The Conners Parent Rating Scale: Psychometric, clinical and cross-cultural considerations in typically developing 4- to 12-year-old French-speaking children

Key words: Conners Scale, validation, confirmatory analyses, children, ADHD

Abstract

The principal aim of this study was to validate the five-factor structure of the French version of the Conners Parent Rating Scale-CPRS in French-speaking children. A sample of children with Attention Deficit and Hyperactivity Disorder (ADHD) was assessed and their ADHD CPRS profile was examined. Confirmatory factor analysis shows that the CPRS presents good psychometric properties and has a factor structure similar to the original version. Furthermore, the CPRS shows high rates of sensitivity and specificity when the ADHD and control group scores are compared. Clinical and cross-cultural implications are discussed.

Introduction

The Conners Parent Rating Scales (CPRS) are principally intended to be used as clinical and research tools with children suffering from neurodevelopmental disorders, and particularly ADHD.

The first version of the CPRS (CPRS-93; Conners, 1973) included 93 items which assessed problematic behavior in children within 25 different areas (e.g., peer relationships, temper, etc.) in order to identify "hyperkinetic" children and to analyze the effectiveness of drug treatments. Later, Goyette, Conners, and Ulrich (1978) tested the psychometric properties of a 48-item version (CPRS-48) and obtained a five-factor structure. This shorter rating form provides a qualitative and quantitative picture of children's emotions and behavior, based on five subscales assessing (1) Conduct Problems, (2) Learning Problems, (3) Psychosomatic, (4) Impulsive-Hyperactive, and (5) Anxiety. In addition, the CPRS-48 includes the Hyperactivity Index (HI) with 10 items that are considered to be the most sensitive to treatment effects.

Currently, the CPRS-48 remains the most widely used scale in both clinical and research settings in French-speaking European countries (see Wodon, 2008), which is probably explained by its ease and rapidity of completion. However, to our knowledge, its factor structure has never been verified through adequate statistical analyses such as Confirmatory Factor Analyses-CFA (Deplus, 2007). Furthermore, normative data for French-speaking European countries do not exist for this adaptation. Consequently, several authors (e.g., Wodon, 2008) suggest using the normative data from the study by Goyette et al. (1978), which could be problematic for two main reasons. First, we can question the relevance of using the 34-year-old normative data from

Goyette et al. (1978) in assessing children without considering the period's influence on children's behavior (including changes in politics and the economy, family environment, and multimedia since 1978). Secondly, these normative data come from the US and should be used with caution in a French-speaking European culture. This latter point is particularly challenging considering that some cultural differences have been found in other psychopathology screening measures between French-speaking countries (e.g., France) and the US (e.g., see Shojaei, Wazana, Pitrou, & Kovess, 2009), and between the Flemish community of Belgium and the US (Braet et al., 2011).

From this perspective, this study principally aims to verify the five-factor structure of the CPRS-48 in a sample of typically developing children. In addition, the raw scores obtained will be compared to the normative data from the US collected by Goyette et al. (1978). Finally, we will compare the CPRS scores of a sample of ADHD children and a matched-control group.

Part 1

Participants

The CPRS-48 was distributed in several schools in the French-speaking part of Belgium. A total of 377 typically developing children (178 boys) from 4 to 12 years old were included in this study.

Material

In the CPRS-48, parents have to rate their child's behavior on a 4-point Likert scale from 0 (not at all) to 3 (severely). The five-factor structure described by Goyette et al. (1978) was examined.

Results

Confirmatory factor analysis

CFA were computed using LISREL 8.80 (Jöreskog & Sörbom, 2006) to examine the factor structure of the French adaptation of the CPRS-48 using the Robust Maximum Likelihood method (Satorra & Bentler, 1988). A model can be considered to fit the data well when the χ^2/df ratio is inferior to 2, when the root mean square error of approximation (RMSEA) value is comprised between 0 and .05 ; when the comparative fit index (CFI) value is >.90 and finally, when the standardized root mean square residual (SRMR) values remain below 0.10.

The combination indicated an acceptable fit for the five-factor structure assessed (see Figure 1) with $\chi^2(199) = 212.05$, p = .25, and χ^2/df ratio = 1.06; RMSEA=.05; CFI= .94 and SRMR=.04.

Internal reliability

The reliability coefficients for Conduct Problems and Learning Problems are .80 and .78, and .83 for the HI. The reliability coefficient for the Impulsive-Hyperactive scale is .76. However, the coefficient is weaker for the Psychosomatic (α = .58) and Anxiety (α = .55).

Age and sex effect

Analyses of variance were conducted on the five subscales and HI, with age and sex as independent variables. The results (see Table 1) showed no significant sex effect for any of the variables considered. However, an age effect was found for the Learning Problems, Impulsive-Hyperactive and HI subscales.

Comparison with US data

t analyses between the US and Belgian raw scores were first computed for the group whose age range (6–8 years old) was identical to the group used in Goyette et al. (1978, p. 231). These analyses showed significant differences between French and US normative data for the Conduct Problems, Learning Problems, and Impulsive-Hyperactive subscales, but also for the HI. The Belgian sample had lower scores (p<.01).

