

# Use of Drawings to Identify Thought Impairment Among Students with Emotional and Behavioral Disorders: An Exploratory Study

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## Abstract

*This study explores how children's drawings, as rated on the Formal Elements Art Therapy Scale (FEATS), are related to their emotional and behavioral health. Participating students (ages 8-16, N=53), attending a therapeutic day school for students with emotional and behavioral disorders, drew a picture of a person picking an apple from a tree (PPAT). A discriminant function analysis indicated that ratings on five subscales—Integration, Realism, Problem-Solving, Developmental Level, and Details of Objects and Environment—predicted group membership into impaired vs. nonimpaired thinking (74% of cases correctly classified). This study broadens the use of the FEATS to a child clinical population. Further, results validate the use of children's art forms as a basis for clinical insight and suggest that children's drawings can be a helpful tool for diagnosis, treatment, and evaluation purposes.*

## Introduction

The process of creating art has long been considered therapeutic, and for many years artwork has been used as a way to gain insight into a person's emotional status (Junge, 1994; Mackenzie, 1931; Naumburg, 1946). Drawings are used as assessment tools for a number of emotional disorders such as depression, bipolar disorder, and schizophrenia. However, given the subjectivity of interpreting a drawing, using art as an assessment tool is challenging. As early as 1947, there had been a call to make the interpretation of art more objective (Buck, 1947). Finding and explaining valid, meaningful connections between elements of art and the artist's emotional or behavioral status are an additional challenge. The current study broadens the use of an art assessment rating scale to a child clinical population and examines connections between ratings on drawings and thought impairment.

**Editor's note:** This research project was conducted at the Children's Health Council (CHC), Palo Alto, California, by Catherine Roller White, MA, of Casey Family Programs, Seattle, Washington; Joanna Wallace, ATR-BC, of CHC; and Lynne C. Huffman, MD, of CHC and Stanford University Department of Pediatrics, Stanford, California. Correspondence concerning this article may be addressed to Dr. Huffman via e-mail at lynne.huffman@stanford.edu.

## Art-Based Assessments

Art-based assessments and clinical research involve utilizing characteristics of drawings to provide information on participants' diagnosis and clinical state. Utilizing art as an assessment tool with children has several benefits. Art assessments offer (a) an uncensored view of a child's thoughts and feelings (Neale & Rosal, 1993), (b) a nonverbal method of assessment for children who are still developing language skills or who are unwilling to verbalize feelings and emotions (Arrington, 2001), and (c) a nonintimidating means of assessment in which children are likely to participate (Peterson & Hardin, 1997). To be most useful, art assessments should be "non-threatening, easy to administer, not too time-consuming to complete, and easily analyzed" (Anderson, 2001a).

## The House-Tree-Person and the Draw-A-Person

Historically, two of the most commonly used art assessments include the House-Tree-Person (HTP) and the Draw-A-Person (DAP) directives. These assessments rely on symbolic attributes of the art (e.g., drawing of small versus large figures, presence or absence of a protruding tongue in the face, relative positioning of objects) for interpretation. The HTP was developed to provide information about a client's personality and intellectual functioning (Brooke, 1996; Buck, 1947). It has been utilized as an assessment measure for schizophrenia (Xie & Ye, 1994), suicidal ideation (Zalsman et al., 2000), and sexual abuse (Cohen & Phelps, 1985; Drachnik, 1994). Although numerous studies have found significant results using the HTP—particularly in research on sexual abuse—results have been ambiguous; for example, one recent study found no relationship between status as sexually abused and scores on the HTP (Palmer et al., 2000).

The DAP, designed to assess developmental level and to provide information about personality characteristics (Brooke, 1996), has been used with children to assess for sexual abuse (Sidun & Rosenthal, 1987), mood and anxiety disorders (Tharinger & Stark, 1990), and self-esteem and anxiety among patients with cancer (Paine, Alves, & Tubino, 1985). Scores on the Draw-A-Person Screening Procedure for Emotional Disturbance (DAP:SPED) (Naglieri, McNeish, & Bardos, 1991), an adaptation of the

DAP, have been shown to be moderately correlated with measures of behavioral disturbance (Matto, 2002); however, other studies have found no significant relationship between scores on the DAP:SPED and behavioral disturbance (Wrightson & Saklofske, 2000).

