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Efstratopoulou, M., Janssen, R and Simons, J. (2013) *Concordance among physical educators', teachers', and parents' perceptions of attention problems in children*. Journal of Attention Disorders., 17 (5). pp. 437-443. ISSN 1087-0547

This is an Accepted Manuscript published by Elsevier in its final form on 8th February 2012
<https://doi.org/10.1177/1087054711431698>.

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Concordance among physical educators', teachers', and parents' perceptions of
Attention problems in children

Abstract

Objective: The study examined the concordance among rating sources on attention problems of elementary school-aged children. **Method:** A randomly selected sample ($N = 841$) of children was rated by the physical educators, the teachers, and the parents, using the attention Scales of the Motor Behaviour Checklist (MBC; Efstratopoulou, Janssen, & Simons, 2012) the Teacher Report Form (TRF; Achenbach & Rescorla, 2001), the Child Behaviour Checklist (CBCL; Achenbach & Rescorla, 2001) and the ADHD Rating Scale-IV (DuPaul, Power, Anastopoulos, & Reid, 1998). **Results:** Convergent validity of the 'Lack of Attention' Scale of the MBC with the corresponding subscales was supported. Correlations were higher between teachers' ratings and between physical educators' and teachers' ratings than between physical educators' and parents' ratings or between teachers' and parents' ratings. **Conclusion:** Findings underscore the importance of taking the child's settings and observer influences into account and suggest that MBC (Efstratopoulou, Janssen, & Simons, 2012) is a new promising instrument for screening attention problems in school settings.

Key words: inattention; behavioural problems; ADHD; children; convergent validity; physical education

Article Reference

Efstratopoulou, M., Simons, J. & Janssen, R. (2012) Concordance among physical educators', teachers', and parents' perceptions of attention problems in children. *Journal of Attention Disorders*, xx(x), 1–7. doi: 10.1177/1087054711431698

Introduction

1.1 The importance of early assessment

Many children facing symptoms of attentional, emotional, or behavioural problems are placed in public elementary schools without a first screening or diagnosis. These children are "at risk" for school failure, emotional difficulties and significant negative adult outcomes compared to their peers (Eisenberg, Fabes, Guthrie, & Reiser, 2000). Among childhood psychiatric disorders, one of the most challenging behavioural problems for practitioners and educators is Attention-Deficit Hyperactivity Disorder (ADHD) which is characterized by inattention, lack of concentration, and learning difficulties in addition to some degree of hyperactivity and impulsivity (American Psychiatric Association, 2000; Corrigan, 2003). The disorder affects approximately five percent of school aged children (Johnson & Rosén, 2000) which experience difficulties in behaviours crucial to academic success, such as maintaining attention, modulating activity levels, inhibiting impulsive responses, and persisting with academic tasks (DuPaul & Stoner, 2003). Students with ADHD experience persistent and extreme distractibility (Hutchison, 2004), cannot screen out irrelevant stimuli in order to concentrate on tasks long enough to complete them, and does not sustain thought processes long enough to do school work (Bennett, Dworet, & Weber, 2008).

Early identification of attention problems can help to minimize the long-term harm and reduce the overall healthcare burden and costs (Aos, Lieb, Mayfield, Miller, & Pennucci, 2004). Given the costs associated with ADHD, to students themselves, their families, and society as a whole, it is not surprising that reducing the incidence through systematic screening and comprehensive intervention efforts is a growing area of interest to educational research (Kauffman & Landrum, 2009; Lane, 2007; Nelson, Babyak, Gonzalez, & Benner, 2003).

In contrast to the assessment of cognitive status, which is accomplished primarily through direct testing, children's problems and competencies are identified and described based on the reports of others. Thus, how problem behaviours are defined reflects the perceptions and attitudes of observers, as well as children's characteristics, setting or situational demands, and constraints.

