



# Perceived athletic competence and physical activity in children with developmental coordination disorder who are clinically referred, and control children



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## ABSTRACT

The relationship between perceived athletic competence (PAC) and physical activity (PA) in children with developmental coordination disorder (DCD) is still unclear. This study investigated differences in PAC and PA *between*, and *within*, a group of children with DCD that were clinically referred ( $n = 31$ ) and a group of control children ( $n = 38$ ), aged 7–12 years. All children were categorized in four groups: (1) children with DCD/low PAC, (2) children with DCD/normal to high PAC, (3) control children/low PAC, and (4) control children/normal to high PAC. PAC was assessed with the Self-Perception Profile for Children, and PA was assessed with the Modifiable Activity Questionnaire. Children with DCD participated less in unorganized PA, but not in organized PA, compared with control children. Normal to high PAC was found in more than half of the children (64.5%) with DCD. Children with DCD/low PAC and children with DCD/normal to high PAC participated significantly less in unorganized physical activity compared with control children/normal to high PAC, but not compared with control children/low PAC. The results indicate that there are large individual differences in PAC in children with DCD.

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## 1. Introduction

A fair amount of school-aged children experience difficulties in learning and/or performing motor activities. Children can be diagnosed with developmental coordination disorder (DCD) when motor performance is substantially below that expected given the child's chronological age and previous opportunities for skill acquisition. Also, these difficulties have to

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significantly interfere with activities in daily life and/or academic achievement and are not due to a medical condition (American Psychiatric Association [DSM-V], 2013). The prevalence of DCD is estimated around 5–6% in school-aged children, where boys are overrepresented compared with girls (Blank, Smits-Engelsman, Polatajko, Wilson, & European Academy for Childhood, 2012). Children with DCD experience difficulties in performing motor activities that, in turn, cause difficulties in participation in daily life (e.g., physical activity).

Participation in physical activity is essential for social interaction and life satisfaction in children. Also, physical activity reduces the prevalence of overweight (Dupuy, Godeau, Vignes, & Ahluwalia, 2011; Tudor-Locke, Craig, Cameron, & Griffiths, 2011). Children with DCD participate less in social (Sylvestre, Nadeau, Charron, Larose, & Lepage, 2013) and physical activities (Baerg et al., 2011; Cairney et al., 2005; Cairney, Hay, Veldhuizen, Missiuna, & Faught, 2010) compared with their typically developing peers. These differences in physical activity are present in both unorganized and organized physical activity, and remain roughly the same over time in boys (Cairney et al., 2010).

An important determinant whether children are physically active is perceived athletic competence (Anderson, Masse, Zhang, Coleman, & Chang, 2009; Crocker, Eklund, & Kowalski, 2000; Fisher et al., 2011). Perceived athletic competence is the way children perceive their sports ability and athletic performance (Harter, 1982; Raustorp, Stahle, Gudasic, Kinnunen, & Mattsson, 2005; Ridgers, Fazey, & Fairclough, 2007). Children with DCD have a lower perceived athletic competence compared with their typically developing peers (Cocks, Barton, & Donnelly, 2009; Poulsen, Ziviani, & Cuskelly, 2008; Skinner & Piek, 2001). Harter's Competence Motivation theory provides a theoretical framework for explaining the association between perceived athletic competence and physical activity (Harter, 1981). The Competence Motivation theory assumes that children with high perceived competence in a specific domain are more intrinsically motivated to participate in this specific domain, while children with low perceived competence are less motivated.

Cairney et al. (2005) argue that differences in physical activity between children with probable DCD and their typically developing peers are mainly due to the difference in perceived athletic competence. The authors used two models to predict physical activity in children with probable DCD and typically developing children. The first model tested direct effects of probable DCD status (*yes/no*) and perceived athletic competence on physical activity, while the second model tested both a direct effect of probable DCD status on physical activity and an indirect effect of probable DCD status on physical activity via perceived athletic competence. The second model fitted the data best indicating that the effect of probable DCD status on physical activity was mediated through perceived athletic competence. Hence, the direct effect between probable DCD status on physical activity became non-significant in the second model (Cairney et al., 2005).

Most studies solely use the criterion of having low motor performance to categorize children as having DCD. In fact, children are even considered as having *probable DCD* if they solely score below cut-off points on motor performance tests. Few studies have used children who meet *all* criteria for DCD and are clinically referred, to investigate physical activity and perceived athletic competence. Investigating differences in physical activity and perceived athletic competence between children with DCD that are clinically referred and their typically developing peers provides vital information for future intervention programs to promote physical activity in children with DCD.

We used the same set of children who participated in the study by Oudenampsen et al. (2013). Those authors investigated differences in physical activity between children with DCD and case-control children, and its relationship with aerobic fitness. However, for the present study, we excluded children who were diagnosed with DCD solely based on low scores on manual dexterity from further analysis because no relationship is expected between manual dexterity, perceived athletic competence, and/or physical activity (Piek, Baynam, & Barrett, 2006). Therefore, we first investigated if differences in unorganized and organized physical activity were still present after removal of the children that were diagnosed with DCD solely based on manual dexterity. Then, we investigated differences in perceived athletic competence between children with DCD and control children. Next, we categorized children based on DCD status (*yes/no*) and perceived athletic competence status (*high/low*) resulting in four groups: (1) DCD/low perceived athletic competence; (2) DCD/normal to high perceived athletic competence; (3) control/low perceived athletic competence; and (4) control/normal to high perceived athletic competence. Subsequently, we investigated differences in total physical activity, unorganized physical activity, and organized physical activity between the four groups.

We expect children with DCD to participate less in total physical activity, unorganized physical activity, and organized physical activity after removal of the children that were diagnosed with DCD solely based on manual dexterity. Also, we hypothesize that children with DCD have lower perceptions of their athletic competence compared with control children. Because perceived athletic competence is argued to be an important determinant for physical activity we expect perceived athletic competence to have a mediating effect on the relationship between DCD status and physical activity. Therefore, we expect to find differences between the four groups with the exception of the groups DCD/normal to high perceived athletic competence and control/low perceived athletic competence.

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