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# [Archived] The Impact of Autism on Child Development

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## Introduction

Autism is a developmental disorder characterized by impairments in social reciprocity and communication, and the presence of restricted or repetitive activities. Onset of autism is before the age of three. The etiology of autism is organic, though no single pathologic event has been identified as uniquely or universally associated with the disorder. The diagnosis of autism can be made accurately at two years of age, with social and communication impairments presenting as primary impairments.[1,2] Treatments that are specialized for autism and begin at young ages have been found to contribute to significant gains in cognitive, social and language functioning.[3-8] Thus, several different professional practice parameters emphasize the importance of both early identification and early intervention in promoting more positive outcomes for children with autism.[9-11]

Current prevalence estimates suggest that approximately three to five children per 1,000 are affected with an autism spectrum disorder.[12] These estimates are higher for first-degree relatives; the recurrence rate of autism in siblings has been reported to be between 2% and 8%.[13] Individuals with autism span the entire range of cognitive ability, with more than half functioning in the range of mental retardation, and a substantial proportion functioning within

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the average to above-average range of intelligence.

**Subject**

This review examines the early behavioural features of autism, with particular focus on the social and emotional sequelae of autism under 24 months of age.

**Problems**

There are many challenges to studying autism during infancy. First, there is no biological marker or medical test for autism.  Therefore, the diagnosis is based on behavioural observation and parental report information.[14] Second, the DSM diagnostic criteria for autism were not developed for young children, and some criteria, such as problems with conversational language, are not appropriate for infants and toddlers. As a result, definitive diagnoses of autism are often not made until children are over three years of age. To learn about very early behavioural features, then, studies must either be retrospective or must follow children prospectively until diagnoses are certain. Third, early milestones for social behaviour are less well defined than those related to motor or language development (i.e. walking and talking). Thus, early deviance in social development, which is the core feature of autism, can be challenging to detect. Fourth, some symptoms of autism overlap with those seen in other developmental disorders, such as language disorders and developmental delays, which makes diagnostic determination – as well as selection of appropriate comparison groups – more difficult.  Finally, autism presents differently in every child. The expression of symptoms varies greatly across children as well as within each child throughout development.

**Research Context**

The most common research methodologies used to study early social/emotional development in infants with autism have been retrospective parental reports and analysis of home movies of infants who were later diagnosed with autism. A newer methodology involves the prospective study of high-risk infants, such as younger siblings of children with autism or children who have failed early social-communication screenings.

**Key Research Questions**

This review will address the social and emotional markers of autism in children under 24 months. An emphasis is placed on studies that have compared the early behaviours of children with

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autism to those of children with developmental delays, as these studies are more likely to provide information about autism-specific behaviours, rather than behaviours resulting from concomitant developmental delays.

**Recent Research Results**

*Retrospective parental report:* Retrospective parental reports have provided important information about the early development of children with autism prior to their first referral for diagnosis. However, retrospective reporting is prone to several types of distortions, such as inaccurate recall and reporter bias, which require that their results be interpreted cautiously. Compared with children with non-autistic developmental delays, children with autism have been described as less likely to demonstrate early social-communicative behaviours such as making eye contact,[15] looking at others,[16] greeting others,[15] offering and giving objects,[15] showing and pointing to objects,[15-17] raising arms to be picked up,[15] imitating,[15-17] and using non-verbal vocalizations communicatively.[15] They are also described as less likely to understand or respond to the communication of others, such as following the point of an adult to an object,[15,16] or responding to their names being called.[16] Parents of children with autism also reported that their infants were less likely to play with them during lap games or turn-taking games,[15,16] were less responsive to parents' attempts to join in their play,[15,16] and were more likely to prefer to be alone [16,17] than children with non-autistic delays. Finally, parents reported that infants with autism were less likely to smile at others[16,17] and more likely to exhibit an expressionless face than non-autistic infants.[16]

*Home movie studies:* Retrospective home movie studies have examined video clips of infants with autism in their home environments as young as six months of age. This method has allowed researchers to judge infant behaviours objectively, without the bias of knowing their later diagnoses. Only results from studies that used observers who were blind to children's later diagnoses are summarized below.

