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## ADHD symptoms in national samples of Turkish adolescents: self, parent, and teacher reports

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### Abstract

This study examined the correspondence among child, parent and teacher reports, in rating ADHD symptoms of 937 community children aged 15-18. Correlations between raters, especially parents-teachers and teachers-adolescents, were in the low range. In contrast, parent-adolescent concordance was greater than the other two informant correspondence. Informant correspondence was higher for cognitive/inattentive problems than hyperactivity problems.

*Keywords:* ADHD, adolescent, parent and teacher, Conners' Rating Scales-Revised-Long.

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### 1. Introduction

ADHD is evaluated according to the DSM-IV in clinical settings. Besides DSM-IV, many rating scales have been used to determine the ADHD symptoms and/or treatment effects. Different informants such as parent, teacher, and child respond these scales' items. Each informant offering his or her own unique perspective on the child behavior (Smith, 2007) and has own strengths and weakness (Verhulst, Dekker & van der Ende, 1997). While parents are familiar with children's behaviors across situations and time, teachers have the opportunity to observe and compare children's behavior with that of his/him classmates in a structured school setting. Neither parents nor teachers are able to observe all behaviors of children. Therefore, children, especially as they grow older, are reliable and valuable informants about their own behaviors.

Children behaviors may be situation specific and certain behaviors occurring in only certain settings (i.e., home, and/or school); also, informants differ in their opportunities for observing children, their effects on the children, and their standards of judgment (Achenbach, McConaughy & Howell, 1987; Renk, 2005; Verhulst et al., 1997). Using different information sources such as parent, teacher, and children and adolescent themselves is important to see the whole picture about the children's and adolescent's situations (Kaner, 2009).

Informant discrepancies about problem behaviours of children and adolescents have been studied extensively. Especially, parent-teacher ratings agreement was investigated (i.e., Antrop, Roeyers, Oosterlaan, Van Oost, 2002; Coutinho, Mattos, Schmitz, Fortes, & Borges, 2008; Gomez, 2007; Kolko, & Kazdin, 1993; Loeber, Green & Lahey, 1990; Mitsis, McKay, Schulz, Newcorn & Halperin 2000; Re & Cornoldini, 2009; Serra-Pinheiro, Mattos & Regalla, 2008; Van der Oord, Prins, Oosterlaan & Emmelkamp, 2006; Verhulst et al., 1997). However, few studies have interested in parent-teacher-adolescent agreement on attention problems (Becker, Hagenberg, Roessner, Woerner & Rothenberger, 2004; Cohen, Kelly & Atkinson, 2004; Kolko, & Kazdin, 1993; McConaughy, 1993,

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Smith, Pelham, Gnagy, Molina. & Evans, 2000). Using adolescent' rating with parent and teacher ratings, make more comprehensive determining ADHD symptoms.

Conners' rating scales are most commonly used for this purpose (i.e., Bussing et al, 2008; Conners, 1997; Hale, How, Dewitt & Coury, 2001; Waschbusch & Willoughby, 2008). These assessment instruments have developed empirically based by Conners (1997) and sets obtain standardized ratings of children's behavioral and emotional problems by multiple informants' perspectives. Because the main symptoms of ADHD are inattention, hyperactivity and impulsivity, we used only Cognitive Problems/Inattentive, Hyperactivity, ADHD Index, DSM-IV Symptom Scales (DSM-IV-Inattentive, DSM-IV-Hyperactive-Impulsive subscales of Conners' rating scales.

In this study, we examined how the information from parents, teachers, and adolescents about ADHD symptoms in adolescents match with each other with Conners' rating scales. This is the first study investigating three different information sources (parent, teacher and adolescent) evaluations' in terms of ADHD symptoms in Turkey.

## 2. Methodology

### 2.1 Sample.

In the present study data were collected from non-clinic adolescents and from their parents and their teachers. The sample consist of 937 adolescents aged 12-18 (mean age is 16.24, SD=0.96), including 486 girls (51.9%) with a mean age of 16.15 years (SD=0.94) and 451 boys with a mean age of 16.34 years (SD=0.97).