1.2 Agreement between rating sources

Considerable literature addresses issues of method effects in cross-informant studies, and both instrument and informant effects have been identified (Achenbach, McConaughy, & Howell, 1987; Fergusson & Horwood, 1987; Greenbaum, Dedrick, Prange, & Friedman, 1994; Phares, Compas, & Howell, 1989). For school-age children, the two major sources of information about problems are parents (usually mothers) and teachers. The assessment in schools is necessarily as it emphasizes the importance of parents' involvement in their children's schooling, including their input into decisions about assessment and intervention. As noted by Kolko and Kazdin (1993), however, "The complex relationship between informant correspondence and various clinical demographic characteristics of both children and their parents/families remains understudied" (p. 993). This has been especially true in the assessment of children in school, where decisions about student's educational and behaviour problems have been made primarily by school professionals, with parents being the recipients rather than the contributors of information. In general, concordance has been found to be higher when informants have similar relationships with the children being rated than when raters represent different roles. Thus, there is stronger agreement between parents than between parents and teachers, suggesting that there may be differences in raters' frames of reference and/or that children's behaviours vary in different settings.

In addition, research findings of parent-teacher ratings of clinic-referred children indicate that concordance was higher for the clinic-referred children than for non-referred children (Kolko & Kazdin, 1993; Loeber, Green, Lahey, & Stouthamer-Loeber, 1991), and the correlation between parents' and teachers' total problem scores on the CBCL was higher for children in special education than for children in regular classes (Verhulst & Akkerhuis, 1989).

1.3 The role of physical educators in the assessing procedure

Although classroom teachers are in an excellent position to provide information about the child's behaviour, they observe their children mainly during lesson at class settings. In contrast with class settings, Physical Education (PE) lessons and group play situations provide a unique opportunity to observe a child interacting with his/her peers, co-operating or just being on his/her own. The fact that physical educators spend a lot of time with the children and have the flexibility to work with them and observe their behaviours in several ways (e.g., structured lessons or free play situations) and several different settings (inside or outside the classroom, at the playground or at the school-yard), give them the opportunity to distinguish between maladaptive and general age-related motor behaviours. Evidence for the presence of externalizing and/or internalizing symptoms can be obtained in multiple active situations, and

a number of behavioural symptoms can be observed during PE classes and team games (Kashani, Allan, Beck, Bledsoe, & Reid, 1997). Behavioural symptoms can be systematically observed during standardised play procedures (Mol Lous, Wit, De Bruyn, & Riksen-Walraven, 2002) and educators who observe different aspects of children during their lessons are able to identify young children at high risk for school adjustment problems related to attention, conduct, learning, and mood with a great deal of accuracy (Flanagan, Bierman, & Kam, 2003).

Physical education teachers have the knowledge and the skills to focus on the “warning sings” of abnormal motor related behaviours providing useful information about the development of school-aged children. However, there are only a few instruments that use the physical educators as main source of information about children’s development and the majority of them are focusing on movement and motor coordination problems like the Bruininks-Oseretsky Test of Motor Proficiency (BOT-2; Bruininks & Bruininks, 2005), the Test of Motor Development (TGMD; Ulrich, 2000), or the Movement Assessment Battery for Children (MABC-2; Henderson & Sugden, 2007). These instruments mainly assess gross and fine motor skills and neurological development as part of psychological test batteries, for making decisions about educational placement, developing and evaluating motor training programs. In addition, none of the existing instruments for physical educators assess a wide array of children’s problematic behaviours, as most of them are focusing only on specific disorders which are highly connected with performance in sports or with class management in school settings, like the State-Trait Anxiety Inventory for Children (STAIC; Spielberger, 1973) and the Physical Education Classroom Instrument (PECI; Kullina, Cothran, & Regualos, 2003).

1.4 The current study

We suggest that the agreements and disagreements between parents' and educators' perceptions of children's behavioural problems provide important diagnostic information that can inform interventions. The purpose of this study, therefore, was to investigate the correspondence among physical educators', teachers' and parents' ratings of children on attention problems and to investigate the relationships among informants' perceptions on these children’s problematic behaviours. More specifically, in this article, we focus on concordance among physical educators', teachers' and parents' views of the attention problems of elementary school-aged children using ratings from: the Motor Behaviour Checklist for children (MBC; Efstratopoulou, Janssen, Simons, 2012), the Teacher Report Form (TRF; Achenbach & Rescorla, 2001), the Child Behaviour Checklist (CBCL; Achenbach & Rescorla, 2001), and the ADHD Rating scales (ADHD-RS-IV; DuPaul, Power, Anastopoulos, & Reid, 1998).

