CONVERGENT AND DISCRIMINANT VALIDITY OF THE STRUCTURED DIAGNOSTIC INTERVIEW FOR CHILDREN AND ADOLESCENTS (DICA-R)

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This paper examines the convergent validity of the Diagnostic Interview for Children and Adolescents - Revised (DICA-R), using the Child Behavior Checklist of T. M. Achenbach as a criterion. The ability of the instrument to detect subjects with psychopathology in the general population is also studied. The study was made through 196 interviews with psychiatric patients and 130 interviews with subjects from schools and Paediatric Services. The results obtained with the DICA-R are comparable with those obtained from other instruments that are widely accepted and considered as valid. The interview is a valid instrument for use in epidemiological research, as it can distinguish correctly between controls and cases.

Comparative cross-cultural studies and the adoption of diagnostic systems from other cultural domains (DSM-III-R; APA, 1987) are increasingly widespread and common practices. This makes it of prime importance to ensure that evaluations are equivalent and the instruments developed in a given environment can be applied to others.

Concurrent validity, or the degree of agreement between an instrument and other, simultaneous external measures is one of the important aspects when determining usefulness. The establishment of this concurrent validity tells us about the instrument’s degree of effectiveness for predicting or forecasting an interesting variable (the criterion) from its score (Muñiz, 1994). In turn, the comparison of a given characteristic based on different diagnostic instruments may provide data about the usefulness of certain epistemological entities.

There is great controversy about what should be the “ideal” criterion or referent with which to check or examine the instrument being studied (Robins, 1985). Although clinical diagnosis has been considered, it has systematically proved to be weak when compared to the most commonly-used structured interviews, and some authors have questioned its utility (Piacentini, Shaffer, Fisher, Schwab-Stone, Davies and Gioia, 1993). The Spanish version of the Diagnostic Interview for Children and Adolescents-Revised (DICA-R; Reich, Shayka and Taibelson, 1991) has already been studied in relation to clinical diagnosis (Ezpeleta, De la Osa, Júdez, Domènech, Navarro and Losilla, in press), and between slight and moderate concordance rates have been obtained. On this occasion, the chosen referent is the Child Behavior Checklist (CBCL; Achenbach, 1991), a measure widely used and studied in various countries (Bird, Gould, Rubio-Spitec and Staghezza, 1991; Carter, Grogorenko and Pauls, 1995; Hellincks, Grietens and Verhulst, 1994; Schneider, Walter and Remschmidt, 1991; Verhulst, Achenbach, Ferdinand and Kasius, 1993, Xin, Chen, Tang, Lin and McConville, 1992; Ziber, Auerbach and Lerner, 1994). The instrument is easily applied and there is a great deal of data about its psychometric qualities, coming out of results from studies in 28 different cultures (Verhulst and Achenbach, 1995).
The $r$ values in test-retest from the original version (Achenbach, 1991), computed for a sample of 72 children between 4 and 16 years old in the normal population, range between .82 and .95 ($p<.001$). The relation to other similar instruments, such as Conners’ Parents Questionnaire (Conners, 1973), in a sample of 60 external patients, was high ($r=.82$, $p<.001$). CBCL’s empirical construction -based on a list of problems about pre-school behaviour of concern to parents and mental health professionals-, as well as evidence of higher scores for subjects coming from clinical populations than those from normal populations, are its best guarantees of good content and discriminant validity.

Studies on validity frequently limit themselves to studying content and criterion validity. With the exception of research carried out with the DICA (Herjanic and Campbell, 1977), CAS (Hodges and Fitch, 1979) and DISC (Costello, Edelbrock, Dulcan, Kalas and Klaric, 1984), there have been very few efforts to look into discriminant validity of structured interviews (Hodges, 1993). There is not a single study on DICA-R’s ability to discriminate among paediatric and psychiatric samples. Such an aspect seems to be especially relevant for us in an instrument specifically designed for epidemiological research.