#### 2.1.1. Measures

*2.1.1.1. Conners' Parent Rating Scale-Revised/Long-CPRS-R/L (Conners, 1997).* CPRS-R/L contains 80 items. There are 14 subscales: Oppositional, Cognitive Problems/Inattentive, Hyperactivity, Anxious/Shy, Perfectionism, Social Problems, Psychosomatic, Conners Global Indeks (Restless-Impulsive, Emotional Liability), DSM-IV Symptom Scales (DSM-IV-Inattentive, DSM-IV-Hyperactive-Impulsive).

Kaner et al (Kaner, Büyüköztürk, İşeri, Ak, & Özyayın, 2006a) investigated psychometric properties of CPRS-R/L for Turkish parents. 5355 children and adolescents aged 3-17 years old were enrolled in this study. Confirmatory factor analysis-CFA suggested that CPRS-R/L form's structure derived from Turkish children were fit to the original structure of the scale. Correlations between CPRS-R/L with CPRS-48 and RPBC were demonstrated generally at the moderate level. Cronbach's alpha coefficient were 0.85- 0.55. Test-retest reliability values were in the range of 0.73- 0.35.

*2.1.1.2. Conners' Teacher Rating Scale- Revised/Long-CTRS-R/L (Conners, 1997).* With the exception of the Psychosomatic subscale, the teacher and the parent forms contain the same subscales (Conners, 1997). CTRS-R/L has 59 items. Kaner et al (2006b) were conducted CFA on the data obtained by administering the CRTRS-L on teachers of 5355 children of the 3-17 age group in Turkey. CFA showed that the CRTRS-L's structure obtained from the Turkish children was consistent with an original scale excluding one item (Item 42) in a different subscale. Also, ADHD Index separated two subscales which named ADHD Index-Inattentive and ADHD Index-Hyperactive. It was found that the relationship between the CTRS-R/L and CRTRS-28 and the RPBC were of medium significance in general. Cronbach alpha coefficients were ranged 0.80-0.94. Further, a test-retest reliability coefficient was analysed (0.62-0.99).

*2.1.1.3. Conners-Wells Adolescent Self-Report Scale-Long-CASS-L (Conners, 1997).* CASS-L contains 87 items and 10 subscales (Family Problems, Emotional Problems, Conduct Problems, Cognitive Problems/Inattentiveness, Anger Control, Hyperactivity, ADHD Index, DSM-IV Symptom Scales (DSM-IV-Inattentive, DSM-IV-Hyperactive-Impulsive).

Adaptation study of CASS-L to Turkish adolescents were conducted by Kaner et al (Kaner et al., 2006c). CFA suggested that CASS-L's structure derived from Turkish adolescents were fit to the original structure of the scale. The Cronbach alphas of the CASS-L (0.76-0.87) and test-retest reliability was also investigated (0.64-0.81).

Adolescents, parents, and teachers are asked to rate frequency of a specific behaviour of an adolescent on a 4 point Likert-type scale, ranging from 0=not true at all (never, seldom), 1=just a little true (occasionally), 2=pretty

much true (often, quite a bit), and 3=very much true (very often, very frequent). A higher score corresponds to a greater presence of symptomatic behaviours.

### 3. Results

The present study assessed concordance of self-and informant ratings of youth's ADHD symptoms in a national sample of Turkish adolescents. Pearson correlations of parents, teachers' and youths's reports of the adolescents's ADHD problems are presented in Table 1.

