



## Can gymnastic teacher predict leisure activity preference among children with developmental coordination disorders (DCD)?

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### ABSTRACT

The aims of the study were to analyze: (1) whether significant differences exist between children with typical development and children with developmental coordination disorders (DCD) in their preference to participate in leisure activities (2) whether the teacher estimation of activity form (TEAF) evaluation predicts participation preference. Participants were 68 children, aged 6–9.83 years, 35 diagnosed as DCD by pediatrician and based on the Movement ABC (M-ABC) and 33 children with typical development. The controls were matched by age and gender to the DCD group. The children filled the preference for activities of children (PAC) and their sport teacher completed the TEAF.

Significant differences were found between the groups in their participation preference based on the PAC items and subscales as well as in the TEAF scores.

Significant correlations were found between the TEAF and PAC subscales. TEAF score significantly predicted children's preference to participate in leisure activities.

Study results recommend using the TEAF for screening DCD and to further consider participation issues among children with DCD as a preventive aid for consequently socio-emotional implications of DCD.

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### 1. Introduction:

Developmental coordination disorders (DCD) is a prevalent yet under-recognized movement skill disorder. DCD is defined as a condition where motor ability is below that expected for age and cognitive ability, but is not attributable to any diagnosed sensory or neurological problems. The motor coordination difficulties significantly interfere with child's participation in everyday activities and academic achievement (American Psychiatric Association, 2000). As such, DCD is one of the most common disorders affecting school-aged children (Wann, 2007).

Children with DCD often show severe secondary outcomes such as difficulty with social relationships, lower self-worth and self-esteem, anxiety, depression, leading to emotional and behavioral disorders (Missiuna, Rivard, & Batlett, 2006; Poulsen, Ziviani, Cuskelly, & Smith, 2007). Thus, secondary outcomes of DCD may also contribute to the negative affects on child's participation.

Participation refers to the nature and extent of a person's involvement in life situations. Participation is essential for psychological and emotional well-being as well as for skill development, and contributes to one's life satisfaction and sense of competence (World Health Organization – WHO, 2001).

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The World Health Organization, international classification of functioning, disability and health (2001) emphasizes that functioning is the interaction of the individual with his/her physical, social, and psychological environment. Thus, it is important to refer to the interaction between the individual's body structures/functions and his/her ability to perform activities and to participate in real-life (WHO, 2001).

Studies highlight that DCD negatively affect the child's participation in terms of limited skills of self care, academic tasks (difficulties in writing, typing), leisure activities, recreational activities or a combination of all these (Kirby, 2011; Polatajko & Cantin, 2005). Thus, it is necessary to use a vast point of view in DCD evaluation and treatment which will also include referring to participation patterns of children with DCD.

When evaluating participation, it is important to recognize that one of the major determinants of participation in leisure and recreation is individual preferences or interests (Searle & Jackson, 1985). Interest in taking part in activities is closely related to an individual's level of participation. Thus, preference can lead to participation, and participation can also lead to the development of stronger interests (Garton & Pratt, 1991).

The evaluation should also refer to participation in various environments. However, while most studies about participation of children with disabilities focused on school environment, additional knowledge is required regarding participation in after school hours. This important time includes ADL, play and leisure activities (Jarus, Lourie-Gelberg, Engel-Yeger, Bart, 2011). Moreover, the evaluation of participation in leisure activities should refer to various activities, including: recreational activities, active physical activities, social activities, skill-based activities, and self-improvement/educational activities which can be categorized under two domains: *Formal activities*, such as music or art lessons, organized sports, or youth groups, are more structured, have rules and organization, involve leaders and often require pre-planning. *Informal activities*, such as reading, talking on the phone, or doing a puzzle, are typically more spontaneous, occur with less planning, and have only few rules (Kalscheur, 1992; King, Law, Kertoy, & Yung 2003; King et al., 2004; Sloper, Turner, Knussen, & Cunningham, 1990).

While most previous studies about the negative impacts of DCD on children's participation are mainly reported by parents (Summers, Larkin, & Dewey, 2008), the present study used a child's self report – the preference for activities of children (PAC) (King et al., 2004). This was based on the literature according to which children hold a unique, valid, and stable view about themselves (Sturgess, Rodger, & Ozanne, 2002).

In order to address and prevent DCD negative outcomes on children's participation, the evaluation process should start as early as possible (Polatajko, Fox, & Missiuna, 1995; Schoemaker et al., 2006). For that, early screening needs to be performed. The literature highlights that this screening may be also performed in non-clinical settings (Hay, Hawes, & Faught, 2004). One main setting is school, in which children participate in a major part of their time (Faught et al., 2008). Since motor testing is both time consuming and expensive, questionnaire-based assessments were developed for screening DCD (Cairney, Hay, Faught, Flouris & Klentrou, 2007). Some of them were based on parents report (e.g., DCDQ) (Wilson, Kaplan, Crawford, Campbell, & Dewey, 2000) and child's report (Hay et al., 2004). Additional studies mentioned the importance of referring to teacher's report (Faught et al., 2008; Schoemaker, Smits-Engelsman, & Jongmans, 2003), since teachers observe children engaging in different play (e.g., recess) and in scholastic activities (e.g., handwriting) (Faught et al., 2008).

Yet, a debate exists between researchers in regard to the suitable teacher's report tool. Wright and Sugden (1996) used the M-ABC teacher checklist in conjunction with the M-ABC performance test to determine the prevalence among Singaporean children with DCD. They found that the checklist was moderately correlated with the M-ABC test but the sensitivity was very low (14.3%). Schoemaker et al. (2003) reported an even lower correlation between the teacher's checklist and the MABC, but found much higher rates of sensitivity (50–80% at the 15th percentile cut-point across age groups) and encouraged to search for alternative instruments. Faught et al. (2008) used the teacher estimation of activity form (TEAF) (Hay, 1992; Hay & Donnelly, 1996) and found that sports teachers showed an accurate understanding of their students' physical ability potential and activity behavior. The authors stated that it is easier for teachers to report on "general perceptions" of the children's physical ability, than on specific motor domains (e.g., ball skills) as found in other teachers' checklists for screening DCD.

Taking it all together, it is important to screen DCD as early as possible, and when found, refer to its vast affects, including child's participation.

The purposes of this study were to examine (1) whether significant differences exist between children with typical development and children with DCD in their preference to participate in leisure activities and in their physical activity level as reported by their sports teachers, (2) whether the sports teacher reports predict child's participation preference.

Answering these aspects may illuminate the importance of sports teachers in screening DCD and highlight the necessity of referring to child's participation patterns in intervention process.

## 2. Methods

### 2.1. Participants

Participants were 68 children, aged 6–9.83 years. All participants were registered in mainstream public schools in the northern region of Israel. Participants' familial socioeconomic status ranged from low to high, in accordance with parents' reports about their mean income level per month and the values published by the Central Bureau for Statistics in Israel (2011).

The study group included 35 children with DCD, as diagnosed by a pediatrician/developmental neurologist as suffering from DCD, according to the DSM-IV criteria, and by occupational therapists who examined the children by using the

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