

Psychometric Properties of Children's Depression Inventory in Community and Clinical Sample

Anna Figueras Masip¹, Juan Antonio Amador-Campos², Juana Gómez-Benito², and Victoria del Barrio Gándara³

¹Institut de Seguretat Pública de Catalunya (Spain)

²Universitat de Barcelona (Spain)

³Universidad Nacional de Educación a Distancia (Spain)

The psychometric characteristics of the Children's Depression Inventory, CDI (Kovacs, 1992) in a sample of 1705 participants (792 boys and 913 girls) and a clinical sample of 102 participants (42 boys and 60 girls) between 10 and 18 years old are presented. Reliability coefficients range, for both samples, from .82 (test) to .84 (retest) in the community sample, and .85 (test, clinical sample); test-retest reliability is .81 in the community sample. The mean scores are similar to other Spanish and English ones. Girls score higher than boys. The cut-off point that best differentiates between depressive and community participants is 19, with a sensitivity of 94.7%, a specificity of 95.6%, a positive predictive value of .90, and a negative predictive value of .98.

Keywords: depressive symptoms, assessment, childhood and adolescence, psychometric study, CDI.

Se presentan las propiedades psicométricas del Children's Depresión Inventory, CDI (Kovacs, 1992) en una muestra comunitaria de 1.705 participantes (792 chicos y 913 chicas) y en una muestra clínica de 102 participantes (42 chicos y 60 chicas) con edades comprendidas entre los 10 y los 18 años. La fiabilidad del CDI es elevada para ambas muestras: consistencia interna entre 0.82 (test) y 0.84 (retest) en muestra comunitaria, y de 0.85 (test, muestra clínica); la correlación test-retest es de 0.81 en la muestra comunitaria. Las puntuaciones medias son similares a las encontradas en otras muestras españolas y anglosajonas. En general, las mujeres obtienen puntuaciones superiores a los varones. El punto de corte que mejor discrimina entre los participantes diagnosticados de depresión y el grupo comunitario de contraste es 19, con una sensibilidad de 94.7%, una especificidad del 95.6%, un valor predictivo positivo de 0.90 y un valor predictivo negativo de 0.98.

Palabras clave: síntomas depresivos, evaluación, infancia y adolescencia, estudio psicométrico, CDI.

This investigation was carried out in the research team consolidated by the Generalitat de Catalunya, 2005SGR 00365 and 2009GR 822.

Correspondence concerning this article should be addressed to Juan Antonio Amador-Campos. Departamento de Personalidad, Evaluación y Tratamientos Psicológicos. Facultad de Psicología. Universidad de Barcelona. Passeig de la Vall d'Hebron, 171. 08035 Barcelona (Spain). E-mail: jamador@ub.edu

Depression is expressed through a series of symptoms that include loss of interest in activities normally performed, low self-esteem, social isolation, fatigue, crying, sleep and eating disorders, and self-defeating impulses. In children and adolescents, irritability, difficulties to interact effectively with classmates and family members, behavior problems, cognitive alterations, and decreased academic performance are also observed.

The clinical assessment of depression takes place in various phases: diagnosis and prognosis, treatment, follow-up, and evaluation of treatment efficacy (Klein, Dougherty, & Olino, 2005). Self-reports are useful instruments both for diagnoses and to appraise treatment efficacy (Lewinsohn, Rohde, & Seely, 1998). The Children's Depression Inventory (CDI; Kovacs, 1992) is one of the most frequently used self-reports for the assessment of depressive symptomatology in infancy and adolescence. The CDI was created from the Beck Depression Inventory (Beck, 1978) to be administered to children and adolescents of school age. Kovacs carried out two preliminary versions of the CDI in 1975 and 1976, in which she modified the scoring, the content, and the drafting of the items. The definite version was published in 1977 (Kovacs, 1992). The test manual was published in 1992 and it includes the author's own psychometric data of CDI studies and a review of other authors' studies. In 2004, the Spanish adaptation of the CDI was published (del Barrio & Carrasco, 2004).

The CDI is recommended to be administered from 7 to 17 years of age. The raw score of 20 was established by Kovacs (1992) as the cut-off point. In other studies carried out with Spanish children and adolescents, the cut-off point was reduced to 19 (del Barrio & Carrasco, 2004) or to 17 (Canals, Martí-Henneberg, Fernández-Ballart, & Doménech, 1995). In a clinical sample of Puerto Rican adolescents, Rivera, Bernal, and Rosselló (2005) found that the cut-off point that best identifies the participants with depression disorder is 20.

The mean scores of CDI fall within an interval of 5.30 and 17.40 in community samples (Koizumi, 1991; Rotundo & Hensley, 1985) and of 5.92 and 19.20 in clinical samples (Kovacs, 1992; Rotundo & Hensley, 1985).

Sex differences in the CDI scores are inconsistent and vary depending on the studies. Some investigators have found that males score higher than females (Bartell & Reynolds, 1986; Kovacs, 1992); other authors have found that females score higher than males (Ghareeb & Beshai, 1989; Lewinsohn et al., 1998; Liss, Phares, & Liljequist, 2001; Reinherz et al., 1990; Weiss et al., 1992), and lastly, several studies found no sex differences in the CDI scores (Helsen & Matson, 1984; Weiss & Weisz, 1988; Wierzbicki, 1987). In the review of Lewinsohn et al. (1998), it was found that the females presented a higher number of symptoms of depression, both in the group diagnosed with depression and in the group without depression, although these differences were not statistically significant. In a clinical sample of children and adolescents, Liss et al. (2001) found

that the girls presented higher CDI scores than the boys, both in the youngest group (7-12 years) and in the oldest one (13-17 years).