Table 1. Informants agreement on CPRS-R/L, CTRS-R/L and CASS-L

Parent-Teacher (n=937)							
Parent	Teacher						
	CP-I	H	ADHD-I	ADHD-H	DSM-IV/I	DSM-IV/HI	DSM-IV/T
CP-I	.24**	.12**	.20**	.10**	.21**	.11**	.18**
H	.04	.10**	.05**	.08**	.03	.10**	.07*
ADHD	.14**	.11**	.14**	.09**	.13**	.10**	.13**
DSM-IV/I	.13**	.08*	.11**	.07**	.11**	.08*	.11**
DSM-IV/HI	.10**	.14**	.06**	.14**	.04	.16**	.11**
DSM-IV/T	.05	.12**	.10**	.12**	.08*	.14**	.12**
Parent-Adolescent (n=937)							
Parent (n=937)	Adolescent						
	CP-I	H	ADHD	DSM-IV/I	DSM-IV/HI	DSM-IV/T	
CP-I	.58**	.26**	.52**	.55**	.35**	.52**	
H	.38**	.46**	.42**	.37**	.55**	.54**	
ADHD	.54**	.41**	.55**	.54**	.50**	.61**	
DSM-IV/I	.52**	.27**	.47**	.54**	.38**	.54**	
DSM-IV/HI	.33**	.52**	.38**	.34**	.62**	.57**	
DSM-IV/T	.48**	.46**	.48**	.50**	.58**	.63**	
Teacher-Adolescent (n=937)							
Teacher	Adolscent						
	CP-I	H	ADHD	DSM-IV/I	DSM-IV/HI	DSM-IV/T	
CP-I	.21**	.05	.18**	.13**	.06	.11**	
H	.07*	.10**	.08*	.08*	.14**	.13**	
ADHD-I	.16**	.07*	.16**	.14**	.05	.11**	
ADHD-H	.06	.11**	.06	.06*	.13**	.11**	

DSM-IV/I	.17**	.04	.15**	.11**	.05	.12**
DSM-IV/HI	.06	.11**	.07*	.06	.16**	.12**
DSM-IV/T	.13**	.09**	.13**	.10**	.11**	.11**

\* $p < 0.05$ ; \*\* $p < 0.001$

As shown Table 1, parent-teacher agreement were between 0.03-0.24. The correlations for teacher-adolescent ratings were 0.05-0.21. These results show that correlations between parent and teacher ratings and self and teacher ratings were low. On the other hand, all parent-self correlation coefficients (0.26-0.63) were significant but low to moderate (for DSM-Total,  $r=0.63$ ; for DSM-Hyperactive-Impulsive,  $r=0.62$ ; for Cognitive Problems-Inattentive,  $r=0.58$ ; for ADHD Index,  $r=0.55$ ; for DSM-Inattentive,  $r=0.54$ ).

For both parent-teacher and teacher-adolescent ratings in inattentiveness scales (respectively  $r=0.11$ -0.24;  $r=0.11$ -0.21), the correlations were found to be a little bit higher than in hyperactivity scales (respectively  $r=0.08$ -0.16;  $r=0.10$ -0.16). Correlations were between 0.46-0.62 in hyperactivity and 0.52-0.58 in inattentiveness scales for parent-youth ratings.

#### 4. Discussion

The present study evaluates agreements between parent, teacher, and adolescent ratings in terms of ADHD symptoms via Conners rating scales.

The results showed that the highest consistency were between parent and youth assessments. The other two cross-informants consistencies' were quite low. Although Conners (1997) found more higher correlations between raters than ours, the current findings are consistent with previous discrepancy research showing that parent, teacher and adolescent have different perceptions about ADHD symptoms. Previous research examining informant consistency of childhood hyperactivity/inattention has been largely supported our findings. The present and the past research have shown low to moderate levels of agreement across different informants of psychopathology including ADHD (Achenbach et al., 1987; Conners, 1997; Deb, Dhaliwal, & Roy, 2008; De Los Reyes, & Kazdin, 2005; Gau, Soong, Chiu, & Tsai, 2006; Gomez, 2007; Kolko, & Kazdin, 1993; McConaughy, 1993; Renk, 2005; Smith, 2007; Sullivan & Riccio, 2007). In the well known study of Achenbach et al (1987), the authors conducted a metaanalysis to examine the relationship between parents, teachers, and the children themselves. This analysis revealed low to moderate correlations between raters. Low correlations between multiple informants may be considered as lack of reliability in informant' reports. It must be assumed that different informants present different contributions to the diagnosis information, rather than assuming that one of these informants may be inaccurate or invalid (Achenbach et al., 1987). It is also indicate that these informants could not substitute for one another (Achenbach et al., 1987). Every informants present value informations with different perspective. Thus, instead of considering the accuracy of any one informant, researchers and clinicians must obtain information on children's problem behaviors from multiple perspectives and investigate the methods for combining information from multiple informants.

