Assessment of Disordered Thinking in Children and Adolescents: The Rorschach Perceptual–Thinking Index

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The new Rorschach Perceptual–Thinking Index (PTI; Exner, 2000a, 2000b) was designed to assess thought disorders more accurately than the Schizophrenia Index (SCZI; Exner, 1993). Using a sample of child and adolescent inpatients, we examined the relation of Rorschach variables (PTI, SCZI, M–, and X – %) to thought disorder indexes on a behavior rating scale (Behavior Assessment System for Children; Reynolds & Kamphaus, 1992) and a self-report measure (Personality Inventory for Youth; Lachar & Gruber, 1995). Results indicate that, when used in a categorical manner, the PTI differentiated between those patients with and without elevated thought disorder scores on the other measures. Of all Rorschach variables, M– was most related to the other measures, indicating that this variable may be a particularly robust indicator of thought disorder among children and adolescents.

Although formal thought disorders such as psychosis and schizophrenia are relatively uncommon in the general child population (Remschmidt, Schulz, Martin,
Warnke, & Trott, 1994), when they do occur these children are difficult to treat and often have poor clinical outcomes. Thought disorders in children are qualitatively different from other forms of childhood psychopathology as they have both “internalizing” (e.g., flat affect and social withdrawal) and “externalizing” (e.g., impulsivity and inattention) symptoms. Furthermore, the American Academy of Child and Adolescent Psychiatry (1997) reported that schizophrenia in children and adolescents is thus difficult to diagnose due to a great deal of comorbidity with other disorders such as mood disorders, organic disorders, autism, and other behavioral and emotional disorders.

Due to the high comorbidity and varied clinical presentations of children and adolescents with thought disorders, precise measurement is paramount. Assessment of child and adolescent psychopathology should include measurement across different settings by different raters (e.g., Anastasi & Urbina, 1997; Mash & Terdal, 1997). Popular means of assessing psychopathology in children and adolescents include self-report of the children or adolescents themselves, projective techniques such as the Rorschach, and the reports of significant others using behavior rating scales (Kamphaus & Frick, 1996; Ollendick & Greene, 1998).

Among these measurement techniques, the Rorschach appears to be uniquely suited as a measure of thought disorder. Using the Rorschach, a number of previous researchers have found positive results in the differentiation of those with and without psychotic disorders (e.g., Exner, 1986, 1993; Exner, Thomas, & Mason, 1985; Hilsenroth, Fowler, & Padawer, 1998; Jorgensen, Anderson, & Dam, 2000; Perry, Viglione, & Braff, 1992).

Many of these studies have used the Schizophrenia Index (SCZI; Exner, 1993), a summary of Rorschach variables assessing disordered thinking, inaccurate perception, and interpersonal ineptness. Although the SCZI appears clinically useful, reliable, and valid among adult populations (Hilsenroth et al., 1998; Ilonen et al., 1999; Jorgensen et al., 2000; Meyer, 1993; Netter & Viglione, 1994), results have been somewhat mixed among children and adolescents. For example, Exner et al. (1985) found that adolescents with schizophrenia produced inflated SCZI variables. In a recent study of inpatient children, Stokes, Pogge, Grosso, and Zaccario (2001) examined SCZI scores and scores on the parent-rated Personality Inventory for Children–Revised (PIC–R; Wirt, Lachar, Klinedinst, & Seat, 1984). They found that children with elevated SCZI scores (< 4) had elevated scores on several PIC–R variables related to thought disorder, anxiety, and cognitive dysfunction.

However, research has indicated that children and adolescents produce more false positive SCZI scores than adult populations (Viglione, 1999). Studies have shown that bright and talented adolescents often display higher SCZI scores (Franklin & Cornell, 1997). Furthermore, in a recent study, Holaday (2000) found that outpatient children and adolescents diagnosed with posttraumatic stress disorder scored significantly higher on SCZI than those with oppositional defiant disorder (ODD). Holaday concluded that the SCZI may be a nonspecific indicator of
thought disorder and that it “could be an inappropriate or inaccurate tool in diagnosing schizophrenia in younger individuals” (p. 155).

To address these problems and to increase the diagnostic utility of the Rorschach for assessing thought disorder, the Perceptual–Thinking Index (PTI; Exner, 2000a, 2000b) was created. The PTI is a five-variable index that draws from Rorschach indexes of both perceptual distortion and cognitive slippage. The five PTI variables and six SCZI variables appear in Table 1.

