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Elaboration, validation and standardization of the five to fifteen (FTF) questionnaire in a Danish population sample



Rikke Lambek^{*}, Anegen Trillingsgaard

Department of Psychology, Aarhus University, Bartholins Allé 9, 8000 Aarhus C, Denmark

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ABSTRACT

The five to fifteen (FTF) is a parent questionnaire developed to assess ADHD, its common comorbid conditions and associated problems in children and adolescents. The present study examined (1) the psychometric properties of scores on the new teacher version of the FTF, (2) competing models of the FTF subdomain structure and (3) the psychometric properties and utility of scores on the newly developed FTF impact questions. Parents ($n = 4258$) and teachers ($n = 1298$) of Danish children and adolescents (ages 5 to 17 years), selected using simple random sampling, completed the FTF. In the largest study of the FTF to date, parent and teacher scores had acceptable psychometric properties. The FTF subdomains were organized into six domains labelled cognitive skills, motor/perception, emotion/socialization/behaviour, attention, literacy skills and activity control and analysis of these domains may provide additional information when applying the FTF in the future. The impact questions yielded information above and beyond that provided by symptom count alone and appeared to increase the ability of the FTF to identify at risk children and adolescents.

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1. Introduction

Neurodevelopmental disorders such as attention-deficit/hyperactivity disorder (ADHD) are associated with high rates of comorbidity and overlapping problems such as executive dysfunction, social skills deficits and language impairment (Jensen et al., 2001; Staikova, Gomes, Tarter, McCabe, & Halperin, 2013; Willcutt, Doyle, Nigg, Faraone, & Pennington, 2005). While several excellent questionnaires (Achenbach & Rescorla, 2001; DuPaul, Power, Anastopoulos, & Reid, 1998) assess some of these comorbidities/problems, the need for a scale that covers the whole range led a Nordic multidisciplinary research group to develop the five to fifteen (FTF) questionnaire which targets ADHD, its common comorbid conditions and associated problems in children and adolescents aged 5 to 15 years (Kadesjö et al., 2004). The FTF questionnaire (available at www.5-15.org) has 181 items that can be endorsed as “does not apply” (0), “applies sometimes or to some extent” (1) or “definitely applies” (2). Items are arranged into eight domains covering motor skills, executive functions, perception, memory, language, learning competencies, social skills and emotional/behavioural problems. The domains can be further divided into 22 subdomains investigating gross and fine motor skills, attention, hyperactivity-impulsivity, hypoactivity, planning/organising, perception of space, time, and body, as well as visual perception, memory, comprehension, speech, communication skills, reading/writing, math, general learning, coping skills during learning, social skills, internalizing and

^{*} Corresponding author. Tel.: +45 87165815; fax: +45 87150201.
E-mail address: rikkel@psy.au.dk (R. Lambek).

externalizing behaviour and obsessive–compulsive behaviour. The reliability and validity of the FTF domain and subdomain scores have been demonstrated by studies finding acceptable to good internal consistency, test–retest reliability, and inter-rater agreement (Kadesjö et al., 2004) as well as significant associations with relevant scores from questionnaires (Bohlin & Janols, 2004) and performance-based measures (Korkman, Jaakkola, Ahlroth, Pesonen, & Turunen, 2004; Lind et al., 2010). The FTF is currently translated into 6 languages (more are pending) and used extensively in clinical practice and research.

The FTF was originally developed as a parent questionnaire. However, the items pertain to aspects of child and adolescent functioning that should also be evident outside the family context (e.g., in school), and therefore teachers should be able to complete the FTF as well (Kadesjö et al., 2004). The FTF has already been administered to teachers in a few previous studies and preliminary results suggest an association between parent and teacher ratings (Farooqi, Hägglöf, & Serenius, 2013; Lindblad, Gillberg, & Fernell, 2011). As multi-informant ratings are generally recommended in the clinical assessment and hopefully should establish some level of reliability, an official teacher questionnaire was developed. This questionnaire was identical to the parent version, but “child” was substituted with “pupil” where relevant.