2. Method

2.1 Participants' characteristics

A randomly selected sample ($N= 841$) of elementary school-aged children was used in the study. The overall sample consisted of 421 (50, 1%) girls and 420 (49, 9%) boys, ranging from 6 to 11 years ($M=8.4$ years, $SD=1.7$ years.) and they had the Greek nationality (99 %). The data derived from 35 typical Greek elementary schools widely spread across the country selected so that the sample distribution would be representative of the urban and rural population. The schools were located in urban areas (63.3%) and in rural areas and islands (36, 7%). The participant’s teachers of the schools ($N=210$) were asked to randomly select four children (2 boys and 2 girls) from each class and to rate them on the Attention scale items of the TRF (Achenbach, & Rescorla, 2001) and Attention items from the ADHD rating scale (Du Paul, Power, Anastopoulos, et al., 1998). The physical education teachers of the schools ($N= 62$) were asked to rate the same students using the Lack of Attention scale (10 items) of the Motor Behaviour Checklist (MBC) for children. In addition, the parents of the participant’s children

were asked to fill in the Attention problem scale of parent's version of Achenbach test (CBCL, Achenbach & Rescorla, 2001) and the Attention items from ADHD rating scale (parent's form).

2.2 Assessment Instruments

2.2.1 Motor Behaviour Checklist (MBC) for children

In this study, we introduce the Motor Behaviour Checklist for children (MBC; Efstratopoulou, Janssen, Simons, 2012) as a screening instrument to measure the motor related behavioural symptoms of elementary school-aged children. The Motor Behaviour Checklist for children (MBC) is a behaviour scale designed to be completed by the physical educator teacher who knows the child well enough to rate his/her motor behaviour. Responders are asked to observe the child during physical education classes and free play situations and to rate each behaviour on a 5-point Likert scale ranging from "never" (0) to "almost always" (4). The MBC for children consists 59 motor related behaviour items included in two broadband factors (Externalizing and Internalizing) and seven problems scales: Rules breaking (7 items), Hyperactivity/Impulsivity (14 items), Lack of Attention (10 items), Low energy (4 items), Stereotyped behaviours (2 items), Lack of Social interaction (10 items), and Lack of Self regulation (12 items). The internal consistency (ranging from .82 to .95), the reproducibility (ranging from .85 to .90), and the interrater agreement (ranging from .75 to .91), assessed in previous studies, suggest that MBC for children is an instrument homogeneous in content, with high temporal stability and high correlation agreement.

2.2.2 Child Behaviour Checklist (CBCL) and Teacher Report Form (TRF)

One of the most popular approaches to measure childhood behaviour problems has been to use rating scales that are completed by either parents or teachers. The Child Behaviour Checklist (CBCL) and Teacher Report Form (TRF), (Achenbach & Rescorla, 2001) are among the most widely used parent-report measures of youth emotional and behavioural problems in both clinical and research settings. The problem behaviour items measure three broadband scales: Internalizing, Externalizing, and Total Problems, and eight syndrome scales: Withdrawal, Somatic Problems, Anxiety/Depression, Social Problems, Thought Problems, Attention Problems, Delinquent Behaviour, and Aggressive Behaviour (Achenbach, 1991).

The items on both CBCL and TRF, were rated as Not True (0), Somewhat or Sometimes True (1), or Very True or Often True (2), and summed to yield (a) eight syndrome scale scores, (b) six DSM-oriented scale and (c) broad-band scale scores (including internalizing and externalizing total scores). With well-established normative data and standardized clinical cut offs, the instruments have demonstrated strong psychometric properties within clinical settings for discriminating between referred and non referred populations (Achenbach, 1991; Chen, Faraone, Biederman, & Tsuang, 1994; Drotar, Stein, & Perrin, 1995). Validity and reliability of the syndrome and DSM-oriented scales have been also documented (Achenbach & Rescorla 2001; Achenbach, Dumenci, & Rescorla, 2002).