The PTI is a significant revision of the SCZI and was developed by examining the classification efficacy of the six SCZI variables and revising those that had higher false positive rates (Exner, 2000b). The PTI contains two variables new to the Comprehensive System (CS; Exner, 1991, 1993) Extended Form Appropriate (XA%) and WDA% (Exner, 2000b). The variable XA% is defined as the sum of all +, o, and u responses divided by R. A new variable, WDA% is calculated by dividing the sum of +, o, and u responses given to the W and D areas by the sum of all responses given to the W and D areas (Exner, 2000b). Exner (2000b) reported that the PTI is designed to reduce false positives among both adults and adolescents. Like SCZI, PTI was not intended as a diagnostic tool to identify schizophrenia specifically but rather as a means to alert clinicians to the possibility of disturbed thinking or cognitive slippage.

Two components of both SCZI and PTI have often been implicated as potential indicators of thought disorder: M– (human movement responses with poor form quality) and X – % (the percentage of responses with poor form quality; Exner, 1993). Rorschach indicated that M– might be one of the most important and efficient variables for differentiating between schizophrenic and nonschizophrenic

<table>
<thead>
<tr>
<th>PTI</th>
<th>SCZI</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. XA%&lt; .70 and WDA%&lt; .75</td>
<td>1. X + %&lt; .61 and S – %&lt; .41 or X + %&lt; .50</td>
</tr>
<tr>
<td>2. X – %&gt; .29</td>
<td>2. X – %&gt; .29</td>
</tr>
<tr>
<td>3. Lv2 Sp Sc&gt; 2 and FAB2&gt; 0</td>
<td>3. FQ–≥ Fqu or FQ–&gt; FQo + FQ+</td>
</tr>
<tr>
<td>4. if R&lt; 17 and WSUM6&gt; 12c or R&gt; 16 and WSUM6&gt; 17d</td>
<td>4. Lv2 Sp Sc&gt; 1 and FAB2&gt; 0</td>
</tr>
<tr>
<td>5. If M–&gt; 1 or X – %&gt; .40</td>
<td>5. Raw Sum6 Sp Sc&gt; 6 or Wsum6&gt; 17</td>
</tr>
<tr>
<td>6. M–&gt; 1 or X – %&gt; .40</td>
<td></td>
</tr>
</tbody>
</table>

Note. PTI = Perceptual–Thinking Index; SCZI = Schizophrenia Index.

aXA (Extended Form Appropriate)% = All responses with FQ+, FQo, or FQu divided by R. bWDA (W, D Appropriate)% = All W, WS, D, and DS responses with FQ+, FQo, or FQu divided by the sum of all W, WS, D, or DS responses. cIf R< 17: for ages 5 to 7, WSum6> 16; for ages 8 to 10, WSum6> 15; for ages 11 to 13, WSum6> 14. dIf R> 16: for ages 5 to 7, WSum6> 20; for ages 8 to 10, WSum6> 19; for ages 11 to 13, WSum6> 18.
patients (Exner, 1993). Similarly, \( X - \% \) has been an effective variable in the differentiation of patients with thought disorder (Kleiger, 1999; Weiner, 1966).

The purpose of this article was to examine the relation of Rorschach variables \((SCZI, PTI, M-, \text{ and } X-\%)\) with behavior ratings and self-report of thought disorder in children and adolescents. Convergence between these three assessment techniques is assessed through both dimensional and categorical analyses. This article is distinctive because it is the first to (a) examine the utility of the new \( PTI \) variable in an inpatient sample of children and adolescents and (b) investigate the convergence of three means of assessing thought disorder in a younger population.

**METHOD**

**Participants**

Data for this study were conducted as part of a larger investigation of multimethod, multitrait assessment (Smith, 2000). Behavior ratings, self-report, and Rorschach data were collected for 42 inpatient children and adolescents (Mean age = 13.7 years, range = 8 to 18) consecutively admitted to a small private south-central United States psychiatric hospital specializing in short-term treatment of acute psychiatric disorders in children and adolescents. All of the patients were White and 18 (42.9\%) were male. The racial background of the participants is representative of the larger community in which there is a small proportion of minorities. Patients with IQ scores lower than 80 were excluded.

Primary psychiatric diagnoses of the sample included major depressive disorder \((n = 18, 42.9\%)\), attention deficit hyperactivity disorder (ADHD; \(n = 8, 19.0\%)\), dysthymia \((n = 4, 9.5\%)\), and ODD \((n = 4, 9.5\%)\). Seventy-nine percent of the sample presented with more than one Axis I disorder. The most common secondary diagnoses were ODD \((n = 10, 23.8\%)\), dysthymia \((n = 9, 21.4\%)\) and ADHD \((n = 7, 16.7\%)\). Only two (4.8\%) of the patients had diagnoses of schizophrenia. Therefore, in this study we aimed to assess thought disturbance among a general psychiatric population of children and adolescents.

