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Psychosocial adjustment and attention in children with developmental coordination disorder using different motor tests

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ABSTRACT

This study examined the consistency between the findings of developmental coordination disorder (DCD) as identified by the Bruininks–Oseretsky Test of Motor Proficiency (BOTMP) and the Movement Assessment Battery for Children (MABC), and explored the psychosocial and attention characteristics of children with DCD identified by the two motor tests, respectively. Participants were 270 children (male: 161, female: 109; age 7.74 ± 0.81 years). The association between DCD status identified by each of the motor tests and psychosocial problems measured by the Child Behavioral Checklist-Chinese version (CBCL-C) was examined using multiple logistic regressions. The results showed that DCD identified by the BOTMP was associated with high scores on the Withdrawn and Social Problems, with a higher proportion of females identified. DCD identified by the MABC was associated with high scores on the Withdrawn and Attention Problems and low score on the Aggressive Behavior. The results reaffirmed the lack of consistency between the motor tests and indicated that children identified by the two motor tests showed different profiles of attention and psychosocial adjustment.

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1. Introduction

Developmental coordination disorder (DCD), a marked impairment in motor coordination that does not have an identifiable neurological or sensory problems, occurs in about 6% of children between the age of 5 and 11 (American Psychiatric Association, 2000), and has received considerable attention because it has a negative impact on the child's daily living and academic performance (Mandich, Polatajko, & Rodger, 2003; Smyth & Anderson, 2000; Stephenson & Chesson, 2008) and may persist into adulthood (Rasmussen & Gillberg, 2000), with increases in problems in psychosocial adjustment (Cantell, Smyth, & Ahonen, 1994; Rasmussen & Gillberg, 2000; Stephenson & Chesson, 2008).

As biological markers of DCD are lacking, diagnosis is based on norm-referenced tests coupled with difficulty in academic performance or activities of daily living (Henderson & Henderson, 2002). According to the DSM-IV-TR (American Psychiatric Association, 2000), the first diagnostic criterion for DCD is that a child's motor coordination in the performance of daily activities is substantially below chronological age and IQ expectations. The meaning of "substantially" is often operationalized as a score on a standardized measure of motor performance below the cut-off score (Henderson & Henderson, 2002). Yet, researchers have noted that there is no "gold standard" for the assessment of motor skills (Crawford, Wilson, & Dewey, 2001; Dewey & Wilson, 2001; Kirby & Sugden, 2007).

By far the two most popular instruments to assess motor skills are the Bruininks–Oseretsky Test of Motor Proficiency (BOTMP) (Bruininks, 1978) and the Movement Assessment Battery for Children (MABC) (Henderson & Sugden, 1992). The former is one of the most widely used diagnostic instruments by North America's therapists and other professionals (Crawford et al., 2001) while the MABC is a test used increasingly to screen for children with DCD in clinics as well as in research (Wilson, 2005). Nevertheless, Henderson and Sugden (1992) found only a moderate correlation between the MABC and the BOTMP ($r = -0.53$). Other studies found that the two tests do not identify the same children as motorically impaired (Crawford et al., 2001; Dewey & Wilson, 2001; Tan, Parker, & Larkin, 2001). Furthermore, many researchers have noted that children with DCD form a heterogeneous group with various subtypes (Jongmans, Smits-Engelsman, & Schoemaker, 2003; Visser, 2003; Wright & Sugden, 1996). Therefore, children classified as DCD by different motor tests may also demonstrate different behavioral patterns including different psychological characteristics.

Since different tests identify different children with DCD, it could be valuable to investigate characteristics of children identified respectively by the two most popular motor tests: the MABC and the BOTMP. With such information, more focused intervention programs could be planned for children with DCD.

Among the characteristics of children with DCD, problems of attention and psychosocial adjustment have been investigated because problems, especially of attention, are often reported to co-occur with motor difficulties (Dewey, Kaplan, Crawford, & Wilson, 2002; Dewey & Wilson, 2001; Kirby & Sugden, 2007; Stephenson & Chesson, 2008; Tseng, Howe, Chuang, & Hsieh, 2007). These co-occurring problems make the child particularly vulnerable to academic or behavior difficulties (Gillberg, 2003; Kirby & Sugden, 2007; Watemberg, Waiserberg, Zuk, & Lerman-Sagie, 2007).

Studies reported that children who were identified as having motor impairments by the MABC or the Test of Motor Impairment-Henderson revision (TOMI-H) (the former version of the MABC) (Stott, Moyes, & Henderson, 1984) were more anxious than their peers, withdrew from social situation, or had social interaction problems (Schoemaker & Kalverboer, 1994; Smyth & Anderson, 2000). Watson and Knott (2006) reported children with DCD were more depressed and used more passive and avoidance strategies than the children without DCD.

It is apparent that children with DCD identified by the MABC often have accompanying attention and psychosocial problems. However, we have found no articles in which the psychological profile of children with DCD as identified by the BOTMP has been investigated. The main purpose of the study was, therefore, to explore possible differences in the characteristics of attention and psychosocial adjustment of children with motor coordination problems as identified by the BOTMP versus the MABC. In addition, the consistency between the findings of DCD as identified by the BOTMP compared with the MABC was examined.