## The Formal Elements Art Therapy Scale

The Formal Elements Art Therapy Scale (FEATS) potentially is a more reliable assessment tool compared to other commonly used assessments because it offers added objectivity in the evaluation of art. In contrast to most art assessments, the FEATS is not based on the symbolic meaning of art but on the elements of art that a viewer can see, such as use of color or line quality. As such, the FEATS focuses on *how* a picture is drawn, rather than on *what* is drawn in a picture (Gantt & Tabone, 1998, 2003; Junge, 1994). To date, more than 5,000 drawings from clinical adult participants and 1,000 drawings from nonclinical child and adult participants have been collected and scored with the FEATS (Anderson, 2001b).

Whereas a fair amount of research exists on the use of the FEATS in adult clinical samples (Feder & Feder, 1998; Gantt, 1990; Gantt, 1993), less is known about the utility of the assessment with children. Several studies have been conducted recently to extend the use of the FEATS to a child and adolescent population. The FEATS has been used to investigate attention-deficit/hyperactivity disorder (ADHD) in children (Munley, 2002), low self-esteem in adolescents (Ferber, 1996), and anxiety and depression in pediatric kidney transplant patients (Wallace et al., 2004).

Munley's (2002) research consisted of a descriptive, matched-pair design study with 6 boys (ages 5-12), three diagnosed with ADHD and three as controls. Results indicated that ratings on three FEATS subscales (Color Prominence, Details of Objects and Environment, and Line Quality) most accurately identified children suffering from ADHD. Although the findings are promising, they must be interpreted with caution because of the extremely small sample size.

Ferber (1996) conducted a correlational study of high school freshmen ( $N=32$ ) to examine the relationship between ratings on the FEATS and self-esteem, as rated on the Coopersmith Self-Esteem Inventory-School Form (CSI-SF). Results showed that the FEATS scores of female participants had a higher correlation with the CSI-SF than those of the male participants, specifically on the Prominence of Color and Person subscales. The drawings created by adolescents with low self-esteem, as identified by the CSI-SF, were scored lower on several FEATS subscales (Details of Objects and Environment, Line Quality, and Person) than drawings created by adolescents with high self-esteem. Across the board, however, correlations between self-esteem and FEATS scores were weak.

Most recently, the FEATS was used in a study of 64 pediatric kidney-transplant patients ages 6 to 21 (Wallace et al., 2004). Results indicated that the FEATS identified depressed patients who were not recognized through the use of self-report measures alone, suggesting that the iden-

tification of pediatric transplant recipients who are suffering from depression or emotional trauma may be better achieved using a combination of self-report measures, observation-based evaluation, and art-based assessments.

In this exploratory study, we investigated the efficacy of utilizing art as a means of assessing children's behavioral and emotional health. The aim of the present study was to explore the relationship between the FEATS and measures of emotional and behavioral health in a sample of students with severe emotional and behavioral disorders.

## Method

### Setting and Participants

Participating students were enrolled at a nonpublic, therapeutic day school for students with severe emotional and behavioral disorders. This school provides an extensive and intensive array of services to enrolled students, including behavior management, mental health treatment, medication monitoring, and special education services. Students attending the school have difficulty functioning at home and school due to behavior disorders, social and emotional problems, neurological problems, or developmental delays. These students have complex problems and likely would be placed in residential settings if the school were not available to them. Most students have scores in the clinical range on Internalizing (63%), Externalizing (63%), and Total Problems (81%) scales of the parent-rated Child Behavior Checklist (CBCL) (Achenbach & Rescorla, 2001), confirming the presence of severe emotional and behavioral problems.

