

The CHAT (Checklist for Autism in Toddlers; Baron-Cohen, Allen, & Gillberg, 1992), which is used with children aged 18 months, is the first screening instrument that is applied in a general population. Based on information from both parent report and direct observation, three key behaviours — gaze monitoring, declarative pointing, and pretend play — are viewed as the best indicators of autism (Baron-Cohen, Cox, Baird, Swettenham, & Nighingale, 1996). However, despite high rates of specificity (> 95%), low rates of sensitivity (that is, high rates of false negatives) were reported in a follow-up study (Baird et al., 2000). The Pervasive Developmental Disorders Screening Test-II (PDDST-II; Siegel, 2004) can also be applied as early as 18 months of age. The PDDST-II is a clinically derived parental report questionnaire. The first version of this early screening instrument (PDDST; Siegel, 1999) showed high sensitivity, but moderate specificity (Rogers, 2001).

The ESAT (Early Screening for Autistic Traits; Willemsen-Swinkels et al., in press) was designed for detection of high-risk children at an even earlier age (for more specific details, see Dietz, Willemsen-Swinkels, Van Daalen, Van Engeland, & Buitelaar, in press). At 14 months, the 4-item ESAT ('appropriate smiling/crying', 'normal reactions to sensory stimuli', 'interest in different toys', and 'playing in a varied way') was administered at well-baby offices. When warranted, the pre-screening was followed by behaviour observations of a clinician at the child's home. The 14-item ESAT questionnaire was then filled in by both the parent and the clinician. Children identified as screen-positive were seen for further investigations (Van Daalen et al., personal communication, September 15, 2004).

As a result of progress in early identification of children with autism, a focus on early intervention emerged. Dawson and Osterling (1997) combined information across several early intervention programs. They reported promising findings for early intervention, regardless of the different strategies and philosophical approaches of the various programs. Substantial developmental gains were demonstrated for children with autism. Van Berckelaer-Onnes and Hansen (2004) emphasized that the diagnostic process should be adapted to the parents' level of acceptation. They stressed that timing is crucial; a diagnosis that is made too quickly, could result in rejection. This in turn might mean a delay of necessary support and treatment for both child and parents.

Autism and attachment

In his first volume of 'Attachment and Loss', Bowlby (1969) cited Bettelheim (1967) and Mahler (1965) when he referred to children with autism. In a note, he explained that some forms of autism may be due to unpredictable social responses of the mother. In his second volume, Bowlby (1973) referred to the work of Tinbergen and Tinbergen (1972). He stated that "the behaviour of an autistic child shows a complete absence of attachment together with many indications of chronic fear" and furthermore "… the underlying condition may be one of chronic and pervasive fear, which cannot be allayed by contact with an attachment figure because the child also fears humans" (p. 221). According to Bowlby (1973), a combination of two or more of the following factors seemed most likely to be the cause: genetic factors, brain damage and inappropriate mothering. In his revised version of 'Attachment and loss, volume 1' Bowlby (1982) referred only briefly to Bettelheim (1967). Bowlby did not conduct research on attachment in children with autism, and at the time of his writing about autism, no pertinent studies were available.

The idea that attachment problems would be involved in autism is also clear in the formal diagnostic criteria for autism in the DSM. The DSM-III (APA, 1980) described that in autism there is a "… failure to develop normal attachment behaviour". Children with infantile autism are characterized by "… [a] lack of responsiveness to and a lack of interest in people, …", "… [an] indifference or aversion to affection and physical contact", and "may treat adults as if they are interchangeable" (p. 87). The DSM-III-R (APA, 1987) stated that "the attachment of some toddlers to their parent(s) may be bizarre, …" (p. 34). There is however no explicit assertion about attachment left in the DSM-IV (APA, 1994) and the DSM-IV-TR (APA, 2000). In contrast with Green (2003), who discussed the possibility of placing autism and attachment disorders on a continuum, we will not go into the latter. As emphasized before, autism has a strong genetic liability, while the ontogeny of the DSM-IV attachment disorder (Reactive Attachment Disorder; APA, 1994) is associated with grossly pathogenic care (Van IJzendoorn & Bakermans-Kranenburg, 2003).

This thesis

The main focus of this dissertation is on attachment in children with autism. In *Chapter 2*, a meta-analysis of empirical studies on attachment and autism is presented

(*N* = 287). The aim was to examine if children with autism display less secure attachment behaviour in comparison with children without autism. Furthermore, we explored the effects of possible moderators in order to explain the variability between study outcomes. Most studies on attachment in children with autism used the SSP (Strange Situation Procedure; Ainsworth, Blehar, Waters, & Wall, 1978) to measure security of attachment. As children with autism are vulnerable to disruptions in daily routines (Van Berckelaer-Onnes, 1983), the unexpected separation (which is the essence of the SSP) might be very stressful for these children. Furthermore, the children with autism in the attachment studies were chronologically (and often also mentally) older than the age of 24 months for which the SSP is validated. The Attachment Q-sort (AQS; Waters, 1987) seems a good alternative to measure attachment in children with autism, as it is developed to observe attachment security in a natural setting and it can be used within a broader age range (up to 48 months). In *Chapter 3*, the use of the Attachment Q-sort (Waters, 1987) to measure attachment security in children with autism was explored. The main research question was whether it is warranted to use the original Attachment Q-Sort (and the original criterion for security) when attachment behaviour is observed in children with autism. Therefore, the original attachment criterion sort was compared with a criterion sort of children with autism defined by clinicians and researchers. In *Chapter 4*, an empirical study on attachment behaviour in children with autism in a 'natural setting' is described, and associations with parenting variables are examined. Attachment was measured with the Brief Attachment Screening Questionnaire (BASQ; Bakermans-Kranenburg, Willemsen-Swinkels, & Van IJzendoorn, 2003). The BASQ, administered by group nurses based on direct observations, is composed of pertinent secure-base items of the Attachment Q-Sort. Parenting style, parental efficacy, parental experiences of daily hassles, social support, and psychological problems were assessed through questionnaires. Children diagnosed as ASD, mentally retarded, or language delayed were compared to normally developing children and their parents. Our aim was to explore if less attachment security is characteristic for children with ASD or for a clinical diagnosis in general. Furthermore, the study was meant to shed some light on the impact of having a child with ASD (or another clinical diagnosis) on parenting. In *Chapter 5*, the concluding chapter, the findings of the studies are summarized and discussed. The chapter concludes with implications for further research.

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2

Autism and attachment: A meta-analytic review[1]

Abstract

Method: Sixteen studies on attachment in children with autism were reviewed, and ten studies with data on observed attachment security (N = 287) were included in a quantitative meta-analysis. **Results**: Despite the impairments of children with autism in reciprocal social interaction, the majority of the studies found evidence for attachment behaviours in these children. In four samples using the Strange Situation procedure the average percentage of secure attachments amounted to 53% (n = 72). Meta-analytic results showed that children with autism were significantly less securely attached to their parents than comparison children, and the combined effect size for this difference was moderate (r = .24). Children with autism displayed less attachment security than comparisons without autism, but this difference disappeared in samples with children with higher mental development, and in samples in which autism was mixed with less severe symptoms of autistic spectrum disorders. **Conclusions**: It is concluded that attachment security is compatible with autism, and can be assessed with Strange Situation type of procedures. The co-morbidity of autism and mental retardation appears to be associated with attachment insecurity.

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Attachment is conceptualised as the affectional bond or tie that infants form between themselves and their mother figure (Ainsworth, Blehar, Waters, & Wall, 1978; Bowlby, 1969/1982; Cassidy & Shaver, 1999). The attachment system is activated when the child is tired or distressed, or when there are threats in the environment. In these situations, children display attachment behaviour: they seek proximity to or contact with the caregiver, resuming play after having been comforted. Attachment behaviour patterns reflect the child's anticipations about caregiver reactions to bids for comfort. These anticipations, in turn, guide child strategies for managing stress. The attachment relation between the caregiver and the child is the cumulative outcome of the child's experiences in interaction with the caregiver across the first year (Ainsworth, 1979). Ainsworth and her colleagues (Ainsworth et al., 1978) have developed the Strange Situation Procedure as a procedure for the assessment of the quality of the attachment relationship. Attachment behaviour in children between 12 and 21 months of age is observed in a laboratory playroom where they are confronted with a stranger and two short separations from the caregiver (once with and once without the stranger present). Classification is based on the child's reaction on the reunion with the caregiver. The child's behaviour in the two reunion episodes is rated with scales for proximity seeking, contact maintaining, avoidance and resistance, and on the basis of these ratings an attachment classification is assigned.

Children classified as secure (type B) use the attachment figure as a base from which to explore. On reunion, they actively seek interaction, and they are comforted by contact when distressed. On the whole, they appear to strike a balance between attachment and exploratory behaviour. Insecure-avoidant children (type A) show little or no response to the attachment figure's leave taking, although their heart rates during separation are as elevated as those of secure children (Spangler & Grossmann, 1993). On reunion, they avoid the caregiver actively, looking away and turning towards toys. The continuous exploration of these children during the Strange Situation is considered a strategy aimed at minimisation of attachment behaviour. Children classified as insecure-resistant (type C) appear preoccupied with their attachment figures throughout the procedure. They show great distress on separation, and combine contact seeking with contact resistance on reunion. They cannot easily be comforted, and often remain distressed throughout the procedure. They appear to maximise the display of attachment behaviour. The additional classification of disorganised attachment (type D) is assigned when a child shows a (momentary) breakdown of a consistent strategy to deal with the stress involved in the Strange Situation. Indicative of disorganised attachment are the (sequential or simultaneous) display of contradictory attachment behaviours, expressions of fear or apprehension regarding the parent, stereotypies, undirected movements and expressions, and freezing or stilling of all movement with a disoriented expression (Main & Solomon, 1990). However, Pipp-Siegel, Siegel, and Dean (1999) noted that some disorganised behaviours, such as stereotypical behaviour and freezing or stilling, may be indicative of either disorganised attachment or neurological impairment, or both. Because disorganised behaviour is a momentary breakdown of an otherwise organised strategy, the category is assigned together with a best-fitting, alternative secure, insecure-avoidant, or insecure-resistant classification.

Autism

Kanner (1943) was the first to describe autism as a developmental disorder with a failure to form affective contact with others. His view had great implications for later research. In 1978, Rutter synthesised Kanner's report and subsequent research. He noted that the social and communication impairments in autism were distinctive and could not be accounted for solely as resulting from associated learning disability, and that the onset of the condition was very early (Rutter, 1978). DSM-IV (APA, 1994) considers the autistic disorder (AD) to be the most prototypic form of Pervasive Developmental Disorders. The diagnostic criteria are qualitative impairment in social interaction, qualitative impairment in communication, and restricted repetitive and stereotyped patterns of behaviour, interests, and activities. The majority (75%) of the children with the autistic disorder are mentally retarded, commonly in the range of IQ 35–50. Children with AD may show a failure to cuddle; an indifference to affection or physical contact; a lack of eye contact, facial responsiveness or socially directed smiles; and a failure to respond to their parents' voices. Older children with AD may show difficulties in reciprocity, turn taking, and recognition of affective expression and attribution of mental states of others (DSM-IV, 1994). The category Pervasive Developmental Disorder Not Otherwise Specified (PDD-NOS) is used when there is a severe and pervasive impairment in the development of reciprocal social interaction or verbal and nonverbal communication skills, or when stereotyped behaviour, interests, and activities are present. In many studies on autism, subjects with PDD-NOS and with autistic disorder have been combined because the same criteria that define the autistic disorder can be applied in general to the category PDD-NOS. The differences lay in the atypical symptomatology, or sub-threshold autistic symptomatology of PDD-NOS.

Attachment in children with autism

In the classification scheme of the DSM-III (APA, 1980), the first DSM taxonomy in which autism was differentiated from childhood schizophrenia (Volkmar, 1998), autism was described as a failure to develop normal attachment behaviour. In DSM-III-R (APA, 1987), it is noted that 'the attachment of some autistic children may be bizarre' and that there may be 'no or abnormal seeking of comfort at times of distress' (see Buitelaar, 1995; Van Berckelaer-Onnes & Luncangeli, 1999). Empirical research on attachment behaviour in children with autism shows, however, that these children display attachment behaviour to their attachment figure when distressed, and that they discriminate between parents and stranger by directing more social behaviours to the caregiver than to the stranger (Buitelaar, 1995). Furthermore, autistic and control children tend to react rather similarly to a separation from the parent by increasing proximity seeking behaviour on reunion (Buitelaar, 1995).

In normative, non-clinical samples about 65% of the children are classified as securely attached, 20% receive a classification as insecure-avoidant, and 15% are classified as insecure-resistant (Van IJzendoorn, Goldberg, Kroonenberg, & Frenkl, 1992). The additional classification as disorganised is assigned in about 15% of normal cases (Van IJzendoorn, Schuengel, & Bakermans-Kranenburg, 1999). Research on attachment in children with autism is complicated by the fact that the scoring system of

the Strange Situation is validated for normal children in the age range of 12 to 21 months. For older children a coding manual for preschool children is available (Cassidy & Marvin with the MacArthur Attachment Working Group, 1992), but it presupposes normal cognitive development (and the system is still in the process of being validated). There are only a few studies with the Strange Situation procedure administered to children with mental retardation (see Vaughn, Goldberg, Atkinson, & Marcovitch, 1994, for children with Down's syndrome, and Barnett et al., 1999, and Sierra, 1989, for children with neurological problems). Attachment studies of children with autism conducted so far involve children who are always chronologically older and often mentally older than the upper level of 21 months. Moreover, researchers have been reluctant to administer the standard Strange Situation Procedure in the case of children with autism. As a general rule, children with autism have difficulties dealing with disruptions of daily routines (Van Berckelaer-Onnes, 1983), and for some of these children unexpected separations are quite distressing. Therefore, separations have been shortened, or reduced to only one separation with the stranger present, and attachment classifications on the basis of these modified Strange Situation Procedures have been reported.

In this paper, several questions pertaining to attachment in children with autism will be addressed. First, the available studies may shed light on the issue of whether the distribution of attachment classifications in samples of children with autism is similar to the distribution of attachment classifications in normative samples. Thus, our first question is: Do children with autism have the same chance of establishing a secure attachment relationship with their parent as control children without autism, or does their social impairment interfere with the establishment of a secure attachment relationship? And, following from this question, are children who are more broadly diagnosed as PDD(-NOS) more often securely attached than children with infantile autism/childhood autism/autistic disorder? Secondly, is security of attachment in autism associated with mental development? This question is relevant because Shah and Wing (1986) noted that the severity of the social deficit in autism is directly related to the level of general cognitive functioning. In the same vein, Wing and Gould (1979) concluded that the severity of the 'autistic impairment' was directly related to the level of cognitive impairment, and noted that social dysfunction was also evident in non-autistic mentally retarded populations. As mentioned before, the majority of the children with the autistic disorder is mentally retarded, which might affect their attachment behaviour. Thirdly, is there a relation between attachment security and chronological age in children with autism? Rogers, Ozonoff, and Maslin-Cole (1993) hypothesised a development from insecurity to increasing signs of security, assuming later development of secure attachment than in normally developing children. Lastly, with a view to the different designs of the studies on attachment behaviour in children with autism, we also examined whether studies with matched comparison groups, in which the distinguishing characteristic of the children with autism is more precisely delineated, showed larger differences between the attachment security of children with and without autism than studies with non-matched comparison groups.

To answer these questions, we will first present a brief narrative review of the extant studies on attachment in children with autism. We are aware that this is not the first review of attachment studies regarding children with autism (see, e.g., Buitelaar, 1995; Yirmiya & Sigman, 2001). We update the review of studies on autism and attachment, and we structure the synthesis of the research to date around the specific questions mentioned above. This qualitative summary will be followed by a quantitative meta-analysis that to our knowledge is the first in this area. A quantitative analysis and synthesis of attachment studies with children with autism is needed, as narrative reviews may be insufficient to create a coherent picture (Cooper & Hedges, 1994). Specifically in the domain of research on autism and attachment each individual study is quite small, and statistically non-significant trends might nevertheless be important in a substantive way. Through meta-analysis, it is possible to detect general trends across studies, and to explain differences in findings between studies on the basis of study characteristics (Mullen, 1989; Rosenthal, 1991, 1995). In sum, in the narrative review we provide a qualitative synthesis of the empirical studies on attachment in children with autism, and in the meta-analysis we aim at tracing general trends, providing a tentative evidence- based answer to the aforementioned questions.