**Measures**

**BASC.** The Basic Assessment System for Children—Parent Report Form (BASC—PRF; Reynolds & Kamphaus, 1992) is a 126-item behavior rating scale. Each item is a descriptor of behavior (e.g., “bullies others,” “stutters”) followed by a 4-point Likert-type scale ranging from 1 (never) to 4 (almost always). The BASC yields nine Clinical scales: Hyperactivity, Aggression, Conduct Problems, Anxiety, Depression, Somatization, Atypicality, Withdrawal, Attention Problems; either two (adolescent form) or three (child form) Adaptive Scale scores including
Social Skills, Leadership, Adaptability (child form only); three Composites (i.e., Externalizing and Internalizing Problems and Adaptive Skills); and the global Behavioral Symptoms Index (Reynolds & Kamphaus, 1992).

The BASC scales have shown test–retest reliabilities ranging from .84 to .92 for 2- to 8-week intervals. Internal consistency calculations ranged from .67 to .90 and .64 to .89 for boys and girls, respectively. The test authors (Reynolds & Kamphaus, 1992) reported that the BASC scales have shown appropriate scale elevations when administered to diagnostic groups. Furthermore, the BASC showed considerable concurrent validity with the Child Behavior Checklist (Doyle, Ostrander, Skare, Crosby, & August, 1997) and the Devereux Scales of Mental Disorders (Smith & Reddy, 2000). The two BASC scales used in our study—the Atypicality Scale and the Withdrawal Scale—were selected for inclusion because they may assess both the positive (Atypicality) and negative (Withdrawal) symptoms of a psychotic disorder.

PIY. The Personality Inventory for Youth (PIY; Lachar & Gruber, 1995) is a 270-item, true–false, self-report measure for children and adolescents ages 8 to 18. The PIY yields nine clinical scales and 24 subscales and has illustrated good reliability and validity (Kamphaus & Frick, 1996; Lachar & Gruber, 1995). The median internal consistency estimate was .85 for the clinical scales but only .73 for the subscales. Test–retest coefficients for the nine clinical scales had a median of .82 but were lower for the subscales at a median of .73. Although more data are needed at present, test authors Lachar and Gruber (1995) found moderate correlations between Minnesota Multiphasic Personality Inventory (Hathaway & McKinley, 1943) and PIY scales. The four PIY scales used in this study were the Reality Distortion Composite, which is comprised of the Hallucinations and Delusions and Feelings of Alienation scales, as well as the Social Withdrawal Composite. As was the case with the BASC, these four scales were included because they represent the assessment of the positive (hallucinations and delusions) and negative (feelings of alienation and social withdrawal) symptoms of thought disorder as well as a summary variable of thought disturbance (reality distortion).

The PIY has different clinical cutoff points for its various subscales and composites. On the Reality Distortion Composite, a T score of greater than or equal to 59 is considered indicative of probable difficulties. On the Feelings of Alienation subscale, a T score ≥ 65 reflects a clinical elevation, whereas a T score ≥ 69 on the Hallucinations and Delusions subscale represents likely difficulties with active perceptual difficulties. Last, a T score ≥ 59 is considered a clinically significant elevation on the Social Withdrawal Composite.

Rorschach. Reliability and validity estimates of the Rorschach are described extensively elsewhere (Exner, 1993; Exner & Weiner, 1995; Meyer, 1997; Viglione, 1999; Viglione & Hilsenroth, 2000; Wagner, Alexander, Roos, & Adair,
The Rorschach variables used in this study were the SCZI, PTI, M–, and X–%.

Procedure

At intake, parents or legal guardians gave written informed consent for patients’ participation. Parents then completed the behavior rating scales within 3 days of admission. PIYs and Rorschachs were administered within 1 week of admission. PIYs were completed by all patients and computer scored. Invalid Rorschachs and PIYs were removed from analyses. For the Rorschach, those with less than 14 responses and $\Lambda \geq 1$ were excluded (Exner, 1993). For the PIY, cases were excluded if elevations on any of the validity scales were at a level considered invalid by the test authors (Lachar & Gruber, 1995).

Rorschachs were individually administered according to Exner’s (1991, 1993) CS by the first author. All Rorschachs were scored by the second author (an advanced clinical psychology graduate student from an American Psychological Association accredited psychology doctoral program) who was blind to patient diagnosis, patient identification, history, and all other test data. To estimate reliability, 20 of the protocols were randomly selected and rescored by Steven Smith. Level of interrater agreement was calculated using Meyer’s (1999) formulas for estimating kappa for CS score segments. As is seen in Table 2, $\kappa$ coefficients for all response segments were either “good” or “excellent.”

