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# Self-efficacy toward physical activity and the physical activity behavior of children with and without Developmental Coordination Disorder<sup>☆</sup>



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### ABSTRACT

**Purpose:** Affecting 5–6% of children, Developmental Coordination Disorder (DCD) is a prevalent chronic condition. The nature of the disorder – impaired motor coordination – makes avoidance of physical activity (PA) common. The purpose of this study was to examine the effect of barrier and task self-efficacy on PA behavior in children with DCD and a group of typically developing (TD) children.

**Methods:** Children were compared on their perceived ability to complete different intensities and duration of PA (task efficacy) and their confidence in completing PA when faced with everyday barriers (barrier efficacy). An accelerometer was used to record their activity over the subsequent week.

**Results:** Children with DCD were found to have significantly lower task efficacy and barrier efficacy. They also spent significantly less time in moderate to vigorous physical activity (MVPA). Multivariate analyses revealed that gender modified the relationship for both groups. Separate multivariate regressions, were therefore conducted by gender. A direct effect of DCD on PA was observed for boys, but not for girls. Further analyses showed that neither task efficacy nor barrier efficacy influenced the relationship between DCD and PA.

**Conclusion:** Results from this study confirm that children with DCD have lower task and barrier self-efficacy than TD children and that males have lower PA levels than their TD peers; however neither

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task or barrier self-efficacy mediated the relationship between DCD and PA.

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## 1. Introduction

Developmental Coordination Disorder (DCD) is a chronic, neurodevelopmental disorder that is believed to affect approximately 5–6% of school-aged children (APA, 2000; Kadesjo & Gillberg, 1999). Children with DCD have motor coordination abilities that are substantially below age-related norms, and which significantly interfere with academic achievement and/or performance of activities of daily living (American Psychiatric Association (APA), 2000).

Previous research has shown children with DCD to be less physically active than typically developing children (Bouffard, Watkinson, Thompson, Causgrove Dunn, & Romanow, 1996; Cairney, Hay, Veldhuizen, Missiuna, & Fought, 2009), and it is believed that this activity-deficit places them at greater risk for obesity (Cairney, Hay, Fought, & Hawes, 2005) and poor physical fitness (Cairney, Hay, Fought, Flouris, & Klentrou, 2007; Schott, Aloh, Hultsch, & Meermann, 2007), which in turn places them at increased risk for coronary vascular disease later in life (Fought, Hay, Cairney, & Flouris, 2005). In order to prevent these negative secondary consequences, a better understanding of the reasons why children with DCD participate less in PA is needed.

Several psychological factors have been identified in the literature, which may help us to understand the activity-deficit between children with and without DCD. Generalized self-efficacy toward physical activity, which refers to a child's overall perceived competence and predilection toward physical activity (Hay, 1992), is lower in children with DCD (Cairney, Hay, Fought, Mandigo, & Flouris, 2005), and is strongly associated with reduced participation in free and organized play in these children (Cairney, Hay, Fought, Wade, et al., 2005). A closely related construct – perceived athletic competence – has also been shown to be lower in children with DCD when compared to typically developing children (e.g., Cantell, Smyth, & Ahonen, 1994; Rose, Larkin, & Berger, 1997; Shoemaker & Kalverboer, 1994; Skinner & Piek, 2001). Perceived competence in this domain refers to the child's perception of mastery of physical skills (Harter, 1982). Finally, when asked to reflect on why they were inactive as children, adults with DCD recall failures at physical pursuits and fear of humiliation from peers as the main reasons for avoiding PA (Fitzpatrick & Watkinson, 2003).

While fear of humiliation, poor perceived athletic competence and low self-efficacy toward physical activity may be important factors accounting for overall lower levels of physical activity participation in children with DCD, several limitations in previous research need to be addressed. First, most existing studies of physical activity behavior in children with DCD rely on self-report measures of physical activity (Cantell et al., 1994; Losse et al., 1991; Piek, Baynam, & Barrett, 2006; Piek, Dworcan, Barret, & Coleman, 2000; Skinner & Piek, 2001). Self-report measures often result in an overestimation of physical activity when used with children and adolescents (Welk, Corbin, & Dale, 2000). This could be the result of social desirability bias, but also may be due to the cognitive demands associated with retrospectively estimating intensity and duration of the behavior. Motion sensor monitors provide an objective measure of physical activity and may provide a less biased estimate of physical activity as beliefs and perceptions do not directly affect the estimation of activity. Accelerometers are able to capture random bursts of physical activity and participation in structured and unstructured activities that is difficult to capture in self-reports (Armstrong & Welsman, 2006); however, very few studies have used as them to estimate physical activity in children with DCD (Baerg et al., 2011). The relationship between perceptions of competence or self-efficacy toward physical activity and physical activity behavior has not been established using objective measurements of physical activity.

In addition, research on the impact of DCD on physical activity has not yet linked perceived self-efficacy toward physical activity in specific behavioral contexts. Some have argued that measures of self-efficacy should be activity specific (e.g., “I am good at basketball”), and connected to specific behaviors, either intention or actual behavior (e.g., I can play basketball today) (Bandura, 2004; Maddux, 1995). Global measures of self-efficacy and competence are broad constructs, capturing general (not behavior specific) attitudes and perceptions toward physical activity, and therefore are likely

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