In community samples, the internal consistency of the CDI ranges between .75 and .94 (Cronbach's alpha: Monreal, 1988; Saylor, Finch, Spirito, & Bennett, 1984), and between .73 and .89 (split halves: Helsen & Matson, 1984; Saylor et al., 1984). Test-retest reliability varies between .83 with a 1-week interval (Saylor et al., 1984) and .84 with a 2-week interval (Kovacs, 1992).

In clinical samples, the internal consistency of the CDI ranges between .71 and .89 (Cronbach's alpha: Weiss & Weisz, 1988), and between .57 and .84 (split halves: Hepperlin, Stewart, & Rey, 1990; Saylor et al., 1984). Test-retest reliability varies between .54 at a 6-month follow-up (Weiss & Weisz, 1988) and .87 at one week (Saylor et al., 1984). As the CDI measures a state rather than a trait, the interval between test and retest should be short, between two and four weeks (Kovacs, 1992; Sitanerios & Kovacs, 1999).

The correlation between the CDI and other self-reports that assess depressive symptomatology reach values between .56 and .78 with the Reynolds Adolescent Depression Scale RADS (del Barrio, Colondrón, de Pablo, & Roa, 1996; Nieminen & Matson, 1989) and between .70 and .73 for the Reynolds Child Depression Scale, RCDS (Bartell & Reynolds, 1986; del Barrio et al., 1996; Reynolds, Anderson, & Bartell, 1985).

The studies that analyzed the factor structure of the CDI with community and clinical samples offer different numbers of factors: eight (Monreal, 1988), seven (Saylor et al., 1984), six (Craighead, Smucker, Craighead, & Ilardi, 1998), five (Craighead et al., 1998; Kovacs, 1992; Weiss et al., 1991), three (Weiss & Weisz, 1988), two (del Barrio & Carrasco, 2004) and some one-factor results (Weiss et al., 1992). García, Aluja, and del Barrio (2008) tested, by means of confirmatory factor analysis, the factor solutions of three, five, and six factors in a sample of children and adolescents between 7 and 16 years of age. They found that the five- and six-factor models presented a better fit, along with the second-order one-factor general solution.

The goal of this study was to present the psychometric characteristics of the bilingual Spanish-Catalan version of the CDI in the Catalan population of children and adolescents and to verify the usefulness of the CDI as a screening instrument of depressive symptomatology in children and adolescents, by means of the diagnostic precision indexes.

Method

Participants

Two samples were assessed, a community and a clinical sample. The community sample is made up of 1,705

participants aged between 10 and 17 years ($M = 13$ years, $SD = 1.5$ years) from seven public and concerted schools of the province of Barcelona, who were registered between 5th grade of Primary Education (PE) and 4th grade of Compulsory Secondary Education (CSE) (PE: 5th grade: 57 boys, 67 girls; 6th grade: 83 boys, 108 girls; CSE: 1st grade: 181 boys, 181 girls; 2nd grade: 137 boys, 154 girls; 3rd grade: 191 boys, 213 girls; 4th grade: 143 boys, 190 girls). Of the sample, 53.5% were girls (913) and 46.5% were boys (792). We randomly selected one school from each district of the city of Barcelona and four schools from the areas corresponding to the children's and youths' mental health centers, from which the clinical sample was collected. Seven schools agreed to collaborate in the study (five from Barcelona city and two from the province of Barcelona).

The clinical sample comprised 102 participants (42 boys, 41.2%, and 60 girls, 58.8%) aged between 9 and 18 years ($M = 14$ years, $SD = 2$ years). The participants were in 4th, 5th, and 6th grade of PE, the four grades of CSE, and 1st grade of High school (PE: 4th grade: 2 boys, 3 girls; 5th grade: 6 boys, 3 girls; 6th grade: 5 boys, 3 girls; CSE: 1st grade: 6 boys, 6 girls; 2nd grade: 4 boys, 11 girls; 3rd grade: 8 boys, 16 girls; 4th grade: 7 boys, 10 girls; High School: 1st grade: 4 boys, 8 girls). The clinical sample was recruited from two Children's and Youths' Mental Health Centers (in Spanish, "Centro de Salud Mental Infantil y Juvenil," hereafter abbreviated to CSMIJ) of the province of Barcelona. Of this clinical sample, 19 participants were diagnosed with depression, 21 with anxiety disorders, 9 with behavior and learning problems, 9 with eating disorders, and 44 had no definite diagnosis made by the CSMIJ teams when coding the data of the CDI.

The socioeconomic level of the community sample, calculated with the Hollingshead (1975) index, was as follows: high 20.4%; medium-high 15.1%; medium 26.0%; medium-low 32.2%; and low 5.4%. And the socioeconomic level of the clinical sample was: high 0%; medium-high 12.1%; medium 9.1%; medium-low 66.7%; and low 12.1%.

Instruments

The *Children's Depression Inventory* (CDI, Kovacs, 1992) is made up of 27 items that assess depressive symptomatology. Each one of the items has three response options that score 0 (*absence of symptomatology*), 1 (*mild symptomatology*), or 2 (*severe symptomatology*). Half of the items begin with the option that reflects higher severity of the symptom, and in the rest, the presentation sequence is reversed. The total score ranges between 0 and 54 points.