2.2.3 ADHD Rating Scale

The ADHD RS-IV (DuPaul, Power, Anastopoulos, & Reid, 1998) is a easy-to administer instrument based on the DSM-IV criteria for Attention Deficit/Hyperactivity Disorder for diagnosing ADHD in children and adolescents and for assessing treatment response. Containing 18 items, the scale is linked directly to DSM-IV diagnostic criteria for ADHD. The manual provides two versions of the scale: a parent questionnaire on home behaviours, and a teacher questionnaire on classroom behaviours. The items on ADHD scale, are rated as; almost

never (0), rarely (1), many times (2), very often (3) and summed to yield (a) a total score and (b) separate scales scores. The Attention scale score is computed by summing the odd numbered items of the ADHD RS-IV (9 items) and the Hyperactivity/ Impulsivity scale score is computed by summing the even numbered items of the ADHD RS-IV (9 items).

2.3 Assessment Procedures

Prior to any data collection, all participants and their legal guardians underwent standardized Institutional Review Board-approved notice of privacy and consent procedures. The study was in line with the guidelines given by the Research Ethics Board of the K.U. Leuven. The classroom teachers were asked to select in a specific random way, based on the numbers of their students' educational files, four children (two boys and two girls) from each grade and to rate them on the attention items of TRF (Achenbach & Rescorla, 2001) and ADHD RS-IV (DuPaul, Power, Anastopoulos, & Reid, 1998) for teachers. The parents of the selected children were informed about the aim of the study and the assessment procedures, by the research assistant and the classroom teacher of the school. It was clarified that the children were selected in a random way, and the data will be treated as anonymous and confidential only for the study purposes. The parents were asked to rate their own child on Attention problem scale, using the CBCL (Achenbach & Rescorla, 2001) and the attention items from the parents' version of ADHD RS-IV (DuPaul, Power, Anastopoulos, & Reid, 1998). Finally, the physical education teachers of the schools were asked to rate their students, on the Lack of Attention problem scale of the Motor Behaviour Checklist (MBC; Efstratopoulou, Janssen, Simons, 2012) for children.

2.4 Statistical analysis

We assess correlations among rating sources and among different assessment instruments. Because the measures were of the same trait or concept, it was expected them to be positive and strongly correlated. However, the fact that attention problems were rated based on different instruments (MBC, TRF, CBCL, ADHD RS-IV), and ratings derived from different rating sources (Physical educators, Teachers and Parents), we focus on the investigation of concordance among raters.

3. Results

The correlation coefficients among physical educators', teachers' and parent's ratings are in Table 2. An initial examination of the results confirms the convergent validity of the Lack of Attention problem scale of the MBC in correlation with the corresponding sub scales.

More specifically, the physical educators' ratings on the Lack of Attention problem scale of MBC were significantly correlated with teachers' ratings on both ADHD RS-IV, and TRF, with correlation coefficients of .56 ($p < .001$), and .47 ($p < .001$), respectively. For the parents' ratings, the correlations between physical educators' ratings on MBC and parents' ratings on ADHD RS-IV, and CBCL, were .45 ($p < .001$), and .42 ($p < .001$), respectively, indicating that, the correlations found between physical educators and teachers in our sample were higher than between physical educators and parents on the Attention scales in both instruments used.

With regard to teachers' ratings, the correlation found between TRF and ADHD RSIV, was .66 ($p < .001$), which was the highest correlation coefficient among raters and instruments used in this study, when, the correlation found for parents' ratings between CBCL and ADHD RS-IV, was .54, ($p < .001$). Examining correlations between teachers' and parents' ratings, the correlations coefficients found between teachers' ratings on TRF and parents' ratings on

ADHD RS-IV (parents' version) were .44 ($p < .001$) and .62 ($p < .001$) between teachers' ratings on ADHD RS-IV (teachers' version) and parents' ratings on ADHD RS-IV (parents' version). Finally, the correlations found between parents' ratings on CBCL and teachers' ratings on TRF and between parents' ratings on CBCL and teachers' ratings on ADHD RS-IV (teachers' version), were .50 ($p < .001$) and .48 ($p < .001$) respectively.

