Parent Assessment of Psychological and Behavioral Functioning Following Pediatric Acquired Brain Injury

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Objective: Compare the measured prevalence rate of psychopathology and behavior disorders in 29 children with acquired brain injuries using four parent-report instruments.

Method: Two questionnaires, the Child Behavior Checklist (CBCL) and the Personality Inventory for Children (PIC-R) and two interview measures, the Diagnostic Interview for Children and Adolescents (DICA-R) and the Vineland Adaptive Behavior Scales (VABS), were completed following injury or diagnosis.

Results: The DICA-R identified the highest prevalence of anxiety disorders and acting-out behaviors, whereas the CBCL identified the lowest prevalence. Opposite results were found within the domain of attentional problems. Interview measures were more concordant for global psychological impairment than were questionnaires.

Discussion: Discordant findings across measures are discussed in terms of type of disorder, classification model, response format, item characteristics, and scaling.

Key words: assessment; validity; pediatric; psychopathology; acquired brain injury; parent-report; CBCL; PIC-R; DICA-R; VABS.

The negative impact of stressful or traumatic events on the psychological well-being of children is increasingly evident. A growing body of literature indicates that children with chronic illness or acquired brain injury (ABI) are at increased risk for developing emotional and behavioral problems and for exhibiting impairments in adaptive behavior (Breslau, 1985; Brown, Chadwick, Shaffer, Rutter, & Traub, 1981; Butler, Rourke, Fuerst, & Fisk, 1997; Fletcher, Ewing-Cobbs, Miner, Levin, & Eisenberg, 1990; Rutter, 1981). Although numerous measures are available to assess the levels of psychological impairment in the general child population, few of these have been systematically compared or psychometrically evaluated for use with low incidence populations such as chronically ill children or those sustaining ABI. Studies of these unique populations typically employ instruments designed to assess psychological functioning in the general child population under the implicit assumption that the psychometric properties of these measures remain intact. Such assumptions may prove invalid. For example, children with ABI, who have been exposed to numerous medical procedures and treatments, are likely to have clinically elevated scores on...
measures that include questions about somatic symptoms (Perrin, Stein, & Drotar, 1991). Without further empirical evaluation regarding their diagnostic validity, conclusions based on measures of psychopathology administered to such populations may be misleading.

Despite the trend among researchers and their funding agencies to use multiple measures of the same purported constructs as a means of documenting convergent validity in their samples, there is no guarantee that such measures will actually yield similar results, particularly when the measures used have not been systematically evaluated within unique populations. Discrepant diagnostic results may arise from a variety of sources, thus rendering the task of assessing psychological functioning more difficult and making it impossible to discern the true rate of psychological and behavioral impairment in a given population. A more serious problem may be the fact that diagnostic discrepancies among measures increase the risk that children with psychological and behavioral impairments will also not be reliably and accurately identified. Failing to accurately assess the emotional, behavioral, or adaptive functioning in these children can compound physical, cognitive, and neuropsychological deficits experienced as a result of chronic illness or ABI.

This study compared the prevalence rates of psychopathology and behavior problems in children with ABI when measured by four widely used parent-report instruments, the Child Behavior Checklist (CBCL; Achenbach & Edelbrock, 1983), the Personality Inventory for Children-Revised (PIC-R; Wirt, Lachar, Klinedinst, & Seat, 1977), the Diagnostic Interview for Children and Adolescents-Revised (DICA-R; Reich & Welner, 1988), and the Vineland Adaptive Behavior Scales (VABS; Sparrow, Balla, & Cicchetti, 1984). Each of these instruments has been empirically validated and shown to be psychometrically sound for identifying psychological or behavioral problems in the general population of children. Numerous studies have compared each of these measures to other available behavioral rating scales and structured interview measures as well as to DSM-III-R diagnoses and external validators (the reader is referred to the following as examples: Biederman et al., 1993; Clark, Kehle, Bullock, & Jensen, 1987; Jensen et al., 1996; and Kline, Lachar, & Gdowski, 1988). To date, however, few studies have directly compared the prevalence rates of clinically significant impairment yielded by each of these measures in the general population or in clinic-referred child populations. The existing studies provide support for the assumption that these measures have convergent and concurrent validity when used with the populations for which they were developed. For example, Pearson and Lachar (1994) found that both the CBCL and PIC-R significantly predicted level of adaptive functioning in elementary school children, as measured by the VABS. In another study of clinic-referred children, Kronenberg, Blumensohn, and Apter (1988) found the CBCL to be less reliable than the DICA-R at diagnosing affective disorders, as compared to clinical interview, projective testing, and other measures of depression. On the other hand, when used with adolescents with Prader-Willi syndrome, the CBCL and VABS were found to be highly correlated (Dykens, Hodapp, Walsh, & Nash, 1992). Although these studies have provided empirical support for the valid use of these instruments with both the general population of children and clinic-referred samples, none has provided such evidence with respect to children with ABI. Consequently, this study addressed the following questions: (a) Do these different measurement tools influence the prevalence rates of psychological or behavioral disorders in this sample of children with ABI? (b) Do different measures of child psychopathology or behavior problems reliably diagnose the same child as having a particular disorder? (c) What factors might account for any observed discordance across measures?

