



Psychometric properties of the Italian version of the Developmental Coordination Disorder Questionnaire (DCDQ-Italian)



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ABSTRACT

A valid tool that contributes to the diagnosis of Developmental Coordination Disorder (DCD) is represented by the Developmental Coordination Disorder Questionnaire 2007 (DCDQ'07). Recently we developed the Italian version of DCDQ (DCDQ-Italian). The aim of this study was to further analyze the psychometric properties in a sample of Italian school children aged 5–12 years and to establish cut-off scores with respect to age groups. A total of 698 parents completed the DCDQ-Italian and 45 of them repeated it after 2 weeks for test–retest reliability. One hundred and seventeen children were tested using the Movement Assessment Battery for Children. Confirmatory factor analysis supported this version to be consistent with the original. Cronbach's alpha for the total score was 0.89 and test–retest reliability was 0.88. Two-ways ANOVA for total and single subscales showed a significant main effect for age group only and not for gender. Sensitivity and specificity for our community based sample were 59% and 65% respectively, considering the cut-off scores for the 15th percentile of M-ABC and increasing when age groups were taken into account (ROC curve = 0.62). The agreement with the original was good if 15th is considered. This is the first study on the psychometric property of DCDQ in a community sample of Italian children. The DCDQ-Italian could be used as a screening tool for motor coordination difficulties in Italian children. Slight differences in cut-offs should be considered when using this version.

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1. Introduction

During the last two decades there has been a growing interest in children with developmental coordination disorder (DCD) (Visser, 2003; Blank, Smits-Engelsman, Polatajko, & Wilson, 2012). These children, who face inadequate motor skills in daily life without evidence of an underlying neurological disorder, represent about 5–10% of the school-aged population (Zwicker, Missiuna, Harris, & Boyd, 2012). Children with DCD may limit physical activities and sports, reach poor academic

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achievements and have low self-worth, anxiety and depression (Piek, Bradbury, Elsley, & Tate, 2008; Fitzpatrick & Watkinson, 2003).

DCD represents a life-long risk factor and early identification is necessary to deal adequately with the problem at an early stage and to intervene with specific programmes. The timely identification of DCD has been recommended by several authors (Cairney, Hay, Faught, Flouris, & Klentrou, 2007; Schoemaker et al., 2006) but proper screening tools for this use are still not globally shared between professionals in the field. Motor coordination testing is often too time consuming and expensive for population screening and cannot be used for purposes of early identification.

An economic and efficient tool for screening children is represented by parent and/or teacher questionnaires and the results can then be confirmed by more specific motor coordination tests.

One parent report instrument is the Developmental Coordination Disorder Questionnaire (DCDQ) composed of 15 items (Wilson et al., 2009). It has been designed in Canada as a rapid motor screening tool for children aged 5–15 years and has been validated in several countries (Schoemaker et al., 2006; Martini, St-Pierre, & Wilson, 2011; Tseng, Fu, Wilson, & Hu, 2010; Salamanca, Naranjo, & González, 2012; Kennedy-Behr, Wilson, Rodger, & Mickan, 2013). The DCDQ correlates well with specific motor tests (i.e. Movement Assessment Battery for Children, M-ABC, Henderson and Sugden, 1982) and achieves high discriminate function (Wilson et al., 2009).

The adapted Italian version of the DCDQ achieves satisfactory internal consistency and reliability (Caravale, Baldi, Gasparini, & Wilson, 2014).

The aim of the present study was to investigate the psychometric properties of the DCDQ-Italian in a school population sample of children aged 5–12 years using the M-ABC as criterion standard for diagnosis of DCD.

2. Methods

2.1. Measures

2.1.1. The Italian version of the Developmental Coordination Disorder Questionnaire (DCDQ-Italian)

The DCDQ-Italian is a 15-item parent questionnaire designed to screen for coordination disorders in children aged 5–15 years. Parents are asked to answer on a five-point Likert scale when comparing motor performance between their child and peers. Each item is scored from 1 to 5 points, giving a total score of 15–75 points. The total score indicates whether the child is in the group of children with “indication of, or suspect for, DCD” (lower scores), or “probably not DCD” (higher score) with respect to three age groups (5–7 years and 11 months, 8–9 years and 11 months and 10–15 years). Translation, cross-cultural adaptation and preliminary psychometric qualities of the Italian version were described in a previous study demonstrating that this tool achieves satisfactory internal consistency and reliability (Caravale et al., 2014).

2.1.2. The Movement Assessment Battery for children (M-ABC)

The Movement ABC (Henderson et al., 1982) is a norm ranked test designed to provide an indication of motor functioning through an evaluation of both fine and gross motor skills, in children aged 4–12 years. The test provides four age-related (4–6, 7–8, 9–10, 11–12) item sets within 3 subsections: Manual Dexterity, Ball Skills, and Static and Dynamic Balance. Quantitative performance of each item is scored from 0 (best) to 5 (worst). Item scores are summed producing subsection scores, comparable to normative data to determine whether subsection performance is typical, suspect, or definitely impaired. Subsection scores are summed creating a total score. Subsections and total scores can be transformed to centile scores. The M-ABC has good validity and reliability (Henderson & Hall, 1982). We used the 15th centile as criterion for DCD diagnosis as other authors have (Schoemaker et al., 2006; Geuze, Jongmans, Schoemaker, & Smith-Engelman, 2001).

2.2. Participants and procedures

Participants were recruited from three elementary and three middle schools in two Italian cities, Pavia (northern Italy) and Roma (central Italy). Families came from various locations (inner city, suburban and rural) and the sample was considered sufficiently expressive of socio-economic status of the population. Parents were informed about the research project by researchers and teachers through organized meetings at school, explanatory leaflets and/or individual talks, and consents were obtained. Parents were asked to complete: (1) a semi-open questionnaire on the anamnesis with the intent to collect information on child medical history and development; (2) the DCDQ-Italian at home, and (3) a consent to allow the administration of the M-ABC if their child was selected. Children diagnosed with developmental delay, intellectual deficit, neurological disorder (i.e. cerebral palsy, muscular dystrophy) or autism spectrum disorder were excluded. Incomplete DCDQ were rejected.

Fifty parents were asked to complete the DCDQ again 14 days later for testing the reliability; 45 of them returned the questionnaire.

M-ABC tests were administered to children that scored on DCDQ-Italian with “indication of, or suspect for, DCD” and to age and gender matched controls. Research assistants administered M-ABC tests at school, blinded of the DCDQ results.

Nine hundred and fifty DCDQ-Italian were distributed and 779 returned (82%). After the exclusions relating to participants and/or to the completeness of the DCDQ or anamnestic data, 698 DCDQ-Italian were included for the analysis.

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