Following Hambleton’s (1994) guidelines on the necessary requirements for considering an instrument as reliable and valid, and the need to demonstrate these features regardless of those of the original instrument, the goal in the present work is to focus on the study of two types of validity in the Spanish version of the DICA-R structured diagnostic interview (Ezepeleta, De la Osa, Júdez, Doménech and Navarro, 1994): 1) Concurrent validity between DICA-R and CBCL in the parents’ version, and 2) discriminant validity when applying DICA-R to two different samples, one psychiatric and the other school-paediatric.

**METHOD**

**Subjects**

Data on DICA-R/CBCL concurrent validity (Study 1) corresponds to 147 children and adolescents, external psychiatric patients and their parents. Subjects were aged between 6 and 17 years old, and were recruited from four Primary Child Psychiatric Assistance centres. All the subjects were attending the centres for the first time. Distribution by sex was: 68 boys (46.3%) and 79 girls (53.7%). 100% of families were Caucasian. Hollingshead’s (1975) socio-economic status index distributed as follows: Class I: 2.8%; Class II: 7.7%; Class III: 13.3%; Class IV: 33.6%; Class V: 42.6%. Clinicians selected all those cases presenting one or more of the disorders assessed in the interview. Subjects suspected of mental deficiency were excluded from the study.

For the study of the discriminant validity of the interview (Study 2), results from interviews given to 196 external psychiatric patients (the previous 147 plus 49 new admissions to the centres) and their parents, together with those of another 130 subjects -73 of which came from Public Health Network Paediatric Services, and 57 from schools, were examined. Subjects ages also ranged from 6 to 17. From now on, we will call the subjects from the Mental Health centres “psychiatric group”, and those recruited from school and paediatric centres “control group”.

The psychiatric group was composed of 87 boys (44.4%) and 109 girls (55.6%). Families’ socio-economic status was as follows: Class I: 3.2%; Class II: 5.9%; Class III: 14.1%; Class IV: 29.7%; Class V: 47.1%. The control group was comprised of 49 boys (37.75) and 81 girls (62.3%). Their socio-economic status was: Class I: 7.1%; Class II: 15.9%; Class III: 14.2%; Class IV: 28.3%, and Class V: 34.5%.

Psychiatric and control groups’ age (t=3.21, p=0.001) and sex ($\chi^2 = 1.44$, p=0.22) comparison showed that the psychiatric group’s mean age (12.72) was higher than that of the control group (11.61). Given the sample size, this difference would appear to be purely statistical, with no clinical significance, so that the two groups are comparable.

**Measures**

CBCL is a standardised instrument for the assessment of child behaviour problems. It evaluates clinical subscales of Isolation, Somatisation, Anxiety/Depression, Social Problems, Thinking Problems, Attention Problems, Criminal Conduct and Aggressive Behaviour. It also allows one to obtain a global score for the grouping of the so-called internalising and externalising syndromes, as well as a total score of symptoms present. Scales have been empirically developed, and they offer T scores. DICA-R is a structured diagnostic interview, based on DSM-III-R’s (APA, 1987) diagnostic criteria, which covers all the most frequent psychiatric syndromes in childhood and adolescence. It is presented in three versions, one for children between 6 and 12 years old (DICA-R-C), another for adolescents between 13 and 17 years old (DICA-R-A), and a common version for parents of both age groups (DICA-R-P). The Spanish adaptation has proved to have good test-retest reliability, with $k$ values between .46 (n=57) for anxiety disorders and 1.00 (n=56) for ingestion disorders in the children’s version; between .54 (n=53) for disorders due to distur-
bing behaviour and .75 (n=53) for ingestion disorders in the adolescents’ version; and .41 (n=61) for anxiety disorders and .61 (n=61) for state of mind disorders in the parents’ version (Ezpeleta, De la Osa, Doménech, Navarro y Losilla, 1995b). It also has excellent reliability among interviewers, with $\kappa$ values ranging from .65 to 1.00 for the set of the three versions (De la Osa, Ezpeleta Doménech, Navarro y Losilla, 1996). Concordance with the clinician was between slight and moderate, with $\kappa$ values from .06 (n=63) for phobias to 1.00 (n=63) for anorexia in the DICA-R-C version; from .07 (n=65) for separation anxiety disorder to .55 (n=45) for anorexia in the DICA-R-A; and from .09 (n=61) in phobias to 1.00 (n=65) for behaviour disorders in the DICA-R-P version (Ezpeleta, De la Osa, Júdez, Domenech and Losilla, in press).