Method

Three search strategies were used in the identification of studies for inclusion in the narrative review and/or in the meta-analysis. First, a systematic computerised literature search within WinSPIRS, Online Contents, Dissertation Abstracts, and Web of Science was executed with the key words 'attachment' and 'autism'. Second, the references of the collected papers, book chapters and reviews on attachment and autism (e.g., Buitelaar, 1995; Yirmiya & Sigman, 2001) were searched for relevant studies. Third, experts in the field were asked to mention studies on attachment. Following these procedures, 16 studies on attachment and autism were found. Studies that assessed only maternal perception of their children's attachment behaviours (Hoppes, 1989; Hoppes & Harris, 1990; Vanmeter, 1996) were not included in the current review. For inclusion in the meta-analysis, studies should report data that allow for the computation of effect sizes for the dichotomous or continuous variable: secure versus insecure attachment. Six studies did not meet this criterion (Pantone & Rogers, 1984; Sigman & Ungerer, 1984; Sigman, Mundy, Sherman, & Ungerer, 1986; Sigman & Mundy, 1989; Shirataki, 1994; Bernabei, Camaioni, & Levi, 1998). These explorative studies in the field of attachment in children with autism focused on signs of attachment in these children, but did not measure attachment security. They are included in the narrative review, however, as some of these studies were essential in demonstrating that children with autism do develop attachment relationships with their caregivers.

Security of attachment in children with autism: a narrative review

Children with autism are impaired in reciprocity in social interaction. Nevertheless, many studies found evidence for attachment behaviours in these children, such as distress or searching for their mother during a separation (Bernabei et al., 1998; Pantone & Rogers, 1984, Sigman & Mundy, 1989, study II; but see Sigman & Mundy, 1989, study I, Sigman & Ungerer, 1984, and Spencer, 1993, for contrasting observations), or showing preference for the mother over the stranger at reunion (Bernabei et al., 1998; Pantone & Rogers, 1984; Sigman & Mundy, 1989; Sigman et al., 1986; Sigman & Ungerer, 1984). Other studies, however, report atypical behaviours of children with autism in a separation–reunion procedure, for example more contact-maintaining behaviour to the stranger, the absence of greeting at reunion, and the inability to be comforted by the mother through physical contact (e.g., Shirataki, 1994).

Attachment security. A crucial issue is whether children with autism have the same chance of establishing a secure attachment relationship with their parent as normally developing children. Studies that not only focus on the absence or presence of attachment behaviours in young children with autism, but also assess in some way the quality of attachment in these children and in comparison children without autism provide the empirical evidence that is needed to answer this question.

Four studies found rather low percentages of secure children with autism, or a substantial difference in attachment security between children with and without autism (Bakermans-Kranenburg, Rutgers, Willemsen-Swinkels, & Van IJzendoorn, 2003; Capps, Sigman, & Mundy, 1994; Pechous, 2001; Spencer, 1993). Spencer (1993) found that only 5% of the children with autism actively greeted their mother upon reunion, compared to 35% of the developmentally delayed children and 80% of the normally developing children. Children with autism less frequently attempted to approach or to stay close to their mothers, and they avoided maternal approaches more frequently than the other children. In Capps, Sigman, and Mundy's (1994) study, 40% of the children were classified as securely attached. Interestingly, mothers of children who were classified as securely attached showed greater sensitivity than mothers of children who were insecurely attached (as has been found in normal samples, see De Wolff & Van IJzendoorn, 1998). Pechous (2001) did not use the Strange Situation Procedure, but observed children with autism in 1- to 1.5-hour-long home-observations with the Attachment Q-Sort (AQS; Waters, 1987). AQS security scores are based on the sorting of 90 descriptions of child behaviour in a non-stressful situation. The sorts of the 90 items are correlated with the profile of a prototypical secure child. The mean security score was -.10 (range -.47 to .14). This score was lower than the mean security score of .29 that was found in a large sample of normal children (see NICHD, 2001).

In Bakermans-Kranenburg et al. (2003) toddlers were screened at the well-baby offices with an early screening device for autistic traits. Children were observed in the SSP, and a continuous score for attachment security was derived from the scores on Ainsworth's rating scales for proximity seeking, contact maintaining, resistance, and avoidance with the simplified Richter's algorithm (Van IJzendoorn & Kroonenberg,

1990). Children with autism had significantly lower attachment security scores than the comparison children with developmental language disorder.

In six other studies (Dissanayake & Crossley, 1996, 1997; Rogers & Dilalla, 1990; Rogers, Ozonoff, & Maslin-Cole, 1991, 1993; Shapiro, Sherman, Calamari, & Koch, 1987; Willemsen-Swinkels, Bakermans-Kranenburg, Buitelaar, Van IJzendoorn, & Van Engeland, 2000) the proportion of secure children with autism was not particularly low, or not significantly lower than the proportion of secure children in the comparison groups. Shapiro et al. (1987) found higher percentages of security in children with infantile autism (54%) or atypical PDD (50%) than in comparison groups with Developmental Language Disorder (13%) or mental retardation (33%). Dissanayake and Crossley (1996, 1997) did not find any differences in attachment behaviour following short separations between children with infantile autism, matched Down syndrome children, and matched normal children. Willemsen-Swinkels et al. (2000) used both Ainsworth et al.'s (1978) coding system for attachment security and Main and Solomon's (1990) additional coding system for disorganised attachment behaviour. The proportion of secure children with either autism or PDD-NOS but without mental retardation (63% secure; one unclassifiable child was categorised insecure as is usual) was not significantly lower than the percentage of secure children in the comparison groups (with developmentally language delayed children and normally developing children, respectively). In the group of children with both autism or PDD-NOS and mental retardation 54% were classified as secure. In three studies of Rogers and her colleagues on overlapping groups from the same clinic (Rogers & Dilalla, 1990; Rogers et al., 1991, 1993), attachment behaviour of children with autism and children with PDD was observed in a modified SSP. Child behaviours indicative of security or insecurity were translated into an overall score of security of attachment (Rogers et al., 1991). Rogers and Dilalla (1990) report a mean attachment score of 2.9 (*SD* = 1.4), on a 5-point rating scale, implying that there were signs of both attachment security and insecurity. Rogers et al. (1991) compared children with autism and PDD with children with other psychiatric diagnoses. Ainsworth's rating scales for child behaviour in the SSP (proximity seeking, contact maintaining, contact resistance and avoidance) were coded and overall security scores (see before) were assigned. The groups of children with and without autism or PDD did not differ on the overall security score, or on any of the interactive subscales. Rogers et al. (1993) found that 50% of the children with autism or PDD showed behaviours indicative of secure attachment, and that none of the children were nonattached.

In sum, four studies found rather low percentages of secure children with autism, and six studies (three of which from the same research group) reported a substantial proportion of secure children with autism, or no significant differences in security between children with autism and comparison groups.

Diagnostic criteria. The severity of the disorder may affect the prevalence of attachment security. Four studies compared attachment behaviour of children with autistic disorder to attachment of children who are classified as PDD-NOS. One study (Rogers & Dilalla, 1990) found lower security scores for children with infantile autism than for

children diagnosed as PDD (DSM-III). Three other studies (Rogers et al., 1993; Shapiro et al., 1987; Willemsen-Swinkels et al., 2000) report quite similar security scores or percentages of secure children in the groups with autism respectively PDD-NOS. These four studies are the only studies to date that present separate results for children with autism versus PDD-NOS, so only meta-analytic comparisons can provide further information regarding the issue.

Mental development. Mental development (MD) may also play a part in the development of secure attachment relationships. The association between security scores and mental development has been directly tested by Rogers and her colleagues (1991, 1993). They found that less developmentally delayed children were rated as more secure. The autistic disorder often goes together with mental retardation, so that in most studies there was a substantial difference between the mean age of the sample and the reported mental age (MA) of the children. The mean mental age of the children ranged from 16.1 months (Spencer, 1993) to 55 months (Willemsen-Swinkels et al., 2000; subgroup without mental retardation). Meta-analytical combination of studies on mentally more delayed autistic children *versus* autistic children with higher mental development may shed further light on this issue.

Chronological age. Rogers et al. (1993) hypothesised a development from insecurity to increasing signs of security, assuming later development of secure attachment in children with autism than in normally developing children. Indeed, in their studies security scores were related to chronological age (Rogers et al., 1991, 1993). Reviewing the other studies, four studies on attachment in children with autism involved toddlers (Bernabei et al., 1998; Bakermans-Kranenburg et al., 2003; Shirataki, 1994; Spencer, 1993). In three of these studies (Bakermans-Kranenburg et al., 2003; Shirataki, 1994; Spencer, 1993) children with autism scored quite low on attachment behaviour. The fourth study, however, found more attachment behaviours (as observed from home movies) between 6 and 18 months than after this age period (Bernabei et al., 1998). All other studies involved children who were older than 3 years of age, ranging from 40 months (Shapiro et al., 1987, with 54% of the children securely attached) to 69 months (Willemsen-Swinkels et al., 2000, with 63% securely attached children). These studies seem to support Rogers et al.'s (1993) notion of more security in older children with autism. A formal test of this hypothesis is included in the meta-analytic section (see below).

Matching of comparisons. The designs of the studies included in this review were divergent. Two studies only included children with autism (Capps et al., 1994; Pechous, 2001); the other studies included various comparison groups, such as developmentally delayed children (Spencer, 1993), Down syndrome children (Dissanayake & Crossley, 1996, 1997), children with a developmental language disorder (Bakermans-Kranenburg et al., 2003; Shapiro et al., 1987; Willemsen-Swinkels et al., 2000), children with other psychiatric diagnoses (Rogers et al., 1991) and/or groups with normally developing children (Spencer, 1993).

Four studies included matched comparison groups, allowing for a comparison of children with autism with children who were similar on potential biasing characteristics such as mental development or difficulties in social behaviour (associated with language delay) but differed in the absence or presence of the autistic disorder. In Rogers et al. (1991) children with autism and PDD were matched with children with other psychiatric diagnoses on cognition and language delay. The groups of children did not differ on attachment security. In Spencer (1993) children with autism were matched with both developmentally delayed children and normally developing children on mental age. Dissanayake and Crossley (1997) matched each of the individual children with autism on chronological age, sex, and birth order with normally developing children. Moreover, they included a comparison group of Down syndrome children, who were matched as a group to the children with autism on receptive language ability. Although they did not report any differences on attachment behaviour among the three groups, the second comparison group seems most adequate for the examination of differences in attachment security, and this comparison group has been used in the meta-analysis (see below). In Willemsen-Swinkels et al. (2000) children with developmental language delay were matched with children with autism on the basis of nonverbal mental skills, and normally developing children were matched on chronological age to the mental age of the children with autism. Therefore, children with autism *without* co-morbid mental retardation could be compared with normally developing children, and children with autism *and* mental retardation could be compared with children with developmental language delay.

Thus, two studies (Capps et al., 1994; Pechous, 2001) only included children with autism, ten studies included comparison groups with other psychiatric diagnoses or normally developing children, and four studies (Dissanayake & Crossley, 1997; Rogers et al., 1991; Spencer, 1993; Willemsen-Swinkels et al., 2000) included matched comparison groups, allowing for a more precise comparison of children with autism with children without autism who are similar on potential biasing characteristics.

In sum, there is ample evidence for attachment behaviours in children with autism, although impairments in responsiveness and contact seeking and maintaining are also reported. Percentages of attachment security as assessed with the SSP ranged from 40% (Capps et al., 1994) to 63% (Willemsen-Swinkels et al., 2000). Of all children with autism or PDD who were observed in the SSP (total N = 72), 53% were securely attached. In the following meta-analysis, we try to detect general trends across the studies on attachment security in children with autism.

Table 1

Studies on attachment and autism included in the meta-analysis

Authors	*Classification of Autism*	*N*	*CA*	*MD*	*Method*	*Comparison group*	*Design*[1]	*Diagnosis*[2]	*Classification of Attachment*	*Results*		
										r	*CI (95%)*	*p*
Bakermans-Kranenburg, Rutgers, Willemsen-Swinkels, & Van IJzendoorn, 2003	DSM-IV, AD	47	31.4	.61	SSP	Children with Develop-mental Language Disorder	0	1	Richters' security score (SSP)	.40	.13 ~ .62	<.01
Capps, Sigman, & Mundy, 1994	DSM-III, IA	15	48.6	.50	Modified SSP	Normative sample	0	1	ABCD	.57	.08 ~ .84	.02
Dissanayake & Crossley, 1996, 1997	DSM-III, IA	25	51.6	.56	Modified SSP	Children with Down syndrome	1	1	Proximity and social behaviour after separation/ reunion	.00	-.40 ~ .40	1.00
Pechous, 2001	DSM-IV, AD	14	48.9	.29	Observation	Normative sample	1	1	Attachment Q-Sort	.68	.23 ~ .89	<.01
Rogers & Dilalla, 1990	DSM-III, IA and PDD	55	45.0	.70	Modified SSP	--	0	.67	Ainsworth interactive subscales and an overall security score	.07	-.20 ~ .33	.62
Rogers, Ozonoff, & Maslin-Cole, 1991	DSM-III,IA and PDD	34	47.6	.82	Modified SSP	Other psychiatric diagnoses	1	.65	Ainsworth interactive subscales and an overall security score	-.02	-.36 ~ .32	.91
Rogers, Ozonoff, & Maslin-Cole,	DSM-III, IA and PDD	32	42.6	.74	Modified SSP	--	0	1	Ainsworth interactive subscales and	.18	-.18 ~ .50	.31

1993									an overall security score			
Shapiro, Sherman, Calamari, & Koch, 1987	DSM-III, IA and PDD	36	41.4	.71	Modified SSP	Children with Developmen-tal Language Disorder or Mental Retardation	0	.60	ABC	-.32	-.59 ~ -.01	.05
Spencer, 1993	ICD-10, childhood autism	40	30.4	.53	Modified SSP	Developmentally delayed children	1	1	Reaction on separation and reunion	.38	.07 ~ .62	.01
Willemsen-Swinkels et al., 2000	DSM-IV, AD and PDD-NOS (overall classification PDD)				Modified SSP				ABCD			
	DSM-IV; PDD + MR	32	67	.36		Children with Developmen-tal Language Disorder	1	.92		.33	-.02 ~ .61	.06
	DSM-IV; PDD	38	69	.80		Normally developing children	1	.58		.17	-.15 ~ .47	.28

[1] matched comparison of the autistic sample

[2] proportion of children with autism in the sample (infantile autism/childhood autism/ autistic disorder versus PDD(-NOS))

Meta-analysis on attachment security in children with autism

In the narrative review 16 studies have been described. For inclusion in the meta-analysis, the contrast between secure and insecure attachment was critical. Attachment was defined in terms of secure versus insecure, because most studies did not report more differentiated classifications. This selection procedure yielded ten studies on attachment and autism (see Table 1).

Meta-analytic procedures. In a meta-analysis, the unit of analysis is the outcome of the studies on attachment in autism. In our case, the relevant outcome was the effect size for the comparison of attachment security between the autistic group and a comparison group. In meta-analysis data is usually based on different sample sizes in the various studies, and therefore the homogeneity of variance required for conventional statistics is lacking (Mullen, 1989; Rosenthal, 1991). In the current meta-analysis, the statistics presented in the studies (such as the correlation coefficient (r), chi-square (χ^2), probability level (p), and t -distribution (t)) were transformed into common metrics of effect size, namely Pearson's correlation coefficient r, and a combined effect size across all studies was computed. The 95% confidence intervals around the point estimate of an effect size were also computed (see Table 1).

Tests for homogeneity of study results were applied in order to check whether such results were sampled from different populations. Borenstein, Rothstein, and Cohen's (2000) Comprehensive Meta-Analysis (CMA) program computed fixed as well as random effect model parameters. Significance tests and moderator analyses in fixed effects models are based on the assumption that differences between studies leading to differences in effects are not random, and that, in principle, the set of study effect sizes is homogeneous at the population level. Significance testing is based on the total number of subjects, but generalisation is restricted to other participants that might have been included in the same studies of the meta-analysis (Rosenthal, 1995). In random effects models significance testing is based only on the total number of studies and generalisation is to the population of studies from which the current set of studies was drawn (Rosenthal, 1995).

It has been argued that random effects models more adequately mirror the heterogeneity in behavioural studies, and use non-inflated alpha levels when the requirement of homogeneity has not been met (Hedges & Olkin, 1985). We decided to present the combined effect sizes and their confidence intervals in the context of fixed or random effects models depending on the outcome of the pertinent homogeneity test. The Q-statistics are presented to test the homogeneity of the specific set of effect sizes, and to test the significance of moderators (Rosenthal, 1995; Mullen, 1989; Borenstein et al., 2000). In our series of meta-analyses some data sets were heterogeneous. In those cases, the random effects model parameters (significance, confidence intervals) are somewhat more conservative than the fixed effects parameters, and the moderator tests (based on the fixed effects) should be considered to be descriptive of the specific set of studies at hand (Rosenthal, 1995).

Finally, we tried to explain the variability of the effect sizes on the basis of relevant predictor variables derived from the narrative review. The following

predictors were included in the meta-analysis: (a) proportion of children with autism in the sample (infantile autism/childhood autism/autistic disorder versus PDD(-NOS), (b) mental development (average mental age of the children divided by the average chronological age of the children), (c) average chronological age of the children, (d) matching (did the study include a matched comparison group), and (e) year of publication.