RESULTS

Data analyses proceeded in three steps. First, analyses of variance (ANOVAs) were used to examine any differences in all Rorschach, PIY, and BASC variables based on gender. Next, correlations between Rorschach, PIY, and BASC indexes of thought disorder were examined. In the third step, patient groups on the BASC and PIY were determined by using cutoff scores on Rorschach variables (SCZI, PTI,
Means and standard deviations of all study variables are presented in Table 3. These results reflect that the mean scores of the two indexes from the BASC are both ≥ 60, indicating clinically significant elevations. Conversely, all PIY score means were < 60, reflecting a lack of clinically significant elevations. Rorschach means are somewhat elevated relative to Exner’s (1993) sample.

In the first step of data analysis, ANOVAs were used to examine any potential effects of gender on the study variables. Results found no mean differences between boys and girls in the sample on any of the Rorschach, PIY, or BASC variables. The next step of data analysis correlated scores on the BASC Atypicality and Withdrawal Scales, PIY Reality Distortion and Social Withdrawal Composites, Feelings of Alienation and Hallucinations and Delusions Scales, and Rorschach PTI, SCZI, M–, and X – % scores (see Table 4). No correlations were computed between the PIY Reality Distortion Composite and the two scales that comprise it (Hallucinations and Delusions and Feelings of Alienation Scales). Results indicated no significant correlations between PTI and scales from the other measures. The same was also true for SCZI. There was a high degree of relation between SCZI and PTI ($r = .94$). Although there was a significant moderate correlation between $X – %$ and $M–$ ($r = .41, p < .001$), this correlation may be largely due to the influence of poor form ($FQ–$) in both $X – %$ and $M–$. The BASC scales (Atypicality, Withdrawal) were moderately correlated with the PIY Reality Distortion Composite and the Hallucinations and Delusions Scale.

![Table 3](image)

**Note.** BASC = Behavior Assessment System for Children; PIY = Personality Inventory for Youth; PTI = Perceptual–Thinking Index; SCZI = Schizophrenia Index.

*a* For comparison purposes, in Stokes, Pogge, Grosso, and Zaccario’s (2001) sample of patients (mean age = 9.38 years), the mean SCZI was 2.86 ($SD = 1.65$). In Exner’s (1993) sample of 14-year-old nonpatients (the age closest to the mean age of the sample), the mean for $M–$ was .13 ($SD = .50$) and the mean $X – %$ was 9 ($SD = 7$).
## TABLE 4
Correlations Between BASC, PIY, and Rorschach Indexes of Thought Disorder

<table>
<thead>
<tr>
<th>Scale</th>
<th>Rorschach</th>
<th>BASC</th>
<th>PIY</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>PTI</td>
<td>SCZI</td>
<td>M–</td>
</tr>
<tr>
<td>Rorschach</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SCZI</td>
<td>.94***</td>
<td>.42</td>
<td></td>
</tr>
<tr>
<td>M–</td>
<td>—a</td>
<td>—a</td>
<td></td>
</tr>
<tr>
<td>X – %</td>
<td>—a</td>
<td>—a</td>
<td>.41**</td>
</tr>
<tr>
<td>BASC</td>
<td>Atypicality</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Reality Distortion</td>
<td>.25</td>
<td>38</td>
<td>.22</td>
</tr>
<tr>
<td>Hallucinations and Delusions</td>
<td>.10</td>
<td>38</td>
<td>.04</td>
</tr>
<tr>
<td>Feelings of Alienation</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Social Withdrawal</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PIY</td>
<td>Reality Distortion</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hallucinations and Delusions</td>
<td>.24</td>
<td>33</td>
<td>.23</td>
</tr>
<tr>
<td>Feelings of Alienation</td>
<td>.29</td>
<td>33</td>
<td>.29</td>
</tr>
<tr>
<td>Social Withdrawal</td>
<td>.28</td>
<td>33</td>
<td>.27</td>
</tr>
</tbody>
</table>

Note. BASC = Behavior Assessment System for Children; PIY = Personality Inventory for Youth; PTI = Perceptual–Thinking Index; SCZI = Schizophrenia Index.

*aCorrelation not computed due to summary variable.

*p < .05. **p < .01. ***p < .001.
The following step of data analysis involved examining PTI and SCZI categorically using cutoff scores. A score of ≥ 4 was used for the six-item SCZI, as this score has been shown to result in the greatest diagnostic efficiency for the scale (Hilsenroth et al., 1998). Although Exner (2000a) did not specify a specific cutoff value for PTI, for our study a cutoff of ≥ 3 was used for the five-item PTI, as this represented approximately 1 SD above the mean of the sample (i.e., $M = 1.60, SD = 1.73; M + SD = 3.33$). Exner (2000b) reported various PTI cutoff scores for an adult sample of patients and nonpatients. In that sample, a score of ≥ 3 resulted in an overall correct classification rate of 85% when comparing schizophrenic patients versus nonpatients, 79% when comparing schizophrenic patients with mood disorder patients, and 87% in comparisons between schizophrenic and personality disordered patients. There are no reported child and adolescent norms yet for the PTI. Results of categorical analyses are found in Tables 5 and 6.