The *Reynolds Adolescent Depression Scale* (RADS, Reynolds, 1987, 2002) is made up of 30 items and uses a Likert-type response format, ranging from 1 (*almost never*) to 4 (*almost always*). The total score of the RADS can range from 30 to 120 points. The RCDS can be administered individually or collectively; it can also be administered orally to adolescents with reading difficulties.

The *Reynolds Child Depression Scale* (RCDS, Reynolds, 1989) is made up of 30 items, 29 of which use a 4-point Likert-type response format, ranging from 1 (*almost never*) to 4 (*almost always*); the last item of the scale requires participants to select from among five faces the one that best represents their mood. The total score of the RCDS can range between 30 and 121 points. The RCDS can be administered individually or collectively; it can also be administered orally to children with reading difficulties.

The *Youth Self Report* (YSR; Achenbach, 1991a) has two parts: the first part (social adjustment) is made up of 17 items that assess diverse aspects of children's and adolescents' social and academic adjustment; the second part has 103 items that assess psychopathological alterations, with a response format with three alternatives: 0 (*not true*), 1 (*somewhat true or sometimes true*), and 2 (*very true or frequently true*). These 103 items are grouped into eight narrow-band scales (withdraw, somatic complaints, anxious/depressed, social problems, thought problems, attention problems, delinquent behavior, and aggressive behavior) and two broad-band scales (internalization and externalization). In this work, we only take into account the scores of the second part.

The CDI, the RADS, the RCDS, and the YSR were administered in a bilingual Spanish-Catalan version. This format was chosen because of the experience of previous works in which we verified that the bilingual version facilitates the comprehension of the sentence (Figueras, 2006; Figueras, Amador, & Guàrdia, 2008).

Procedure

The data presented in this study are part of a more extensive investigation that has assessed depressive symptomatology in children and adolescents. The assessment procedure followed Reynolds' (1986) multistage model. In the first two phases, we administered a self-assessment instrument of depressive symptomatology (the RCDS or the RADS, depending on the age of the participants), at two temporal moments two weeks apart (test and retest phases). In the third phase, the participants who exceeded the cut-off point, either in the RCDS or the RADS, in the test and retest phases, were assessed more extensively, collecting multimethod (questionnaires and interviews) and multi-informant (participants, parents, and teachers) information. In this work, we present the results obtained in the CDI in the test and retest phases for the community sample, and in the test phase for the clinical sample.

Data was collected from the community sample anonymously and collectively, in groups of 20 students. This was carried out during the students' tutoring class by two psychologists in the presence of the classroom tutor. The participants indicated their sex and date of birth in the protocols and the questionnaires for the test and retest phases were paired for each classroom using these data.

The data of the clinical sample were collected by a clinical psychologist during the initial interview at the CSMIJ. The clinical team of the CSMIJ performed the diagnosis according to the criteria of the Diagnostic and Statistical Manual of Mental Disorders-IV-TR (American Psychiatric Association, 2002), disregarding the results of the CDI.

The CDI, the RADS, or the RCDS (depending on their age) was administered to all the participants of the community and clinical samples. In addition, the YSR was also administered to a group 146 participants of the community sample and to 36 participants from the clinical sample.

The assessment procedure for both groups was approved by the Deontological Commission of the Association of Psychologists of Catalonia (COPC) and by the boards of directors of the schools that collaborated in the study, as well as by the teams of psychologists of the participating clinical centers. The questionnaires of the community sample were anonymous. The only information requested from the participants was their date of birth and sex. The parents of the participants from the community sample received a letter that explained the assessment process, the confidential nature of the information, and their right, and that of their children, to drop out of the study any time they wished. The participants were informed of the confidential nature of the information they provided and of their right to drop out of the study, and they were asked to consent to participate in the study. We obtained informed consent from the parents of the participants from the clinical sample as well as that of the participants themselves.

Data Analysis

We explored the data matrix and verified that there were no values outside the range. The percentage of missing data was lower than 7% in all the variables studied. To analyze the effect of the Grade × Sex interactions on the scores of the community sample at the test and retest phase, a repeated measures MANOVA was performed. Reliability was studied by means of Cronbach’s alpha, internal consistency, and the test-retest correlations that were used to verify the stability

of the test. Concurrent validity with the diverse tests as criteria was analyzed by means of Pearson’s correlation coefficient. For the clinical sample, age and sex differences were analyzed with univariate ANOVA and Student’s *t*-test. In all cases, we used a level of significance of .05.

We also analyzed the sensitivity and specificity of the CDI to classify the cases of the sample with or without depression disorder by means of the ROC curve. For this purpose, we selected from the community sample a nonsymptomatic group of 45 participants, who had scored below the cut-off point in the RCDS or in the RADS, at the test and retest phases. This group was paired in age and sex with the group diagnosed with depression. Sensitivity is the capacity of a test to identify the positive cases that present the disorder; that is, the proportion of true positives. Specificity is the capacity to correctly classify the negative cases, those that do not present the disorder. Positive predictive value is the proportion of participants with a positive result in the test who actually present the disorder. Negative predictive value is probability that a participant with a negative result in the test does not, in fact, present the disorder.

Results

Community Sample

We carried out multivariate repeated measures ANOVA, using as within-subject variables the CDI scores at test and retest phases, and as between-subject factor the academic grade and sex. We found no interactions in CDI scores between the administration phase (test and retest) and the academic grade or the sex of the participants, but there were significant differences between the test and retest phases. The results of this analysis are shown in Table 1.