Enrolled students range from 7 to 17 years old and are 86% male. Each of the eight classrooms enrolls a maximum of 12 students and is staffed by four professionals, including a teacher, teaching assistant, clinician, and behavior specialist. Onsite, the school also has a psychiatrist, two crisis managers, one educational specialist, and four one-on-one aides. In addition to individual, group, and family therapy, students receive art therapy and music therapy. Enrichment activities include science, computer lab, and physical education. The overall goal of the school is eventual placement of students in less restrictive public school programs.

### Measures

Measures in this study include the Formal Elements Art Therapy Scale (FEATS) and the Child and Adolescent Functional Assessment Scale (CAFAS).

### The FEATS

Each drawing was rated on the FEATS. The FEATS is used to assess drawings and consists of 14 subscales: Prominence of Color, Color Fit, Implied Energy, Space, Integration, Logic, Realism, Problem-Solving, Developmental Level, Details of Objects and Environment, Line Quality, Person, Rotation (absence of), and Perseveration (absence of). Each subscale is rated from 1 to 5 with 5 indicating

higher levels of the characteristic (e.g., *more* prominence of color, *better* color fit, *higher* developmental level, etc.). The FEATS rating manual contains concrete descriptors for each score on each subscale, and color reproductions of representative drawings are provided in the manual for each subscale. Previous research has indicated that scores on the FEATS are correlated with adult psychiatric disorders such as bipolar disorder (mania), major depression, and schizophrenia (Gantt, 2001; Gantt & Tabone, 1998).

The five subscales used in the discriminant function analysis were: Problem-Solving (whether and how the person picks the apple from the tree), Integration (the degree to which objects in the picture create an interconnected whole), Realism (the extent to which objects in the picture are drawn realistically), Developmental Level (comparing drawings to Lowenfeld's stages of artistic development), and Details of Objects and Environment (a quantification of the amount of detail in the drawing).

### The CAFAS

The CAFAS is designed for clinicians to rate functional impairment in children and adolescents ages 7 to 17. The eight subscales of problems assessed on the CAFAS include three Role Performance subscales (one each for school, home, and community) and five others: Behavior Toward Others, Moods/Emotions, Self-Harmful Behavior, Substance Use, and Thinking. Children are rated on each subscale as having no impairment, mild, moderate, or severe impairment; subscale scores range from 0 to 30, resulting in a total score of 0 to 240 with higher scores indicating greater impairment (Hodges, 2000).

Scores on the Thinking subscale of the CAFAS were used as the dependent variable in this study. According to rating descriptors, children whose thought is "not disordered or eccentric," as reflected in their communication, are rated as having no impairment in thinking. Sample descriptors for mild impairment in thinking are "eccentric or odd speech" and "thought distortions." Moderate impairment consists of "frequent distortion of thinking" and disorganized communication. Severe impairment involves difficulty communicating because of "incoherent thought or language" or an inability to distinguish reality from fantasy (Hodges, 2000).

### Procedure

Parents of students attending the school were informed of the research project at a school open house at the beginning of the school year. Subsequently, letters and consent forms were sent home to further explain the study and to gain informed consent for participation. Two of 77 parents declined to participate in the study, both because of student requests not to participate. The research protocol received Institutional Review Board approval through Stanford University.

Participating students were asked to draw a "person picking an apple from a tree" (PPAT). The PPAT art directive has been used widely as a standard drawing task. The

PPAT is a task requiring an integrative approach, combining at least three items (a person, an apple, and a tree) in order to solve a problem. Consistent with the guidelines for administration of the PPAT art directive, each student was provided with Mr. Sketch® Scented Markers and white cardstock, and students were provided as much time as they desired for completion of the drawing. Each drawing was labeled with a unique identification number. Although the vast majority of student drawings did not contain identifying information, any identifying information that did exist was removed.

Drawings were rated independently by three art therapists who do not work at the therapeutic day school. One rater is a professor of art therapy with more than 30 years experience as an art therapist; the second rater teaches art therapy and has a private practice; and the third rater works as an art therapist with troubled adolescents. All raters received training in the use of the FEATS to evaluate art. Eight filler drawings (completed by staff and children of staff at the Children's Health Council) were also rated by the art therapists to allow a gauge of the scale's discriminant validity. Ratets were blind to the study's research questions.

