



# The role of the CBCL in the assessment of autism spectrum disorders: An evaluation of symptom profiles and screening characteristics



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## ABSTRACT

**Background:** The Child Behavior Checklist (CBCL) offers the possibility to obtain information about a large number of psychiatric and somatic symptoms in a short period of time. This study aimed to examine symptom profiles and the usefulness of the CBCL for screening purposes in ASD.

**Method:** Our sample comprised 1800 children and adolescents aged 4–18 years ( $M = 10.91$ ,  $SD = 3.34$ ), who had been diagnosed with high-functioning ASD ( $n = 130$ ,  $IQ > 70$ ), ADHD ( $n = 337$ ), Internalizing Disorders ( $n = 364$ ) or other psychiatric disorders ( $n = 969$ ).

**Results:** In line with previous research, children and adolescents with ASD showed a high prevalence of behavior problems, which was even higher in cases of comorbid ASD + ADHD. However, the sensitivity and specificity of the CBCL syndrome scales were low.

**Conclusion:** Although the CBCL is not a suitable screening instrument for the identification of ASD, high scores on the syndrome scales Social problems, Withdrawn, Thought problems and also Attention problems might be an indication for further and differential diagnostic procedures. Concerning the evaluation of co-occurring behavior problems in ASD the CBCL is of good utility – as part of a thorough assessment routine.

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## 1. Introduction

Autism spectrum disorder (ASD) is a severe, complex neurodevelopmental disorder characterized by impairments in social interaction and communication, as well as restricted and repetitive behaviors. There is considerable heterogeneity in the expression and severity of the core and associated symptoms of ASD. Furthermore, ASDs show a high rate of accompanying comorbid disorders (up to 70–85%). Comorbid disorders that often occur together with ASD are cognitive impairment, ADHD, tic disorders, obsessive-compulsive disorders, as well as mood and anxiety disorders (e.g. Abdallah et al., 2011). In clinical practice, it has to be determined whether symptoms such as social problems, inattention and hyperactivity are solely attributable to ADHD or whether these symptoms justify a comorbid diagnosis of ASD and ADHD. Several studies have investigated the co-occurrence of ASD and ADHD, with recent evidence suggesting common underlying genetic mechanisms of the two disorders (Ronald, Happe, & Plomin, 2008; Taurines et al., 2012). Around 30–80% of individuals with ASD also fulfill the criteria for an additional ADHD diagnosis (Mattila et al., 2010). The same diagnostic difficulties that occur

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in ASD and ADHD can also be found for ASD and anxiety or mood disorders (Simonoff et al., 2012; Tyson & Cruess, 2012; van Steensel, Bogels, & Perrin, 2011). Prevalence estimates for anxiety and mood disorders in ASD range from 10 to 50% (Simonoff et al., 2013; Simonoff et al., 2008). Nevertheless, internalizing disorders such as anxiety and depression always have to be considered as possible differential diagnoses when assessing individuals with suspected ASD (e.g.: Tyson & Cruess, 2012; van Steensel, Bogels, & Wood, 2013).

The assessment of ASD with gold standard measures is very time consuming and requires personal resources. ASD-specific screening questionnaires aim to reduce the number of patients who have to run through a complete clinical examination. The Social Communication Questionnaire (SCQ; Rutter, Bailey, & Lord, 2003) and the Social Responsiveness Scale (SRS-2; Constantino & Gruber, 2012) are widely used and thoroughly evaluated. But although screening questionnaires can be useful for identifying children with suspected ASD, they mostly show weaknesses concerning the discrimination between ASD and disorders which display a similar clinical picture (Matson, Wilkins, Beighley, & Turygin, 2012).

The Child Behavior Checklist (CBCL; Arbeitsgruppe Deutsche Child Behavior Checklist, 1993) is a questionnaire widely used in clinical practice as it allows time efficient gathering of information about a large number of psychiatric and somatic symptoms in different age groups. The psychometric properties of the CBCL have been evaluated in a vast number of studies, also with regard to ASD symptom patterns. In 1988, Rescorla (1988) analyzed the internal structure of the CBCL and found eight factors, including an autistic/bizarre factor. This supported the assumption that the CBCL could also be applied to the screening of children with suspected ASD. In a study by Duarte, Bordin, de Oliveira, and Bird (2003), sensitivity and specificity of the autistic/bizarre items and the Thought problems scale were high when children with autism were compared to children diagnosed with other psychiatric disorders or typically developing children, respectively.