There were significant sex differences in the CDI scores, with the girls scoring higher than the boys in the 3rd and 4th grades of CSE, both at the test and the retest phases (see Table 2). Regarding the differences among grades, the post-hoc Scheffé contrasts revealed statistically significant

Table 1
Analysis of the Interactions between Grade, Sex and Administration Phase for the CDI

	F	df	p	Observed power
Within-Subject Contrasts				
RETEST	46.995	1. 1425	< .001	1.000
RETEST* SEX	1.523	5. 1425	.179	.539
RETEST*GRADE	1.679	1. 1425	.195	.254
RETEST*SEX*GRADE	1.052	5. 1425	.386	.380
Between-subject effects				
GRADE	19.356	5. 1425	< .001	1.000
SEX	5.969	1. 1425	.015	.685
GRADE*SEX	3.048	5. 1425	.010	.871

differences among the scores of the participants from 5th and 6th grade of PE and 1st-graders of CSE, on the one hand, and the rest of the grades of CSE, on the other, with the scores of the PE participants and the CSE 1st-graders being lower than the scores of the rest of the CSE grades. Moreover, the scores of the CSE 2nd-graders differed significantly from those of the CSE 3rd- and 4th-graders.

Table 2 presents the means and standard deviations of the CDI in the two administration phases (test and retest) by sex and school grade and the contrasts as a function of sex for each school grade. The scores of the retest phase were lower than those of the test phase, a decrease observed in all the grades and in both sexes. Figure 1 shows the mean scores of boys and girls in the test and retest phases.

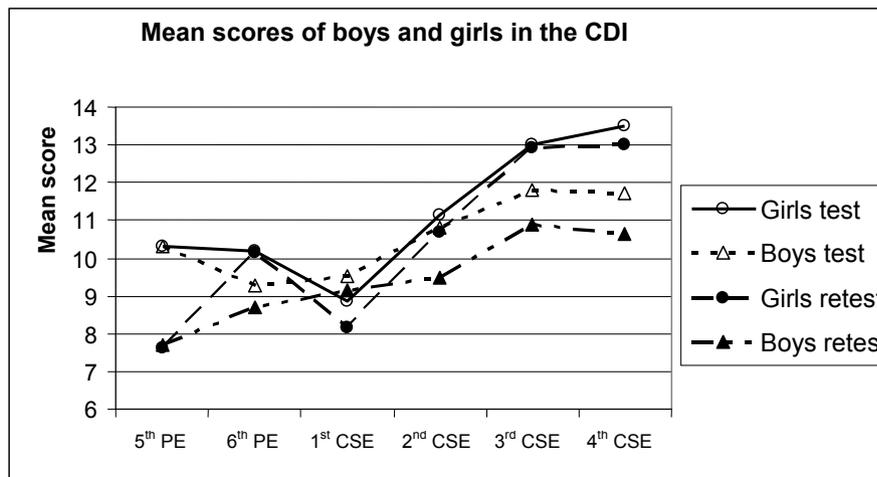


Figure 1. Mean scores of the CDI in the community sample in the test and retest phases.

Table 2
Mean Scores and Standard Deviations (in Brackets) of the CDI in the Test and Retest Phases, by Grade and Sex, and Contrast by Sex

GRADE	CDI TEST				CDI RETEST			
	Boys M (SD)	Girls M (SD)	Total M (SD)	Boys-Girls Contrast <i>t</i>	Boys M (SD)	Girls M (SD)	Total M (SD)	Boys-Girls Contrast <i>t</i>
5 th grade PE	<i>n</i> = 57 10.33 (5.68)	<i>n</i> = 67 10.30 (6.82)	<i>n</i> = 124 10.31 (6.30)	.31	<i>n</i> = 32 7.72 (6.02)	<i>n</i> = 38 7.61 (4.34)	<i>n</i> = 70 7.66 (5.14)	.09
6 th grade PE	<i>n</i> = 83 9.29 (5.25)	<i>n</i> = 108 10.19 (5.46)	<i>n</i> = 191 9.80 (5.38)	1.15	<i>n</i> = 56 8.68 (5.69)	<i>n</i> = 74 10.14 (5.62)	<i>n</i> = 130 9.51 (5.67)	1.46
1 st grade CSE	<i>n</i> = 181 9.54 (5.09)	<i>n</i> = 181 8.87 (5.54)	<i>n</i> = 362 9.20 (5.32)	1.18	<i>n</i> = 162 9.14 (6.17)	<i>n</i> = 162 8.17 (5.24)	<i>n</i> = 324 8.65 (5.74)	1.53
2 nd grade CSE	<i>n</i> = 137 10.80 (5.67)	<i>n</i> = 154 11.15 (5.93)	<i>n</i> = 291 10.99 (5.80)	.51	<i>n</i> = 119 9.49 (6.08)	<i>n</i> = 141 10.70 (6.23)	<i>n</i> = 260 10.15 (6.18)	1.58
3 rd grade CSE	<i>n</i> = 191 11.80 (5.95)	<i>n</i> = 213 12.99 (5.61)	<i>n</i> = 404 12.43 (5.80)	2.08*	<i>n</i> = 169 10.88 (6.05)	<i>n</i> = 191 12.93 (6.30)	<i>n</i> = 360 11.97 (6.26)	3.13**
4 th grade CSE	<i>n</i> = 143 11.72 (5.79)	<i>n</i> = 190 13.52 (6.23)	<i>n</i> = 333 12.75 (6.10)	2.29**	<i>n</i> = 126 10.63 (5.68)	<i>n</i> = 168 12.99 (6.34)	<i>n</i> = 294 11.98 (6.17)	3.30**

Note. PE = Primary Education, CSE = Compulsory Secondary Education.

