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Reliability and validity of the Finnish version of the motor observation questionnaire for teachers

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ABSTRACT

Objectives: Observational screening instruments are often used as an effective, economical first step in the identification of children with Developmental Coordination Disorder (DCD). The aim was to investigate the psychometric properties of the Finnish version of the Motor Observation Questionnaire for Teachers (MOQ-T-FI).

Methods: The psychometric properties were tested using two separate samples (S1: age range 6–12, M 9y 5mo, females 101, males 92; S2: age range 6–9, M 7y 7mo, females 404, males 446). Teachers completed the MOQ-T-FI in both samples, and in sample 2 teachers' ratings were compared to student's performance on the Movement Assessment Battery for Children-Second Edition (MABC-2). Internal consistency was investigated by using Cronbach's alpha, predictive validity by receiver operating characteristic (ROC) analysis, concurrent validity by correlation analysis, and construct validity by factor analysis.

Results: The MOQ-T-FI behaves consistently with its original Dutch version. The internal consistency was excellent ($\alpha = 0.97$). The bifactor model, with one general factor and two specific factors, fit the data significantly better than the first-order model. The concurrent validity with the MABC-2 was moderate ($r = 0.37$ $p < 0.001$). Sensitivity was 82.5% and specificity 44.5%, respectively.

Conclusion: Notwithstanding the low specificity the MOQ-T-FI can be considered as a promising screening tool in the school environment for Finnish children at risk of motor learning problems.

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1. Introduction

Developmental coordination disorder (DCD) is a common neurodevelopmental disorder affecting approximately 5–6% of school-aged children. It is characterized by an inability to execute movement skills, with a significant negative impact on the child's performance in activities of daily living or academic skills (APA, 2013). The identification of children with DCD is

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complicated. A general lack of awareness, DCD's variability in presentation and comorbidity are the main reasons why identification is often delayed (Kennedy-Behr, Wilson, Rodger, & Mickan, 2013; Kirby, Davies, & Bryant, 2005; Wilson, Ruddock, Smits-Engelsman, Polatajko, & Blank, 2013), or even ignored. However, early identification is recommended to avoid commonly occurring secondary problems, such as social and emotional difficulties (Kirby, Sugden, & Purcell, 2014; Rigoli, Piek, Kane, & Oosterlaan, 2012; Viholainen, Aro, Purtsi, Tolvanen, & Cantell, 2014; Wagner, Bös, Jascenoka, Jekauc, & Petermann, 2012), health problems and inactivity (Hendrix, Prins, & Dekkers, 2014; Joshi et al., 2015; Rivilis et al., 2011), or academic problems (Cantell, Smyth, & Ahonen, 2003; Kantomaa et al., 2013).

The question, however, is how to best recognize those children who need support for their motor development. Standardized tests are time consuming and expensive (Cools, De Martelaer, Samaey, & Andries, 2009). Furthermore, there is disagreement on what might be the most accurate test in diagnosing DCD (Piek, Hands, & Licari, 2012; Watter et al., 2008), because commonly used standardized tests measure only discrete aspects of movement competency (Lane & Brown, 2015; Rudd et al., 2015). Observational questionnaires could reconcile the discrepancy between motor tests and give information about more diverse aspects of motor development (Doderer & Miyahara, 2013). Consequently, in order to measure movement competence, it is suggested to use a wider range of test batteries (Rudd et al., 2015). Therefore, a multilevel approach for testing and evaluation in different environments is recommended (APA, 2013; Cools et al., 2009; Wilson, 2005). Observational screening instruments are often used as an effective, economical first step in the identification of children with motor learning difficulties (Cairney et al., 2007; Green et al., 2005). Several questionnaires for parents (Rosenblum, 2006; Wilson et al., 2009), teachers (Faught et al., 2008; Henderson, Sugden, & Barnett, 2007; Rosenblum, 2006; Schoemaker, Flapper, Reinders-Messelink, & Kloet, 2008) and children (Barnett, Robinson, Webster, & Ridgers, 2015; Cairney et al., 2007) have been developed for that purpose, though it should be noted that questionnaires are subjective (Schoemaker & Wilson, 2014). Nevertheless, the questionnaires do provide useful information about functional motor abilities and how motor problems interfere with academic achievement or activities of daily living (Netelenbos, 2005; Schoemaker, 2014).

In Finland, there are no observational questionnaires available for motor screening purposes. This lack notwithstanding, the new national school curriculum (which came into effect in August 2016) expects teachers to recognize motor learning difficulties in 6–9-year-old children. The Finnish National Core Curriculum focuses on earliest possible support in order to prevent the emergence and accumulation of problems. Support for growth and learning are provided in three stages: general support, intensified support and special support. General support provided by the classroom teacher is available for everyone as part of everyday teaching. If general support is not enough, then pedagogical assessment is required. Intensified and special supports are based on precise and careful assessment (FNBE, 2016). Therefore, an observational screening tool is needed to help teachers to recognize all children who need support in motor learning.

Cultural translation was chosen instead of developing a new questionnaire because it ensures comparability across international populations. (EACD, 2011; Rihtman, Wilson, & Parush, 2011). On the basis of a large systematic review, the Motor Observation Questionnaire for Teachers (MOQ-T) was chosen for culture and language adaptation in Finland (Asunta, Viholainen, Ahonen, Westerholm, & Rintala, 2014). This study aims to determine the psychometric properties of the Motor Observation Questionnaire for Teachers (MOQ-T-FI), and to investigate if the questionnaire can be used as a screening tool for motor learning difficulties in Finland. So far, sensitivity and specificity in motor observation questionnaires are usually lower in population-based screenings than they are in clinical populations. The sensitivity and specificity of MOQ-T have been investigated in a combined clinic-control sample only. This study is the first one to investigate the sensitivity and specificity of MOQ-T in a population-based sample.

2. Methods

2.1. Participants

Reliability and validity analyses were based on two community-based data sets: the first data set (S1; teachers $n = 27$, children $n = 193$, 6–12 years, $M_{\text{age}} = 9\text{y } 5\text{mo}$; females 52.3%, males 47.7%) and the second data set (S2; children $n = 850$, 6–9 years, $M_{\text{age}} = 7\text{y } 7\text{mo}$; females 47.5%, males 52.5%). All children were without neurological, physical or intellectual disabilities. In S1, eight pre- and elementary schools in central Finland were selected. These were geographically distributed and included urban, suburban and rural areas. In most cases, all children from each class were tested. The exceptions included those cases in which the class size and the amount of consents received were large. For these, every second child was selected alphabetically. In S2, which serves as the reference data, the children were selected comprehensively from pre- and elementary schools in five different territories in Finland (north, south, west, east, and southwest), proportionally to the number of inhabitants. Each territory was divided further into three different municipalities (urban, suburban and rural). From each included class, three girls and three boys were selected by a specific system: every second child in alphabetical order. For pragmatic reasons, some classes were included as a whole. Ethical approval was obtained from the University of Jyväskylä Ethical Committee. Parents provided written, and children oral, consent.

2.2. Procedure

The first data set (S1) was designed to investigate concurrent validity, discriminative validity and predictive validity. All children were assessed with two instruments: the Movement Assessment Battery for Children – Second Edition,

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