4. Discussion

In this study, we specifically addressed the degree of concordance between parents' and educators' views of attention problems of children, using a randomly selected normative database of elementary school-aged children. Questions of parent-teacher concordance are especially important as these rater groups are commonly used sources of information for children's behavioural status. In addition, raters' agreement is especially relevant given the increased involvement of parents in diagnostic and placement decisions and the movement toward inclusion of children with attention problems in general education programs.

Physical educators, classroom teachers and parents completed comparable measures assessing children's attention problem behaviours in school and in home settings. Examination of the correlations among ratings indicated that, the correlations found between physical educators and teachers in our sample were higher than between physical educators and parents on the Attentions scales in both instruments used.

These findings are in line with studies suggesting that concordance has been found to be higher when informants have similar relationships with the children being rated than when raters represent different roles (Achenbach, McConaughy, & Howell, 1987; Greenbaum, Detric, Prange, & Friedman, 1994). Thus, there was stronger agreement between teachers, and between physical educators and teachers than between parents and physical educators or between parents and teachers, suggesting that there may be differences in raters' frames of reference and/or that children's behaviours vary in different settings.

These differences may reflect situational demands and/or differences in the salience and importance of particular child behaviours for parents and educators. The modest level of concordance may also be related to actual differences in children's behaviour at home and at school. The variations in ratings on attention problems, as perceived by parents and educators, have implications for the content of intervention as well as for assessment because the focus or emphasis in intervention may differ for parents and teachers. Consistent with literature indicating moderate agreement (.41, $p < .001$) on attention problem scales between parents' and teachers' ratings on TRF and CBCL in a Greek sample, (Rousos, Karantanos, Richardson, Hartman, Karajiannis, Kyprianos, Lazaratou, et al., 1999) the correlation between raters on these instruments was slightly higher (.50, $p < .001$) in our study.

The highest correlation between ratings in this study was observed between teacher's ratings on TRF and ADHD-RS-IV, which was expected as the same teacher rated the child, in classroom settings using different instruments. Given that the focus on this study was on the concordance among raters, it must be noted that the highest concordance was observed between physical educators' and teachers' ratings. More specifically, physical educators' ratings on Lack of Attention scale of MBC were higher correlated with teachers' ratings on ADHD-RS-

IV than with teachers' ratings on TRF. One possible reason is the fact that from MBC and ADHD-RS-IV, only attention items were used in this study, when from the TRF and CBCL the attention problem scales contained items describing both, inattention and hyperactivity, without having separate scores for attention items.

In general, our findings suggest that physical education teachers have the knowledge and the skills to focus on attention problems providing useful information and children's situational conditions must be taken into account in clinical/educational assessment, as well as underscore the importance of multiple informants when assessing children with attention problems.

4.1 Practical implications and recommendations for future research

The findings of this study are quite encouraging for the future use of MBC for children in the Greek population. The 'Lack of Attention' problem scale of MBC demonstrated significant convergent with ADHD-RS-IV and with Attention problem scale of TRF, indicating that the instrument can be used as a valid measure for assessing attention problems during physical education class in school settings. Taking into consideration that early identification for emotional and/or behavioural problems can help to minimize the long-term harm and reduce the overall healthcare costs (Aos et al, 2004), the MBC for children could be used for various educational purposes including research projects and intervention programs. More specifically, the MBC may help physical educators in developing class management techniques for reducing attention problems of their students, assess the effectiveness of their interventions with a pre-post administration and help them decide about the referral or not of their students with attention problems for further diagnostic evaluation.

Future studies could examine the convergent and discriminant validity of the MBC subscales using ratings from similar in content subscales of behavioural assessment instruments or ratings from clinical population.

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