

# Relationship between motor skill impairment and severity in children with Asperger syndrome<sup>☆</sup>

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## Abstract

This study examined the correlation between severity and motor impairment in children with Asperger syndrome (AS). Children, ages 6–12 with AS ( $N = 51$ ) and a control group of typical children ( $N = 56$ ), were assessed using the Social Responsiveness Scale (SRS) and the Movement Assessment Battery For Children (MABC). A bivariate correlational design was used to compare the scores (Spearman rank correlational coefficient). Significant differences were seen between typical, mild to moderate and severe categories of SRS scores, based on the Kruskal–Wallis one-way analysis of variance by ranks ( $p < .05$ ). Strong correlations were found between the MABC motor impairment levels and the SRS severity levels. This study adds a clearer understanding of the relationship between motor impairment and severity for children with AS. The degree of correlation indicates that motor skill impairment is a function of severity within AS.  
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## 1. Introduction

Motor skill impairment has been examined in numerous studies of children with Asperger Syndrome (AS). Delayed motor milestones and motor clumsiness are listed in the International

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Statistical Classification of Diseases and Related Health Problems, 10th Edition (ICD-10; World Health Organization, 1992) as associated, but not necessarily diagnostic features of AS, while the Diagnostic and Statistical Manual of Mental Disorders, 4th Edition, Text Revision (DSM-IV-TR; American Psychiatric Association, 2000) does not include any type of motor problem in the diagnosis. Motor skill impairments have been found in 50–100% of participants in previous studies (Ghazuiddin & Butler, 1998; Ghazuiddin, Butler, Tsai, & Ghazuiddin, 1994; Gillberg, 1998; Green et al., 2002; Klin, Volkmar, Cicchetti, & Rourke, 1995). While occupational and physical therapists frequently address these motor problems in their interventions for children with AS, no study has investigated the relationship between motor impairment and severity with these children. Using a recently developed assessment of autistic impairment severity, the Social Responsiveness Scale (SRS, Constantino & Gruber, 2005), with the widely used Movement Assessment Battery for Children (MABC, Henderson & Sugden, 1992), we sought to examine the relationship between these characteristics of children with AS.

## 2. Literature review

Diagnostic criteria for AS include impaired social interaction; restricted, repetitive, and stereotyped patterns of behavior, interests, and activities; and lack of delay in language or cognitive development. AS is a diagnostic category under the larger group of Pervasive Developmental Disorders (PDD) in the ICD-10 (WHO, 1992) and is known as Asperger's disorder in the DSM-IV-TR (APA, 2000). The United States Department of Health and Human Services, Centers for Disease Control and Prevention (CDC, 2006), recognizes a prevalence rate for PDD between two and six per 1000 individuals. Epidemiological data for AS are not yet available from the CDC, but a recent study estimated a prevalence of 9.5 per 10,000 children (Chakrabarti & Fombonne, 2005), and a four to one ratio of boys to girls is suggested (Ehlers & Gillberg, 1993). Asperger (1944) noted that each of the four case histories in his original paper, describing children who would later be identified as having Asperger syndrome, had some problem with delayed motor skills or motor incoordination. Wing (1981) described 90% of the 34 cases that she had diagnosed based on Asperger's descriptions as being "poor at games involving motor skills, and sometimes the executive problems affect the ability to write or to draw" (p. 116).

### 2.1. Long-term participation and pervasive developmental disorders

To understand the importance of the limitations of individuals with PDD, it is helpful to explore the long-term issues from studies examining adult participation. Among five studies of between a to 43 subjects, proportions of individuals who participated in successful adult occupations of living semi-independently or independently, participating in paid work, or attending college was less than 50% (Larsen & Mouridsen, 1997; Mawhood, Howlin, & Rutter, 2000; Rumsey, Rappaport, & Sceery, 1985; Szatmari, Bartolucci, Bremner, Bond, & Rich, 1989; Venter, Lord, & Schopler, 1992). The number of subjects who had married was very low, with the highest number of two in one study (Larsen & Mouridsen). In a study of 42 adults with HFA and AS, researchers found that they often have extensive need for help from their families and/or society (Engström, Ekström, & Emilsson, 2003). These rather bleak adult outcomes may have some relationship to motor impairment. They also support the importance of early identification and intervention addressing the factors, such as motor impairment, that are related to participation, in order to facilitate more successful adult participation.

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