Similar analyses were conducted for the other age groups. These analyses showed significant differences only in the US and the Belgian scores for Conduct Problems, with lower scores (p<.01) for the Belgian preschoolers (3–5 versus 4–5). However, in the older age groups (9–11 and 9–12), the analyses showed significant differences between French and US normative data for the Conduct Problems and Impulsive-Hyperactive subscales, but also for the HI. Again, the Belgian sample had lower scores (p<.01).

Part 2

Participants

ADHD and control groups. Children who consulted for attention disorders from January to July 2012 in our clinical neuropsychological unit were screened for ADHD according to the DSM-IV criteria by a trained examiner. Fifteen children (13 boys, mean age in months: 95; SD: 14.89) with a diagnosis of ADHD confirmed by a French adaptation of the ADHD Rating Scale-IV (DuPaul, Power, Anastopoulos, & Reid, 1998) were included in this study. The control group

consisted of 30 children recruited from the Part 1 (26 boys; mean age in months: 96.1; SD: 14.87) who were matched for age and sex (p>.05).

Results

t tests revealed significant differences for several scales between ADHD and control group (see Table 3). Logistic regression analyses showed that the CPRS subscales contributed significantly to distinguishing the ADHD children from the control group, with a specificity ranging from 93.33% (Conduct Problems) to 96.66% (HI and Impulsive-Hyperactive), and a sensitivity ranging from 0% (Anxiety) to 93.33% (HI and Impulsive-Hyperactive).

Discussion

The results confirm the five-factor structure of the CPRS in 4-to 12-year-old French-speaking children. Interestingly, these results indicate that, despite the fact that the data were collected in different cultural environments and at different economic and social periods, the factor structure of the French version of the CPRS is similar to that of the original version (Goyette et al., 1978), suggesting that the psychometric properties of the scale possess strong and lasting cross-cultural robustness. Furthermore, with exception of the Psychosomatic and Anxiety subscales, the reliability coefficients are satisfactory.

Although our data are not strictly comparable to the results of Goyette et al. (1978) given that Goyette et al. included a larger age range (3–17 years) in their study than we did (4–12 years), we can, however, make some comparisons between the two studies. Three important points must be highlighted. First, the principal connection between the two studies is that age can be

considered as a significant determinant of the scores on the Impulsive-Hyperactive scale and the HI, an observation also confirmed by other studies (e.g., Conners, Sitarenios, Parker, & Epstein, 1998). Secondly, we did not find any significant effect of sex on any of the subscale scores (with only a marginal effect for the Conduct Problems subscale). This lack of influence of sex on the CPRS is quite surprising, but had already been observed with the CPRS in other cultures (e.g., El-Hassan Al-Awad & Sonuga-Barke, 2002). Third, our results showed evidence that the normative scores collected from the Belgian French-speaking children are lower than the US children's scores, particularly for the middle and older age groups (with significant differences principally for the Conduct Problems and Impulsive-Hyperactive subscales and the HI index). One explanation of this discrepancy could be that the cultural background influences the "way of thinking about a child," and consequently has an impact on parental ratings on behavior scales (Braet et al., 2011). These performance divergences, which could be interpreted as an effect of cultural biases demonstrate the need to provide culturally adapted norms so children with and without psychopathological disorders can be better detected. From a clinical point of view, these results show that the use of normative data from the US could lead to inaccuracy and a risk of underestimating behavioral problems when used with French-speaking children.

Finally, our results confirm that the CPRS, and particularly the Impulsive-Hyperactive and HI subscales, is very successful at discriminating between ADHD children and control children, with high levels of specificity and sensitivity.

In conclusion, this study confirms the original five-factor structure of the CPRS when used with French-speaking children. Furthermore, comparisons between the US normative data and the Belgian data showed evidence of cultural biases and emphasized the necessity of using specific

culturally adapted normative data when administering behavioral scales to children. Finally, this study showed the clinical utility of the French version of the CPRS in distinguishing ADHD children who are being treated for attention disorders from control children.

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Figure 1. *Factor loading for each CPRS subscale.*