Patients who had positive PTI scores also had significantly higher scores on BASC Atypicality, PIY Reality Distortion Composite, Hallucinations and Delusions Scale, Feelings of Alienation Scale, and Social Withdrawal Composite. Furthermore, those with positive PTI scores differentiated between those with clinical and nonclinical scores on the PIY Reality Distortion Composite ($T \geq 59$) and Social Withdrawal Composite ($T \geq 59$). Those with positive PTI scores also neared the clinical cutoff of $T \geq 65$ on the PIY Feelings of Alienation Scale as well. Patients with positive SCZI scores had significantly higher scores on PIY Reality Distortion Composite, Feelings of Alienation Scale, and Social Withdrawal Composite. The SCZI differentiated patients with clinical ($T \geq 59$) and nonclinical scores on the PIY Reality Distortion Composite.

Categorical analyses were also conducted for patients with one or more M–response versus those with no M– responses. These results are presented in Ta-

<table>
<thead>
<tr>
<th>Scale</th>
<th>Negative PTI</th>
<th>Positive PTI</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>$M$</td>
<td>$SD$</td>
</tr>
<tr>
<td>BASC Atypicality</td>
<td>71.4$^a$</td>
<td>18.21</td>
</tr>
<tr>
<td>BASC Withdrawal</td>
<td>59.4$^a$</td>
<td>16.47</td>
</tr>
<tr>
<td>PIY Reality Distortion Composite</td>
<td>53.3$^c$</td>
<td>14.00</td>
</tr>
<tr>
<td>PIY Hallucinations and Delusions</td>
<td>53.4$^c$</td>
<td>14.57</td>
</tr>
<tr>
<td>PIY Feelings of Alienation</td>
<td>52.4$^c$</td>
<td>11.89</td>
</tr>
<tr>
<td>PIY Social Withdrawal</td>
<td>48.3$^c$</td>
<td>9.64</td>
</tr>
</tbody>
</table>

*Note.* BASC = Behavior Assessment System for Children; PIY = Personality Inventory for Youth; PTI = Perceptual–Thinking Index.

$a_n = 25$, $b_n = 13$, $c_n = 24$, $d_n = 9$.

*$p < .05$, **$p < .01$. 
Table 7. Results indicate that patients with at least one $M-$ response had greater scores on the BASC Atypicality Scale and all of the PIY scales and composites. Positive and negative scores on $M-$ differentiated clinical ($T \geq 60$) versus nonclinical scores on BASC Atypicality and PIY Reality Distortion Composite ($T \geq 59$), PIY Hallucinations and Delusions scale ($T \geq 69$), and PIY Social Withdrawal Composite ($T \geq 59$). Patients with positive $M-$ scores approached the clinical cutoff score of $T \geq 65$ on the PIY Feelings of Alienation Scale. Results indicated no significant differences between patients with $X-\% < .29$ and those with $X-\% \geq .29$. Means and standard deviations for patients with $X-\% \geq .29$ are presented in Table 8.

### TABLE 6
Mean BASC and PIY Scores for Patients With and Without Positive SCZI Scores

<table>
<thead>
<tr>
<th>Scale</th>
<th>Negative SCZI</th>
<th>Positive SCZI</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>$M$</td>
<td>$SD$</td>
</tr>
<tr>
<td>BASC Atypicality</td>
<td>72.5&lt;sup&gt;a&lt;/sup&gt;</td>
<td>18.15</td>
</tr>
<tr>
<td>BASC Withdrawal</td>
<td>61.0&lt;sup&gt;a&lt;/sup&gt;</td>
<td>18.82</td>
</tr>
<tr>
<td>PIY Reality Distortion Composite</td>
<td>53.6&lt;sup&gt;c&lt;/sup&gt;</td>
<td>14.40</td>
</tr>
<tr>
<td>PIY Hallucinations and Delusions</td>
<td>54.2&lt;sup&gt;c&lt;/sup&gt;</td>
<td>14.95</td>
</tr>
<tr>
<td>PIY Feelings of Alienation</td>
<td>52.2&lt;sup&gt;c&lt;/sup&gt;</td>
<td>12.07</td>
</tr>
<tr>
<td>PIY Social Withdrawal</td>
<td>48.7&lt;sup&gt;c&lt;/sup&gt;</td>
<td>9.98</td>
</tr>
</tbody>
</table>

**Note.** BASC = Behavior Assessment System for Children; PIY = Personality Inventory for Youth; SCZI = Schizophrenia Index.