Procedure
Study 1
Several interviewers, previously trained in the use of the interview, administered DICA-R to children and their parents on a date as close as possible to the first contact with the Mental Health centre they attended. In order to do this, formal written consent from the parents and the child’s verbal assent was required. Interviewers were unaware of the clinician’s diagnosis at the time of making the interview. Once it was finished a CBCL form was given to the parents, who were to fill it out and return it on their next visit to the clinician.

Pearson’s linear correlation coefficient was computed between the score for each CBCL subscale –including the internalising and externalising groupings- and the number of symptoms present in each of the disorders assessed by DICA-R. This index was also worked out for each scale in the questionnaire and the total of symptoms present in the interview.

Study 2
Evaluation of psychiatric patients and their parents was made in a way similar to that described in the previous study; the same applied to the paediatric sample. The paediatric sample of the control group was recruited from the paediatric services of two hospitals. Children, although hospitalised, were suffering from mild disorders (phimosis, bone fractures...) Children suffering from chronic or psychosomatic disorders were excluded from the study. The school sample of the control group included part of the sample from the second phase of the study on Obesity-Bulimia-Anorexia (Toro, Saldaña and Raich, 1993). This sub-sample was comprised of children randomly selected among those who had a score lower than the cut-off point established in the screening test (Eating Attitudes Test; Garner and Garfinkel, 1979). Peculiarities in the schools’ internal functioning prevented the parents of these subjects being interviewed, though all the children had their parents’ authorisation to voluntarily participate in this study. DICA-R’s discriminant capacity analysis between two previously-established groups was studied at the quantitative as well as the qualitative levels. A $t$-test was carried out on the differences between the means of the total number of symptoms present in the interview for each group and the difference between the means of the total number of disorders detected by DICA-R.

Also studied was DICA-R’s ability to suitably locate subjects in the pre-established groups through the analysis of sensitivity and specificity of the test and using $\chi^2$. A subject was considered non-pathological when he/she did not show any of the disorders covered by the interview. The presence of one diagnosis was sufficient to consider the subject as being within a pathology group.

Data from both studies was processed by a DAT 2.0 system (Doménech y Losilla, 1995), which guaranteed the absence of logical and arithmetical errors, and allowed the generation of diagnoses using the algorithms previously defined by the interview. Diagnoses were made separately for parents’ and children/adolescents’ evaluations. Statistical analysis was made using SPSS. CBCL was scored according to Achenbach’s (1991) scales and norms appropriate to each age.

RESULTS
Study 1
With regard to the convergence of information obtained through CBCL and DICA-R, it is observed that virtually all correlations in Study 1 were positive (Tables 1 and 2), indicating that the higher the score in any of the scales involved, the higher the number of symptoms detected by DICA-R in each of the listed diagnoses. In these same tables, bisecting correlations between T scores in the wide-range internalising and externalising categories and the DICA-R diagnoses are shown. Correlations between DICA-R and CBCL were, in general, of low to moderate level, and around half of them reached statistical significance.

Regardless of the person reporting, the highest correlations were found between disorders due to disturbing behaviour (attentional deficit disorder with hyperactivity TDAH, defiant negativity ND) and those dimensions most related to these disorders (attentional problems, aggressive behaviour, criminal and externalising conduct), and between the total number of symptoms in the interview and the total score.
Values were higher when information was obtained from the same reporter (parents answered the interview and the CBCL). Separation anxiety disorder (TAS) did not show a significant relationship with any dimension, either when information was provided by parents, or when children gave it. In the interview with children, the dimension that related least with syndromes was Isolation.