Matched groups make comparisons with the attachment security of children with autism more precise. In the studies that did not include a comparison group, the distribution of (in-)security in the group of children with autism was compared with the normative distributions (for ABC-classifications based on 21 samples with 1,584 infant–parent dyads, Van IJzendoorn et al., 1992; and for ABCD-classifications based on 15 samples with 2,104 infant–parent dyads, Van IJzendoorn et al., 1999). When a study described more comparison groups, mental development was taken as the criterion for selecting one or the other comparison group. Autistic groups with mainly mentally retarded subjects were compared with children with developmental problems (children with Down syndrome or language delay), while autistic children without mental retardation were compared with normal children.

Meta-analytic decisions. In the study of Shapiro et al. (1987) we contrasted atypical PDD and AD with developmental language disorder and mentally retarded children. The Strange Situation yielded ABC-classifications, and we included the comparison between secure (B) and insecure (A and C) children. The children with autism in the Rogers study (Rogers & Dilalla, 1990; Rogers et al., 1991) were contrasted with the comparison group of psychiatrically and intellectually impaired children from the Rogers et al. (1991) report. In Rogers et al. (1993) a correlation between the CARS (Schopler, Reichler, DeVellis, & Daly, 1980; Schopler, Reichler, & Renner, 1988) and the security score was given. Because the three Rogers reports involve overlapping groups from the same clinic, the outcomes of the three papers were combined and the combined effect size was included in further analyses.

Spencer (1993) gave overall ratings of reunion behaviour, which was considered to be most comparable to attachment security as indexed by the Strange Situation classifications. The distinction between secure and insecure children in Spencer's study was based on the distribution of attachment security in normal children (Van IJzendoorn et al., 1992). The scores for 'actively greets mother' were contrasted with the scores for 'contacts mother in limited way' and 'fleeting or no contact with mom'. The children with autism were compared with the developmentally delayed group. In the study by Capps et al. (1994) all children with autism received a primary classification of D. To differentiate between the children, they were sub-classified as secure (B), insecure-avoidant (A), insecure-resistant (C) or disoriented (D) or unclassifiable. The distinction between secure and insecure was based on the contrast between the B-classifications versus the A, C, D, and unclassifiable categories. The resulting distribution was compared with the normative distribution (Van IJzendoorn et al., 1999).

Dissanayake and Crossley (1997) reported no significant difference between children with autism and the comparison groups of either normal or Down syndrome children (the latter group being the most adequate comparison group). The effect size for the study was thus fixed at r = .00 (Mullen, 1989). For meta-analytic purposes, the study of Willemsen-Swinkels et al. (2000) was subdivided in two autistic sub-groups. The AD/PDD-NOS children *with* mental retardation were compared with children with a language disorder, and the AD/PDD-NOS children *without* mental retardation were compared with children with a normal development. The AQS security scores of the children in Pechous' (2001) study were compared to the mean AQS security score of the largest normative sample available (NICHD, 2001). Pechous' (2001) study also included an attachment-based intervention, aimed at enhancing the mothers' sensitivity to their children's signals. The intervention was rather successful; the mean security score in the intervention group was .35 (range -.12 to .60). However, because the intervention explicitly aimed at promoting attachment security, the intervention restricts the comparability of the results for this subgroup with the results from other studies. Therefore, we excluded the attachment intervention group from the meta-analysis.

Results

Autism and attachment: combined effect size

The main question for the current meta-analysis was: 'do children with autism differ from children without autism with regard to attachment security?' The meta-analytic answer was that children with autism indeed were less securely attached to their parents than children without autism. The meta-analysis (N = 287) resulted in an effect size of r = .24 (*CI* .04-.43, random model). The set of outcomes was heterogeneous (Q (df = 8) = 21.65, p < .01). In particular, the Shapiro et al. (1987) study showed a deviating effect size (r = -.32). The fixed effect size (r = .22) was not much different from the random effect size, but in case of heterogeneous sets of studies the random parameters are to be preferred (see above). In line with Cohen (1988), who indicated moderate effect sizes as ds of .50, we may interpret this outcome as a moderate effect of autism on attachment security, that is, children with autism were significantly less secure than comparison children without autism (the combined effect was comparable to a d of about .50). The combined effect of r = .24 suggested that children with autism score about one-half of a standard deviation lower on attachment security than the comparisons without autism.

Explaining variation between studies

As the set of studies was heterogeneous it was important to test the associations with predictor variables in order to explain the variation between the studies (Mullen, 1989).

Diagnostic criteria. Autism was not equally strictly defined in all studies, and in some studies children with autism were mixed with children with PDD(-NOS). We compared studies that included infantile autism/autistic disorder/childhood autism and studies that also included children with PDD(-NOS), see Table 2.

Table 2
Moderators of effect sizes for studies on attachment and autism

	k	*N*	*r*	*95 % CI*	*Q homogeneity*	*p*[1]
Total set	9[2]	287	.24*	(.04 ~ .43)	21.65	<.01
Diagnosis					7.45[3]	<.01
Autism / PDD	4	146	.06[4]	(-.11 ~ .22)	7.89	
Autism	5	141	.38***[4]	(.22 ~ .52)	6.31	
Mental development					10.41[3]	<.01
< .70	6	173	.37***[4]	(.23 ~ .50)	6.37	
> .70	3	114	-.02[4]	(-.21 ~.17)	4.87	
Chronologial age					1.20[3]	.27
Below median	4	163	.14	(-.22 ~ .47)	13.34**	
Median or above	5	124	.29**[4]	(.11 ~ .45)	7.11	
Design						
Matched					0.17[3]	.68
Yes	4	135	.24*[4]	(.07 ~ .40)	2.60	
No	5	152	.28	(-.12 ~ .61)	18.88***	
Publication Year					2.40[3]	.12
Before 1995	4	131	.17	(-.25 ~.53)	12.93**	
1995 or later	5	156	.30**[4]	(.15 ~ .44)	6.31	

* $p < .05$, ** $p < .01$

[1] *p*-value for the test of the contrast between subgroups of studies

[2] after meta-analytic combination of the three Rogers' studies (Rogers & Dilalla 1990; Rogers et al, 1991; 1993)

[3] *Q*-value for the contrast between subgroups of studies

[4] fixed effect

The five studies with IA/AD/childhood autism (n = 141) yielded a larger combined effect size (r = .38) than the four studies (n = 146) with the broader defined criteria (IA/PDD according to DSM-III or AD/PDD-NOS according to the DSM-IV) (r

= .06). The difference was significant (Q (df = 1) = 7.45, p < .01). The more strictly autism was defined, the larger were the effects on attachment, that is, the more insecure the children were compared to children without autism. This moderator (autism versus PDD(-NOS)) divided the total set of studies into two homogeneous subsets (Q (df = 4) = 6.31, p = .18, and Q (df = 3) = 7.89, p = .05). The combined effect sizes reported for the two subsets were, therefore, based on the fixed model.

Mental development. Mental development of the children with autism appeared to be more important. When we divided the set of studies in those studies in which the quotient of mental to chronological age was less than .70 (k = 6, n = 173), and those samples reaching .70 or more (k = 3, n = 114), we found a much stronger effect size for the former set of studies. In the six studies with children who were more mentally delayed the combined effect size amounted to r = .37, whereas in the three studies with less delayed children the combined effect size was r = -.02. The contrast between these effect sizes was significant (Q (df = 1) = 10.41, p < .01). Both sub-sets of studies were homogeneous (Q (df = 5) = 6.37, p = .27, and Q (df = 2) = 4.87, p = .09). The combined effect sizes reported for the two subsets were, therefore, based on the fixed model. In fact, in samples including children with autism with a higher mental development, we did not find a significant association between autism and attachment security. Only in samples with mentally more delayed children with autism did these children appear much less secure than their comparisons without autism.

Chronological age. Chronological age was suggested to be important as children with autism might develop secure patterns of attachment at a later stage. Chronological age was split at the median. The contrast was not significant (Q (df = 1) = 1.20, p = .27): studies with younger children (r = .14, k = 4, n = 163) did not show higher effect sizes for attachment security than studies with older children (r = .29, k = 5, n = 124). Younger children with autism were thus not more often insecure than their counterparts without autism in comparison with older autistic children and their counterparts.

Matching. The design of the study (matched versus non-matched) did not explain the variability of effect sizes. The four studies with matched groups (n = 135) yielded a smaller combined effect size (r = .24) than the five studies (n = 152) with non-matched groups (r = .28) (random effects model). Thus, the effects of autism on attachment tended to be smaller in studies with more carefully matched comparisons, but this difference was not significant (Q (df = 1) = .17, p = .68).

Publication year. The predictor 'year of publication' (publication year was 1995 or later versus earlier studies) showed a trend that more recent studies uncovered larger effect sizes (r = .30, k = 5, n = 156) than less recent studies (r = .17, k = 4, n = 131), but the contrast was not significant (Q (df = 1) = 2.40, p = .12).

Discussion

Many children with the autistic disorder, or diagnosed with the broader PDD(-NOS) concept, show signs of attachment security, despite their impairment in reciprocal social interaction. In several studies the children display less contact seeking and contact maintaining with their mothers than control children. However, they demonstrate clear preference for their mothers over a stranger and many of them show an increase in proximity seeking with their mothers after a separation. Pervasive Developmental Disorders may alter the behavioural patterns that express attachment security (Rogers et al., 1993), but they seem not to preclude the development of secure attachment relationships. In fact, 53% of all children with autism or PDD showed attachment security (between 40% and 63% across the different studies that used the Strange Situation Procedure). Nevertheless, the meta-analysis showed that children with the autistic disorder or with PDD(-NOS) are less often securely attached to their parents than children without the autistic disorder, and the effect size is rather substantial (r = .24). The outcomes of the studies varied, probably due to the heterogeneity of the included samples that used different measures, different diagnoses, and various comparison groups. The power of meta-analysis lies exactly in finding significant contrasts within these heterogeneous sets. In searching for significant moderators of the variability, we found that two factors were critical: 1) whether samples consisted of children with autism only; and 2) whether children with autism were more mentally delayed. Both moderators led to homogeneous sub-sets of studies, and thus can be considered important factors explaining the diversity of effect sizes. Autism only (apart from the more broadly defined PDD(-NOS)) is associated with substantially more insecurity, as is the combination of autism and mental retardation. It should be noted that the set of studies on autism and attachment is rather small, and thus the power to find significant effect sizes and significant moderators seems small as well. Nevertheless, we found a significant overall effect size, and two significant moderators, for which the meta-analytical power evidently was sufficient. It should be noted that the two moderators – mental development and diagnosis – may not be completely independent (a substantial proportion of the children with autism are mentally delayed as well), but they generate only partially overlapping subsets of studies in the meta-analyses and therefore allow for detecting their moderating effect.

Starting with the first important moderator – diagnostic criteria – we found evidence that children with more strictly defined autism are less securely attached and show less responsiveness in their contact with the caregivers. This may indicate that parents of children with the autistic disorder 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. Concerning the second important moderator – mental development – we failed to find a difference in attachment security between the children with autism that displayed higher mental development and their comparisons. In fact, only the autistic children with lower mental development showed more signs of insecurity than their comparisons. Based on this finding we may

conclude that the construction of an internal working model of attachment relationship in children with both pervasive developmental disorders *and* mental retardation may develop differently from children without autism. Yirmiya and Sigman (2001) suggest that children with autism show most difficulties with behaviours that necessitate a working model of the self, the other, and their interdependence, and Rogers et al. (1991, 1993) have argued that the construction of an internal working model may be a difficult task for children with autism. Dissanayake and Sigman (2001) indicate that the impairment in emotional understanding and responsiveness may be overcome by compensatory cognitive strategies utilised by higher-functioning individuals, but they note that these strategies may not fully compensate for the observed deficits. It should be noted that chronological age was not a significant moderator, contrary to our expectation (see Rogers et al., 1993), but a less impaired mental development certainly helped to decrease the difference in attachment security between autistic/PDD(-NOS) and comparison children. The classification of attachment in the Strange Situation is based on the assumption that the child is able to give meaning to the parent's departure, and as a consequence he or she may show secure attachment. The Central Coherence theory emphasises the problems in sense-making of children with autism (Frith, 1989; Happé, 1994; Noens & Van Berckelaer-Onnes, in press). From this point of view, it is not surprising that mental development affects the construction of the internal working model of the attachment relationship.

It should be noted that the narrative review did not point unequivocally to mental development and diagnostic criteria as the most important factors in determining the chances of establishing a secure attachment relationship for children with autism. The narrative review suggested an association between chronological age and security, but Rogers et al.'s (1993) notion of more security in older children with autism was not confirmed meta-analytically. It was mental development that was of overriding importance in distinguishing studies with normative rates of attachment security from studies with low percentages of secure children with autism. Reviewing the role of diagnostic criteria, we found only four studies that reported on separate groups with children diagnosed as autistic or PDD(-NOS). One of these studies indeed found that security ratings for children with infantile autism were lower than for children diagnosed as PDD (Rogers & Dilalla, 1990), but the three other studies did not point to a difference between the two diagnostic groups (Rogers et al., 1993; Shapiro et al., 1987; Willemsen-Swinkels et al., 2000). Meta-analysis turned out to be an essential tool for detecting the significant influence of diagnostic criteria across studies.

Because only two studies reported on disorganised/disoriented attachment behaviour in children with autism (Capps et al., 1994; Willemsen-Swinkels et al., 2000), we are not able to address the question of whether disorganised attachment is over-represented in samples of children with autism. Some disorganised behaviours may be inherent to the autistic disorder, in particular to the problems in sense-making. Vaughn and his colleagues (1994) found that in Down children behavioural dysfluencies resulting from the Down syndrome may easily be confused with real signs of disorganisation, and they suggested that valid application of the Strange Situation procedure may require some basic cognitive abilities in the children who are assessed

(see also Pipp-Siegel et al., 1999). The same restriction in the applicability of the SSP may pertain to children with autism co-morbid with severe mental retardation. Nevertheless, we found significantly more physiological stress reactivity (heart rate variability) in disorganised children with autism compared to non-disorganised children (Willemsen-Swinkels et al., 2000). Thus, the concept of attachment security and attachment disorganisation may be used in a valid way in children with autism even when they are mentally retarded.

In normally developing children maternal sensitivity is found to promote attachment security (De Wolff & Van IJzendoorn, 1997). Unfortunately, we could not meta-analytically explore the influence of parental sensitivity on attachment security in children with autism, because only one study included a measure of maternal sensitivity (Capps et al., 1994). Capps et al. (1994) reported that mothers of children with autism who were sub-classified as securely attached displayed greater sensitivity than mothers of children with autism who were sub-classified as insecurely attached. If sensitive parents are able to promote secure attachment relationships with their children with autism, this may function as a protective factor and provide children with autism a better prognosis for social development (Capps et al., 1994; Willemsen-Swinkels et al., 2000). Longitudinal, prospective studies starting early in the autistic child's life may be crucial for disentangling the different roles of parental sensitivity and children's autistic impairments in the emergence of the first attachment relationships.

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3

Autism and attachment: The Attachment Q-sort[2]

Abstract

Children with autism are able to show secure attachment behaviours to their parents/caregivers. Most studies on attachment in children with autism used a (modified) Strange Situation Procedure (SSP; Ainsworth, Blehar, Waters, & Wall, 1978) to examine attachment security. An advantage of the Attachment Q-sort (AQS; Waters 1995) over the SSP is that it can be attuned to the secure-base behaviour of children from special populations. In this study experts in the field of autism (both clinicians and researchers; N = 59) defined an AQS for children with autism. Separate criterion sorts were defined for the social subtypes aloof and active-but-odd (Wing & Gould, 1979), but the two criterion sorts could be combined into one AQS for children with autism. It is concluded that with minor amendments the original Attachment Q-sort (Vaughn & Waters, 1990; Waters, 1995) is applicable in observing attachment behaviour of children with autism.

[2] Rutgers, A. H., Van IJzendoorn, M. H., Bakermans-Kranenburg, M. J., & Swinkels, S. H. N. (submitted).

Autism is characterized by impairments in reciprocal social interaction, communication and the presence of stereotyped behaviour, interest, and activities (DSM-IV; APA, 1994). Nevertheless, review studies on attachment in children with autism indicate that children with autism are able to form secure relationships with their attachment figures (see Buitelaar, 1995; Yirmiya & Sigman, 2001). Buitelaar (1995) emphasizes that children with autism are able to show preferentional proximity seeking and reunion behaviour to the attachment figure after separation. A recent meta-analysis of studies on attachment in children with autism (Rutgers, Bakermans-Kranenburg, Van IJzendoorn, & Van Berckelaer-Onnes, 2004) shows that in comparison with children without autism, children with autism were significantly less securely attached to their parents/caregivers. However, differences between children with and without autism disappeared when children with autism had higher levels of functioning or when the children were diagnosed with less severe autistic symptoms.