<sup>a</sup>$n = 25$, <sup>b</sup>$n = 13$, <sup>c</sup>$n = 22$, <sup>d</sup>$n = 11$.

<sup>*</sup>$p < .05$.

### TABLE 7
Mean BASC and PIY Scores for Patients With and Without $M-$ Responses

<table>
<thead>
<tr>
<th>Scale</th>
<th>$M-$ = 0</th>
<th>$M-$ ≥ 1</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>$M$</td>
<td>$SD$</td>
</tr>
<tr>
<td>BASC Atypicality</td>
<td>72.0&lt;sup&gt;a&lt;/sup&gt;</td>
<td>18.03</td>
</tr>
<tr>
<td>BASC Withdrawal</td>
<td>61.4&lt;sup&gt;a&lt;/sup&gt;</td>
<td>17.67</td>
</tr>
<tr>
<td>PIY Reality Distortion Composite</td>
<td>53.0&lt;sup&gt;c&lt;/sup&gt;</td>
<td>13.62</td>
</tr>
<tr>
<td>PIY Hallucinations and Delusions</td>
<td>52.4&lt;sup&gt;c&lt;/sup&gt;</td>
<td>14.05</td>
</tr>
<tr>
<td>PIY Feelings of Alienation</td>
<td>52.5&lt;sup&gt;c&lt;/sup&gt;</td>
<td>12.02</td>
</tr>
<tr>
<td>PIY Social Withdrawal</td>
<td>48.7&lt;sup&gt;c&lt;/sup&gt;</td>
<td>10.06</td>
</tr>
</tbody>
</table>

**Note.** BASC = Behavior Assessment System for Children; PIY = Personality Inventory for Youth.

<sup>a</sup>$n = 28$, <sup>b</sup>$n = 10$, <sup>c</sup>$n = 24$, <sup>d</sup>$n = 8$.

<sup>*</sup>$p < .05$. <sup>**p</sup>$p < .01$. 
The diagnosis of thought disorders in children and adolescents requires comprehensive data from a number of different sources. Psychological assessment can play an important role in the diagnostic decision-making process, especially among children and adolescents. The Rorschach has a long history of use in the assessment of thought disorders (Acklin, 1999; Kleiger, 1999), and the PTI is a new addition to existing Rorschach thought disturbance variables. Our study is the first investigation of the new Rorschach PTI in a sample of inpatient children and adolescents.

An examination of scale means indicates a seemingly large discrepancy between the three measures. The BASC, a behavior rating scale, reflected a rating of pathology on the Atypicality Scale at over 2 SDs above the normative mean. This seems to be high considering the content of the Atypicality Scale (odd and unusual behaviors reflective of possible psychosis, schizophrenia, or autism) and the lack of psychotic diagnoses in this sample. Conversely, on the PIY there were no scale means greater than the clinical cutoff of $T = 60$. This seems to reflect a common occurrence in inpatient child and adolescent assessment: Out of a sense of frustration, parents or caregivers may overreport their child’s difficulties, whereas the children and adolescents may underreport difficulties to prevent a lengthy hospitalization (Sawyer, Baghurst, & Mathias, 1992). Despite this dichotomy, the Rorschach variables used in our study were elevated relative to Exner’s (1993) normative sample. However, this elevation was to a degree that might be expected on these scores in this population. This indicates that the Rorschach may be especially useful in the assessment of inpatient children and adolescents, as it is may not be as amenable to “faking good” as self-report indexes.

With the exception of $M_–$, results from this study indicate few significant correlations between Rorschach variables and variables from the BASC and the PIY.