The factor structure of the FTF subdomains has been examined in three previous studies using principal component analysis (PCA). One study found a two-factor solution, representing learning difficulties and socio-emotional problems in a population-based sample (Bohlin & Janols, 2004). Another population-based study resulted in one broad general development factor and three additional factors representing socio-emotional problems/control, cognition/motor function/language, and communication/school learning (Beltrán-Ortiz, de Barra, Franzani, Martinich, & Castillo, 2012). Finally, a study with a clinical sample with ADHD resulted in six factors including cognitive skills, motor/perception, emotion/socialization/behaviour, attention, literacy skills, and activity control (Bruce, Thernlund, & Nettelbladt, 2006). Because of these inconsistent results the factor structure of the FTF subdomains deserves to be re-examined and using parent as well as teacher ratings.

Mounting evidence suggests a discrepancy between the number of symptoms or problems reported and the degree of functional impairment endured. For instance, the rate of ADHD appears to decrease when diagnosis is based not solely on symptom count but also functional impairment (Gathje, Lewandowski, & Gordon, 2008), just as individuals not identified as cases by symptom count may suffer from significant impairment (Sibley et al., 2012). Inspired by this line of work, 10 impact questions were added to the FTF. The impact questions were formulated in general terms such as “Do problems with X interfere your child’s daily function” (parents) or “Do problems with X interfere with your pupil’s function in school” (teachers) to be rated as “Not at all” (0), “A little” (1), “Quite a lot” (2) or “A great deal” (3). Impact questions were placed immediately after domains, with the exception of the executive function domain, where separate impact questions were included after subdomains. This was done because the executive function domain included ADHD DSM-IV/5 congruent items as well as items pertaining to hypoactivity and planning/organising and recent studies suggest that neither hypoactivity, nor problems with planning/organising are symptomatic of ADHD, albeit more likely distinct but often co-occurring problems (Barkley, 2013; Lambek et al., 2011).

Additionally, an upward extension of the age range to 16 and 17-year-olds was performed and a few items slightly elaborated to reflect a broader age range. Due to space constraints descriptive statistics for 16 to 17-year-olds are provided as supplementary data and only the major conclusions regarding the inclusion of older adolescents are reported in the article.

The present study constitutes the largest study of the FTF questionnaire to date and is the first to examine the psychometric properties of FTF teacher scores, competing models of the FTF subdomain structure and the newly developed FTF impact questions. The study had three specific aims. The first aim was to assess the reliability of domain and subdomain scores. Second, the construct validity of the FTF questionnaire was investigated. Finally, the psychometric properties and utility of the impact scale scores were examined.

2. Method

2.1. Participants

Statistics Denmark, a state institution under the Ministry of Economic Affairs and the Interior, was employed to select an age- and gender stratified simple random sample (approximately 1%) of the population of children between the ages of 5 and 17 years ($N = 865,414$) living in Denmark at the time of the study. After individuals with research protection and recent emigrants or deaths were excluded ($n = 2185$), parents of 9065 children were invited to participate. A total of 4263 parent questionnaires were returned, including questionnaires from parents of five sibling pairs; subsequently, one member of each sib-pair was randomly selected and excluded from the study. The majority of the remaining questionnaires ($n = 4258$) were completed by mothers (71%). The FTF sample (children) was mainly Caucasian of Danish descent (95%). Comparisons between the FTF sample and the background population indicated that differences were small ($\leq 4\%$ units in 8 out of 11 socioeconomic variables concerning labour force participation and income), albeit that the FTF sample was slightly underrepresented with respect to lower socioeconomic groups. Parents were encouraged to forward an invitation letter to the child’s primary teacher (see Section 2.2). A total of 1415 teacher questionnaires were returned. After excluding 115 teacher questionnaires without a corresponding parent questionnaire and one half of two sib-pairs, 1298 teacher questionnaires were included in the present study. The majority of teachers came from primary and lower secondary schools (77% public, 13% private, 2% special education, and 3% continuation), 3% came from kindergarten-equivalent facilities and 2% from upper secondary schools.

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