Method

Participants

Families and children were participants in a longitudinal study of the effects of childhood ABI. Participants were referred by the rehabilitation services of three major pediatric hospitals in the Atlanta metropolitan area. Each child had sustained a moderate or severe ABI necessitating hospitalization. For those children who had sustained a traumatic brain injury (TBI), moderate injury was defined as a Glasgow Coma Scale (GCS) score of 9 to 12, whereas severe injury was defined as a GCS score ≤ 8. Consistent medical data regarding duration of coma in the TBI group were difficult to obtain, but all children were assessed only after performing the Chil-
Therefore, only those children from the larger sample for whom all measures were available were included in this study. Children with elevated PIC-R validity scales, suggesting parent-report bias, were also excluded from this study.

**Procedure and Measures**

Following injury or diagnosis \((M = 116 \text{ days}; SD = 47.91)\), one parent, usually the mother, completed four measures of child psychological and behavioral functioning. Parental informed consent and verbal assent from the child were obtained prior to beginning the assessment process. All measures were completed within three weeks of each other, with 76% completed on the same day or on consecutive days and 18% completed within one week. The characteristics of the parent-report measures used to assess psychopathology in this sample of children differed in measurement format, response mode, item scaling, and type of model. Both the CBCL and PIC-R are dimensional questionnaires. The CBCL requires parents to rate specific statements about the child as “not true,” “somewhat or sometimes true,” or “true or often true,” whereas the PIC-R requires them to rate statements about their child as true or false. The other two measures, the DICA-R and VABS, are interview methods of assessment. The DICA-R requires the parent to indicate whether specific child symptoms are present or absent and yields categorical DSM-III-R diagnoses. On the other hand, the VABS is a dimensional interview that requires the parent to rate whether their child is “never,” “sometimes or partially,” or “usually” able to perform specific behaviors.

Global psychological and behavioral functioning was assessed by each of the four measures. Three of the four also assessed four domains of psychopathology, including anxiety, depression, acting-out behaviors, and attention problems. Because the VABS does not have similar domain scores, it could not be included in the comparison of specific diagnostic categories. Table I presents a summary of the scales used from each measure, as well as the specific criteria for determining the presence of impairment. Diagnostic categories were chosen in an effort to focus on more specific types of common childhood psychopathology and to include both internalizing and externalizing manifestations of impairment. Existing literature indicates that children with ABI experience an increase in both domains...
Table I. Scales and Inclusion Criteria for Global Psychological Functioning and Each Diagnostic Category by Measure

<table>
<thead>
<tr>
<th>Cut-off</th>
<th>CBCL</th>
<th>PIC-R</th>
<th>DICA-R*</th>
<th>VABS*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Global</td>
<td>T &gt; 60</td>
<td>T &gt; 60</td>
<td>&gt;1 diagnosis</td>
<td>Significant</td>
</tr>
<tr>
<td>Anxiety</td>
<td>Total problems</td>
<td>Adjustment</td>
<td># of diagnoses</td>
<td>OAD; SAD; OCD</td>
</tr>
<tr>
<td>Depression</td>
<td>Anx/Dep</td>
<td>Anxiety</td>
<td>Depression; dysthymia</td>
<td></td>
</tr>
<tr>
<td>Acting-out</td>
<td>Aggression</td>
<td>Delinquency</td>
<td>ODD; CD</td>
<td></td>
</tr>
<tr>
<td>Attention</td>
<td>Attention problems</td>
<td>Hyperactivity</td>
<td>ADHD</td>
<td></td>
</tr>
</tbody>
</table>

*Overactive Disorder (OAD); Obsessive-Compulsive Disorder (OCD); Separation Anxiety Disorder (SAD); Oppositional Defiant Disorder (ODD); Conduct Disorder (CD); Attention Deficit Hyperactivity Disorder (ADHD).
*Includes moderate and severe levels of significance, as defined in Sparrow, Balla, & Cicchetti (1984).