### TABLE 8
Mean BASC and PIY Scores for Patients With and Without $X – % \geq .29$

<table>
<thead>
<tr>
<th>Scale</th>
<th>$X – % &lt; .29$</th>
<th>$X – % \geq .29$</th>
<th>$M$</th>
<th>$SD$</th>
<th>$M$</th>
<th>$SD$</th>
<th>$F$</th>
</tr>
</thead>
<tbody>
<tr>
<td>BASC Atypicality</td>
<td>74.4$^a$</td>
<td>19.54</td>
<td>82.2$^b$</td>
<td>19.76</td>
<td>1.24</td>
<td></td>
<td></td>
</tr>
<tr>
<td>BASC Withdrawal</td>
<td>62.2$^a$</td>
<td>18.03</td>
<td>63.1$^b$</td>
<td>9.77</td>
<td>0.03</td>
<td></td>
<td></td>
</tr>
<tr>
<td>PIY Reality Distortion Composite</td>
<td>56.1$^c$</td>
<td>15.20</td>
<td>61.0$^d$</td>
<td>13.08</td>
<td>0.68</td>
<td></td>
<td></td>
</tr>
<tr>
<td>PIY Hallucinations and Delusions</td>
<td>56.2$^c$</td>
<td>17.11</td>
<td>60.0$^d$</td>
<td>12.08</td>
<td>0.33</td>
<td></td>
<td></td>
</tr>
<tr>
<td>PIY Feelings of Alienation</td>
<td>54.4$^c$</td>
<td>12.06</td>
<td>59.8$^d$</td>
<td>12.90</td>
<td>1.14</td>
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</tr>
<tr>
<td>PIY Social Withdrawal</td>
<td>50.5$^c$</td>
<td>12.09</td>
<td>55.9$^d$</td>
<td>11.89</td>
<td>1.20</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Note. BASC = Behavior Assessment System for Children; PIY = Personality Inventory for Youth. $^a_n = 27$. $^b_n = 11$. $^c_n = 25$. $^d_n = 8$. 

**DISCUSSION**

The diagnosis of thought disorders in children and adolescents requires comprehensive data from a number of different sources. Psychological assessment can play an important role in the diagnostic decision-making process, especially among children and adolescents. The Rorschach has a long history of use in the assessment of thought disorders (Acklin, 1999; Kleiger, 1999), and the PTI is a new addition to existing Rorschach thought disturbance variables. Our study is the first investigation of the new Rorschach PTI in a sample of inpatient children and adolescents.

An examination of scale means indicates a seemingly large discrepancy between the three measures. The BASC, a behavior rating scale, reflected a rating of pathology on the Atypicality Scale at over 2 SDs above the normative mean. This seems to be high considering the content of the Atypicality Scale (odd and unusual behaviors reflective of possible psychosis, schizophrenia, or autism) and the lack of psychotic diagnoses in this sample. Conversely, on the PIY there were no scale means greater than the clinical cutoff of $T = 60$. This seems to reflect a common occurrence in inpatient child and adolescent assessment: Out of a sense of frustration, parents or caregivers may overreport their child’s difficulties, whereas the children and adolescents may underreport difficulties to prevent a lengthy hospitalization (Sawyer, Baghurst, & Mathias, 1992). Despite this dichotomy, the Rorschach variables used in our study were elevated relative to Exner’s (1993) normative sample. However, this elevation was to a degree that might be expected on these scores in this population. This indicates that the Rorschach may be especially useful in the assessment of inpatient children and adolescents, as it is may not be as amenable to “faking good” as self-report indexes.

With the exception of $M_–$, results from this study indicate few significant correlations between Rorschach variables and variables from the BASC and the PIY.
These results are not surprising and echo the findings of previous studies that found little or no relation between different measurement types (e.g., Achenbach, McConaughy, & Howell, 1987; Archer & Krishnamurthy, 1993a, 1993b; Krishnamurthy, Archer, & House, 1996; Meyer, 1996, 1997, 1999; Weissman et al., 1987). This lack of significant correlations may be due to method effects or the specific variance associated with a particular measurement technique (Campbell & Fiske, 1959; Greenbaum, Dedrick, Prange, & Friedman, 1994). These results may indicate that the measures are assessing different components of the same construct. For instance, the Rorschach variables may be measuring different aspects (e.g., more unconscious) of thought disturbance than the self-report or behavior rating scales (Meyer, 1996).

Although recent research results suggest that SCZI and PTI can be used dimensionally (Exner, 2000a; Hilsenroth et al., 1998), they can be interpreted categorically using cutoff scores as well. In our study, ANOVAs were calculated for cutoff scores of the PTI and SCZI. The results of the categorical analyses seem to indicate that when the Rorschach variables are examined categorically in a clinically relevant manner, the results are relatively positive in relation to the other measures of thought disorders. Contrasting positive and negative scores on the SCZI and PTI resulted in significant differences on the PIY Reality Distortion Composite, Feelings of Alienation Scale, and Social Withdrawal Composite. Furthermore, both the SCZI and PTI differentiated between those patients with and without elevated PIY Reality Distortion Composite scores. These results suggest that the SCZI and PTI may be relatively useful measures of thought disturbance in children and adolescents.

Unlike the SCZI, the PTI variable significantly differentiated between those with high and low scores on the BASC Atypicality Scale and PIY Social Withdrawal Composite scores. The performance of the SCZI in relation to the parent-rated BASC is different than the performance of the SCZI in relation to the parent-rated PIC–R in the study by Stokes et al. (2001). In their study, high and low scores on the SCZI significantly differentiated between those with high and low PIC–R scores. The difference between their results and ours may be due to their larger sample size (N = 413) or it may suggest that the PIC–R measures thought disorder in a manner that is more similar to the SCZI than the BASC.