In general, syndromes obtained the highest correlations with the narrow band dimensions theoretically most related to them. Thus, for example, anxiety disorders showed the highest correlation with anxiety/depression. The same occurred with wide band correlations: affective-emotional syndromes (anxiety and depression) significantly related to them. Thus, for example, anxiety disorders related least with syndromes was Isolation. In the interview with children, the dimension that gave it. In the interview with children, the dimension that related least with syndromes was Isolation.

DISCUSSION

DICA-R’s convergent validity with CBCL was moderate to low. However, this relation is, in general, stronger when parents are the reporters than in the case of children, particularly in externalising-type behaviours (Biederman et al, 1993; Gould, Bird and Jaramillo, 1993; Jensen, Allan, Salzberg, Richters and Watanabe, 1993; Kazclin and Heidish, 1984; Shekim, Catwell, Kashani, Beck, Martin and Rosenberg, 1986), as might be expected, given that there is a single reporter and because, in these types of disorder, parents seem to provide better information (Ezepeleta, De la Osa, Doménech, Navarro y Losilla, 1995a). Another explanation might be the greater capacity of the instrument chosen as criterion for discriminating these types of disorder rather than the internalising ones (Jensen et al, 1993). The highest relation is always obtained between the syndrome and the dimension theoretical.
The only syndrome that showed no significant relation is the Separation Anxiety Disorder (TAS). This was the case with both parents’ information and with children’s, so that it would not seem to be due to the reporter but, probably, to a problem in the epistemological definition of the disorder. In this sense, it should be noted that there were no significant differences among the CBCL scores when those subjects diagnosed as having this disorder were compared to those that did not have it. Epistemological definition problems of the TAS are discussed in the thorough revision made for this syndrome by DSM-IV (APA, 1994). This relationship again suggests a substantial convergence between the two different approaches, and gives support to the validity of certain constructs they have in common -as was already suggested by work in this line by Edelbrock and Costello (1988), when they compared DISC and CBCL results. In relation to this, we must mention that, when analysing the convergence between CBCL results and the clinician’s diagnosis -derived from the information coming from parents and children together-, the statistically significant correlations obtained between dimensions and diagnoses were fewer, in general, and the values lower (De la Osa, Ezpeleta, Doménech, Navarro y Losilla, in preparation).

The dimension least related to syndromes is Isolation. Theoretically, this dimension would be mainly related with Avoidance Disorder (TE), which has disappeared in the DSM-IV classification. The number of subjects presenting this diagnosis was so small that it was not included in this study. Achenbach (1980) warns that the psychometric approach is quite unsuitable for the evaluation of scarce pathologies. In the case of parents, Isolation correlates with depressive syndromes, TAS and ND, whilst this is not so according to the information coming from the children. Again, such a discrepancy could be due to the fact that isolation is an observable behaviour for which -as we already commented- adults are better reporters. The same argument could be applied to the lack of correlation between the Obsession category and the Thinking Problems scale, in contrast to what occurs with the Compulsions category. While compulsions are, in the majority of cases, observable behaviours, obsessions are not.

The total number of symptoms in the interview (categorical system) shows a significant relationship to all the dimensions. When the reporters in DICA-R were the children and the reporters in CBCL were the parents, there was also a significant relation between the two instruments, which indicates that the categorial and dimensional systems converge.