The CBCL and CAFAS were completed for each student at the time of student enrollment and annually thereafter. For students who had been attending the school for 1 year or less, CBCL and CAFAS scores from the time of enrollment were used in this study. For students who had been attending the school for 1 year or more, their most recent scores were used (e.g., 1-year scores were used for students who had attended the school for between 1 and 2 years, and 2-year scores were used for students who had attended the school for between 2 and 3 years).

### Data Analysis

Descriptive statistics were calculated to gain a better understanding of the sample. Intraclass correlation coefficients were calculated to assess interrater reliability across the three raters on each of the 14 FEATS subscales. After testing interrater reliability, subscale scores were averaged across raters to create one score for each subscale. Exploratory analyses of variance (ANOVAs) were conducted to examine the relationship between scores on the FEATS subscales and scores on the CAFAS. A discriminant function analysis was performed to predict group membership (impaired thinking vs. nonimpaired thinking) from 5 of the 14 FEATS subscales based on results of the ANOVA procedures.

### Results

#### Sample

The sample consisted of students enrolled in a non-public, therapeutic day school for students with emotional and behavioral disorders. Of the 75 students in the sample, four did not create a drawing and 18 did not have scores on the CAFAS. These 22 students were excluded from further analyses, leaving 53 students in the usable sample. Student diagnoses included, among others, attention-deficit/

**Table 1**  
Descriptive Statistics and Interrater Reliability  
for Mean FEATS Subscale Scores

Subscale	Mean	SD	Min/Max	Alpha
Prominence of Color	3.16	1.14	1.0-5.0	.88
Color Fit	4.03	0.98	1.2-5.0	.84
Implied Energy	3.28	0.83	1.2-5.0	.86
Space	3.38	1.10	1.0-5.0	.93
Integration	3.23	0.76	1.0-4.7	.46
Logic	4.24	0.94	1.0-5.0	.78
Realism	2.71	0.77	1.3-4.8	.73
Problem-Solving	3.08	1.17	1.0-5.0	.83
Developmental Level	2.79	0.66	1.5-4.7	.78
Details of Objects and Environment	2.31	1.03	1.0-4.7	.90
Line Quality	3.35	0.57	1.5-4.3	.47
Person	3.55	0.92	1.0-4.7	.81
Rotation – Absence of	4.46	0.59	2.7-5.0	.13
Perseveration – Absence of	4.74	0.42	3.3-5.0	.26

hyperactivity disorder (ADHD), oppositional defiant disorder, bipolar disorder, and Asperger's syndrome. Most students had more than one diagnosis, and many had concomitant learning disabilities and received speech therapy or occupational therapy.

The mean age of participating students was 12.7 years ( $SD = 2.3$ , range 8.4-16.7 years). They were 89% male ( $n = 47$ ) and 11% female ( $n = 6$ ). At the time they completed the art therapy directive, participating students had been attending the school for an average of 1.1 years ( $SD = .79$ , range 0-3.0 years). The ethnic-group distribution of participating students was as follows: 64% Caucasian ( $n = 33$ ), 10% Hispanic ( $n = 5$ ), 6% Asian-American ( $n = 3$ ), 2% African-American ( $n = 1$ ), and 19% multiracial or other ( $n = 10$ ). Information on race was unavailable for one student.

Distribution of scores on the CAFAS Thinking subscale was as follows: no impairment ( $n = 31$ , 59%), mild impairment ( $n = 12$ , 23%), moderate impairment ( $n = 8$ , 15%), and severe impairment ( $n = 2$ , 4%). Students were divided into two groups based on these scores: (a) the non-impaired-thinking group, with no impairment or mild impairment in thinking ( $n = 43$ , 82%), and (b) the impaired-thinking group, with moderate or severe impairment in thinking ( $n = 10$ , 19%).