(Brown et al., 1981; Fletcher et al., 1990; Rutter, 1981), and recent evidence supports the choice of these diagnostic domains as valid constructs for investigation in this population (Butler et al., 1997).

T-scores on the CBCL and PIC-R above 60, a conservative estimate of 1 SD above the mean, were considered elevated for purposes of this study. Researchers have found that this cut-off, although lower than those recommended in the manuals, accurately predicts psychological impairment for several of the PIC-R and CBCL scales (Lachar, Kline, & Boersma, 1986; Steingard, Biederman, Doyle, & Sprich-Buckminster, 1992). Others have suggested that a cut-off of T ≥ 70 on the CBCL scales may distort categorical comparisons due to the low likelihood of achieving an elevation of this magnitude (Jensen et al., 1996). On the DICA-R, children whose parents did not report the presence of attentional problems prior to age seven, but who otherwise met the criteria for ADHD because they were experiencing attentional problems secondary to an ABI, were identified as meeting the criteria for ADHD for the purpose of this study.

The first set of analyses examined global psychological and behavioral functioning by determining the prevalence rate of impairment identified by each measure. Pearson product-moment correlations among indices of global functioning (T-scores for the CBCL and PIC-R, total number of diagnoses identified by the DICA-R, and total number of maladaptive behaviors endorsed on the VABS) were then computed. A second set of analyses repeated these procedures for the four specific domains of psychopathology assessed by the CBCL, PIC-R, and DICA-R. Pairwise comparisons and percentage agreement between these measures were also computed.

Results

Global Psychological and Behavioral Functioning

The prevalence of global deficits in psychological and behavioral functioning, as identified by each measure, is shown in Table II. On the VABS, 79.3% of children exhibited maladaptive behaviors (41.4% moderate; 31.0% severe). Consistent with these results, 72.4% of children had at least one DSM-III-R diagnosis as measured by the DICA-R (34.5% had only one diagnosis; 37.9% had more than one diagnosis). On the other hand, the CBCL and PIC-R both identified fewer children as experiencing overall psychological dysfunction (24.1% and 31.0%, respectively).

As shown in Table III, all global measures of psychological functioning were significantly positively correlated. Both interview methods of assessment yielded higher prevalence rates of overall impairment than did questionnaires, suggesting that parent-interview methods may be more sensitive, or more biased, in identifying child psychopathology than questionnaires.

Specific Domains of Psychopathology

When evaluating for specific psychological disorders, the DICA-R yielded the highest prevalence rates for anxiety disorders (37.9%) and acting-out behaviors (44.8%), whereas the CBCL yielded the lowest prevalence rates in these diagnostic categories (10.3% anxiety/depression; 24.1% acting-out). The opposite results were found with respect to attentional difficulties. In contrast to the other three categories, the CBCL identified the most children as experiencing difficulty in the attentional problems.
Table II. Percentage of Children Identified as Impaired in Each Category by Measure (n)

<table>
<thead>
<tr>
<th>Measure</th>
<th>Global</th>
<th>Anxiety</th>
<th>Depression</th>
<th>Acting-Out</th>
<th>Attention</th>
</tr>
</thead>
<tbody>
<tr>
<td>CBCL</td>
<td>24.1 (7)</td>
<td>10.3 (3)</td>
<td>10.3 (3)</td>
<td>24.1 (7)</td>
<td>34.5 (10)</td>
</tr>
<tr>
<td>PIC-R</td>
<td>31.0 (9)</td>
<td>24.1 (7)</td>
<td>17.2 (5)</td>
<td>27.6 (8)</td>
<td>27.6 (8)</td>
</tr>
<tr>
<td>DICA-R</td>
<td>72.4 (21)</td>
<td>37.9 (11)</td>
<td>17.2 (5)</td>
<td>44.8 (13)</td>
<td>17.2 (5)</td>
</tr>
<tr>
<td>VABS*</td>
<td>79.3 (23)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*The VABS does not provide related factor scores for the diagnostic categories of anxiety, depression, acting-out disorders, and attentional problems.

