



# Sensory-motor deficits in children with developmental coordination disorder, attention deficit hyperactivity disorder and autistic disorder

Jan P. Piek \*, Murray J. Dyck

*School of Psychology, Curtin University of Technology, G.P.O. Box U1987, Perth 6845, Australia*

---

## Abstract

Children who have been diagnosed with any one developmental disorder are very likely to meet diagnostic criteria for some other developmental disorder. Although comorbidity has long been acknowledged in childhood disorders, little is understood about the mechanisms that are responsible for the high level of comorbidity. In a series of studies, we have investigated the link between sensory-motor deficits and developmental disorders. Poor sensory-motor integration has long been implicated as a cause of motor problems in developmental disorders such as developmental coordination disorder (DCD), and our recent research has also investigated sensory-motor deficits in children with attention deficit hyperactivity disorder (ADHD) and autistic disorder. Based on a critical examination of relevant literature and some of our recent research findings, we argue that the importance of poor sensory-motor functioning in discriminating children with different disorders has been underestimated. Poor sensory-motor coordination appears to be linked to DCD, but not ADHD. Also, sensory-motor deficits in children with DCD and autistic disorder may provide insight into some of the social difficulties found in these groups of children. This research will increase our understanding of why children with one developmental disorder typically also have problems in other areas. © 2004 Elsevier B.V. All rights reserved.

---

\* Corresponding author. Tel.: +618 9266 7990; fax: +618 9266 2464.  
E-mail address: [j.piek@curtin.edu.au](mailto:j.piek@curtin.edu.au) (J.P. Piek).

*PsycInfo classification:* 2330; 3250

*Keywords:* Developmental coordination disorder; Attention deficit hyperactivity disorder; Visual-spatial perception; Autistic disorder

---

## 1. Introduction

The term ‘developmental disorder’ is used to describe a disorder that appears early in an individual’s life, specifically in infancy, childhood or early adolescence (American Psychiatric Association, 1994). Developmental disorders are generally defined in terms of patterns of poor or deviant development in particular behaviours or constructs. For example, children with developmental coordination disorder (DCD) have poor motor control, whereas children with attention deficit hyperactivity disorder (ADHD) have behavioural difficulties defined by symptoms of inattention and/or hyperactivity and impulsivity. Although these two disorders seem quite distinct in terms of their description, our recent research (e.g., Dyck et al., 2004; Piek, Pitcher, & Hay, 1999) has indicated that these different types of problems are related. For example, Piek et al. noted that inattention was related to poor motor ability, particularly fine motor ability. Dyck et al. investigated five ability constructs, namely IQ, language ability, motor ability, empathic ability and attentional control in a representative sample of 390 children. All five constructs were significantly correlated with each other (except language and attention). Also, children with low ability scores (more than one standard deviation below the mean) on one measure were also likely to obtain significantly lower scores on other ability measures. Therefore, it is not surprising that most disorders are comorbid given they are generally defined by one or more of these ability constructs. Nonetheless, most research on developmental disorders has appeared to assume that the disorders are discrete phenomena with specific aetiologies.

Comorbidity has long been recognized in children with developmental disorders such as autistic disorder, ADHD, DCD and language disorders (e.g., Gillberg, 1995; Watson, Baranek, & DiLavore, 2003). Gillberg described a neurodevelopmental dysfunction syndrome, called deficits in attention, motor control and perception (DAMP). Primarily a syndrome that includes children with DCD and ADHD, Gillberg also noted that these children often have empathy deficits associated with pervasive developmental disorders such as autistic disorder. Other researchers, such as Kaplan and colleagues (Kaplan, Wilson, Dewey, & Crawford, 1998), also noted comorbidity between developmental disorders, but have suggested a generalized neurodevelopmental explanation which reflects some underlying neurological abnormality. They argued that discrete syndromes were the exception to the rule. Hill (2001) also suggested that the overlap between specific language impairment and DCD could be due to a neuromaturational delay.

The fact that developmental disorders are typically comorbid implies: (a) that disorders have overlapping causes, or (b) that the direct causes of one disorder affect the mechanisms that cause some other disorder. However, little research has investigated

متن کامل مقاله

دریافت فوری ←

**ISI**Articles

مرجع مقالات تخصصی ایران

- ✓ امکان دانلود نسخه تمام متن مقالات انگلیسی
- ✓ امکان دانلود نسخه ترجمه شده مقالات
- ✓ پذیرش سفارش ترجمه تخصصی
- ✓ امکان جستجو در آرشیو جامعی از صدها موضوع و هزاران مقاله
- ✓ امکان دانلود رایگان ۲ صفحه اول هر مقاله
- ✓ امکان پرداخت اینترنتی با کلیه کارت های عضو شتاب
- ✓ دانلود فوری مقاله پس از پرداخت آنلاین
- ✓ پشتیبانی کامل خرید با بهره مندی از سیستم هوشمند رهگیری سفارشات