Table 2

<table>
<thead>
<tr>
<th>DICA-R C+ A</th>
<th>Isolation</th>
<th>Somatisations</th>
<th>Anxiety/ Depression</th>
<th>Social problems</th>
<th>Thinking problems</th>
<th>Attention problems</th>
<th>Criminal conduct</th>
<th>Aggressive behaviour</th>
<th>Internalising</th>
<th>Externalisng</th>
<th>Total score</th>
</tr>
</thead>
<tbody>
<tr>
<td>TDAH (N=147)</td>
<td>0.01</td>
<td>0.05</td>
<td>0.01</td>
<td>0.38</td>
<td>0.15</td>
<td>0.59</td>
<td>0.35</td>
<td>0.35</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
</tr>
<tr>
<td>ND (N=146)</td>
<td>0.16</td>
<td>0.19</td>
<td>0.20</td>
<td>0.32</td>
<td>0.16</td>
<td>0.31</td>
<td>0.49</td>
<td>0.65</td>
<td>0.22</td>
<td>0.68</td>
<td>0.47</td>
</tr>
<tr>
<td>TC (N=146)</td>
<td>0.09</td>
<td>0.10</td>
<td>0.07</td>
<td>0.29</td>
<td>0.19</td>
<td>0.40</td>
<td>0.61</td>
<td>0.44</td>
<td>0.11</td>
<td>0.50</td>
<td>0.38</td>
</tr>
<tr>
<td>DM (N=146)</td>
<td>0.24</td>
<td>0.21</td>
<td>0.42</td>
<td>0.07</td>
<td>0.31</td>
<td>0.19</td>
<td>0.13</td>
<td>0.15</td>
<td>0.36</td>
<td>0.15</td>
<td>0.27</td>
</tr>
<tr>
<td>TD (N=146)</td>
<td>0.35</td>
<td>0.15</td>
<td>0.31</td>
<td>0.13</td>
<td>0.21</td>
<td>0.12</td>
<td>0.08</td>
<td>0.01</td>
<td>0.30</td>
<td>0.08</td>
<td>0.23</td>
</tr>
<tr>
<td>TAS (N=147)</td>
<td>0.14</td>
<td>0.16</td>
<td>0.11</td>
<td>0.10</td>
<td>0.07</td>
<td>0.00</td>
<td>0.10</td>
<td>0.07</td>
<td>0.03</td>
<td>0.07</td>
<td>0.03</td>
</tr>
<tr>
<td>TAE (N=147)</td>
<td>0.16</td>
<td>0.24</td>
<td>0.38</td>
<td>0.11</td>
<td>0.27</td>
<td>0.08</td>
<td>0.02</td>
<td>0.01</td>
<td>0.31</td>
<td>0.01</td>
<td>0.01</td>
</tr>
<tr>
<td>PHOBIA (N=144)</td>
<td>0.15</td>
<td>0.12</td>
<td>0.29</td>
<td>0.12</td>
<td>0.21</td>
<td>0.12</td>
<td>0.02</td>
<td>0.03</td>
<td>0.26</td>
<td>0.06</td>
<td>0.18</td>
</tr>
<tr>
<td>Obs. (N=146)</td>
<td>0.11</td>
<td>0.16</td>
<td>0.27</td>
<td>0.18</td>
<td>0.19</td>
<td>0.18</td>
<td>0.18</td>
<td>0.06</td>
<td>0.20</td>
<td>0.08</td>
<td>0.18</td>
</tr>
<tr>
<td>Compl. (N=146)</td>
<td>0.09</td>
<td>0.04</td>
<td>0.29</td>
<td>0.06</td>
<td>0.30</td>
<td>0.00</td>
<td>0.04</td>
<td>0.08</td>
<td>0.19</td>
<td>0.06</td>
<td>0.14</td>
</tr>
<tr>
<td>Somat. (N=146)</td>
<td>0.06</td>
<td>0.35</td>
<td>0.11</td>
<td>0.03</td>
<td>0.09</td>
<td>0.05</td>
<td>0.03</td>
<td>0.00</td>
<td>0.18</td>
<td>0.04</td>
<td>0.13</td>
</tr>
<tr>
<td>Total number of symptom (N=147)</td>
<td>0.28</td>
<td>0.36</td>
<td>0.43</td>
<td>0.46</td>
<td>0.43</td>
<td>0.49</td>
<td>0.53</td>
<td>0.40</td>
<td>0.59</td>
<td>0.62</td>
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</tbody>
</table>

As far as the internalising disorders are concerned, we concur with the findings of Edelbrock and Costello (1988) or Kazdin and Heidish (1984), who found relationships between the anxiety/depression scales and the corresponding diagnostic category. In this line, Brunshaw and Szatmari (1988) found higher correlations between DICA and the Survey Diagnostic Checklist in this diagnostic category and in the combination Anxiety/Depression. On the contrary, our results conflict with those of Kronenberg, Blumensohn and Apter (1988), who found low relations between depression, CBCL and DICA (Herjanic and Reich, 1982), or Biederman et al (1993), who found no relationships between the depression syndrome and the Depression/Anxiety scale.