Table III. Correlations Between Indices of Global Psychological Functioning

<table>
<thead>
<tr>
<th></th>
<th>PIC-R</th>
<th>DICA-R</th>
<th>VABS</th>
</tr>
</thead>
<tbody>
<tr>
<td>CBCL</td>
<td>.52*</td>
<td>.63***</td>
<td>.75***</td>
</tr>
<tr>
<td>PIC-R</td>
<td>—</td>
<td>.56**</td>
<td>.42*</td>
</tr>
<tr>
<td>DICA-R</td>
<td>—</td>
<td>—</td>
<td>.65***</td>
</tr>
</tbody>
</table>

*p < .05.
**p < .005.
***p < .001.

domain (34.5%), whereas the DICA-R identified the fewest children as having a diagnosis of ADHD (17.2%). Results from the PIC-R indicate that this instrument consistently yielded prevalence rates that fell between those for the other two instruments.

Correlations between measures for each diagnostic category are presented in Table IV. Whereas all measures were significantly positively correlated for the domains of depression and acting-out behaviors, only the PIC-R and CBCL were significantly positively correlated in the domain of anxiety disorders. This is consistent with previous research indicating poor concordance of anxiety disorders across all types of measurement conditions (Hodges, 1993). In the category of attentional problems, the PIC-R was significantly correlated with both the CBCL and DICA-R; however, no relation was found between the CBCL and DICA-R for this diagnostic domain.

Although significant correlations were obtained between measures, different measures frequently failed to identify the same child as having the same type of disorder. Measures were highly concordant for those children who did not receive a diagnosis (percentage agreement ranged from .62 to .76); however, concordance between measures for those children identified as impaired was variable. Two-by-two comparisons were used to determine percentage diagnostic agreement among measures for those children who received a score in the clinical range on the CBCL or PIC-R or who received a clinical diagnosis on the DICA-R. (Percentage agreement was used rather than Cohen's kappa because the latter is extremely sensitive to uneven probabilities of group measurement, that is, impaired versus non-impaired, within the sample [Hartmann, 1977; Sylvester, Hyde, & Reichler, 1987].) As shown in Table V, percentage agreement was low for all pairwise measures and categories. The lowest concordance rate for all pairwise comparisons (18%) was between the CBCL and the DICA-R in the category of anxiety disorders. The highest concordance rate for all pairwise comparisons (60%) was found between these two measures for the category of depression.

Discussion

Interview measures identified a higher comparable percentage of children as experiencing global psychological and behavioral impairment than did the
parent-report questionnaires. One plausible explanation is that standardized paper-and-pencil measures are less sensitive than interview measures and may fail to identify children whose maladaptive behavior, as rated by the VABS, is moderately significant or whose DICA-R yields only one diagnosis. In a recent review of the literature on psychiatric disorders in the first three months following traumatic brain injury, Max et al. (1997) found rates of psychiatric disorders comparable to those yielded by interview measures of assessing global psychopathology in the present study. Although these rates were somewhat lower for those children sustaining mild head injuries, they were nearly twice that identified by questionnaires in this study. Thus, interview measures, which allow parents to elaborate their responses, while carrying the potential for subjective interpretation by the person conducting the interview, seem to identify more children as experiencing overall psychological and behavioral difficulty than parent-report questionnaires with forced-choice responses. This finding is consistent with another study of children with head injuries, which found that parent-report questionnaires were not as robust at identifying impairment in children as interview methods of assessment (Fletcher et al., 1990).

When specific diagnostic categories are considered, different parent-report measures of psychopathology in children with ABI yield different prevalence rates for each of four diagnostic categories. Dimensional measures yielded lower prevalence rates for anxiety disorders and acting-out behaviors than did the categorical measures, whereas dimensional measures yielded higher prevalence rates for attentional problems than did the categorical measures.