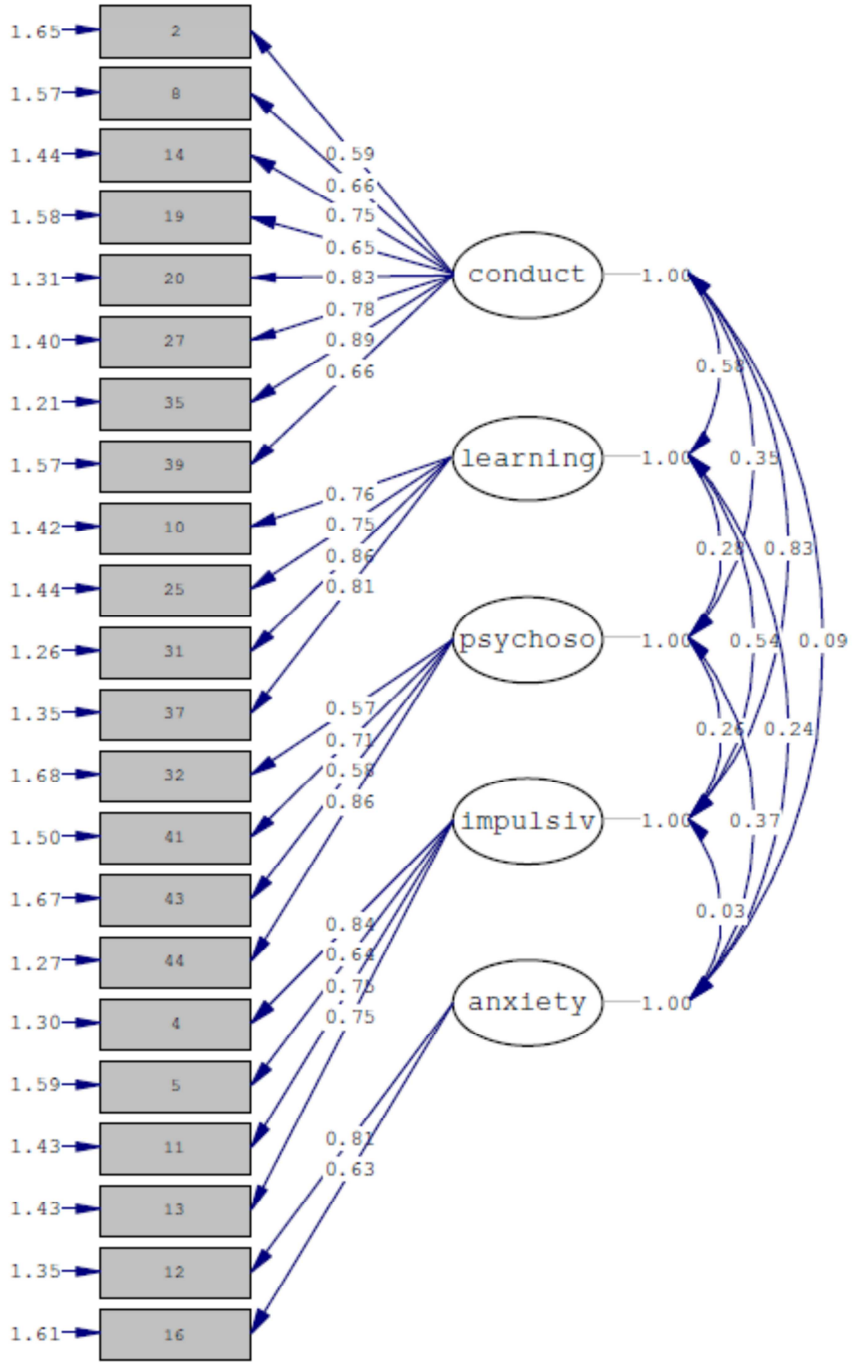

Table 1. *Effect of age and sex*

Factors		
Conduct Problems	F	*P*
Age	.93	.49 (n.s.)
Sex	2,83	.09 (n.s.)
Age×Sex	.16	.99 (n.s.)
Learning Problems		
Age	3.15	.002
Sex	.29	.59 (n.s.)
Age×Sex	.25	.98 (n.s.)
Psychosomatic		
Age	.34	.95 (n.s.)
Sex	.31	.58 (n.s.)
Age×Sex	.76	.64 (n.s.)
Impulsive-hyperactive		
Age	2.46	.01
Sex	1.23	.27 (n.s.)
Age×Sex	.66	.73 (n.s.)
Anxiety		
Age	1.86	.06
Sex	.006	.94 (n.s.)
Age×Sex	.94	.48 (n.s.)
Index		
Age	3.96	.0002
Sex	.80	.37 (n.s.)
Age×Sex	.49	.86 (n.s.)

Note. *df* for all analyses: age (8, 359); sex (1, 359); age×sex (8, 359)

Table 2. *Mean age and standard deviations (SD) for the subscales of the CPRS*

Age Group (both sexes)	Conduct		Learning		Psychosomatic		Hyperactive		Anxiety		HI	
	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD
4–5 years old (n = 78)	.34	.39	.64	.57	.15	.31	.90	.67	.71	.64	.69	.48
6–8 years old(n = 132)	.25	.36	.34	.42	.14	.27	.65	.63	.54	.56	.45	.43
9–12 years old (n = 167)	.28	.28	.45	.51	.16	.27	.65	.59	.55	.50	.47	.40

Table 3. *Means and standard deviations (SD) and results of t tests for ADHD and control group.*

	ADHD Group (n = 15)		Control Group (n = 30)			
	M (SD)		M (SD)		*t* value	*P*
Conduct Problems	.85	.47	.23	.42	4.45	<.0001
Learning Problems	2	.60	.25	.29	13.25	<.0001
Psychosomatic	.20	.27	.12	.26	.99	>.05
Impulsive-Hyperactive	4.30	1.13	.79	.79	12.14	<.0001
Anxiety	.46	.39	.58	.74	–.57	>.05
HI	1.72	.45	.32	.31	12.14	<.0001