* *p* < .05. ***p* < .01.

The test-retest correlation was .81. The internal consistency of the scale was satisfactory ($\alpha = .82$). The inter-item correlation matrix (r between .01 and .37) showed that there was no redundancy among the test items. The alpha values of the total scale decreased upon eliminating any item, except for Item 19 (see Annex 1), the elimination of which slightly increased the alpha value, which rose to .83.

The CDI had very high concurrent validity with the RADS ($r = .81$) and high concurrent validity with the RCDS, ($r = .76$), the anxiety/depression ($r = .64$) and the internalization scales ($r = .63$) of the YSR.

Clinical Sample

To analyze the data of the clinical sample, the participants were divided into two groups: between 8 and 12 years of age (4th, 5th, and 6th grade of PE and 1st grade of CSE) and between 13 and 18 years (2nd, 3rd, 4th grade of CSE and 1st grade of High School). Significant differences were observed as a function of sex, $F(1, 98) = 8.948, p = .004$, but not as a function of age, $F(1, 98) = 2.737, p = .101$.

Table 3 shows the basic statistics (means and standard deviations) for the two groups of the clinical sample. No significant sex differences were found in the younger group (8-12 years), but there were differences in the older group (13-18 years) in which the girls scored significantly higher than the boys.

Concurrent validity was very high with the RADS ($r = .83$) and high with the RCDS ($r = .71$). Internal consistency was satisfactory ($\alpha = .85$). The inter-item correlation matrix and the alpha values of the total scale, upon eliminating any item, followed a similar pattern to that found in the community sample.

Diagnostic Precision of the CDI

In this section, we examine the diagnostic precision of the CDI, understood as the capacity to correctly classify the participants in clinically significant groups, by means of analysis of the sensitivity and specificity of the test. The participants diagnosed with depression by the psychiatrists of the clinical services where the data was collected, following the DSM-IV-TR (APA, 2000) criteria, were used as cases, and the participants from the non-symptomatic community group were used as control cases. Figure 2 shows the area under the curve and Table 4 presents the values of sensitivity and specificity for different cut-off points that may be useful depending on whether one wishes to increase the sensitivity or the specificity when using the test. The area under the curve was .93 (95 % confidence interval—CI—between .95 and 1.00). The cut-off point that best combines the values of sensitivity and specificity was 19; sensitivity of .947 (95% CI between .740 and .999) and specificity of .956 (95% CI between .849 and .995).

Table 3

Means and Standard Deviations (in Brackets) of the CDI Scores for the Two Groups of the Clinical Sample

Group	7-12 Years	<i>T</i> (<i>p</i>)	13-18 Years	<i>T</i> (<i>p</i>)
Boys	12.75 (6.37)	1.43 (.163)	14.62 (6.04)	3.24 (.002)
Girls	16.77 (8.73)		20.23 (7.62)	
Total	14.55 (7.61)		18.23 (7.56)	

Table 4

Sensitivity and Specificity for Different Cut-off Points of the CDI

Cut-off point	Sensitivity	Specificity	PPV	NPV
13	1.00%	68.9%	.58	1.00
14	94.7%	75.6%	.62	.97
15	94.7%	82.2%	.69	.97
16	94.7%	86.7%	.75	.98
17	94.7%	88.9%	.78	.98
18	94.7%	91.1%	.82	.98
19	94.7%	95.6%	.90	.98
20	89.5%	100%	1.00	.96
21	78.9%	100%	1.00	.92

Note. PPV = positive predictive value, NPV = negative predictive value.

Discussion and Conclusions

The psychometric characteristics of the CDI found in this study are similar to those obtained in other works carried out with this instrument, in community and clinical samples in Spanish- and non-Spanish-speaking contexts.

Firstly, the distribution of the CDI scores in the community sample confirms the tendency to a decrease in the retest phase, the so-called “attenuation effect” (Egger & Angold, 2004). In this vein, diverse investigations have shown that repeated administrations of self-reports, with different temporal intervals between them, are associated with a significant decrease in the scores at the second administration compared to the first one (Finch, Saylor, Edwards, & McIntosh, 1987; Meyer, Dyck, & Petrinack, 1989). This effect was also found in the parents’ (Achenbach, 1991b) and teachers’ (Achenbach, 1991c) reports.

The means and standard deviations in the test and retest phases, both in the community and the clinical sample, were similar to those found in other studies carried out in Anglo-Saxon contexts (Helsen & Matson, 1984; Hepperlin et al., 1990; Kovacs, 1992; Rotundo & Hensley, 1985; Saylor et al., 1984; Weiss & Weisz, 1988; Wierzbicki, 1987), in the Spanish adaptation (del Barrio & Carrasco, 2004) or, for example, in the German (Steinsmeier, 1987), Arab (Ghareeb

& Beshai, 1989) or Japanese versions (Koizumi, 1991). The mean total scores in the test phase ranged between 9.20 and 12.75 in the community sample, and between 11.13 and 20.93 in the clinical sample.