To account for the fact that the CBCL yields the lowest prevalence rates for the three diagnostic categories of anxiety, depression, and acting-out behaviors, there are at least two plausible explanations. First, symptoms of anxiety and depression load on the same CBCL scale (Anxiety/Depression), and it is therefore impossible to discern which type of internalizing difficulties an individual child is experiencing. This is consistent with the literature indicating that the CBCL is generally a poor predictor of internalizing diagnoses (Hepperlin, Stewart, & Rey, 1990; Jensen, Shervette, Xenakis, & Richters, 1993; Reynolds & Johnston, 1994). Moreover, in order for a child's score to be elevated in the clinical range on this scale, he or she must be experiencing either symptoms of both disorders or more symptoms of one disorder than necessary to diagnose that disorder according to DSM-III-R criteria. Although there may be sufficient overlap between symptoms of anxiety and depression in younger children such that a single scale may be sufficient (Hodges & Craighead, 1990), these symptoms become more differentiated in older children (Cole, Truglio, & Peeke, 1997; Craighead, Curry, & Ilardi, 1995), suggesting that a single Anxiety/Depression scale, such as that of the CBCL, may not be as useful as independent scales to assess each set of symptoms in older children. The Anxiety/Depression scale on the CBCL is significantly positively correlated with a DICA-R diagnosis of depression but not with a DICA-R diagnosis of anxiety, suggesting that children with elevated scores on this scale are more likely to appear depressed, according to the DICA-R, than anxious. The PIC-R, which has separate Anxiety and Depression scales, on the other hand, identifies more children as experiencing difficulty in each of these domains, and both scales are significantly positively correlated with the CBCL Anxiety/Depression scale.

Second, the CBCL compresses the raw data by assigning the same T-score to all children whose raw scores fall below the 69th percentile. Therefore, be-

<table>
<thead>
<tr>
<th>Variable</th>
<th>Percentage agreement</th>
<th>n*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Anxiety</td>
<td></td>
<td></td>
</tr>
<tr>
<td>PIC-R/DICA-R</td>
<td>41</td>
<td>12</td>
</tr>
<tr>
<td>CBCL/PIC-R</td>
<td>43</td>
<td>7</td>
</tr>
<tr>
<td>CBCL/DICA-R</td>
<td>18</td>
<td>11</td>
</tr>
<tr>
<td>Depression</td>
<td></td>
<td></td>
</tr>
<tr>
<td>PIC-R/DICA-R</td>
<td>25</td>
<td>8</td>
</tr>
<tr>
<td>CBCL/PIC-R</td>
<td>33</td>
<td>6</td>
</tr>
<tr>
<td>CBCL/DICA-R</td>
<td>60</td>
<td>5</td>
</tr>
<tr>
<td>Acting-out behaviors</td>
<td></td>
<td></td>
</tr>
<tr>
<td>PIC-R/DICA-R</td>
<td>54</td>
<td>13</td>
</tr>
<tr>
<td>CBCL/PIC-R</td>
<td>27</td>
<td>11</td>
</tr>
<tr>
<td>CBCL/DICA-R</td>
<td>43</td>
<td>14</td>
</tr>
<tr>
<td>Attentional problems</td>
<td></td>
<td></td>
</tr>
<tr>
<td>PIC-R/DICA-R</td>
<td>50</td>
<td>8</td>
</tr>
<tr>
<td>CBCL/PIC-R</td>
<td>30</td>
<td>12</td>
</tr>
<tr>
<td>CBCL/DICA-R</td>
<td>25</td>
<td>12</td>
</tr>
</tbody>
</table>

*Denotes the number of children who reached the criteria for impairment on at least one measure. Percentage agreement, therefore, denotes the extent to which the measures agreed that n children were impaired. For example, four (50%) of the eight children identified with attention problems by the PIC-R were also identified with ADHD on the DICA-R.
cause of the way it is scored, children who have subtle or mild emotional and behavioral problems may not be identified by this instrument (Perrin et al., 1991), and this truncating affects any measure of association with other instruments. The PIC-R and the DICA-R do not compress raw scores in the same way, and each yields a higher prevalence rate in these three diagnostic categories than does the CBCL, suggesting that these two instruments may be more sensitive to identifying children experiencing more mild levels of anxiety, depression, or acting-out difficulties.