Most studies of attachment in children with autism were designed for laboratory settings, in which attachment behaviours were measured under stressful conditions (e.g. Rogers & Dillala, 1990; Shapiro, Sherman, Calamari, & Koch, 1987) or in free play (Sigman, Mundy, Sherman, & Ungerer, 1986). Most studies on attachment in children with autism used an adapted version of the Ainsworth Strange Situation Procedure (SSP; Ainsworth, Blehar, Waters, & Wall, 1978), a standardized procedure involving a standard sequence of separations from and reunions with the caregiver. Although predicted associations between maternal sensitivity and child attachment security as assessed in the SSP were found in one of the studies (Capps, Sigman, & Mundy, 1994), the ecological validity of these laboratory studies may be a subject for debate in the case of children with autism. Information regarding attachment behaviours that are specific for children with autism in a naturalistic setting may provide useful additional information or may even be preferred over stressful laboratory settings.

Measuring Attachment in Autism

'Attachment security', defined as trust in the availability of the attachment figure (Ainsworth et al., 1978), must be inferred from behaviour that is observable. The SSP (Ainsworth et al., 1978) has become the classic measure by which the child-attachment figure relationship is defined (Cassidy & Shaver, 1999). Also in children with autism a (modified) Strange Situation is generally used as a measure for attachment (e.g. Capps et al., 1994; Willemsen-Swinkels, Bakermans-Kranenburg, Buitelaar, Van IJzendoorn, & Van Engeland, 2000). In the SSP, an average of 53% of the children with autism has been classified as securely attached to their parent/caregiver (Rutgers et al., 2004).

Buitelaar (1995) noticed in his review that in most studies of children with autism that used the SSP, the children were chronologically and mentally older than the upper-bound of about 20 months for which the SSP was designed. Furthermore, unexpected separations with their parents/caregivers in an unfamiliar situation can be very stressful for children with autism, as they are vulnerable to disruptions in daily routines (Van Berckelaer-Onnes, 1983). As a result, the majority of the studies applied a

modified SSP, e.g. one separation or shortened separations. But the use of a modified SSP further complicates the interpretation of the findings and hampers the comparison of these studies with normative studies in attachment (Buitelaar, 1995).

As an alternative to the SSP, Waters and Deane (1985) introduced the Attachment Q-Sort (AQS; Waters, 1987). The AQS attachment security is based on naturalistic observations of parent-child interactions and can be applied to children from 12 to 48 months of age (Vaughn & Waters, 1990). The 90 AQS-items (Vaughn & Waters, 1990) reflect behavioural descriptions of children in a natural setting; these include secure-base behaviours as well as behaviours unrelated to attachment security, e.g. motor maturity or temperament. After observation (for recommendations regarding the observational setting see Waters, 1995), the items should be sorted into nine piles, depending on whether the description is characteristic or not characteristic for the child's behaviour. On the basis of experts in the field of attachment theory, a criterion sort for attachment security has been developed by averaging the experts' scores for an ideally secure child. Also for constructs like sociability and dependency criterion sorts have been developed (Waters, 1995). A child's security score is assessed by the correlation of the observer's AQS of the specific child and the attachment security criterion sort.

The use of the AQS has some advantages over the use of the SSP. We already referred to the higher ecological validity, as the AQS is applied in a natural setting instead of in a laboratory, and to the broader age range for which the AQS can be used. Another advantage is that the AQS is less intrusive than the SSP because a standard sequence of separations and reunions has been avoided. As a result, the AQS can be applied more frequently, for example in studies that want to measure short-term effects of a treatment program. Furthermore, the AQS provides not only assessments of secure-base behaviour but also of sociability, dependency, and other constructs that may be indexed by a sub-set of the 90 items. Lastly, as the criterion sort for the prototypical secure-base behaviour can be adapted by a team of experts, the AQS can be attuned to children from special populations (see Van IJzendoorn, Vereijken, Bakermans-Kranenburg, & Riksen-Walraven, 2004).

Research with the Attachment Q-sort in Children with Autism

Two studies used the Attachment Q-sort (Vaughn & Waters, 1990; Waters, 1995) to assess attachment in children with autism. Pechous (2001) examined the quality of attachment security in fourteen children with autism. Half of the children and their parents participated in a treatment program. The children's ages ranged from 28 to 80 months. The Attachment Q-sort security scores, the average score of two observers, were based on 1 to 1.5 hour long home observations. Pechous (2001) reported only post-treatment attachment security scores; the intervention group demonstrated significantly higher attachment scores than the non-treatment group.

Second, Brauner (2003) also examined the effects of a treatment program in children with autism. The mother-child, father-child and combined family attachment relationships of six families were rated by the therapist/researcher and a co-therapist. Three therapy sessions in the first half and three therapy sessions in the second half of

the attachment-oriented family therapy were compared. Brauner (2003) reported on combined attachment scores: four families showed more attachment security, while two families still showed the same level of attachment security after intervention. The children in the program were between 64 and 80 months of age.

Both studies (Brauner, 2003; Pechous, 2001) used the original criterion sort (Waters, 1995), a criterion sort composed for children from a normative sample. An important question is whether these children's attachment-behaviours have the same behavioural profile of attachment security as normally developing children in a natural setting. Children with autism may show differential attachments in more subtle ways than non-clinical children as they are not always inclined to display strong proximity seeking behaviour at reunion with their parent or caregiver (Willemsen-Swinkels et al., 2000). It is urgent to examine if the distribution of the original criterion sort for the 'optimal secure child' is also applicable for children with autism. As autism is characterized by heterogeneity of the disorder, we wonder if the behavioural descriptions will be the same for different social subtypes of autism (Wing & Gould, 1979).

Social Subtypes in Autism

Wing and Gould (1979) presented a subclassification that differentiated children with autism according to particular patterns of social behaviour. Three subtypes are identified on the basis of the quality of social interaction: aloof, passive and active-but-odd. Socially aloof children are characterized by indifference or rejection of social initiative made by others. The passive social subtype also shows no tendency to socially interact with others, though they do not actively reject social approaches from others. Children who fall within the active-but-odd subtype are characterized by the willingness to make social approaches, but their social interaction can be described as odd and egocentric.

Several studies support the existence of the three social subtypes (Castelloe & Dawson, 1993; Volkmar, Cohen, Bregman, Hooks, & Stevenson, 1989), although the social subtypes aloof and active-but-odd represent the most validated subtypes (e.g. Borden & Ollendick, 1994; O'Brien, 1996). Some studies (e.g. Borden & Ollendick, 1994; Castelloe & Dawson, 1993) replicated the original finding that subgroup classification was related to severity of autism. Volkmar et al. (1995), however, were not able to replicate findings from the Wing and Attwood study (1987) in which subgroup classification corresponded to the traditional (DSM-) diagnostic categories.

Several studies underline the important role of level of functioning in differentiating between subtypes (Borden & Ollendick, 1994; Waterhouse et al., 1996). In general, high cognitive functioning is more common in the active-but-odd children, while low functioning is most likely found in the aloof children. In addition, Volkmar's (1989) results suggest that, although cognitive functioning is important in subtype assignment, social subtyping itself reflects a special contribution. Next to developmental level, chronological age has been suggested to be related to subgroup classification (Volkmar et al., 1989). Younger children were more likely to fit in the aloof social subtype, while older children showed social behaviour according to the

active-but-odd subtype. Beglinger and Smith (2001) note that longitudinal studies found comparable results, but due to methodological differences between studies it is difficult to conclude if there is a relation between social subtype of autism and developmental level.

In sum, in our study we examine if the original Attachment Q-sort is applicable for children with autism. On the basis of experts' criterion sorts, we will define an AQS for children with autism. A distinction will be made for social behaviour that is characteristic for aloof children and behaviour that is shown by active-but-odd children. We will explore at item-level if the distribution for a prototypical secure child with autism is similar to the criterion sort of the original AQS. Thus, our main question is whether it is warranted to use the original AQS for children with autism, as in the studies of Pechous (2001) and Brauner (2003), or whether a specific criterion sort should be used for children with autism?

Method

Participants and Procedure

Forty-two Dutch clinical experts and 17 international research experts in the field of autism defined the construct of attachment in children with autism. In Table 1 information about the background of the experts is provided. As it may be difficult to refer to the 'prototypical secure' child with autism because these children are characterized by an impairment in reciprocal social interaction, experts were asked to sort the AQS for an 'insecurely attached child with autism'. Experts were assigned to define the AQS either for the subtype aloof or the subtype active-but-odd. Descriptions of attachment (Ainsworth, 1973; Bowlby, 1969/1982), autism (DSM-IV; APA, 1994) and the two social subtypes of autism (Prizant & Schuler, 1987) were provided.

Table 1
Background variables of the experts

	Total (N = 59)	*Clinicians (n = 42)*	*Researchers (n = 17)*
Gender			
Female %	84.7	85.7	82.4
Self children %[1]	55.9[1]	50.0[1]	76.5
Age (years)[1]			
M	41.4[1]	41.1[1]	41.9
SD	10.8	10.0	12.7
Experience with children with autism (years)[1]			
M	10.7[1]	9.6[1]	13.2
SD	9.0	7.4	11.8

[1] two missing values

The Dutch clinicians were visited at their workplace, and the international researchers were sent instructions by mail. All experts received the same comprehensive written instructions on the AQS sorting. First, experts were instructed to familiarize themselves with the 90 attachment Q-sort cards (Vaughn & Waters, 1990; Waters, 1995). Second, they were asked to distribute the items in groups that fit well, items that fit somewhat or are not applicable, and items that do not fit well with the image they have of the insecure child with autism. Next, these three groups were subdivided into three consecutively numbered piles. As a result nine piles ranging from 'does not fit at all with the image of an insecure child with autism' to 'fits very well with the image of an insecure child with autism' were formed. Last, the items were sorted so that there were 10 attachment Q-sort cards in each of the nine piles.

Twenty-one clinical experts and 7 research experts sorted the AQS for the social subtype aloof, and 21 clinical experts and 10 research experts sorted the AQS for the social subtype active-but-odd. The correlations among the aloof sorts ranged from .09 to .85 (M = .53, SD = .13), and from -.22 to .80 (M = .46, SD = .18) among the active-but-odd sorts. Correlations among the sorts of all experts ranged from -.22 to .85 (M = .48, SD = .17). Internal consistency reliability (Cronbach's alpha) for all sorts was .98 (N = 59), for the aloof sorts internal consistency was .97 (N = 28) and for the active-but-odd sorts internal consistency was .96 (N = 31).

Statistical Analysis

First, item placements for attachment security in children with autism were computed; separate Q-sort item placements were computed for the social subtypes aloof and active-but-odd. Since experts were asked to sort the AQS for an insecure child with autism, expert's item placements were reversed. Second, Pearson correlation between the original Attachment Q-sort (Vaughn & Waters, 1990; Waters, 1995) and the newly composed Attachment Q-sort for children with autism was computed. Also, we tested with analyses of variance, with Bonferroni alpha corrections, which mean item-placements differed significantly for the aloof and the active-but-odd subtypes. Fourth, Pearson correlations between the criterion sort of attachment in children with autism and the original criterion sort of dependency were computed to explore the discriminant validity. Last, in the meta-analytic program CMA (Borenstein, Rothstein, & Cohen, 2000) the expert's correlations with the original criterion sort were imputed, with the number of AQS-items as sample size (N = 90). We used meta-analytic procedures because each expert sort can be considered as a study outcome based on 90 observations (the 90 items). Moderator analyses were performed in order to examine whether they could significantly explain the variability of the effect sizes. The following moderators were included: (a) gender, (b) type of expert (clinicians/researchers), (c) age of the experts, (d) years of the experts' experience with children with autism, (e) whether the experts had children themselves, and (f) the social subtype that the experts sorted (aloof/active-but-odd). Homogeneity of the specific set of effect sizes and the significance of the moderators were tested with Q-statistics (Rosenthal, 1995; Mullen, 1989; Borenstein et al., 2000). When the data-set was heterogeneous the more conservative tests for random instead of fixed effects were presented. Two clinicians

did not report on background variables, the mean values were imputed for these missing data.

Results

The mean item placements for children with autism and for the separate social subtypes aloof and active-but-odd are presented in Table 2. Both social subtypes were combined into one criterion sort for children with autism, because they both correlated .98 with the combined criterion sort for children with autism. Only one item differed significantly when the aloof and the active-but-odd subtypes were compared. The item 'When he is upset or injured, child will accept comforting from adults other than mother' was placed higher in the active-but-odd criterion sort (i.e. was considered more descriptive of a secure child with autism) in comparison with the aloof criterion sort. The criterion sort for the aloof subtype correlated .93 with the criterion sort for the active-but-odd subtype.

Table 2

Criterion sort for autism and the subtypes aloof and active-but-odd

Item	*Item Description*	*Original AQS*	*Autism (N = 59)*	*Aloof (n = 28)*	*Active-but-odd (n = 31)*
			M (SD)	*M (SD)*	*M (SD)*
01	Child readily shares with mother or lets her hold things if she asks to	8.0	7.0 (1.5)	7.1 (1.4)	6.9 (1.6)
02	When child returns to mother after playing, he is sometimes fussy for no clear reason	1.8	2.8 (1.7)	2.8 (1.5)	2.9 (1.8)
03	When he is upset or injured, child will accept comforting from adults other than mother	4.8	4.7 (2.7)	3.4 (2.4)*	6.0 (2.4)*
04	Child is careful and gentle with toys and pets	6.2	6.6 (1.7)	6.1 (1.6)	6.9 (1.7)
05	Child is more interested in people than in things	6.3	6.5 (1.7)	6.6 (1.8)	6.4 (1.6)
06	*When child is near mother and sees something he wants to play with, he fusses or tries to drag mother over to it*	2.2	4.5 (2.3)	5.3 (2.3)	3.8 (2.2)
07	Child laughs and smiles easily with a lot of different people	4.3	5.4 (2.3)	4.6 (2.3)	6.0 (2.2)
08	When child cries, he cries hard	3.3	2.7 (1.5)	2.8 (1.4)	2.7 (1.7)
09	Child is lighthearted and playful most of the time	6.5	6.5 (1.7)	6.2 (1.7)	6.8 (1.8)
10	Child often cries or resists when mother takes him to bed for naps or at night	2.3	2.6 (1.4)	2.8 (1.4)	2.5 (1.5)
11	Child often hugs or cuddles against mother, without her asking or inviting him to do so	7.5	6.3 (2.6)	7.1 (2.2)	5.5 (2.6)

12	Child quickly gets used to people or things that initially made him shy or frightened him.	6.0	6.9 (1.7)	6.7 (1.9)	7.1 (1.5)
13	When the child is upset by mother's leaving, he continues to cry or even gets angry after she is gone	2.7	2.9 (2.1)	2.8 (2.1)	3.0 (2.1)
14	When child finds something new to play with, he carries it to mother or shows it to her across the room	7.8	7.6 (1.4)	7.9 (1.2)	7.2 (1.6)
15	Child is willing to talk to new people, show them toys, or show them what he can do, if mother asks him to	7.7	7.3 (1.3)	7.5 (1.3)	7.2 (1.4)
16	Child prefers toys that are modeled after living things	5.2	5.9 (1.5)	5.6 (1.5)	6.3 (1.6)
17	Child quickly loses interest in new adults if they do anything that annoys him	3.5	3.3 (1.6)	3.6 (1.9)	2.9 (1.3)
18	Child follows mother's suggestions readily, even when they are clearly suggestions rather than orders	8.5	7.1 (1.5)	7.1 (1.4)	7.0 (1.5)
19	When mother tells child to bring or give her something, he obeys	7.7	6.7 (1.7)	6.9 (1.6)	6.4 (1.8)
20	Child ignores most bumps, falls, or startles	4.2	3.3 (1.9)	3.3 (1.9)	3.2 (1.9)
21	*Child keeps track of mother's location when he plays around the house*	8.8	6.1 (2.6)	7.1 (2.1)	5.2 (2.8)
22	Child acts like an affectionate parent toward dolls, pets, or infants	6.5	7.2 (1.6)	7.1 (1.6)	7.3 (1.5)
23	When mother sits with other family members, or is affectionate with them, child tries to get mom's affection for himself	2.7	3.7 (2.0)	4.4 (1.9)	3.0 (2.0)
24	When mother speaks firmly or raises her voice at him, child becomes upset, sorry, or ashamed about displeasing her	4.5	4.5 (2.4)	4.9 (2.4)	4.2 (2.4)
25	Child is easy for mother to lose track of when he is playing out of her sight	2.0	2.9 (2.2)	2.4 (2.1)	3.3 (2.2)
26	Child cries when mother leaves him at home with babysitter, father, or grandparent	3.3	4.2 (2.7)	4.5 (2.9)	4.0 (2.6)
27	Child laughs when mother teases him	6.3	7.1 (1.4)	6.9 (1.5)	7.2 (1.3)
28	Child enjoys relaxing in mother's lap	7.5	7.6 (1.6)	7.8 (1.5)	7.5 (1.6)
29	At times, child attends so deeply to something he doesn't seem to hear when people speak to him	4.3	3.5 (1.9)	3.3 (2.0)	3.8 (1.8)
30	Child easily becomes angry with toys	2.3	3.1 (1.1)	3.2 (1.3)	3.0 (1.0)
31	Child wants to be the center of mother's attention	2.5	3.9 (2.3)	4.4 (2.1)	3.5 (2.5)
32	When mother says 'No' or punishes him, child stops misbehaving	7.2	6.9 (1.6)	7.0 (1.6)	6.7 (1.7)
33	Child sometimes signals mother (or gives the impression) that he wants to be put down, and then fusses or wants to	1.3	2.6 (1.5)	2.5 (1.5)	2.6 (1.5)