Bölte, Dickhut, and Poustka (1999) found that the scores on the Social, Thought, and Attention problems scales were three standard deviations higher in a sample with autism in relation to the normative sample. In addition, Ooi, Rescorla, Ang, Woo, and Fung (2011) found a “CBCL ASD profile”, consisting of high scores on the Withdrawn, Social problems and Thought problems scales. Holtmann, Bolte, and Poustka (2007) compared the CBCL scores of children with pervasive developmental disorder (PDD) and those with comorbid high attention problems (PDD+). They found that children in the PDD+ group showed significantly higher scores on the Withdrawn, Anxious/Depressed, Social problems and Thought problems scales. In summary, children and adolescents with ASD mostly show higher scores on the CBCL Withdrawn, Social problems, and Thought problems scales, and partially also on the Anxious and Attention problems scales. Thus, the CBCL shows sufficient ability to identify autistic behavior through typical problem patterns on the eight syndrome scales and to indicate comorbid symptoms (e.g. Bölte et al., 1999; Duarte et al., 2003). The aim of the present study was to evaluate CBCL profiles and the utility of the CBCL 4–18 as a screener for ASD, in a sample of children with high-functioning autism (HFA: ASD without intellectual and language impairments and IQ > 70). In previous studies, samples mainly comprised children and adolescents with mental retardation (Hartley, Sikora, & McCoy, 2008; Sikora, Hall, Hartley, Gerrard-Morris, & Cagle, 2008), while only a few studies included children with IQ > 70 (Hurtig et al., 2009; Schroeder, Weiss, & Bebko, 2011). Often, intellectual functioning is not mentioned at all (Duarte et al., 2003; Muratori et al., 2011) or not further defined (Ooi et al., 2011).

Using the well-established CBCL as a broadband questionnaire to indicate both ASD symptoms and accompanying problems before the application of an ASD specific screening instrument seems promising. With regard to the previous findings, we hypothesize that the CBCL is able to map differences between groups of various psychiatric disorders: Firstly, we expect higher scores for the ASD group on the Withdrawn, Social problems, Thought problems and Attention problems scales compared to other psychiatric disorders (Hypothesis 1: ASD symptom profile). Secondly, we expect that participants with HFA and additional ADHD symptoms will show even higher scores than participants with HFA and without ADHD and participants with other psychiatric disorders on the Withdrawn, Social problems, Thought problems, Attention problems, and Anxious/Depressed scales (Hypothesis 2: ASD + ADHD symptom profile). However, we expect the discrimination between HFA and highly relevant differential diagnoses, especially ADHD and internalizing disorders, by data of the CBCL to be weak, as the CBCL was not specifically designed for the identification of ASD but rather for the comprehensive collection of psychiatric and somatic symptoms (Hypothesis 3: Screening potential). Altogether, we predict the CBCL to be a useful

**Table 1**  
Sample description.

	total sample	HFA-	HFA + ADHD	ADHD	ID	other	
n	1800	88	42	337	364	969	
Boys	1303	79	37	289	197	701	
Girls	497	9	5	48	167	268	
Age in years (SD)	10.91 (3.34)	11.16 (3.98)	11.33 (3.51)	8.94 (2.74)	11.15 (2.88)	11.47 (3.38)	
IQ	% IQ above average (≥ 115)	11.4	18.6	21.4	11.7	12.3	9.9
	% IQ average (85–114)	75.7	57.0	45.2	78.1	80.8	76.0
	% IQ below average (70–84)	12.9	24.4	33.3	10.2	7.0	14.1

Abbreviations: ADHD = Attention deficit/hyperactivity disorder, HFA = High-functioning autism without comorbid ADHD, HFA + ADHD = High-functioning autism with comorbid ADHD, ID = Internalizing Disorders, IQ = Intelligence Quotient, SD = Standard Deviation

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