Inconsistency between informants may be due to that behaviors of concern may be related to a specific setting or context. In other words, most pairs of informants have different roles and saw the children under different conditions such as home, school, and clinical settings, and they interact differently with the child (Achenbach et al., 1987), and also, children and adolescents behave differently at school and at home.

The lowest agreement was on the adolescent's relationships with the teacher. On the other hand, parent-adolescent agreement was higher than teacher-adolescent agreement. These findings indicate that the adolescents agree with their parents more often than they agree with teachers. It may be that student's relationship with teachers in high school are changing with each teacher. Also, it seems that parents share more common perspective with their children in terms of ADHD symptoms than teachers. Consistently with our findings, Parker, Bond, Recker & Wood (2005) report moderate agreement between adolescent and parent ratings. In other two research, Achenbach, Dümenci & Rescoria (2002) and Becker et al (2004) reported identical findings with ours'.

Also it was found that the correlations parent-teacher and teacher-adolescent ratings in inattentiveness scales were to be a little bit higher than in hyperactivity scales. Our findings seem to support the notion and findings that hyperactivity symptoms appear to be typical of young children and decrease with age, whereas inattention is relatively pervasive developmental characteristic, appear to be more stable across various life contexts, being more characteristic of older children, and even in general population may not change from childhood to adolescence (Antrop et al., 2002; Conners, 1997; Coutinho et al., 2008; Deng, Liu & Roosa, 2004; Dias et al., 2008; Gau et al., 2006; Glutting, Youngstrom & Watkins, 2005; Gomez, 2007; Kumar & Steer, 2003; Luk, Leung, & Lee, 1988; Pierrehumbert, Bader, Thevoz, Kinal & Halfon, 2006; Pineda et al., 2005; Ruchkin, Lorberg; Koposov, Schwab-Stone & Sukhodolsky, 2008; Van der Oord et al., 2006; Waschbusch & Willoughby, 2008). However, few studies revealed contradictory results (Kaner, 2009; Mattison, Bagnato & Strickler, 1987; Re & Cornoldini, 2009; Zuker, Morris, Ingram, Morris, & Bakeman, 2002). For example, Gau et al. (2006) reported that hyperactivity decreased over school grade levels for girls and boys according to parents' perspectives, but this was not obtained in teachers' reports; inconsistently from our finding teacher reported inattention and cognitive problems increased over school grade levels only for boys aged 6-16 years.

Overall, current findings supported the importance to take into account different informants' judgements identifying ADHD symptoms in children and adolescents. However, there are several limitations of this study. The main weakness of this study is the use of measures using different questions for different informants. When such measures are employed, discrepancy between parent, teacher and child reports may simply be the result of them answering similar but different items (Carlston & Ogleb, 2009). Future research regarding informant rating scales must take into consideration item level agreement. Research about item-level agreement between different informants can guide researchers and clinicians in evaluating and integrating information (Cai, Kaiser, & Hancock, 2004) from these informants for preventing specific problem behaviors in different settings such as home and schools. But this suggestion seems like not to explain exactly the differences of raters' perceptions in the current study. There is a contradictory finding to this suggestion in our study. In the DSM-IV/Inattentive and DSM-IV/Hyperactive-Impulsive scales all items are identical in parent and teacher forms except one item in both subscales. However, it was found that low correlations in parent-teacher ratings for both subscales. Nevertheless, it should be used same items content comparing informants' judgement.

Although there are several advantages of using rating scales which psychometric properties empirically based, future research must use other research methodology such as direct behavioral observations, and parent and teacher interviews besides completion of rating scales of different informants. Multi-dimensional assessment could lead to more accurate identification of children with ADHD.

Agreement between informants' ratings was greater for younger children than adolescents (Achenbach et al., 1987; Tang, 2002). Thus, future research will necessarily address informant agreements using samples with children of different ages.

Informant agreement in current study may be influenced by a number of factors. Informant discrepancies may relate to characteristics of parents, teachers, and the youths. Future research will necessarily need to evaluate if informant and child agreement is influenced by child (such as age, gender, type of problem) and informant characteristics (i.e., mental health).

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