	be picked right back up				
34	When child is upset about mother leaving him, he sits right where he is and cries	1.2	2.3 (1.9)	1.9 (1.4)	2.7 (2.2)
35	Child is independent with mother	4.3	3.3 (2.4)	3.0 (2.0)	3.5 (2.8)
36	Child clearly shows a pattern of using mother as a base from which to explore	8.8	8.2 (1.3)	8.6 (0.8)	7.9 (1.6)
37	Child is very active	4.8	3.8 (1.8)	4.5 (1.9)	3.3 (1.5)
38	Child is demanding and impatient with mother	1.2	1.7 (1.2)	2.0 (1.5)	1.5 (0.8)
39	Child is often serious and businesslike when playing away from mother or alone with his toys	4.7	3.7 (1.7)	3.5 (1.7)	4.0 (1.7)
40	Child examines new objects or toys in great detail	6.5	5.3 (1.8)	4.8 (1.5)	5.8 (2.0)
41	When mother says to follow her, child does so	8.5	6.9 (1.3)	7.0 (1.3)	6.9 (1.3)
42	Child recognizes when mother is upset	8.2	6.9 (2.3)	7.6 (1.7)	6.3 (2.6)
43	Child stays closer to mother or returns to her more often than the simple task of keeping track of her requires	4.7	3.9 (2.7)	4.5 (2.7)	3.4 (2.6)
44	Child asks for and enjoys having mother hold, hug, and cuddle him	7.7	7.6 (1.7)	8.1 (1.2)	7.2 (2.0)
45	Child enjoys dancing and singing along with music	5.2	5.2 (1.6)	5.1 (1.2)	5.4 (1.8)
46	Child walks and runs around without bumping, dropping, or stumbling	5.7	4.8 (1.5)	4.9 (1.5)	4.7 (1.5)
47	Child will accept and enjoy loud sounds or being bounced around in play, if mother smiles and shows that it is supposed to be fun	7.2	6.7 (1.7)	6.8 (1.6)	6.6 (1.9)
48	Child readily lets new adults hold or share things he has, if they ask to	6.0	5.2 (2.4)	4.8 (2.4)	5.5 (2.4)
49	Runs to mother with a shy smile when new people visit the home	6.3	6.3 (1.8)	6.3 (2.1)	6.2 (1.5)
50	Child's initial reaction when people visit the home is to ignore or avoid them, even if he eventually warms up to them	3.5	3.2 (2.2)	3.1 (2.2)	3.4 (2.2)
51	Child enjoys climbing all over visitors when he plays with them	4.7	4.9 (2.1)	4.8 (2.1)	5.1 (2.2)
52	Child has trouble handling small objects or putting small things together	3.8	4.5 (1.1)	4.5 (1.4)	4.5 (0.8)
53	Child puts his arms around mother or puts his hand on her shoulder when he picks him up	8.5	7.2 (1.6)	7.0 (1.6)	7.3 (1.6)
54	Child acts like he expects mother to interfere with his activities when she is simply trying tot help him with something	1.5	2.5 (1.7)	2.3 (1.1)	2.8 (2.1)
55	Child copies a number of behaviors or ways of doing things from watching mother's behavior	7.0	6.8 (1.6)	6.6 (1.5)	6.9 (1.6)

56	Child becomes shy or loses interest when an activity looks like it might be difficult	2.7	3.7 (1.5)	3.8 (1.7)	3.6 (1.3)
57	Child is fearless	4.0	3.6 (2.3)	3.8 (2.2)	3.5 (2.4)
58	Child largely ignores adults who visit the home	3.2	3.3 (1.8)	2.7 (1.6)	3.9 (1.9)
59	When child finishes with an activity or toy, he generally finds something else to do without returning to mother between activities	3.8	4.5 (2.5)	4.0 (2.4)	4.9 (2.6)
60	If mother reassures him by saying 'It's OK' or 'It won't hurt you', child will approach or play with things that initially made him cautious or afraid	8.5	7.8 (1.3)	8.1 (1.0)	7.5 (1.5)
61	Plays roughly with mother	1.8	2.9 (1.6)	2.9 (1.2)	2.9 (2.0)
62	When child is in a happy mood, he is likely to stay that way all day	5.5	6.2 (1.5)	5.8 (1.4)	6.5 (1.6)
63	Even before trying things himself, child tries to get someone to help him	2.0	3.5 (1.8)	3.6 (1.8)	3.5 (1.8)
64	Child enjoys climbing all over mother when they play	7.0	5.8 (2.2)	5.8 (2.0)	5.8 (2.4)
65	Child is easily upset when mother makes him change from one activity to anther	1.8	2.5 (1.6)	2.5 (1.8)	2.5 (1.5)
66	Child easily grows fond of new people very easily	7.0	5.5 (2.3)	5.1 (2.3)	5.9 (2.2)
67	When the family has visitors, child wants them to pay a lot of attention to him	4.0	4.5 (2.2)	4.5 (2.2)	4.4 (2.3)
68	On the average, child is a more active type person than mother	5.0	4.3 (1.9)	4.5 (1.9)	4.1 (2.0)
69	Rarely asks mother for help	2.3	2.5 (2.0)	2.1 (1.5)	2.9 (2.2)
70	Child quickly greets mother with a big smile when she enters the room	8.0	7.9 (1.4)	8.3 (1.3)	7.5 (1.5)
71	If held in mother's arms, child stops crying and quickly recovers after being frightened or upset	8.8	8.3 (1.0)	8.4 (0.9)	8.2 (1.2)
72	If visitors laugh at or approve of something the child does, he repeats it again and again	4.5	5.2 (2.1)	5.0 (2.1)	5.4 (2.1)
73	Child ahs a cuddly toy or security blanket that he carries around, takes it to bed, or holds when upset	5.2	5.5 (2.4)	5.4 (2.7)	5.7 (2.2)
74	When mother doesn't do what child wants right away, child behaves as if mom were not going to do it at all	1.5	1.8 (0.9)	1.7 (1.0)	1.8 (0.9)
75	*At home, child gets upset or cries when mother walks out of the room*	1.2	3.3 (2.7)	3.8 (2.5)	2.8 (2.7)
76	When given a choice, child would rather play with toys than with adults	3.2	3.2 (1.7)	2.8 (1.6)	3.6 (1.8)
77	When mother asks child to do something, he readily understands what she wants	7.7	6.5 (1.7)	6.4 (1.8)	6.5 (1.6)

78	Child enjoys being hugged or held by people other than his parents and/or grandparents	4.5	5.4 (2.4)	4.8 (2.4)	5.9 (2.4)
79	Child easily becomes angry at mother	1.0	2.1 (1.4)	2.1 (1.5)	2.1 (1.3)
80	Child uses mother's facial expressions as good source of information when something looks risky or threatening	8.5	7.6 (1.4)	7.8 (1.2)	7.5 (1.7)
81	Chills cries as a way of getting mother to what he wants	1.8	2.9 (1.7)	2.9 (1.7)	2.8 (1.7)
82	Child spends most of his play time with just a few favorite toys or activities	4.0	3.4 (1.6)	3.1 (1.5)	3.7 (1.6)
83	When child is bored, he goes to mother looking for something to do	6.5	6.6 (1.6)	6.9 (1.2)	6.5 (1.8)
84	Child makes at least some effort to be clean and tidy around the house	5.0	5.4 (1.5)	4.8 (1.2)	6.0 (1.4)
85	Child is strongly attracted to new activities and new toys	7.5	6.1 (1.8)	5.7 (1.8)	6.4 (1.8)
86	Child tries to get mother to imitate him, or quickly notices and enjoys it when mom imitates him on her own	6.5	6.8 (1.6)	6.8 (1.4)	6.9 (1.8)
87	If mother laughs at or approves of something the child has done, he repeats again and again	5.8	6.4 (2.0)	6.6 (1.8)	6.2 (2.2)
88	When something upsets the child, he stays where he is and cries	1.2	2.0 (1.5)	1.7 (1.0)	2.3 (1.8)
89	Child's facial expressions are strong and clear when he is playing with something	6.5	6.1 (1.8)	6.0 (1.8)	6.1 (1.8)
90	*If mother moves very far, child follows along and continues his play in the area she has moved to*	8.3	6.3 (2.4)	7.0 (2.0)	5.7 (2.6)

Items in italic: difference between the Attachment Q-sort for children with autism and the original Attachment Q-sort (Vaughn & Waters, 1990; Waters, 1995) is ≥ 2.

* significant difference between the aloof and active-but-odd subtypes, Bonferroni alpha corrected level $p < .00056$ (.05/90)

The correlation between the AQS for children with autism and the original criterion sort (Vaughn & Waters, 1990; Waters, 1995) was .93. The criterion sort for children with autism differed two or more scale-points from the original criterion sort on four items ('When child is near mother and sees something he wants to play with, he fusses or tries to drag mother over to it' (original item placement 2.2; autism 4.5), 'Child keeps track of mother's location when he plays around the house' (original item placement 8.8; autism 6.1), 'At home, child gets upset or cries when mother walks out of the room' (original item placement 1.2; autism 3.3) and 'If mother moves very far, child follows along and continues his play in the area she has moved to' (original item placement 8.3; autism 6.3). These four items refer in particular to closeness to the mother.

To examine the discriminant validity, the attachment criterion sort was correlated with the criterion sort for dependency. Waters & Deane (1985) found in their study in a normal population that the criterion sorts of dependency and security correlated -.09 at 12 months and -.36 at 36 months. The attachment Q-sort for children with autism correlated .01 (N = 59) with the original dependency criterion sort.

The mean correlation between the expert's criterion sorts for children with autism (N = 59) and the criterion sort of the original attachment Q-sort was .67 (*CI* .64 - .70). The outcomes formed a heterogeneous group (Q = 281.69, p < .01). None of the background variables was a significant moderator of the differences in correlations (see Table 3). Particularly, type of autism (aloof versus active-but-odd) did not significantly explain the variability of the effect sizes (Q = 1.79, p = .18), the effect size for the aloof subtype was r = .69, whereas for the active-but-odd subtype it was r = .65. Furthermore, the variables 'age of the expert' (Q (df = 1) = 0.40, p = .53) and 'years of the experts' experience with children with autism' (Q (df = 1) = 0.28, p = .60) were not significant moderators either.

Table 3

Moderators of the correlations between the expert's criterion sorts for children with autism and the original AQS

	N	*r*	*95% CI*	*Q*	*p*
Total group	59	.67***	(.64 - .70)	281.69***	
Gender				0.17[1]	.68
Female	50	.67***	(.63 - .70)	223.24***	
Male	9	.69***	(.60 - .76)	57.62***	
Type of expert				0.87[1]	.35
Clinicians	42	.68***	(.64 - .72)	144.82***	
Researchers	17	.64***	(.57 - .71)	132.64***	
Self children				0.08[1]	.77
No	25	.68***	(.62 - .72)	85.45***	
Yes	34	.67***	(.62 - .71)	195.82***	
Type of autism				1.79[1]	.18
Aloof	28	.69***	(.65 - .74)	91.33***	
Active-but-odd	31	.65***	(.60 - .69)	181.77***	

[1] Q for the comparison

*** p < .001

Discussion

This study indicates that the use of the original Attachment Q-sort (Vaughn & Waters, 1990; Waters, 1995) is warranted in studies on attachment in children with

autism. The sorts for the aloof and the active-but-odd social subtype could be combined into one criterion-sort for children with autism that is strongly correlated with the original AQS criterion sort for non-clinical children. Nevertheless, for use of the AQS in children with autism the criterion sort for attachment security developed in the current study may be preferred as it incorporates some autism-specific patterns of behaviour.

Rejecting social interaction or interacting in an odd or egocentric way did not result in considerable differences between the experts' AQS criterion sorts. But although the criterion sorts for the aloof and the active-but-odd subtype can be combined, social subtyping might be of interest when comparing children's individual AQS scores. Observational studies with the original AQS that focus on children from distinct social subtypes might reveal subtle differences in their attachment behaviours, and the use of the AQS in intervention studies may reveal more subtle differences between treatment and control groups when criterion sorts specific for the autism subtypes are applied.

The four items that differentiated between the original AQS and the AQS for children with autism referred in particular to proximity to the attachment figure. It was less typical for the optimal secure child with autism in comparison with the 'original' optimal secure child to keep track of mother's location and to follow mother when she moved very far. Furthermore, it was rather uncharacteristic for the normally developing secure child to get upset or to start crying when the mother leaves the room at home, while this item was placed in the middle (somewhat characteristic of security or is not applicable) for children with autism. The same is true for the item that refers to fussing and trying to drag mother over to a toy with which the child wants to play. All four items are part of the secure base phenomenon.

The Attachment Q-sort, next to the SSP, can be regarded as an important and valid instrument to measure attachment in children. In fact, a recent meta-analysis showed that the AQS is one of the gold standards in assessing attachment security and its application in the field of autism is warranted, in particular because of its unobtrusive manner of data-collection (Van IJzendoorn et al., 2004). The two studies (Brauner, 2003; Pechous, 2001) that examined attachment security with the AQS in children with autism found relatively low AQS scores: in Pechous' intervention study (2001) the mean security score of the non-treatment group was -.10; Brauner (2003) did not report Attachment Q-sort scores. In comparison with normally developing children (.32, N = 2,516; Van IJzendoorn et al., 2004) and even in comparison with the combined clinical samples (.21, N = 187; Van IJzendoorn et al., 2004), these average scores for children with autism are strikingly low. It should be noted, however, that the two studies were rather small, and more AQS studies on children with autism are needed to firmly establish their lower AQS security. In a recent meta-analysis on attachment and autism (Rutgers et al., 2004) both lower level of cognitive functioning and more strictly defined autism were associated with substantially more insecurity. Pechous (2001) only included low-functioning children with rather severe autism in her group. As autism is characterized by heterogeneity in behavioural patterns and developmental level, research on attachment in autism with the AQS should take into account the wide variation in symptoms and development. The AQS is particularly well equipped to

address the issue of heterogeneity in treatment studies as the q-sort approach compares behaviour within individuals, and refrains from comparisons between individuals or groups. Each individual child serves as his or her own baseline in sorting the 90 behavioural descriptions within the AQS.

The advantages of the AQS over the SSP are especially meaningful in studies on children with autism. Observational studies in a natural setting with the AQS might reveal more information regarding subtle attachment behaviours in children with autism. Furthermore, as children with autism often participate in a treatment program, the short term effects on attachment security can be examined more extensively, even at the level of the individual child. We are currently testing the BASQ (Brief Attachment Screening Questionnaire; Bakermans-Kranenburg, Willemsen-Swinkels, & Van IJzendoorn, 2003) which is a simplified version of the AQS to be used by professional staff in a treatment facility, and preliminary validation showed promising results. Also, with the AQS as an instrument to measure attachment security, alternative attachment relationships of children with autism may be examined, such as attachments to professional caregivers, teachers, and therapists (Howes, 1999). Here, however, it is not advised to combine the security scores of different attachment relationships, as was done in the study by Brauner (2003), as children may develop a unique attachment relationship with each attachment figure (Howes, 1999). As the meta-analysis on the validity of the AQS showed, attachment disorganization is indexed by extremely low scores on AQS security (Van IJzendoorn et al., 2004). Because children with autism may show attachment disorganization – as different from the regular odd or stereotypical autistic behaviours (Willemsen-Swinkels et al., 2000) – it is important to know that the AQS captures this type of attachment insecurity as well.

In sum, the AQS is a valuable tool for assessing attachment security, not only at group level and in intervention studies, but also on the individual level in monitoring progress of treatment in individual cases. The feasibility of the AQS for assessing attachment in children with autism creates opportunities to develop attachment measures to be used by professionals working with children with autism.

Author Note

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4

Autism, attachment, and parenting: A comparison of children with Autism Spectrum Disorder, Mental Retardation, Language Delay, and non-clinical children[3]

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 indicated 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 cope remarkably well with the challenges of raising a child with ASD.

[3] Rutgers, A. H., Van IJzendoorn, M. H., Bakermans-Kranenburg, M. J., Swinkels, S. H. N., Van Daalen, E., Dietz, C., Naber, F. B. A., Buitelaar, J. K., & Van Engeland, H. (submitted).

Children diagnosed with Autism Spectrum Disorder (ASD) show attachment behaviours to their parents (e.g., Dissanayake & Crossley, 1996, 1997; Rogers, Ozonoff, & Maslin-Cole, 1993), such as distress or searching for their mother during a separation (e.g. Bernabei, Camaioni, & Levi, 1998; Pantone & Rogers, 1984), or showing preference for the mother over the stranger at reunion (e.g. Sigman & Mundy, 1989; Sigman, Mundy, Sherman, & Ungerer, 1986; Sigman & Ungerer, 1984). In his comprehensive review, Buitelaar (1995) concluded that children with autism and comparison children tend to react rather similarly to a separation from the parent by increasing proximity seeking behaviour.