In contrast to the other three diagnostic categories, for which the CBCL yields the lowest prevalence rates, it identifies a higher prevalence of attentional problems than the other measures. Whereas the CBCL yields a higher T-score if parents report many mild attentional problems, the PIC-R and DICA-R require that the specific symptoms of ADHD be endorsed in order to receive an elevated score or a diagnosis. Therefore, the CBCL may be more sensitive to identifying children with attentional problems than either the PIC-R or DICA-R, both of which were developed to identify a specific constellation of symptoms representing ADHD. Children with ABI are at increased risk of developing attentional problems secondary to brain trauma (Levin, Ewing-Cobbs, & Eisenberg, 1995; Ris & Noll, 1994). Therefore, the CBCL may be more accurately identifying these children as experiencing attentional difficulties secondary to ABI, rather than the classic ADHD syndrome, whereas the PIC-R and DICA-R appropriately do not identify these children as experiencing the specific syndrome of ADHD.

An alternative explanation for discrepant prevalence rates is that the DICA-R may be overdiagnosing children with ABI with anxiety, depression, and acting-out disorders. Others have found that the DICA-R tends to overidentify these categories of disorders in the general population of children (Boyle et al., 1993) and that the DICA-R has weak convergent validity with other measures of anxiety (Hodges, 1993). Furthermore, Carlson, Kashani, Thomas, Vaidya, and Daniel (1987) suggest that parent interviews completed during highly stressful times may lead to symptom overreporting. Parents of children who have recently been injured or diagnosed with an ABI are likely to be experiencing high levels of distress, and open-ended interviews, such as the DICA-R, may overpathologize the child’s behavior as the result of parental level of distress.

Children with ABI often have additional deficits secondary to their medical condition that may limit the ability of these instruments to reliably reflect the prevalence of psychopathology in this population. For instance, ABI typically produces cognitive and physiological changes that may manifest themselves in ways that resemble symptoms of internalizing disorders to parents. Although overall ability (as measured by WISC-III Full Scale IQ scores) was not significantly related to measures of psychopathology in our sample, deficits in verbal expressivity were significantly related to some measures. Specifically, WISC-III Verbal IQ scores were significantly (p = .05) correlated with PIC-R measures of anxiety (r = .38), depression (r = .44), and hyperactivity (r = .44), as well as to the DICA-R diagnosis of ADHD (r = .44), suggesting that parents of less verbally communicative children may be more likely to perceive their children as inattentive and as experiencing internalizing symptoms. These results indicate that the aforementioned PIC-R scales may be more sensitive to the organic aspects of ABI. In addition to cognitive or verbal deficits, children with ABI may have decreased facial expressivity, prosody, or arousal levels, as well as changes in appetite and sleep patterns related to hypothalamic or other subcortical damage. Because each of these is also a symptom associated with depression, it is possible that parents mistakenly interpret these common sequelae of brain injury as indicative of a depressed emotional state. Therefore, discordant results may be related to the extent to which each measure includes individual items assessing these symptoms. Should clinicians and researchers fail to take the cognitive and organic aspects of ABI into account in their diagnostic assessment, they increase the risk of inappropriate referral for psychological services, as opposed to cognitive or medical interventions that would address true underlying difficulties.

The cognitive and physiological sequelae of ABI may vary depending on the length of time between injury or diagnosis and assessment, with cognitive and organic deficits typically improving over time. As a result, prevalence rates may change depending on when the assessment occurred. In this study, however, all measures were obtained at the same point in time; thus, this factor cannot explain discordance in the data. If comparisons between studies do not control for temporal considerations, discordance between measures may be overestimated. Although length of time since injury or di-
diagnosis varied widely in our sample (range = 17–240 days), only the PIC-R Anxiety scale was significantly positively correlated (r = .43) with the number of days since injury or diagnosis, suggesting that, according to this measure, children experienced more anxiety as the time between injury or diagnosis and assessment increased.

These different parent-report measures not only yielded different prevalence rates within each diagnostic category, but they also identified different children as impaired. Although these measures are correlated, the fact that they have such low rates of diagnostic agreement with respect to individual children suggests that the issue is not merely one of sensitivity. Lachar and Gdowski (1979) similarly found poor concordance between the PIC and the DICA for these four diagnostic categories. Of all pairwise comparisons for all categories of impairment, the lowest rate of agreement is between the CBCL and DICA-R in the category of anxiety disorders; however, these two measures have the highest rate of agreement of all pairwise comparisons in the category of depression. These results suggest that those children with an elevated score on the CBCL Anxiety/Depression scale are more likely to appear depressed on the DICA-R rather than anxious. Despite the low rate of agreement on which children are experiencing psychological and behavioral problems, these measures had a high rate of agreement for determining which children were not having difficulty.