### Descriptive Results

For 10 of the 14 subscales, interrater reliability coefficients ranged from .73 to .93, indicating adequate agreement among the three raters (Table 1). The alpha coefficients for two subscales, Integration and Line Quality, were .45 and .47, respectively, indicating marginal agreement. Alpha coefficients for two other subscales, Rotation and Perseveration, were only .13 and .26, respectively, indicating unacceptable agreement among raters. These two subscales were not used in the discriminant function analysis.

Drawings were rated highest on Perseveration (4.74), Rotation (4.46), and Logic (4.24) subscales. Drawings were rated lowest on Details of Objects and Environment (2.31), Realism (2.71), and Developmental Level (2.79) subscales (Table 1). Girls scored slightly higher than boys did on all subscales except Problem-Solving; no gender differences were significant. In contrast to previous research using the FEATS with children (Gantt, 2001), there were no significant correlations between age and any of the subscales.

### Differences in FEATS Ratings Based on Impairment in Thinking

ANOVAs examining differences between the nonimpaired thinking and impaired thinking groups on FEATS ratings were conducted. Significant group differences were noted for ratings on five of the 14 FEATS subscales, with drawings of students in the nonimpaired-thinking group consistently rated higher than the drawings of students in the impaired-thinking group. This difference was most pronounced for the Problem-Solving subscale, with mean

**Table 2**  
Group Means and Analysis of Variance Summary Table

Subscale	Group	Mean Rating	df	F	p
Problem-Solving	Nonimpaired	3.32	1, 51	12.00	$p < .001$
	Impaired	1.97			
Integration	Nonimpaired	3.33	1, 51	4.08	$p < .05$
	Impaired	2.80			
Realism	Nonimpaired	2.82	1, 51	5.38	$p < .05$
	Impaired	2.23			
Developmental Level	Nonimpaired	2.79	1, 51	5.94	$p < .05$
	Impaired	2.35			
Details of Objects and Environment	Nonimpaired	2.45	1, 51	4.12	$p < .05$
	Impaired	1.73			



**Table 3**  
Classification Results

	Predicted Group Membership			Total
		Nonimpaired	Impaired	
	Original group membership	Nonimpaired	32 (74%)	
	Impaired	2 (20%)	8 (80%)	10
	Total	34	19	100%

scores of 3.32 and 1.97 for the nonimpaired-thinking and impaired-thinking groups, respectively (Table 2).

These five subscales were entered into a discriminant function analysis to predict membership into the nonimpaired-thinking and impaired-thinking groups. A statistically significant function resulted, with an eigenvalue of .30,  $\chi^2(5) = 12.36, p < .05$ . The function accounted for 23% of the variance in group membership. As indicated by the structure matrix, Problem-Solving was the strongest predictor of group membership; the correlation with the function was .90. Correlations for the other four subscales were as follows: Integration, .69; Realism, .65; Developmental Level, .62; and Details of Objects and Environment, .57. Using unweighted prior probabilities, 74% of original grouped cases were correctly classified by the function (Table 3). When prior probabilities were set to reflect the actual respective group sizes (82% of students in the nonimpaired category), 86% of the original grouped cases were correctly classified. However, because it is assumed that group membership of the student artist is not known, results using the more conservative prior probabilities are reported.

All eight of the filler drawings (completed by staff and children of the staff at the Children's Health Council) were classified by the discriminant function analysis as nonimpaired, lending support for the scale's discriminant validity. Figures 1, 2, and 3 are examples of drawings completed by students in the nonimpaired-thinking group, while Figures 4, 5, and 6 are examples of drawings completed by students in the impaired-thinking group. Student age, gender, diagnosis, and FEATS subscale scores are presented in Table 4.