TC, TDAH, ND and DM obtained significant correlations with the same scales, hence emphasising the problem of coexistence between internalising and externalising-type disorders, also noted by other authors (Angold and Costello, 1992, 1993; Edelbrock and Costello, 1988; McConaughy, 1993). In addition, it becomes obvious that correspondence is not univocal, either among syndromes and scales or vice-versa.

Although DICA-R includes, among the explored disorders, those related to ingestion as well as to elimination, the latter are not shown in the table of results. As previously mentioned, correlations were established between the total number of symptoms in a disorder and the scores on CBCL scales; diagnostic criteria characteristics in these disorders mean that they can only be evaluated in terms of presence/absence and, hence, cannot be included in the correlation calculations.

Results of the comparison of the number of symptoms and the number of diagnoses between the psychiatric and the control group allow us to use the interview with some guarantees when trying to differentiate pathological from non-pathological subjects in the general population. Subjects from the psychiatric sample presented a greater number of diagnoses and a higher number of symptoms than those from the paediatric/school sample (control group). These results coincide with those obtained by Costello, Edelbrock and Costello (1985), using the DISC. However, results obtained by these authors are much better for the parents’ version than for the children’s. In our case, results are satisfactory for all the interview versions. Moreover, DICA-R’s high sensitivity confirms its special usefulness for detecting pathological subjects.

**CONCLUSION**

In general terms, we can conclude that the results obtained with the DICA-R structured interview in the Spanish version basically concur with those that can be obtained from the CBCL; thus, it seems to be a valid instrument for the assessment of the most common child psychological disorders.

### Table 3

<table>
<thead>
<tr>
<th></th>
<th>DICA-R’s ability to discriminate between psychiatric and control (paediatric/school) groups</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>DICA</td>
</tr>
<tr>
<td>Total number of symptoms present</td>
<td></td>
</tr>
<tr>
<td>C</td>
<td>13.74 (n=77)</td>
</tr>
<tr>
<td>A</td>
<td>27.19 (n=119)</td>
</tr>
<tr>
<td>P</td>
<td>18.10 (n=193)</td>
</tr>
<tr>
<td>Total number of diagnoses present</td>
<td></td>
</tr>
<tr>
<td>C</td>
<td>1.58 (n=77)</td>
</tr>
<tr>
<td>A</td>
<td>3.06 (n=119)</td>
</tr>
<tr>
<td>P</td>
<td>1.77 (n=193)</td>
</tr>
</tbody>
</table>

### Table 4

<table>
<thead>
<tr>
<th></th>
<th>Percentage of subjects correctly classified by DICA-R</th>
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<tbody>
<tr>
<td></td>
<td>Control Group (specificity)</td>
</tr>
<tr>
<td>DICA-R’s version</td>
<td></td>
</tr>
<tr>
<td>DICA-R-C (n=144)</td>
<td>58.2(n=84)</td>
</tr>
<tr>
<td>DICA-R-A (n=182)</td>
<td>57.1(n=82)</td>
</tr>
<tr>
<td>DICA-R-P (n=265)</td>
<td>65.3(n=94)</td>
</tr>
</tbody>
</table>
The interview is also valid for epidemiological study, since it satisfactorily differentiates between different groups of subjects.

Certain important constructs in child psychopathology would appear to be endorsed by the fact of their significant correlation in the two types of classification. More study is necessary, either to continue validating cross-culturally used instruments, or to validate the diagnostic systems themselves on which they are based: we must continue the search for “the best criterion” for examining results and for improving our knowledge on topics such as the comorbidity of clinical entities or current epistemology.

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