A crucial question is, however, whether infants and young children with an early diagnosis of autism show attachment security to a lesser degree than non-clinical comparisons or to children with clinical disorders implying a less disturbed capacity for social relatedness. Because children with autism are impaired in their social relatedness their parents may often feel stressed and even overwhelmed by the many challenges these children present. Parents of children with autism may have a stronger need for social support to buffer the problems they experience in raising their child, and they may more often develop psychological symptomatology, e.g. depression and anxiety. In the current investigation we study attachment and parenting stresses in families with children diagnosed at an early age as having Autism Spectrum Disorder (ASD). We will compare these children, together with children diagnosed as mentally retarded or suffering from deviant language development, with non-clinical children. Also, we will compare children with ASD with the other clinical groups to explore if these stresses are unique for children with an Autism Spectrum Disorder.

Attachment and autism

Attachment is conceptualised as the affectional bond or tie that infants develop with their attachment figure during the first year of life (Ainsworth, Blehar, Waters, & Wall, 1978; Bowlby, 1969/1982). Bowlby defined attachment in the following way: "To say of a child that he …. has an attachment to someone means that he is strongly disposed to seek proximity to and contact with a specific figure and to do so in certain situations, notably when he is frightened, tired or ill." (Bowlby, 1969, p.371). Patterns of attachment behaviour 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. As the diagnostic criteria for autism focus specifically on qualitative impairment in social interaction and communication, it seems self-evident that even when children with autism show attachment behaviours their attachment security may be considerably impaired. In DSM-IV (APA, 1994), children with autism are described as children who show a failure to cuddle; an indifference to affection or physical contact; a lack of eye contact, facial responsiveness or socially directed smiles; and a failure to respond to their parents' voices. Older children with autism may show difficulties in reciprocity, turn taking, and recognition of affective expression and attribution of mental states of others (DSM-IV; APA, 1994).

A recent meta-analysis of ten studies on attachment in children with autism (*N* = 287; Rutgers, Bakermans-Kranenburg, Van IJzendoorn, & Van Berckelaer-Onnes,

2004) showed that children with autism were significantly less securely attached to their parents than children without autism (resulting in a moderate combined effect size across studies; r = .24). Children with autism are able to form secure attachment relationships, but the parent-child relationship reflects less flexible, sensitive, and synchronous interactive behaviours as a result of the social impairment of children with autism. Furthermore, 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. Only in mentally more delayed samples, children with autism appeared less secure than their comparisons without autism. Rutgers et al. (2004) proposed that the construction of an internal working model of attachment relationships in children with both pervasive developmental disorders and mental retardation may overburden their social and cognitive abilities. This interpretation is in line with Yirmiya and Sigman (2001)'s suggestion that children with autism show most difficulties with behaviours that necessitate a working model of the self, the other, and their interdependence. Furthermore, the meta-analysis of attachment and autism showed that the more strictly autism was defined, the larger the effects were 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 is most valid between 3-5 years of age. At the same time, the assessment of attachment security in older children is more complicated and less valid than in infants (George & Solomon, 1999). It is therefore important to establish an early diagnosis of autism in studying attachment in these children.

The largest part 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. The AQS measures attachment in children from 12 to 48 months on the basis of more naturalistic observations of parent-child interactions instead of in a stressful situation (Vaughn & Waters, 1990). This approach may be particularly interesting for children with autism, as they might be more affected by a somewhat stressful context than normal children. The AQS (Vaughn & Waters, 1990) consists of 90 cards with behavioural descriptions of children in the natural setting, with special emphasis on secure-base behaviour. 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,

Vereijken, Bakermans-Kranenburg, & Riksen-Walraven, 2004). In the current investigation we asked the group nurses to use the Brief Attachment Screening Questionnaire (BASQ; Bakermans-Kranenburg, Willemsen-Swinkels, & Van IJzendoorn, 2003), which is based on the AQS, to assess attachment security in the children during their stay at the toddler unit.

Parenting and autism

Parenting children with autism can be highly stressful (e.g. Koegel et al., 1992; Dunn, Burbine, Bowers, & Tantleff-Dunn, 2001). Impairments in social interaction may have their impact on parental interactive behaviour (Hoppis & Harris, 1990; Kasari & Sigman, 1997). For example, Sigman et al. (1986) found that children with autism showed infrequent sharing of attention with their caregivers; they rarely pointed to an object, held the object for the caregiver to see or brought an object to the caregiver. Noh, Dumas, Wolf, and Fisman (1989) suggest 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 behavioural problems such as crying, disobeying, seeking attention, and requesting help).

Parenting stresses may be or may not be specific to the characteristics of children with autism. 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, parents may feel more restricted in their ability to engage in recreational and leisure activities outside the home. Reluctance to take their child with autism out in public — because of too many frustrations resulting the child's behaviour — can lead to isolation (Blacher, 1984; Van Berckelaer-Onnes & Hansen, 2004). Furthermore, Moes, Koegel, Schreibman, and Loos (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. Children with mental retardation or language delays may provoke similar concerns in their parents who may doubt whether their children will ever become autonomous and well-functioning members of society.

Wishart, Bidder, and Gray (1981), who compared families of developmentally delayed children with families without any known developmental difficulties, suggest that the presence of a developmentally delayed child in the family does not change the family routine to any large extent. The greater intensity of problems generated by children with autism compared to children with Down syndrome may, however, reveal higher levels of parenting stress in parents of the children with autism (Fisman, Wolf, Ellison, & Freeman, 2000; Noh et al., 1989). Furthermore, Rodrigue, Morgan, and Geffken (1990) report 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. Accordingly, Belchic (1996) found no group differences on perceived stress when children with autism, Down syndrome,

and normally developing children were compared, but group differences were found for parental efficacy, with parents of normally developing children reporting more efficacy than parents of children with autism. Cox, Rutter, Newman, and Bartak (1975) found no differences between autistic boys and children with severe developmental disorder of receptive language on early parental stresses of any kind. Although Noterdaeme, Mildenberger, Sitter, and Amorosa (2002) consider the deficits in language/ communication skills as well as problems 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 behavioural 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 & Homatidis, 1989). Indeed, in some studies (e.g. Bristol & Schopler, 1983) parents of children with autism reported more stress when their children perform worse on developmental measures, or are less responsive in social interaction with others (Kasari & Sigman, 1997).

Kasari and Sigman (1997) examined the relation between parental perceptions and observed parent-child interactive behaviours. Interestingly, parental perceptions of the behaviour of the children with autism were more often reflecting actual child – parent interactions than in comparison samples with normally developing children and mentally retarded children. Parents who considered their children with autism as more difficult in temperamental style had children who were less engaged during a social game with the parent and less responsive in interaction with an experimenter. Additionally, Horowitz (2004) indicated that the amount of control mothers of children with autism felt over their situations significantly predicted lower levels of stress, with perception of parenting mediating that relationship.

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). Mothers, who often are their child's primary caretakers, may view the shortcomings of the child with autism as failures on their part and are thereby susceptible to depressive symptoms (Milgram & Atzil, 1988). Regardless of level of stress, it can be expected that the diagnosis of Autism Spectrum Disorder has its impact on parents' psychological functioning and feelings of efficacy in parenting. Parents might, for example, become uncertain regarding how to react on the child's problem behaviour or how to stimulate the child's development. The loss of the parents' confidence in their parental abilities is reflected in feelings of helplessness (Van Berckelaer-Onnes, 1994). DeMyer's (1979) findings suggest guilt in two-third of the mothers of children with autism, and physical and psychological tension in all parents of children with autism. Mothers of children with autism described themselves as unable to pursue personal goals (Holroyd, 1974); they placed less emphasis on their professional careers and more emphasis on their parental role compared to mothers of children without autism (Tunali & Power, 2002). Furthermore, they reported ambivalence and grief over the amount of time devoted to their child with autism at their own expense and that of the family (DeMyer, 1979). 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. Only comparative research on parenting in various clinical and non-clinical samples may show what parental characteristics are specific for Autism Spectrum Disorder and which strains and stresses are generic for parents of handicapped children.

Social support may affect the stress that parents of children with autism experience (Bristol & 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, Noh, Fisman, & Speechley, 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 & Wills, 1985). In the same vein, social support was related to feelings of efficacy in parenting; more perceived social support was associated with feelings of greater personal accomplishment in parenting (Weiss, 2002). In the current investigation we assessed the parents' perceived social support in order to examine differences in social support between diagnostic groups and to explore the possible buffering effect of social support on feelings of efficacy in parenting.

In sum, we tested the following hypotheses in our investigation of children with ASD, mental retardation, language delay, and non-clinical children. First, clinical and non-clinical children were compared on both attachment and parenting. As all children in the clinical groups show problems in interaction and/or communication, children with a clinical diagnosis were expected to be less securely attached. 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 non-clinical comparison children. Even though children with Autism Spectrum Disorder show attachment behaviours their attachment security may be impaired. Therefore, we expected that children with Autism Spectrum Disorder would show less attachment security than non-clinical children. Furthermore, we explored differences in attachment security between children with ASD and the other clinical groups. 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 show more psychological problems. We explored whether other clinical groups differ in similar ways from the non-clinical comparisons. Comparing the ASD group with the other clinical groups, we tested whether or not the problems of parents of Autism Spectrum Disorder children are unique within the clinical groups. In the next step, we tested what factors differentiated most effectively between the diagnostic groups and the comparison group, and between the ASD group and the other clinical groups: attachment security, parenting style, parental stress or parental wellbeing. Lastly, we tested if social support acted as a buffer against the expected higher daily stresses of

parents in the clinical groups. We expected that social support would moderate the relationship between parental daily stresses and parents' feelings of efficacy in parenting.

Method

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; Willemsen-Swinkels et al., in press) at the well-baby offices. Children that had a positive pre-screening were further evaluated during a home visit using the 14-item screening instrument ESAT (Willemsen-Swinkels et al., in press). Next, screen-positive children on the 14-item ESAT were invited for further investigations at the Department of Child Psychiatry (Dietz, Willemsen-Swinkels, Van Daalen, Van Engeland, & Buitelaar, in press). In addition, clinically referred children because of possible autism spectrum disorder or related developmental problems, were seen for further investigations at the Department of Child Psychiatry. A series of five measurements (for details, see below) was scheduled within a period of 5 weeks, with observations of the child's social and communicative behaviour in a small group of very young children and their parents. On the basis of these observations the group nurses completed the BASQ. 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 department.

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 delay, (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. All participants received a predicted diagnosis. The final diagnoses at the follow-up assessments at around four years of age were used in the analysis. Because of small sub-group sizes, the children with AD en PDD-NOS were combined into one ASD group. Within the ASD group, a high and a low functioning group was formed (cut-off score IQ = 70).

The non-clinical comparison children were recruited through child care centres. 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 labour between the spouses. Average socio-economic status was lower- to upper-middle class.

Table 1

Background variables of the families

	Total (N = 89)	*ASD+MR (N = 25)*	*ASD (N = 16)*	*MR (N = 12)*	*LD (N = 11)*	*C (N = 25)*
Marital Status						
% Married	96[1]	96	100[1]	92	82	100
Place of Birth						
% Netherlands	89[1]	92	93[1]	67	82	96
Housing Conditions						
% Family house	77[2]	80	67[1]	75	55	92[1]
Work						
% Paid work	61[1]	48	40[1]	67	55	88
Work partner						
% Paid work	88[3]	84	87[1]	90[2]	89[2]	92

[1] missing 1

[2] missing 2

[3] missing 5

Instruments

Autism. Five measurements took place within a period of five weeks. At each weekly visit, the social and communicative behaviour of the child was observed in a small group of very young children and their parents. The assessments included the Vineland Social-emotional Early Childhood Scales (Sparrow, Balla, & Ciccetti, 1997), a standardized behaviour observation (Autism Diagnostic Observation Schedule (ADOS-G); DiLavore, Lord, & Rutter, 1995), questions regarding developmental history, and paediatric 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 judgement (cf. Lord, 1995). At the follow-up assessments, at around four years, all measurements were repeated, but instead of the Vineland Social-emotional Early Childhood Scales (Sparrow, Balla, & Ciccetti, 1997), the Autistic Diagnostic Instrument Revised (ADI-R; Lord, Rutter, & LeCouteur, 1994) was administered. More details on the psychiatric diagnoses will be reported elsewhere (Van Daalen et al., personal communication, September 15, 2004).

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 in 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. An agreement was reached of 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 & Waters, 1990) with specific behavioural descriptions of children between 12 and 48 months of age. The cards are used to describe the behaviour of a child in the natural setting, with special emphasis on secure-base behaviour. After several hours of observation the observer ranks the cards into nine piles with 10 cards each from "most descriptive of the subject" to "least descriptive of the subject". By comparing the resulting description with the behavioural profile of a 'prototypical secure' child as provided by several experts in the field of attachment theory, a score for attachment security is derived. 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 group nurses 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 .50, explaining 41% of the variance. The Cronbach's alpha for internal consistency of the *BASQ security* score was .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 minutes 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 = .68 (n = 44), showing some evidence for the validity of the BASQ (for details, see Bakermans-Kranenburg et al., 2004).

Parenting. Five questionnaires were administered measuring parenting style and parenting stress. First, the Parental Efficacy Questionnaire (PEQ; Caprara, personal communication, November 16, 1998; Van IJzendoorn, Bakermans-Kranenburg, & Juffer, 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 even 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 .87 (n = 89).

Second, the Child Rearing Practice Report (CRPR; Dekovic, Janssen, & Gerris, 1991) was administered. The CRPR measures authoritative and authoritarian styles of childrearing. 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 .53. Therefore, the Authoritarian style was excluded from further analyses. Cronbach's alpha for Authoritative style (16 items; n = 76) was satisfactory (.74).

Third, the Parenting Daily Hassles questionnaire (PDH; Crnic & 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 .86 (n = 51) and for the intensity .86 (n = 48). Because the correlation between frequency and intensity variables was high (r = .59, n = 88) both sets of items were combined — forming a single *parenting daily hassles* score.

Fourth, the Social Provision Scale (SPS; Cutrona & 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 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 = .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 .83 (n = 78).

Fifth, *parental psychological functioning* was assessed with the SCL-90 (Arrindell & 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 .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 derived 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 less daily hassles. Higher parental efficacy was associated with a more authoritative parenting style, less daily hassles, and less 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).

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	-	.29**	-.23*	.15	-.16	.20	-.02	.25*	-.06
2. Age parent	.18	-	.02	.19	-.06	.10	-.15	.18	.05
3. Age child	.26	.20	-	-.36**	-.08	-.11	.07	.07	.03
Attachment									
4. BASQ Security	-.05	-.05	-.13	-	.01	.19	-.22*	.04	-.01
Parenting									
5. Parental efficacy	-.31*	.10	.00	.07	-	.29**	-.32**	.16	-.28**
6. Authoritative parenting	.11	.20	.05	.01	.29	-	-.03	.08	-.20
7. Parental daily hassles	.28	-.23	.02	-.28	-.43**	.02	-	-.27**	.09
8. Social support	.11	.39**	.36**	.01	.21	.04	-.02	-	-.38**
9. Psychological problems	.11	-.16	-.01	-.08	-.03	-.07	.08	-.29	-

* $p < .05$, ** $p < .01$.

Note: The correlations of the total sample ($N = 89$) are presented in the upper triangle; the correlations for the autism spectrum disorder subgroup ($n = 41$) are presented in the lower triangle of the table.

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 age child, in BASQ security score, in authoritative parenting style, and in social support (see Table 3).