Differences between the nonimpaired-thinking and impaired-thinking groups are most profound in ratings on the Problem-Solving subscale. As can be seen in Figures 1, 2, and 3, the student artists effectively worked out the problem of picking an apple from a tree. Figures 1 and 2 each show a person reaching the apple while standing on the ground, and Figure 3 contains a person with a ladder. Each of these drawings was rated high on the Problem-Solving subscale according to the criteria in the FEATS rating manual. In contrast, Figures 4, 5, and 6 do not show effective solutions to the problem of picking an apple from a tree. Figure 4 shows a person reaching for the apple but not quite grasping it, while Figures 5 and 6 do not indicate that the person is picking an apple from a tree. In accordance with FEATS scoring criteria, each of these drawings was scored low on the Problem-Solving subscale.

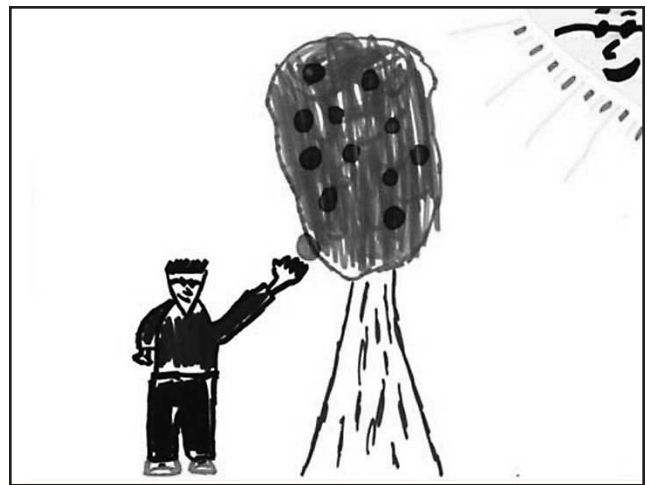


Figure 1



Figure 2

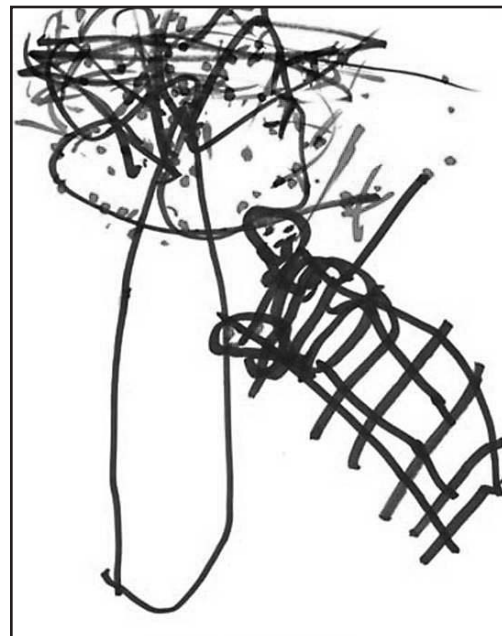


Figure 3



Figure 4



Figure 6

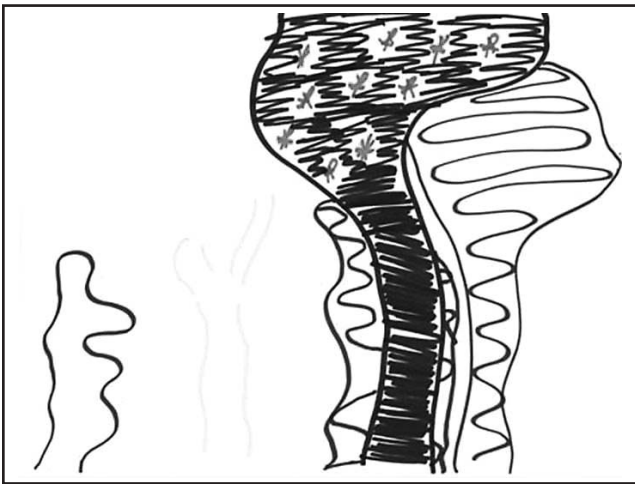


Figure 5

Examination of the drawings also shows differences among drawings on the four other FEATS subscales entered into the discriminant function analysis. Because drawings from the nonimpaired-thinking group contain more objects, their scores on the Integration subscale are higher. Further, with the exception of Figure 3, drawings in the nonimpaired-thinking group are more realistic, contain more details, and are drawn at a higher artistic developmental level than drawings in the impaired group. Although Figure 3 was not rated high on Realism, Details of Objects and Environment, and Developmental Level, the drawing was classified by the function as nonimpaired because of its relatively high ratings on Problem-Solving and Integration.

