Brief Report

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The Formal Elements Art Therapy Scale: A Measurement System for Global Variables in Art

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Introductory Comments by Frances Anderson (Editor, 2000-2001)

When asked to choose one article from my tenure as editor, it seemed as though it would be a fairly easy task. The more I thought about it, however, the more I realized that it would be an almost impossible task. Due to a limit on length, the selection was very difficult to make. One seminal article too long to reprint immediately came to mind: Richard Carolan's "Models and Paradigms of Art Therapy Research" (2001, *18*[4], 190–206). This excellently crafted piece gave an overview of the many types of research along with examples from the art therapy field. Carolan's article should be required reading for all art therapy students.

As a historical document, "Editor's Special Section: Art Therapists in Their Own Words," (2001, *18*[4], 179–188), the published interviews of the ways art therapists responded to the 9/11 events, stands out. I also want to note the contributions of Valerie Appleton to the field of trauma treatment. She started working with traumatized burn victims in 1986, long before many art therapists had discovered the power of art therapy to treat trauma, and wrote about her experiences in "Avenues of Hope: Art Therapy and the Resolution of Trauma" (2001, *18*[1], 6–13). I want to add that we lost a brilliant art therapist and researcher with her untimely death.

The article I finally decided to feature is Linda Gantt's brief report, "The Formal Elements Art Therapy Scale: A Measurement System for Global Variables in Art" (2001, *18*[1], 51–55). The development of the FEATS represents some of the very best research in our field. Since publishing her FEATS manual, over 90 art therapists in the United States and overseas, as well as graduate art therapy students, have used Gantt's scale in their research. It is a momentous contribution.

Introduction

The Formal Elements Art Therapy Scale (FEATS) is a measurement system for applying numbers to global variables in two-dimensional art (drawing and painting). While it was originally developed for use with the single-picture assessment ("Draw a person picking an apple from a tree" [PPAT]), researchers can also apply many of the 14 scales of the FEATS to other types of drawings. This article discusses how art therapists who are studying other assessments can modify specific FEATS scales for their use.

Development of the FEATS

The precursor of the FEATS was the work Paula Howie and I did (Gantt & Howie, 1979) on the correlation of characteristics in art with specific diagnoses in the *Diagnostic and Statistical Manual* (American Psychiatric Association, 1980). We conducted a clinical investigation using a prepublication copy of the third edition (DSM-III). This edition was a radical reworking of diagnostic classification based on an atheoretical, descriptive approach. The number of psychiatric diagnoses was expanded considerably and the acute, clinical disorders (Axis I) were separated from the lifelong personality disorders (Axis II).

We gathered examples of two- and three-dimensional art from patients in two similar psychiatric inpatient facilities (Prince George's General Hospital, Cheverly, Maryland, and Walter Reed Army Medical Center, Washington, DC). Using categories such as color, form, and content, we made a visual comparison of what we thought were the most obvious similarities in the artwork of a number of major diagnostic groups such as schizophrenia, major depression, substance abuse, and bipolar disorder. We distilled these salient characteristics into a chart that summarized our clinical impressions. While this work was based on observations made in art therapy sessions rather than on formal research, it nevertheless gave a structure for comparing and contrasting certain aspects of art done by different groups of patients.

The Next Step in Development

When Carmello Tabone and I began working together, we wanted to develop a method for researching diagnostic information in art that built on the earlier work (Gantt & Howie, 1979) and on the large number of pictures he was amassing from a psychiatric hospital. We were guided by a statement from Elinor Ulman and Bernard Levy, two of our teachers at George Washington University: "Unless

the crudest diagnosis—patient or normal—can be made with sufficient precision, the assumption that paintings and drawings contain data related in regular ways to psychopathological categories lies open to serious question" (Ulman & Levy, 1992, p. 107).

We set out on an ambitious project to investigate both spontaneous and directed art. We immediately met an impasse when we tried to make a decision tree patterned after those in the DSM. We realized that in order to make the first decision at the top of the tree we needed to know what the person had intended to draw. Since we were interested in only the structural aspects of art that one could see in the picture (as opposed to the person's associations), we decided to narrow our focus. While the subject matter is important in actual art therapy sessions, we realized that it was not going to give us the answers we were seeking. Therefore, we decided to hold the content constant and see what formal elements varied from group to group.

Use of the PPAT

We decided to use the assessment "Draw a person picking an apple from a tree" (PPAT). When we began working together over 14 years ago, Carmello had already been collecting PPATs for some time. He had learned this assessment from Tally Tripp, another art therapy student at George Washington University (Gantt & Tabone, 1998, preface). Since then, we have traced this drawing back to Viktor Lowenfeld (1939; Gantt & Tabone, 1998, p. 12). After standardizing the materials and instructions (Gantt & Tabone, 1998, pp. 12-14; Gantt & Tabone, in press), Carmello started collecting PPATs from patients at admission and discharge from every unit of the psychiatric hospital. Soon, it was obvious to us that the changes in form we observed had a consistent and predictable pattern that seemed to vary with certain diagnostic groups. We could not yet verbally describe those patterns, but we began to make notes about certain variables that we thought might separate one group from another.