The limitations and potential biases of parental report must be recognized when interpreting discordant results across measures. Some have suggested that parents may be more accurate when reporting observable behaviors than when asked to report on their child's subjective feelings (Kashani, Orvaschel, Burk, & Reid, 1985; Reich & Earls, 1987; Sylvester et al., 1987), and others have found that children, as opposed to their parents, are better sources of information regarding their own internalizing symptoms (Herjanic & Reich, 1982; Kamphaus & Frick, 1996). Dimensional questionnaires, however, were more concordant for internalizing disorders than for externalizing disorders in this study. Despite possible parental limitations with respect to the accuracy of reporting internalizing symptoms, these results suggest that concordance was not compromised.

Other factors, such as parental distress or psychopathology, may also lead to inconsistency in parent-report. As previously mentioned, it may be unreasonable to expect parents of children who have recently been injured or diagnosed with an ABI to accurately report their child's emotions and behaviors because the parents themselves have also been affected by the trauma and are likely experiencing high levels of distress. While the present study cannot address the ways in which parental distress or psychopathology affect the accuracy of responding, our results do not suggest that either influenced the consistency with which parents responded. When "consistency" between measures was operationalized as number of pairwise agreements for each category, no significant correlations were found with the Family Inventory of Life Events (FILE; McCubbin & Patterson, 1983), a measure of family stress, or with the Symptom Checklist-90-Revised (SCL-90-R; Derogatis, 1992), a measure of parental psychopathology.

It is well established in the literature (Hooper & March, 1995; Kamphaus & Frick, 1996; Kazdin, 1995; Reynolds & Johnston, 1994) that there is a high rate of symptom overlap and comorbidity of these psychiatric diagnoses in children, and caution must therefore be taken when interpreting discordant results across measures. Clinical judgment may prove beneficial when differential diagnosis is necessary. Unfortunately, independent a priori clinician diagnoses are not available for our sample of children, and retrospective diagnoses are confounded by ongoing involvement with these children and their families. While clinical judgment may aid in differential diagnosis, it is by no means the "gold standard" to which assessment instruments should be compared, as clinician diagnosis is not always reliable and valid (Rabinowitz, 1993; Wilson & Evans, 1983) and may be influenced by both clinician training (Prendergast, Taylor, Rapoport, & Bartko, 1988) and theoretical orientation (Cohen, Riccio, & Gonzalez, 1994).

These results highlight the need for careful consideration of measurement issues when selecting diagnostic instruments to investigate psychopathology in populations of children with acquired brain injuries. Each instrument has strengths depending upon the goal of the research or clinical question. For example, if the goal is to identify all children experiencing any impairment in overall psychological or behavioral functioning, the use of an interview method may decrease the risk that children experiencing a lesser degree of difficulty will be overlooked. Interview methods of assessment will also allow clinicians familiar with common ABI se-
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quelae to differentiate symptoms of psychopathology from symptoms of brain injury. Because the DICA-R is lengthy and cumbersome, and the DICA-IV even more so, the VABS may prove more pragmatic in these instances. The VABS also has the benefit of allowing for assessment of change because, unlike the dichotomous scoring of the DICA-R, its scoring system accounts for severity of symptoms. The DICA-R, however, may be the instrument of choice if the goal is to identify specific disorders (perhaps for the purpose of resource allocation) while minimizing the risk of Type II errors because it tends to yield higher prevalence rates, thus reducing the likelihood that a child experiencing difficulty within a specific domain will be overlooked. On the other hand, if the goal is to identify acquired problems with attention and impulse control after an ABI, the DICA-R may not be as useful, and the CBCL may be a better screening instrument for this purpose. Similarly, one of the dimensional measures should be used when making age and gender comparisons because the categorical nature of the DICA-R does not easily allow for such comparisons. Regardless of the purpose, it is important to balance parent interview time with the need for, and relevance of, obtaining a full array of diagnostic information. The current trend to incorporate multiple measures of the same construct completed by a variety of informants in assessment batteries may be counterproductive if different measures or informants provide different results. Given that different types of instruments (i.e., categorical versus dimensional; questionnaire versus interview) yield different prevalence rates and little diagnostic concordance for an individual child, and given that no gold standard is available, the measures selected for investigation must be carefully matched to the specific research population of interest and to the clinical questions. Therefore, clinicians and investigators must consider measurement issues a priori.

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