With regard to differences related to age and sex, the data obtained indicate that, in the community sample, the boys generally scored lower than the girls as of 13-14 years of age (3rd grade of CSE) and the scores increased with participants’ age, both in the community sample and in the clinical sample. In the participants between 10 and 13 years of age (5th and 6th grade of PE, 1st and 2nd of CSE), no differences were found between boys and girls in the CDI scores. With regard to the clinical sample, the differences between boys and girls appear in the oldest group, although the girls still obtain higher scores than the boys in both groups. These data are in accordance with the review of Lewinsohn et al. (1998), who found significant differences between boys and girls in the older groups, between 14 and 18 years old, but they differ from the data of Liss et al. (2001), who found significant differences both in the young group (7-12 years) and in the oldest group (13-17 years). A possible explanation for these differences may be the different make-up of the samples. The samples in this work are community and clinical samples and the predominant diagnoses in the clinical sample, among participants with

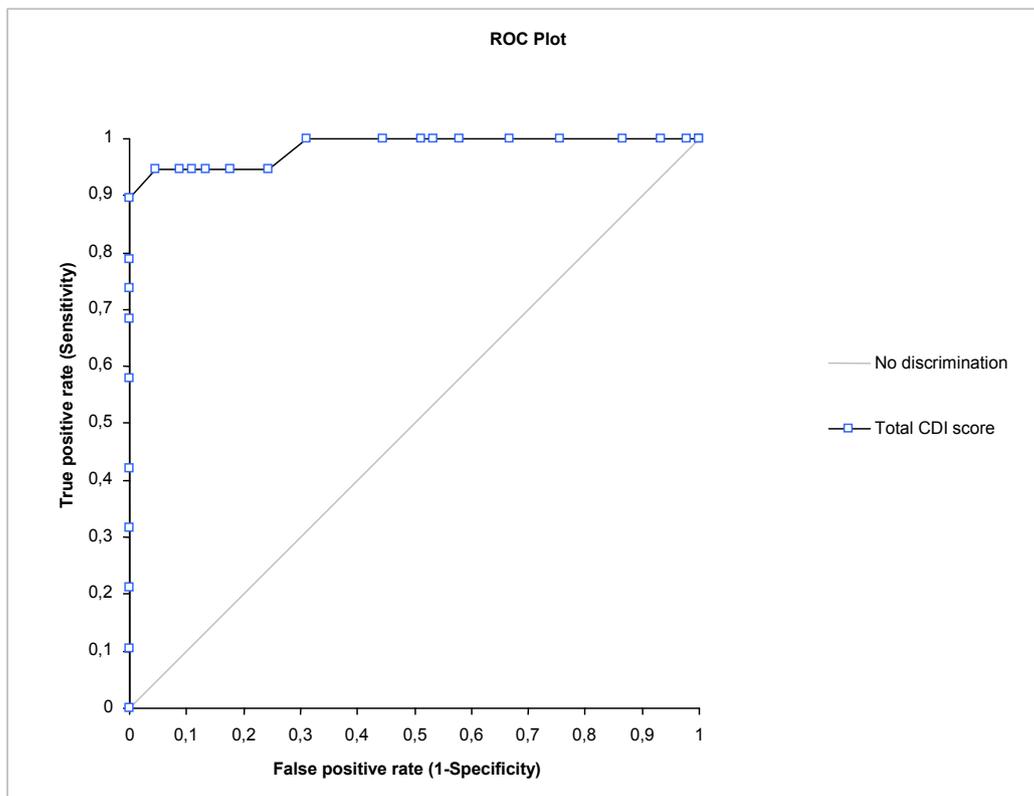


Figure 2. ROC Curve. Area Under the Curve = .98 (95% CI between .95 and 1.00).

a definite diagnosis, were anxiety disorders and mood disorders, whereas the work of Liss et al. (2001) used a clinical sample with diagnoses of depression, behavior problems (for example, oppositional defiant disorder or dysocial disorder) or both. The disparity of the clinical sample may be responsible for these differences. Summing up, the results obtained in this work are similar to those found in other studies (Angold & Rutter, 1992; Lewinsohn et al., 1998; Liss et al., 2001; Nolen-Hoeksema & Girgus, 1994; Reinherz et al., 1990) and they confirm the tendency to find significant differences between sexes in the presence of depressive symptomatology, as of adolescence (approximately 13-14 years), and these differences continue into adulthood.

The cut-off point that best combines sensitivity and specificity corresponds to a raw score of 19, one point lower than that proposed by Kovacs (1992), and the same one recommended by del Barrio and Carrasco (2004) in the Spanish adaptation. In the community sample, 9.3% of the participants exceeded the cut-off point of 19 and, in the clinical sample, this percentage was 31.4%. The use of a higher or lower cut-off point will depend on the purpose of the assessment; if one wishes to screen, it might be more interesting to increase the sensitivity, so one should choose a lower cut-off point; whereas if one wishes to use the test as a diagnostic instrument, it is better to use a higher cut-off point to increase the specificity and control for the presence of false positives. The probability of correctly identifying children and adolescents with depression from a CDI score of 19 or higher is 90% (PPV), which supports the utility of the CDI, and of this cut-off point, in the screening process. Thus, the CDI allows us to identify participants with a possible depressive disorder, who must be assessed by means of a diagnostic process in which diverse instruments and sources of information will be used.

The reliability of the CDI, measured by means of internal consistency and test-retest stability, is satisfactory in both phases and both samples, community and clinical, and it replicates the data of other studies (del Barrio & Carrasco, 2004; Finch et al., 1987; Ghareeb & Beshai, 1989; Helsen & Matson, 1984; Hepperlin et al., 1990; Mestre, Frías, & García-Ros, 1992; Monreal, 1988; Weiss & Weisz, 1988; Weiss et al., 1992; Wierzbicki, 1987). The concurrent validity with other instruments that assess depressive symptomatology (RADS and RCDS) is high, both in the community and the clinical sample, and medium with other self-report instruments that assess a broader array of psychopathological problems (YSR). These results are congruent with the data obtained in diverse studies (Ghareeb & Beshai, 1989; Nieminen & Matson, 1989).