The differences in the performance of the PTI and SCZI in this study suggest that the PTI may be a more pure measure of thought disturbance in children and adolescents than the SCZI. Moreover, this indicates that the PTI may be assessing a more severe thought disturbance that not only has characteristics of cognitive slippage but may be marked by behavioral disturbance as well. Because PTI and SCZI share several common elements, they were very highly related (r = .94). The PTI resulted in more differentiation on the other scales than did the SCZI, illustrating that although these variables are highly related, they operate somewhat differently when used categorically.
However, it must be remembered that like SCZI, PTI is not intended to be a specific diagnostic indicator of schizophrenia or formal thought disorder. Indeed, in this study, although only 2 patients had formal diagnoses of schizophrenia, 13 patients were identified by the PTI as having confused or disturbed thinking. Therefore, although the PTI may be measuring some aspect of thought disorder different from SCZI, it should certainly not be considered a specific indicator of thought disorder, schizophrenia, or psychotic process.

Despite prior research suggesting that X–% is related to schizophrenia (Exner, 1993; Kleiger, 1999; Wood & Lilienfeld, 1999), this variable did not correlate with or differentiate scores on the BASC or the PIY. Perhaps X–% may not function in the same way among child and adolescent samples as it does among adult samples. In our sample, the percentage of patients with X–% ≥ .29 (i.e., 32% for those with completed Rorschachs and PIYs) was quite high compared to Exner’s (1993) normative sample (2% of 13-year-olds had X–% > .30). This indicates that, at least among this sample of children and adolescents, X–% seems to be measuring something not specific to psychic disorders or thought disturbance.

Again, as was seen in the dimensional analyses, M– significantly differentiated BASC and PIY variables. Positive and negative scores on the M– variable also differentiated between those with positive and negative scores on PIY Reality Distortion Composite, PIY Hallucinations and Delusions Scale, and PIY Social Withdrawal Composite. This level of differentiation was greater than that of either the SCZI or the PTI. Research predating the CS and including that of Rorschach (1921/1942) has suggested that the M– variable is uniquely suited for assessing thought disturbance (Exner, 1993; Kleiger, 1999). Exner (1993) suggested that Human Movement (M) responses “appear to reflect the deliberate directing of thinking” (p. 481) and when those responses involve poor form perception, it is likely that thinking and perception is disturbed. Furthermore, distorted Human Movement responses also may speak to an interpersonal misunderstanding or an inability to understand the actions of others. In short, the distortion of human objects and their viability may reflect a serious distortion of thought that is easily measured and detected by other scales.

A few characteristics of this study limit its generalizability. First, in this study we used a small and racially homogeneous clinical sample. Perhaps with a larger sample (i.e., increased statistical power), more correlations between Rorschach variables and the other measures may have achieved statistical significance. Furthermore, the effects of racial and ethnic group membership should be examined in relation to PTI scores. Second, in this study we addressed thought disorder among a sample of patients largely without formal diagnoses of schizophrenia or other psychotic disorders. However the range and type of diagnoses (i.e., predominantly major depression and ADHD) are likely representative of those of child and adolescent inpatients in general inpatient hospitals. Future research should address the
utility and validity of the PTI among children, adolescents, and adults rigorously diagnosed with schizophrenia or other psychotic disorders using Diagnostic and Statistical Manual of Mental Disorders–IV (American Psychiatric Association, 1994) research criteria.

In this study, we examined the utility and validity of a clinical measure without using a nonclinical control group. Although using multiple instrumentation allowed for an examination of concurrent or convergent validity within the clinical sample, a potential restriction of range in scores may have resulted in the lack of significant correlations between measures. With a larger distribution of scores, more convergence between measures may have emerged. However, the lack of a nonclinical control group does not impair the clinical utility of this study. Although an analysis of clinical versus nonclinical groups is important in the process of scale validation, the finer differentiation between clinical groups is likely more important for establishing the clinical utility of a measure. Further research should examine PTI scores of both psychiatric and nonpsychiatric samples to address the performance of the scale across different groups. Different cutoff scores of the PTI should also be examined using diagnostic efficiency statistics (Kessel & Zimmerman, 1993) to determine at which value PTI is most sensitive to clinical and nonclinical levels of thought disturbance.

Despite these limitations, the new Rorschach PTI appears to be a promising measure of thought disorder in children and adolescents. Using a cutoff of ≥ 3, the PTI seems to be more related to behavior ratings and self-report of thought disturbance than SCZI. Clinicians using behavior ratings, self-report, interview, and the Rorschach in their assessment of younger patients may find the PTI a useful addition to their assessment of thought disorder.

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