Table 3

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

	Total (N = 89)	*ASD+MR (N = 25)*	*ASD (N = 16)*	*MR (N = 12)*	*LD (N = 11)*	*C (N = 25)*	*Clin vs C[a] t(87)*	*ASD vs C[b] t(64)*	*ASD vs other Clin[c] t(62)*	*Contrasts[d]*
Background										
SES										
M	5.22	4.85	4.20	4.96	4.45	6.72	5.81**[1]	5.26**[1]	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[1]	-
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	0.00	100.0	9.1	0.00				
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[1]	-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[1]	
SD	0.43	0.42	0.15	0.83	0.36	0.31				

* $p < .05$

** $p < .01$

[1] unequal variances

[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

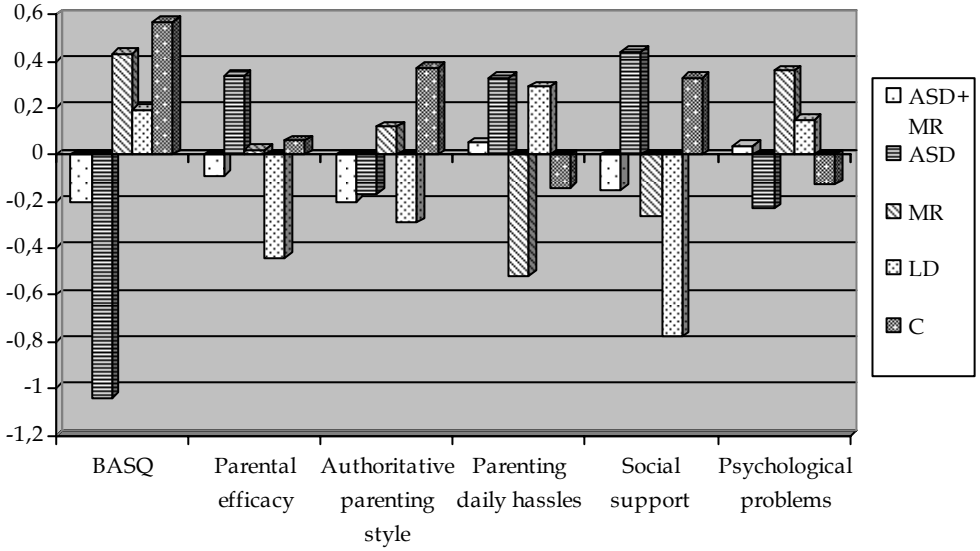
[c] one-way a priori contrasts of the ASD groups versus the other clinical groups

[d] post-hoc contrasts between all groups

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 with the non-clinical comparison group. A priori contrasts showed a similar pattern. In particular, socio-economic status, age child, BASQ security, and authoritative parenting style showed significant differences. Parents of children with Autism Spectrum Disorder had a lower socio-economic status in comparison with parents of non-clinical children, and the ASD children's chronological age was higher. Furthermore, children with ASD showed significantly less attachment security than the non-clinical comparison children, and parents of children with ASD were less likely to show an authoritative parenting style. Lastly, we compared ASD children 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 they 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 are presented in Figure 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. High functioning children with ASD were observed to be less secure than the children in the other groups, including the language delayed children. Parents of high functioning children with ASD and parents of non-clinical children reported more social support than parents of the language delayed children. More parenting daily 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.

Figure 1
Standardized mean scores of the attachment and parenting variables



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 < .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 < .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 = .01. Two significant predictors emerged, namely BASQ security and social support. ASD children again scored lower on the BASQ, and their parents reported to experience more social support (see Table 4).

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)
	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*	-.09	0.18
Parental daily hassles	-0.18	0.66	-0.21	1.41	0.23	1.16
Psychological problems	-0.17	0.61	-0.06	0.11	-0.25	1.37
Social support	0.44	3.95*	0.21	1.36	0.47	4.79*

* $p < .05$, ** $p < .01$

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 neither of the three regression-analyses the interaction term was significant (total: t (1, 85) = -1.87, p = .07; clinical groups: t (1, 60) = -1.77, p = .08; ASD groups: t (1, 37) = -.21, p = .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 a language delay. In our study, therefore, autistic disorder instead of mental retardation of ASD children is the explanation for their lower attachment security. Pertaining to parenting, 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 was authoritative parenting style. Parents of non-clinical children reported relatively high

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, and they contain unequal numbers of children. 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 group nurses, based on their observations in the hospital. The BASQ was developed on the basis of the observer Attachment Q-Sort for which the psychometrics and validity have extensively been documented (Vaughn & 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 older 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. In contrast with the current study, 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 behaviours of children with ASD may be more context-dependent than attachment behaviours of other children. Therefore, the 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 perceive themselves as rather healthy and balanced, and they experience even more social support than the other clinical groups. Although parents of ASD children display less authoritative parenting, they do 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 (e.g. DeMyer, 1979; DeMyer & Goldberg, 1983). The current assessments of parenting have been 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. Research in families of adolescents with autism demonstrated that parents became both more realistic and more pessimistic when their child with autism grew older. While the permanency of the child's impairments became more apparant and the parents' hope for normalcy gave away, concerns regarding the child's future increased (Bristol & Schopler, 1983). 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 at this early age, as parenting is not anymore considered to be a causal factor in the emergence of autism, and it has become universally accepted that genetic factors play an important role in the causation of ASD (Rutter, Bailey, Simonoff, & Pickles, 1997).

Longitudinal studies on parenting, attachment and autism are important to address the question whether the absence of differences between the parents of the various clinical groups will persist when the children are somewhat 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 behaviours 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 potentials of children with Autism Spectrum Disorders, as well as the remarkable resilience of their parents.

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5

Conclusions and discussion

During the past half century, the focus on the origins of autism moved from an emphasis on problematic parenting to the concept of autism as a genetic disorder. While Bowlby (1969) referred in his first work on attachment explicitly to Bettelheim (1967), in his later work he described autism in the light of possible combinations of inappropriate parenting and biological markers (Bowlby, 1973). Only in 1984, the first studies on attachment in autism became available (Pantone & Rogers, 1984; Sigman & Ungerer, 1984). The first study that reported explicitly on attachment security was published in 1987 (Shapiro, Sherman, & Koch, 1987).

Our first aim was to explore if children with autism have a similar chance as children without autism to establish a secure attachment relationship with their parents or other caregivers. In 1980, the DSM-III (APA, 1980) explicitly stated that children with autism are unable to develop normal attachment behaviour. Empirical studies on attachment in children with autism however showed that the opposite was true: Children with autism display attachment behaviours (e.g. searching for their mother during separation, seeking proximity after reunion) when observed with their parents. The average percentage of attachment security in children with autism, when observed in a (modified) Strange Situation Procedure (SSP, e.g. Willemsen-Swinkels, Bakermans-Kranenburg, Buitelaar, Van IJzendoorn, & Van Engeland, 2000), was in fact 53 %. In non-clinical samples around 65% of the children are classified as securely attached (Van IJzendoorn, Goldberg, Kroonenberg, Frenkl, 1992). Nevertheless, a meta-analysis (based on 10 available studies) that focused on the presence or absence of secure attachment behaviours, evidenced that children with autism display attachment security less frequently than children without autism. The effects of five possible moderators of the variability (diagnostic criteria, mental development, chronological age, matched design, and year of publication) were explored. Both more strictly defined autism and the combination of autism with mental retardation were associated with more attachment insecurity. As only two studies (Capps, Sigman, & Mundy, 1994; Willemsen-Swinkels et al., 2000) reported on disorganised behaviour, no conclusions could be drawn on any over-representation of disorganised attachment (Main & Solomon, 1990) in children with autism.

The advantages of the Attachment Q-Sort (AQS; Waters, 1987) over the 'classic' Strange Situation (Ainsworth, Blehar, Waters, & Wall, 1978) are evident from the higher ecological validity (laboratory versus natural setting) and the broader age range to which the AQS can be applied. Another advantage is that the AQS can be adapted, if necessary, to the secure-base behaviour of children from special populations. Therefore,

our second aim was to explore whether attachment in children with autism can be assessed with the AQS, and whether it is warranted to use the original attachment criterion sort when attachment behaviour is observed in children with autism. A high correlation (r = .93) was found when the original criterion sort was compared with a criterion sort of children with autism defined by clinicians and researchers, with only minor differences at item-level. Thus, we may conclude that the original AQS is applicable in studies on attachment and autism. As the AQS can be applied more frequently, it is a viable instrument to evaluate intervention/treatment studies. The only two studies (Pechous, 2001; Brauner, 2003) that used the AQS to measure attachment security in children with autism used it especially for this purpose.

Our third aim was to explore parents' perceptions of raising a child with autism. We conducted an empirical study that focused on possible parenting difficulties together with attachment behaviour observed in a 'natural setting'. As a result of early screening for children at high-risk for autism, we were able to study families of very young children. The children who participated in our study were diagnosed as ASD (Autism Spectrum Disorder), mentally retarded, or language delayed. As we aimed at exploring the characteristics of children with autism and more generally of children with a clinical diagnosis, we added a sample of normally developing children. Attachment was observed with the Brief Attachment Screening Questionnaire (BASQ; Bakermans-Kranenburg, Willemsen-Swinkels, & Van IJzendoorn, 2003). The BASQ, administered by group nurses on the basis of direct observation at a university clinic, is composed of AQS items with high loadings on the security scale (Waters, 1995). Parental self-report questionnaires focused on parenting style, parental efficacy, parental experiences of daily hassles, social support, and psychological problems. Children with ASD were observed to be less secure compared to the other clinical and normal comparison groups. More specifically, in contrast with the meta-analysis, we found that especially the high functioning ASD children showed low attachment security when compared with the children in the other groups. With respect to parenting, only authoritative parenting and social support were found to be important in distinguishing between groups. Parents of normally developing children reported relatively high levels of authoritative parenting in comparison with the ASD group and the total clinical groups. Furthermore, the parents of normally developing children perceived more social support in comparison with the total clinical group, although within the clinical group the ASD group perceived more social support than the other clinical groups. Last, social support could not be considered a significant moderator of the relation between daily hassles on parent's feelings of efficacy. We conclude that parents of these young children with ASD generally do not seem to experience parenting as a greater burden than parents of children without autism. Nevertheless, Bristol and Schopler (1983) concluded that family stress increased as the child with autism grows older. Van Berckelaer-Onnes and Hansen (2004) described four phases in parenting a child with autism: a) from parental intuition to diagnosis, b) from diagnosis to acceptation, c) from acceptation to perspective, and d) from caring to give away with an easy mind. They emphasized that parenting a child with autism is a lifelong challenge.

Theories that emphasize emotional deprivation on the part of the parents as the cause of autism (Bettelheim, 1967) are no longer appropriate today. But what role does parenting play in the development of attachment relationships in children with autism? In normally developing children, parenting behaviour and especially parental sensitivity appears to be of importance in determining attachment security (De Wolf & Van IJzendoorn, 1997). As a result of the (predicted) early impairments in social orientation and involvement of children with autism, Sigman, Dijamco, Gratier, and Rozga (2004) hypothesised that these children form attachment (security) through a different trajectory than normally developing children. They suggested that parents might circumvent their child's social deficits. Only one study is available that reported explicitly on parental sensitivity in a sample of children with autism (Capps et al., 1994). Capps and her colleagues found a positive association between parental sensitivity and the quality of the attachment relationship. The parents of securely attached children with autism were more sensitive in the interaction with their child than the parents of insecure children with autism. In their meta-analysis, De Wolf and Van IJzendoorn (1997) reported weaker associations between parenting and attachment in samples of clinical and lower-class children than in samples with normally developing children. One of their suggestions was that attachment relationships in clinical samples could probably not be explained solely by the association between attachment and parental sensitivity. Belsky (1999) stated: "… to understand how psychological and social context factors influence the development of the parent-child attachment relationship, multiple factors must be considered simultaneously" (p. 260). One might expect that parents perceive extra strains and stresses when rearing a child with autism; these in turn might overrule the potential sensitivity of parents. Although the parents of the clinical children from our sample of very young children seem to cope very well with the challenges of raising their child, the impact of having a child with a disorder might only become visible as development becomes more differentiated. Therefore, we suggest that attachment and parenting in autism should be studied both longitudinally and within a broader social context. Future research that focuses especially on the interaction between parental sensitivity and possible (accumulating) risk factors appears noteworthy (De Wolff & Van IJzendoorn, 1997). Both intervention and treatment programs for children with autism and their parents could benefit from this line of research.

Level of development appears to be associated with attachment security in children with autism. The meta-analysis on attachment and autism documented that only children with autism who displayed a lower mental development showed less attachment security than non-clinical comparisons. In contrast, in our empirical study we found that especially the ASD children with higher mental development showed more signs of insecurity in comparison with non-clinical children. Although Capps et al. (1994) did not find differences with respect to level of intelligence, they reported that securely attached children with autism had better language comprehension and expressive language than insecurely attached children. When observed in interaction with their parents, the insecure children initiated less often social interaction, although

the children did not differ with respect to responsiveness to the parent. Willemsen-Swinkels, Buitelaar, and Van Engeland (1997) observed that high-functioning children with autism responded more frequently to their parent, looked more often to their parent and showed more social bids to their parent in comparison with low-functioning children. Moreover, they found that the parents of the latter children showed less responsivity to their child's bids for social interaction. Hence, can sensitive parenting promote the child's socioemotional and cognitive development via secure attachment relationships? Or conversely or simultaneously, is it the child with autism with better socioemotional and cognitive abilities who makes it easier to react sensitively to (see Capps et al., 1994)? Further research on attachment in autism should try to disentangle the reciprocal interactions between parental behaviour and the child's impairments in both social interaction and cognitive development.

In sum, although studies on attachment in autism revealed the presence of attachment behaviour in children with autism, in comparison with children without autism they showed less frequently secure attachment behaviour. Both more severe symptoms of autism spectrum disorder and lower mental development were associated with attachment insecurity. As an alternative to the use of the SSP to measure attachment security, the AQS was found to be applicable in observing attachment behaviour in children with autism. In an empirical study with attachment measured in a natural setting with the BASQ, it was evidenced that children with autism showed less attachment security in comparison with other clinical and non-clinical comparison groups. Future studies should settle the issue of whether the discrepancy between naturalistic attachment studies (with the AQS or similar measures) and laboratory studies (with the SSP) can be explained by the autistic children's higher awareness to context, which may also be dependent of their level of cognitive development. Furthermore, on the basis of self-report questionnaires, parents of children with autism were found to cope rather well with raising their child with autism. Future research on autism should focus particularly on the role of parenting in the development of attachment security. If the role of sensitive parenting for the development of a secure attachment relationship is substantiated for children with autism as it has been for normally developing children, important implications for intervention and clinical practice emerge.

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Summary in Dutch

Autisme en veilige gehechtheid

Autisme

In 1943 publiceerde Kanner een artikel met uitgebreide gedragsbeschrijvingen van 11 kinderen. Hierin benadrukte hij vooral het onvermogen van deze kinderen om affectieve contacten te vormen; hij gebruikte hiervoor de term *extreme autistic aloneness*. Hoewel Kanner over autisme sprak als *inborn autistic disturbances of affective contact*', merkte hij op dat ook de ouders van deze kinderen een beperkte interesse hadden voor anderen. Sommige onderzoekers (zie bijvoorbeeld Bettelheim, 1959) beschouwden psychosociale tekorten in de opvoeding als dé oorzaak van autisme. Omgevingsfactoren lijken echter niet van invloed te zijn op het ontstaan van autisme (Bailey, Philips & Rutter, 1996). Tweelingonderzoek en gezinsstudies naar autisme en het bredere fenotype van sociale en cognitieve stoornissen hebben laten zien dat deze ontwikkelingsstoornis een belangrijke genetische basis heeft (zie bijv. Bolton et al., 1994).

Tegenwoordig wordt autisme beschreven aan de hand van drie diagnostische criteria: beperkte sociale interacties, beperkte communicatieve vaardigheden, en een beperkt gedragsrepertoire met repetitieve en stereotiepe gedragspatronen, interesses en activiteiten (DSM-IV-TR, 2000). Binnen de autisme spectrumstoornissen (ASS), wordt de autistische stoornis (AS) beschouwd als de meest prototypische vorm van autisme. Kinderen met de diagnose AS laten problemen zien op alle drie de gebieden. Bij driekwart van deze kinderen komt de stoornis voor in combinatie met een verstandelijke beperking. Kinderen met PDD-NOS (Pervasive Developmental Disorder Not Otherwise Specified) verschillen in die zin van kinderen met een AS dat ze naast beperkte sociale interacties gekenmerkt worden door problemen in de communicatie *of* door stereotype gedragingen, interesses en activiteiten.

Gehechtheid

Gehechtheid kan omschreven worden als de emotionele band die een kind aangaat met zijn ouder/verzorger (Ainsworth, Blehar, Waters & Wall, 1978; Bowlby, 1969/1982; Cassidy & Shaver, 1999). Het gehechtheidsysteem wordt geactiveerd wanneer het kind moe is of stress ervaart. Op deze momenten gaat het kind op zoek naar veiligheid bij de opvoeder. Door het zoeken van nabijheid of contact met de ouder/verzorger wordt het kind gerustgesteld. Het is dan in staat om verder te spelen of te exploreren. Het gehechtheidgedrag weerspiegelt de verwachtingen die een kind heeft ten aanzien van de reactie van de opvoeder op de momenten dat het kind steun en troost zoekt. De ervaringen die het kind opdoet in de eerste levensjaren vormen de basis voor een specifiek verwachtingspatroon (Ainsworth, 1979).