In general, more behavioural differences have been found when comparing infants with autism to those with typical development, than for comparisons between autism and developmental delays. Compared to typically developing infants, infants with autism spend less time looking at people,[18-20] vocalizing toward people,[19] orienting toward people,[19] responding to their name,[18,21-23] seeking contact with people, smiling at others,[19,20] and showing anticipatory gestures in response to adult actions.[18,19,23] However, when compared to infants with developmental delays, differences are

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apparent only for behaviours indicating social responsiveness, with infants with autism looking at others less frequently,[23] responding to their names less frequently,[23] and requiring more prompts from their parents when calling their names.[21]

*Prospective studies:* A newer research approach has been to study high-risk infants prospectively. Prospective studies have an advantage over retrospective studies in that researchers can present standard situations to elicit and measure behaviour. One prospective approach has been to follow children who are at risk for autism because of having failed early screenings for autism or for language delay. In two studies,[24,25] the high-risk group consisted of children who failed the Checklist for Autism in Toddlers (CHAT),[26] a screening measure administered at 18 months of age. Both studies compared children receiving a subsequent diagnosis of autism with those receiving a subsequent diagnosis of developmental delay. Results revealed that at 20 months of age, the children with autism spent less time looking at adults during free play,[25] were less likely to look at the face of an adult feigning distress,[24] showed less gaze switching between people and objects,[24,25] and showed less imitation[24] than children with developmental delays.

Wetherby et al.[27] took a different approach, following a group of children who had failed language/communication screenings from the Communication and Symbolic Behavior Scales Developmental Profile (CSBS).[28] Videotapes of the CSBS Behavior Sample were obtained at a mean age of 18 to 21 months for children who received later diagnoses of autism or developmental delay, and children with typical development. Specific social-communication behaviours, such as eye gaze, coordination of gaze with other non-verbal behaviours, directing attention, responding to name, and unusual prosody were found to differentiate the children with autism from the other two groups.

A more recent prospective approach has been to study later-born siblings of children with autism because of their elevated risk for developing the disorder. The only published study to date employing this methodology found that siblings later diagnosed with autism demonstrated several social differences from typically developing controls by the age of 12 months;[29] these differences included eye contact, social interest, affect and imitation.

**Conclusions**

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In sum, the results from retrospective and prospective studies are similar in their findings that infants with autism demonstrate many social impairments before 24 months of age. Early social orienting and joint attention behaviours are the most consistently described impairments in these young children in the domain of social development, while expressing and sharing positive affect and responding to the affect of others may be most impaired in the domain of emotional development. What makes these findings most remarkable is that these symptoms are apparent up to two years before many children are diagnosed with autism. These findings have led many researchers to consider early social orienting impairments as a primary impairment in autism.[30] Although this is beyond the scope of the present review, it should be noted that infants and toddlers who develop autism may display deviant development in non-social domains as well, such as sensory-motor and attentional functioning.

**Implications for the Policy and Services Perspective**

These findings have several implications for policies and services. First, it is clear that autism can affect development very early in life, before a definitive diagnosis can be made. Therefore, continuing support for research on early identification is sorely needed. New questions about ethical obligations and professional responsibilities have arisen with this focus on very young children, because the implications of early social delays for individual children are not yet known. For example, it is not clear whether all infants who display risk markers for autism at 12 months should be referred for early intervention services, or exactly which services they should receive. Could the full expression of autism be prevented by intervening early in life? Further research is needed to determine which services are appropriate for at-risk infants, and whether these services have the potential to prevent the full expression of autism. Second, there is ongoing parallel research being conducted on early brain development in autism. Collaborative work between researchers studying the early behavioural manifestations of autism and those studying early brain development could facilitate our understanding of how the disorder develops and when developmental deviations begin. Finally, collaboration across centres studying high-risk infants will be critical for obtaining sufficient samples to allow more complex questions about the early development of autism to be asked – and answered.

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