## Discussion

This study offers a valuable contribution to art therapy research by expanding research on the FEATS to a clinical child population. Results indicate that, to some extent, ratings on the FEATS can predict whether the child artist has impaired thinking.

## Use of the FEATS with Students with Emotional and Behavioral Disorders

FEATS scores distinguished students who had moderate or severe impairment in their thinking (as rated on the CAFAS) from students who had no or mild impairment in their thinking. This indicates that students with thought impairment approach the art directive in a significantly different way than students without thought impairment. Compared to the nonimpaired group, students in the impaired group showed less integration of objects, created drawings that were less realistic, drew at a lower level of artistic development, included fewer details, and less effectively solved the problem of picking an apple from a tree.

In particular, the Problem-Solving subscale is a strong predictor of impairment in thinking, accounting for most of the variance in the discriminant function. This finding, that the Problem-Solving subscale discriminates among groups, is consistent with previous research. For example, one earlier study indicated that the Problem-Solving subscale distinguishes among four diagnostic groups: major depression, organic mental disorders, schizophrenia, and bipolar disorder (Gantt, 1990). The Problem-Solving subscale is a unique feature of the PPAT art directive, as it requires artists to integrate at least three elements (a person, an apple, and a tree) and to provide a practical solution to the task.

There are several explanations for why the Problem-Solving subscale may be particularly sensitive to differences between students who were impaired versus nonimpaired in their thinking. To successfully solve the problem of drawing a person picking an apple from a tree, sequential thinking and the logical integration of several elements are required. Students who have impairment in their thinking—expressed through delusions, difficulty separating fantasy from reality, or incoherent language—may be unable to organize their thoughts to the degree necessary to successfully solve the drawing problem. Given the disorganization in their thoughts, students with impaired thinking may experience difficulty organizing to draw the picture (e.g., considering the relative sizes and positions of the

**Table 4**  
Demographic Information and Mean FEATS Scores for Sample Students

Figure	Age	Gender	Diagnosis	Integration	Realism	Problem-Solving	Developmental Level	Details
1	16	Male	Major depressive disorder, ADHD, oppositional defiant disorder	3.0	3.3	3.7	3.3	3.2
2	11	Female	Bipolar disorder, obsessive compulsive disorder	4.3	4.3	4.2	3.8	4.0
3	10	Male	Asperger Syndrome	3.5	1.3	4.0	1.8	2.0
4	16	Male	Major depressive disorder	2.2	2.0	1.0	2.2	1.5
5	16	Female	Bipolar disorder	1.5	1.5	1.0	3.0	1.0
6	12	Male	Bipolar disorder, ADHD	1.7	1.3	1.0	1.5	1.0

objects) even if they understand the instructions. This is similar to difficulties experienced by such children in academic and social situations: They may understand directions or expectations but are unable to organize their actions in a logical and appropriate manner.

There were several unexpected findings in the study. Whereas other research with the FEATS has indicated that ratings on PPAT drawings can differentiate diagnoses such as major depression, bipolar disorder, and schizophrenia among adults (Gantt & Tabone, 1998) and ADHD among children (Munley, 2002), this study did not result in clear differentiation of diagnoses by FEATS scores. We conducted several exploratory analyses to see whether there were differences in FEATS scores by diagnosis, but we did not find any distinguishing scores. In fact, children with similar diagnoses were placed correctly in both the impaired-thinking and nonimpaired-thinking groups by the discriminant function analysis. For example, Figure 2 (nonimpaired thinking) and Figures 5 and 6 (impaired thinking) were drawn by students diagnosed with bipolar disorder, and Figures 1 (nonimpaired thinking) and 4 (impaired thinking) were drawn by students with major depressive disorder. Diagnoses such as ADHD and Asperger's syndrome also were represented in both the nonimpaired-thinking and impaired-thinking groups. This may be attributable not only to the relatively small sample size but also to the complex nature of the students enrolled in the therapeutic day school, as many of the children have more than one diagnosis.