Summing up, the bilingual Spanish and Catalan version of the CDI presents adequate psychometric characteristics so it can be considered that this adaptation is useful for the assessment of depressive symptomatology in adolescents from our context.

References

- Achenbach, T. M. (1991a). *Manual for the Youth Self Report and 1991 YSR Profile*. Burlington, VT: University of Vermont.
- Achenbach, T. M. (1991b). *Manual for the Child Behavior Checklist/4-18 and 1991 CBCL Profile*. Burlington, VT: University of Vermont.
- Achenbach, T. M. (1991c). *Manual for the Teacher's Report Form and 1991 TRF Profile*. Burlington, VT: University of Vermont.
- Angold, A., & Rutter, M. (1992). Effects of age and pubertal status on depression in a large clinical sample. *Development and Psychopathology*, 4, 5-28.
- American Psychiatric Association. (2002). *Manual diagnóstico y estadístico de los trastornos mentales - revisado (DM-IV-TR)*. Barcelona: Masson.
- Bartell, N. P., & Reynolds, W. M. (1986). Depression and self-esteem in academically gifted and nongifted children: A comparison study. *Journal of School Psychology*, 24, 55-61.
- Beck, A. T. (1978). *Depression inventory*. Philadelphia, PA: Center for Cognitive Therapy.
- Canals, J., Martí-Henneberg, C., Fernández-Ballart, J., & Domènech, E. (1995). Longitudinal study of depression in an urban Spanish pubertal population. *European Child and Adolescent Psychiatry*, 4, 102-111.
- Craighead, W. E., Smucker, M. R., Craighead, W. L., & Iardi, S. S. (1998). Factor analysis of the Children's Depression Inventory in a community sample. *Psychological Assessment*, 10(2), 156-165.
- del Barrio, V., & Carrasco, M. A. (2004). *CDI. Inventario de depresión infantil*. Madrid: TEA Ediciones.
- del Barrio, V., Colodrón, M. F., de Pablo, C., & Roa, M. L. (1996). Primera adaptación de las escalas de depresión de Reynolds RCDS y RADS a población española. *Revista Iberoamericana de Diagnóstico y Evaluación Psicológica*, 2, 75-100.
- Egger, H. L., & Angold, A. (2004). The Preschool Age Psychiatric Assessment (PAPA): A structured parent interview for diagnosing psychiatric disorders in preschool children. In R. del Carmen-Wiggins, & A. Carter (Eds.), *Handbook of infant, toddler, and preschool mental health assessment* (pp. 223-243). Oxford, NY: Oxford University Press.
- Figueras, A. (2006). *Evaluación multimétodo y multiinformante de la sintomatología depresiva en niños y adolescentes*. (Unpublished doctoral dissertation). Universidad de Barcelona, España.
- Figueras, A., Amador, J. A., & Guàrdia, J. (2008). Psychometric properties of the Reynolds Child Depression Scale in community and clinical samples. *The Spanish Journal of Psychology*, 11, 641-649.
- Finch, A. J., Saylor, C. F., Edwards, G. L., & McIntosh, J. A. (1987). Children's Depression Inventory: Reliability over repeated administrations. *Journal of Consulting and Clinical Psychology*, 16, 339-341.
- García, L. F., Aluja, A., & del Barrio, V. (2008). Testing the hierarchical structure of the Children's Depression Inventory: A multigroup analysis. *Assessment*, 15, 153-164.