Om de kwaliteit van gehechtheid te meten, hebben Ainsworth et al. (1978) een procedure ontwikkeld, de zogenaamde *Vreemde Situatie Procedure*. De ouder wordt tijdens deze procedure gevraagd een "spelkamer" twee maal een paar minuten te verlaten. Het kind blijft de eerste keer achter met een onbekende persoon en de tweede keer alleen. Op basis van de reactie van het kind op de terugkeer van de ouder wordt de kwaliteit van gehechtheid vastgesteld. Vier classificaties kunnen worden onderscheiden. *Veilig gehechte* kinderen gebruiken de gehechtheidsfiguur als basis van waaruit ze de wereld kunnen ontdekken. Deze kinderen lijken een balans gevonden te hebben tussen aan de ene kant gehechtheidsgedrag en aan de andere kant exploratie. Naast een veilige gehechtheid kunnen er twee onveilig gehechte classificaties onderscheiden worden: *onveilig-vermijdend* en *onveilig-ambivalent*. Bij onveilig-vermijdende kinderen verandert er weinig in het gedrag van het kind op het moment dat de ouder de kamer verlaat. Ogenschijnlijk lijkt het kind onverstoord verder te spelen. Bij terugkomst reageren deze kinderen door wegkijken van de ouder, de ouder uit de weg gaan en/of zich richten op het speelgoed. Onveilig-ambivalente kinderen blijven steeds gericht op de ouder. In de Vreemde Situatie reageren deze kinderen heftig wanneer de ouder de kamer verlaat. Bij terugkomst laten zij een mengeling zien van contact zoeken en contact afwijzen. De vierde classificatie, *gedesorganiseerde* gehechtheid, heeft betrekking op kinderen die een (tijdelijke) *breakdown* laten zien in hun manier van omgaan met deze stressvolle situatie. Indicatief voor gedesorganiseerde gehechtheid zijn sequentiële dan wel simultane uitingen van tegenstrijdig gehechtheidgedrag, stereotype bewegingen of verstijven met een gedesoriënteerde gezichtsuitdrukking (Main & Solomon, 1990). Ongeveer 65 procent van de normaal ontwikkelende kinderen is veilig gehecht, terwijl gemiddeld 20 en 15 procent respectievelijk onveilig-vermijdend en onveilig-ambivalent gehecht is (Van IJzendoorn, Goldberg, Kroonenberg & Frenkl, 1992). Bij 15 procent wordt daarnaast de classificatie gedesorganiseerd vastgesteld (Van IJzendoorn, Schuengel & Bakermans-Kranenburg, 1999).

Autisme en gehechtheid

In het classificatiesysteem van 1980 (DSM-III; APA) werd een *onvermogen om zich te hechten* als een centraal kenmerk van autisme onderscheiden. In de gereviseerde versie (DSM-III-R; APA, 1987) stelde men dat de gehechtheidgedragingen van kinderen met autisme bizar kunnen zijn en dat deze kinderen op stressvolle momenten helemaal niet of op een vreemde manier veiligheid zoeken. Empirisch onderzoek laat echter zien dat kinderen met autisme wel degelijk gehechtheidgedragingen laten zien (Buitelaar, 1995). Men vond bijvoorbeeld dat kinderen met autisme bij het vertrek van de ouder wel stress ervaren en op zoek gaan naar de ouder (zie bijvoorbeeld Bernabei, Camaioni & Levi, 1998; Sigman & Mundy, 1989, study II); of dat ze bij terugkomst de voorkeur geven aan moeder boven de onbekende (zie bijvoorbeeld Pantone & Rogers, 1984; Sigman, Mundy, Sherman & Ungerer, 1986). Er zijn echter ook studies die rapporteren dat kinderen met autisme bij terugkomst van de ouder atypisch gedrag vertonen. Bij hereniging met de ouder bleven deze kinderen bijvoorbeeld contact houden met de onbekende persoon of waren moeilijk te troosten door lichamelijk contact met de ouder

(zie bijvoorbeeld Shirataki, 1994). Onze eerste onderzoeksvraag richtte zich specifiek op de vraag: hebben kinderen met autisme eenzelfde kans op het aangaan van een veilige gehechtheidrelatie als kinderen zonder autisme?

De meta-analyse

Om deze vraag te kunnen beantwoorden, is er een meta-analyse uitgevoerd. Een vereiste voor inclusie in de meta-analyse was of uit de studie een effect-grootte berekend kon worden voor het verschil tussen veilige en onveilige gehechtheid. Van de zestien studies die gehechtheid bij kinderen met autisme onderzochten, voldeden er zes studies niet aan deze voorwaarde (bijvoorbeeld Sigman & Mundy, 1989; Shirataki, 1994). Vier studies die deel uitmaakten van de meta-analyse rapporteerden relatief lage percentages veilig gehechte kinderen, of ze rapporteerden een belangrijk verschil in veilige gehechtheid tussen de kinderen met en kinderen zonder autisme (zie bijvoorbeeld Spencer, 1993; Pechous, 2001). De overige zes studies (zie bijvoorbeeld Willemsen-Swinkels, Bakermans-Kranenburg, Buitelaar, Van IJzendoorn & Van Engeland, 2000; Rogers & Dillala, 1990) rapporteerden daarentegen dat een substantieel deel van de kinderen met autisme veilig gehecht was, of dat er geen verschil gevonden was met de vergelijkingsgroep. Drieënvijftig procent van de kinderen met autisme of PDD-NOS die geobserveerd werden tijdens de Vreemde Situatie (n = 72) werd geclassificeerd as veilig gehecht.

Uit de meta-analyse (N = 287) kwam naar voren dat kinderen met autisme of PDD(-NOS) minder vaak veilig gehecht waren dan kinderen zonder autisme of PDD (-NOS). De grootte van het effect van autisme op gehechtheid was aanzienlijk (r = ,24). Dat de resultaten per studie aanmerkelijk varieerden, hing samen met de heterogeniteit van de studies. Ze gebruikten bijvoorbeeld verschillende meetinstrumenten om gehechtheid te meten of verschilden qua diagnose. Twee moderatoren bleken van belang te zijn bij het verklaren van de verschillen tussen studies, te weten *ernst van de stoornis* en *verstandelijke beperking*. Kinderen met strikt gedefinieerd autisme bleken minder vaak veilig gehecht en minder responsief in het contact met hun ouder/verzorger. Dit zou erop kunnen wijzen dat, door de ernst van de problemen die het kind heeft in sociale interacties, de ouders van kinderen met autisme minder goed in staat zijn een veilige gehechtheidrelatie met hun kind op te bouwen. Verder vonden we dat alleen de kinderen met autisme *en* een verstandelijke beperking meer signalen van onveilige gehechtheid lieten zien dan de kinderen zonder autisme. Tussen kinderen met autisme met een hoger verstandelijk functioneren en kinderen zonder autisme bleek geen verschil in de mate van veiligheid te bestaan. Het classificeren van de Vreemde Situatie veronderstelt dat het kind betekenis kan verlenen aan het vertrek van de ouder, en dat het als reactie hierop gehechtheidgedrag laat zien. De Centrale Coherentie Theorie benadrukt de problemen van kinderen met autisme in het betekenis verlenen (Frith, 1989; Happé, 1994; Noens & Van Berckelaer-Onnes, 2004). Een zwakke drang tot centrale coherentie zou de ontwikkeling van een *intern werkmodel* van gehechtheidrelaties kunnen beïnvloeden, terwijl een verstandelijke beperking dit proces nog zou kunnen versterken. Chronologische leeftijd bleek, tegen de verwachting in (zie Rogers et al., 1993), geen belangrijke moderator te zijn in onze meta-analyse.

Slechts twee studies rapporteerden over gedesorganiseerde gehechtheid (Capps, Sigman & Mundy, 1994; Willemsen-Swinkels et al., 2000). Hierdoor kunnen we niet verder ingaan op de vraag of er bij kinderen met autisme sprake is van een oververtegenwoordiging van gedesorganiseerde gehechtheid.

De Attachment Q-sort

Waters en Deane (1985) introduceerden de Attachment Q-sort (AQS; Waters, 1987) als een alternatief voor de Vreemde Situatie (Ainsworth et al., 1978). De AQS wordt gebruikt voor het meten van gehechtheid in natuurlijke situaties. De AQS bestaat uit 90 items (Vaughn & Waters, 1990) met gedragsbeschrijvingen die betrekking hebben op gehechtheid maar ook op gedragingen die niet specifiek hieraan gerelateerd zijn, bijvoorbeeld motorische ontwikkeling of temperament. Na langdurige observatie is het de bedoeling de kaartjes te verdelen in negen stapels. De plaats van het item hangt af van het wel of niet kenmerkend zijn voor het geobserveerde gedrag van het kind. Op basis van itemgemiddelden van gehechtheidexperts is er een verdeling vastgesteld voor een optimaal veilig gehecht kind. De veiligheidscore van een specifiek kind wordt berekend door de geobserveerde AQS te correleren met een rangschikking voor dit 'hypothetisch' optimaal veilig gehechte kind.

Hoewel de meeste studies gehechtheid bij kinderen met autisme onderzochten in een stressvolle situatie of in vrij spel, zou het juist bij kinderen met autisme erg waardevol zijn om gehechtheidgedragingen in een natuurlijke situatie te observeren. Omdat kinderen met autisme kwetsbaar zijn voor verstoring van de dagelijkse routine (Van Berckelaer-Onnes, 1983), zouden onverwachte scheidingen met de ouder voor deze kinderen extra stressvol kunnen zijn. Doordat de AQS geen gebruik maakt van een standaard procedure, kan dit instrument vaker gebruikt worden. Zo kan bijvoorbeeld onderzoek gedaan worden naar de korte-termijn effecten van interventies of naar alternatieve gehechtheidrelaties, bijvoorbeeld met groepsleidsters of therapeuten (Howes, 1999). Buitelaar (1995) merkte op dat in de meeste studies die de Vreemde Situatie gebruikten, de kinderen met autisme chronologisch en mentaal ouder waren dan de leeftijdsgrens van 21 maanden waarvoor de Vreemde Situatie ontwikkeld is. Als gevolg hiervan werd de Vreemde Situatie vaak gebruikt in een aangepaste vorm, bijvoorbeeld met maar één separatie of een verkorte separatie. Hierdoor wordt de interpretatie van de resultaten en vergelijking met normatieve studies naar gehechtheid moeilijker (Buitelaar, 1995). De AQS heeft een groter leeftijdsbereik; de methode kan gebruikt worden bij kinderen tot en met 48 maanden (Vaughn & Waters, 1990). Omdat kinderen met autisme gedesorganiseerde gehechtheid laten zien – afwijkend van hun gebruikelijke stereotype gedragingen (Willemsen-Swinkels et al., 2000) – is het verder interessant dat de AQS ook dit type van gehechtheid onderscheid (zie Van IJzendoorn et al., 2004). Ten slotte is het mogelijk de rangschikking voor prototypische gehechtheidgedragingen aan te passen aan bijzondere populaties (zie Van IJzendoorn, Vereijken, Bakermans-Kranenburg & Riksen-Walraven, 2004).

Onze tweede onderzoeksvraag richtte zich dan ook op het gebruik van de AQS bij kinderen met autisme. Met andere woorden: hebben kinderen met autisme hetzelfde

gedragsprofiel van veilige gehechtheid als normaal ontwikkelende kinderen geobserveerd in een natuurlijke situatie? Zowel clinici als onderzoekers op het gebied van autisme (*N* = 59) hebben een rangschikking gemaakt voor een optimaal veilig gehecht kind met autisme. Deze rangschikking voor kinderen met autisme kwam sterk overeen met de rangschikking die bestaat voor normaal ontwikkelende kinderen (*r* = ,93). We konden concluderen dat de originele AQS (Vaughn & Waters, 1990; Waters, 1995) gebruikt kan worden bij het vaststellen van de mate van gehechtheid bij kinderen met autisme. Eventueel kan men gebruik maken van het specifieke ideaalprofiel voor autisme, maar dat wijkt, zoals onze studie laat zien, slechts weinig af van het standaard ideaalprofiel.

Gehechtheid en opvoeding van een kind met autisme

In ons eigen empirisch onderzoek hebben we de invloed van autisme op gehechtheidgedrag in een natuurlijke situatie *en* op de ideeën en ervaringen van ouders met betrekking tot de opvoeding onderzocht. Door vroege onderkenning van autisme waren we in staat ouders van erg jonge kinderen te onderzoeken. Ons doel was om zowel kinderen met autisme als kinderen met een andere klinische diagnose te bestuderen. Onze studie betrof in totaal 89 gezinnen met jonge kinderen (gemiddelde leeftijd 26,5 maanden). De onderzoeksgroep bestond uit kinderen met een autistische spectrumstoornis (ASS), een taalachterstand, een verstandelijke beperking en een niet-klinische vergelijkingsgroep. Gehechtheid werd geobserveerd aan de hand van de *Brief Attachment Screening Questionnaire* (BASQ; Bakermans-Kranenburg, Willemsen-Swinkels & Van IJzendoorn, 2003). De BASQ is samengesteld uit AQS- items die hoog scoorden op de gehechtheidschaal (Waters, 1995). Groepsleidsters vulden de vragenlijst in na observatie op de Peuterunit. De ideeën van de ouders met betrekking tot opvoeden werden gemeten door middel van ouderschapsvragenlijsten. De vragenlijsten waren gericht op het meten van: opvoedingsstijl, dagelijks ervaren beslommeringen, gevoelens van effectiviteit in de opvoeding, ervaren steun en het welzijn van de ouder.

Kinderen met een ASS lieten minder veilige gehechtheid zien dan kinderen met een andere klinische diagnose en kinderen uit de niet-klinische controlegroep. Hierbij lieten de hoogfunctionerende ASS kinderen minder veilige gehechtheid zien in vergelijking met alle andere groepen. In tegenstelling tot de resultaten van de meta-analyse kon onveiligheid dus verklaard worden door de AS en niet door de verstandelijke beperking. De resultaten van de meta-analyse zijn voornamelijk gebaseerd op studies die gebruik maakten van de Vreemde Situatie om gehechtheid te meten, terwijl gehechtheid hier geobserveerd werd in een natuurlijke situatie. Gehechtheidgedrag van kinderen met autisme is wellicht meer context-afhankelijk dan gehechtheidgedrag van kinderen zonder autisme.

Uit het onderzoek bleek verder dat alleen een autoritatieve opvoedingsstijl en sociale ondersteuning van belang was bij het onderscheid tussen groepen. Ouders van kinderen van de niet-klinische controlegroep rapporteerden een hogere mate van autoritatieve opvoedingsstijl in vergelijking met ouders van kinderen met een ASS en in vergelijking met de totale klinische groep. De ouders van de niet-klinische kinderen

gaven verder aan meer sociale ondersteuning te ontvangen in vergelijking met de totale klinisch groep. Binnen de klinische groep waren het de ouders van de kinderen met een ASS die rapporteerden meer sociale ondersteuning te ontvangen in vergelijking met de ouders van de andere klinische groepen. Ten slotte bleek de ervaren sociale ondersteuning geen significante moderator te zijn in de relatie tussen ervaren dagelijkse beslommeringen en gevoelens van effectiviteit in de opvoeding.

We kunnen concluderen dat ouders van deze jonge kinderen met autisme de opvoeding over het algemeen niet als een grotere belasting ervaren dan ouders van kinderen zonder autisme. Deze ouders lijken goed om te kunnen gaan met de uitdagingen die gepaard gaan met het opvoeden van een kind met autisme (of een andere klinische diagnose). Longitudinale studies zouden kunnen uitwijzen of de impact van het hebben van een kind met autisme verandert wanneer de ontwikkeling van kinderen met autisme zich meer gaat onderscheiden van die van hun leeftijdgenoten (zie bijvoorbeeld DeMyer, 1979; DeMyer & Goldberg, 1983).

Tot slot

Ouderlijke sensitiviteit blijkt bij normaal ontwikkelende kinderen van belang te zijn in de totstandkoming van veilige gehechtheid (De Wolf & Van IJzendoorn, 1997). Er is maar één studie die expliciet onderzoek deed naar sensitiviteit bij kinderen met autisme (Capps et al., 1994). Capps en collega's rapporteerden een positieve relatie tussen ouderlijke sensitiviteit en de kwaliteit van de gehechtheidrelatie. Ouders van veilig gehechte kinderen reageerden sensitiever in interactie met hun kind dan ouders van onveilig gehechte kinderen. Zou het zo kunnen zijn dat sensitiviteit, via een veilige gehechtheidrelatie, de sociaal-emotionele en wellicht de cognitieve ontwikkeling van kinderen met autisme kan stimuleren? Of is het voor ouders gemakkelijker om sensitief te reageren op kinderen met autisme die een betere sociaal-emotionele en cognitieve ontwikkeling laten zien (zie Capps et al., 1994)? Ons voorstel is dat men de relatie tussen gehechtheid en opvoeding longitudinaal en in een bredere sociale context gaat onderzoeken. Dat is van cruciaal belang voor bijvoorbeeld het opzetten van interventiestudies die gericht zijn op een optimale ontwikkeling van kinderen met autisme, en het ondersteunen van hun ouders.

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Curriculum Vitae

Anna H. Rutgers was born in Veendam on October 15th, 1977. In 1995 she completed secondary school at the 'Dollard College' te Winschoten. In the same year, she started her masters on Developmental Psychology at the Catholic University of Nijmegen (nowadays Radboud University Nijmegen). For her master's thesis on 'Pre-school children's implicit and explicit memory of faces', she spent half a year in Bergen, Norway. After her graduation in 2000, she worked as a research assistant at the Max Planck Institute for Psycholinguistics for the Language Comprehension Research Group. In April 2001, she started as a PhD student at the Centre for Child and Family Studies and Data theory at Leiden University. Her research topic was 'Autism and attachment security'.