We were also surprised not to find significant differences in FEATS scores by age. Although partly attributable to the small sample size ( $N=53$ ), this also may be because most of the students in the sample perform below expectations for their age in a variety of situations, such as academics and handwriting, and these performance delays or deficits may manifest themselves in artwork. Whereas typical artistic development results in the production of more sophisticated

art by early adolescence (Drachnik, 1995), the students in this sample may not experience typical development.

As reported above, interrater agreement for two of the 14 FEATS subscales—Rotation (absence of) and Perseveration (absence of)—was unacceptably low. Because the overwhelming majority of student drawings did not contain rotated figures or evidence of perseveration, mean ratings on these subscales were very high (4.5 and 4.7 for Rotation and Perseveration, respectively), which is consistent with previous research (Gantt, 2001; Gantt & Tabone, 2003). Further, there was little variance or range in ratings. Because of this, it is likely that the reliability coefficients underestimate the actual agreement among raters. Previous research using the FEATS also has reported difficulty attaining adequate inter-rater reliability for these two subscales (Gantt, 1993; Gantt & Tabone, 1998, 2003). Achieving adequate interrater reliability for these subscales may prove to be a continuing challenge for studies involving the FEATS.

### Limitations

Several limitations of the study should be noted. First, as in all art therapy assessments, artistic skill may be a confounding variable because some people simply are better artists than others (Kaplan, 1991). Given that the primary discriminating variable was Problem-Solving, a variable that probably is little affected by artistic skill, this issue is likely not to be a major factor in this particular study. Nevertheless, it is an important potential confound in any art-based assessment. A second limitation, also common to all art therapy assessments, involves the subjectivity of rating art. Although raters were provided with concrete descriptors for ratings of all levels of each of the 14 subscales, it is still conceivable that they rated aspects of drawings differently simply because they liked certain drawings better than others. Third, the relatively small sample size in this study ( $N=53$ ) did not provide sufficient power for a



careful analysis of differences in the drawings by student age. For example, we found no significant correlation between student age and ratings on the Developmental Level subscale, although previous studies have indicated that differences by student age do exist (Anderson, 1992, 1994). Finally, the grouping variable in this study was derived from only one score on one instrument provided by each child's clinician. Variability in clinicians' interpretations of the Thinking subscale of the CAFAS could have affected children's placement in the impaired versus nonimpaired groups, affecting the validity of our findings.

### Need for Future Research

Given the promising findings reported in this study, it would be helpful to conduct a similar study using another sample of students with emotional and behavioral disorders to see whether the findings reported here are replicable. To strengthen the validity of the study, it would be beneficial to have a more robust grouping variable for thought impairment than the one used in this study, perhaps created from ratings of multiple respondents.

It would also be useful to conduct longitudinal studies to determine the stability of ratings of children's drawings over time. We plan to administer the PPAT art directive to the same students 9 months after the first administration to allow for an estimation of stability or change over time. Because children's drawings may be influenced by the mood they are in at the time of the drawing, we plan to administer concomitantly a short self-report measure of mood. Ultimately, it would be useful to generate a set of FEATS norms (by age and gender) for both clinical and normal child populations.

### Conclusions

Art assessments offer an additional, nonthreatening form of assessment for children to complement and reinforce other types of assessments. Given that some children—particularly young children, those with cognitive impairments, and those with serious emotional and behavioral disorders—have difficulty expressing their thoughts and feelings verbally, drawing a picture may help them convey more than they otherwise are able to. Further research on the use of art in assessing children's emotional and behavioral health may ultimately improve the accuracy of diagnoses and monitoring of treatment.

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