- Ghareeb, G. A., & Beshai, J. A. (1989). Arabic version of the Children's Depression Inventory: Reliability and validity. *Journal of Clinical Child Psychology, 18*, 323-326.
- Helsen, W. J., & Matson, J. L. (1984). The assessment of depression in children: The internal structure of the Children's Depression Inventory (CDI). *Behavior Research and Therapy, 22*, 289-298.
- Hepperlin, C. M., Stewart, G. W., & Rey, J. M. (1990). Extraction of depression scores in adolescents from a general-purpose behaviour checklist. *Journal of Affective Disorders, 18*, 105-112.
- Hollingshead, A. B. (1975). *Four-factor index of social status*. (Unpublished manual). Yale University, New Haven, CT.
- Klein, D. N., Dougherty, L., & Olino, T. M. (2005). Toward guidelines for evidence-based assessment of depression in children and adolescents. *Journal of Clinical Child and Adolescent Psychology, 34*, 412-432.
- Koizumi, S. (1991). The standardization of Children's Depression Inventory. *Syoni Hoken Kenkyu, 50*, 717-721.
- Kovacs, M. (1992). *Manual of the Children's Depression Inventory*. Toronto: Multi-Heath Systems.
- Lewinsohn, P., Rohde, P., & Seeley, J. R. (1998). Major depressive disorder in older adolescents: Prevalence, risk factors, and clinical implications. *Clinical Psychology Review, 18*, 765-794.
- Liss, H., Phares, V., & Liljequist, L. (2001). Symptom endorsement differences on the Children's Depression Inventory with children and adolescents on an inpatient unit. *Journal of Personality Assessment, 76*, 396-411.
- Mestre, V., Frias, D., & Garcia-Ros, R. (1992). Propiedades psicométricas del Children's Depression Inventory (CDI) en población adolescente: fiabilidad y validez. *Psicológica, 13*, 149-159.
- Meyer N. E., Dyck, D. G., & Petrinack, R. J. (1989). Cognitive appraisal and attributional correlates of depressive symptoms in children. *Journal of Abnormal Child Psychology, 17*, 325-336.
- Monreal, P. (1988). *Estudio de la sintomatología depresiva infantil en la provincia de Gerona. Análisis de algunos factores individuales y psicosociales*. (Unpublished doctoral dissertation). Universitat Autònoma de Barcelona, Spain.
- Nieminen, G. S., & Matson, J. L. (1989). Depressive problems in conduct-disordered adolescents. *Journal of School Psychology, 27*, 175-188.
- Nolen-Hoeksema, S., & Girgus, J. S. (1994). The emergence of gender differences in depression during adolescence. *Psychological Bulletin, 115*, 424-443.
- Reinherz, H. Z., Frost, A. K., Stewart-Berghauer, G., Pakiz, B., Kennedy, K., & Schille, C. (1990). The many faces of correlates of depression in adolescents. *Journal of Early Adolescence, 10*, 455-471.
- Reynolds, W. M. (1986). A model for screening and identification of depressed children and adolescents in school settings. *Professional School Psychology, 1*, 117-129.
- Reynolds, W. M. (1987). *Reynolds Adolescent Depression Scale. Professional manual*. Odessa, FL: Psychological Assessment Resources.
- Reynolds, W. M. (1989). *Reynolds Child Depression Scale. Professional manual*. Odessa, FL: Psychological Assessment Resources.
- Reynolds, W. M. (2002). *Reynolds Adolescent Depression Scale - 2nd ed. Professional manual*. Odessa, FL: Psychological Assessment Resources.
- Reynolds, W. M., Anderson, G., & Bartell, N. (1985). Measuring depression in children: A multimethod assessment investigation. *Journal of Abnormal Child Psychology, 13*, 513-526.
- Rivera, C. L., Bernal, G., & Rosselló, J. (2005). The Children's Depression Inventory (CDI) and the Beck Depression Inventory (BDI): Their validity as screening measures for major depression in a group of Puerto Rican adolescents. *International Journal of Clinical and Health Psychology, 5*(3), 485-498.
- Rotundo, N., & Hensley, V. R. (1985). The Children's Depression Scale. A study of its validity. *Journal of Child Psychology and Psychiatry, 26*, 917-927.
- Saylor, C. F., Finch, A. J., Spirito, A., & Bennett, B. (1984). The Children's Depression Inventory: A systematic evaluation of psychometric properties. *Journal of Consulting and Clinical Psychology, 52*, 955-967.
- Sitanerios, G., & Kovacs, M. (1999). Use of the Children's Depression Inventory. In M. E. Marvish (Ed.), *The use of psychological testing for treatment planning and outcomes assessment* (2nd ed.) (pp. 267-298). Mahwah, NJ: Erlbaum.
- Steinsmeier, J. (1987). *Die Erfassung von Depression bei Kindern: Eine deutsche Version des Children's Depression Inventory (CDI)*. Bielefeld, Germany: Universitat Bielefeld.
- Weiss, B., & Weisz, J. R. (1988). Factor structure of self-reported depression. Clinic-referred children versus adolescents. *Journal of Abnormal Psychology, 97*, 492-495.
- Weiss, B., Weisz, J. R., Politano, M., Carey, M., Nelson, W. M., & Finch, A. J. (1991). Developmental differences in the factor structure of the Children's Depression Inventory. *Psychological Assessment, 3*, 38-45.
- Weiss, B., Weisz, J. R., Politano, M., Carey, M., Nelson, W. M., & Finch, A. J. (1992). Relations among self-reported depressive symptoms in clinic-referred children versus adolescents. *Journal of Abnormal Psychology, 101*, 391-397.
- Wierzbicki, M. (1987). A parent form of the Children's Depression Inventory. Reliability and validity in nonclinical populations. *Journal of Clinical Psychology, 43*, 390-397.

Received December 4, 2008

Revision received October 1, 2009

Accepted November 11, 2009

APPENDIX 1

EXAMPLES OF ITEMS OF THE BILINGUAL SPANISH-CATALAN VERSION OF THE CDI

Item 1

- Estoy triste algunas veces / *Estic trist algunes vegades*
- Estoy triste casi siempre / *Estic trist gairebé sempre*
- Estoy triste siempre / *Estic sempre trist*

Item 2

- A mi nunca me saldrá nada bien / *A mi mai em sortirà res bé*
- No estoy seguro de que las cosas me salgan bien / *No estic segur que les coses em surtin bé*
- A mí todo me saldrá bien / *A mi tot em sortirà bé*

Item 3

- Hago bien la mayoría de las cosas / *Faig bé la majoria de les coses*
- Hago mal muchas cosas / *Faig malament moltes coses*
- Todo lo hago mal / *Tot ho faig malament*

Item 6

- A veces pienso que me pueden ocurrir cosas malas o desagradables / *A vegades penso que em poden passar coses dolentes o desagradables*
- Me preocupa que me puedan ocurrir cosas malas o desagradables / *Em preocupa que em puguin passar coses dolentes o desagradables*
- Estoy seguro de que me ocurrirán cosas malas o desagradables / *Estic segur que em passaran coses dolentes o desagradables*

Item 7

- Me odio / *M'odio*
- No me gusta como soy / *No m'agrada com sóc*
- Me gusta como soy / *M'agrada com sóc*

[Translator's note: As this is the Spanish-Catalan version of a scale originally published in English, the example items have not been translated.]