As we developed the basic concepts for our scales, we found ideas in the work of Lehmann (Lehmann & Risquez, 1953) and Kwiatkowska (1978). Lehmann outlined specific requirements for an art-based assessment (Gantt & Tabone, 1998, p. 5), including the idea that one could "obtain useful and valid information on the patient's medical condition without having to spend additional time in observing the patient while he is painting or in interviewing him about his finished product" (Lehmann & Risquez, 1953. p. 39). Kwiatkowska provided a template for a detailed rating manual. Both researchers used ordinal scales to measure the degree of a variable present in the art.

Our first attempt had six ordinal scales—creativity, artistic skill, bizarreness, representation of the person, amount of detail, and amount of color. In addition, we asked raters to endorse one of several descriptions in the categories of overall impression, grounding and spatial relationships, use of color, orientation of the drawn person, relationship of the person to the apple, relationship of the person to the tree, and relationship of the apple to the tree. In pilot studies, the scales on creativity and bizarreness proved problematic. The art therapists and art therapy students who rated pictures using these scales had difficulty distinguishing between the two concepts. These raters were more likely to rate something as high on the creativity scale but low on the bizarreness scale when we considered it quite bizarre. We eventually dropped both of these scales and reworked the others. The difference of opinion we found in our raters suggests an interesting line of investigation. Perhaps, ratings on these two scales might vary with clinical experience. Certainly, the history of art is replete with examples of "bizarre" ideas that are greeted with derision but later come to be widely accepted. Are we art therapists better or worse raters for our clinical experience or does our training bias us in a predictable way? Art therapists and their judgments about the art of both trained and untrained artists would be a fertile ground for research.

Emphasis on Structure

Paula and I worked with specific diagnostic categories in making our chart (Gantt & Howie, 1979). We tried to find features in the artwork that seemed to be related to a specific diagnosis using only clinical observations. However, we had no overall principles to guide our organization. What we did was describe our general impressions (such as, a "limited palette" and themes of helplessness and hopelessness seemed to be common in the art done by people who had major depression). We then selected two examples of each feature we thought important, whether it was content or structure. We presented slides of these examples at the 1979 Annual Conference of the American Art Therapy Association.

In their study to discriminate between patients and nonpatients based on their art, Ulman and Levy (1992) concluded that structure was likely more important than subject matter. Other writers (Dörken, 1954; Kahn & Jones, 1965; Lehmann & Risquez, 1953; Ogdon, 1975) had suggested that such an emphasis on *how* people drew rather than *what* they drew might be an important topic for research, but at that point no one had devised a generally accepted measurement system.

We felt that our emphasis should be on global characteristics of interest to artists, rather than on the details that psychologists focus on in projective drawing research. While Carmello and I did not realize it at the time, this emphasis now makes it possible for us to use our Formal Elements Art Therapy Scale for art by nonpatients and children as well. This elasticity and adaptability of the FEATS makes it a research tool that also can be used for cross-cultural studies. Furthermore, I feel that one may apply many of the scales to abstract and/or nonrepresentational art. Below I offer suggestions for adaptations of each of the 14 FEATS scales.

Back to the DSM

As Carmello and I collected more pictures, we continued to add and subtract scales and to refine the operational definitions. We achieved a major breakthrough in our thinking about specific research designs when we recast the

formal, structural elements as the *graphic equivalent of symptoms.* However, unlike previous writers, we considered only those symptoms listed in certain specific diagnoses in the DSM. For example, those studying human figure drawings looked for specific details that supposedly signaled anxiety. However, anxiety is not a cardinal symptom of schizophrenia, major depression, bipolar disorder, or the organic disorders such as dementia and delirium (American Psychiatric Association, 1994). Therefore, we would not hypothesize that signs of anxiety would be common in drawings done by people who had these diagnoses. Instead, we developed scales based on the graphic equivalent of depressed or elevated moods (Prominence of Color), decreased or excessive energy (Space, Implied Energy, Details of Objects and Environment), illogical thinking (Logic, Problem-solving, Color Fit, Person, Integration), and cognitive deficits (Rotation, Perseveration, Line Quality, Realism). Therefore, in a specific, direct way, we tied the scales to the DSM. (For more details linking the FEATS to previous art therapy and psychology literature, see the chart on the graphic equivalent of symptoms in Gantt & Tabone, 1998, pp. 26-27.) We added a fourteenth scale that is not a graphic equivalent of a symptom—Developmental Level. Since this concept is of major interest to art therapists and art educators, we felt it was vital to include it.

Fourteen is a rather large number of scales, and it may be that we will eventually reduce them through factor analysis. However, at present, we base our research designs on the idea that, as in the DSM, there is a cluster of symptoms that defines a disorder. It is that *cluster* or pattern (high scores on certain scales and low scores on others) that will best describe the art of specific diagnostic groups (Gantt & Tabone, 1998, pp. 52-53). In the case of major depression, for example, the pattern seems to be low scores on Details, Prominence of Color, Space, and Implied Energy and high scores on Logic. We hope further research will provide statistical support for this description.

Temporal Considerations in Collecting Drawings

Those art therapists who study the correlation of formal elements and psychiatric diagnoses must pay strict attention to the time when they collect the drawings. In the DSM, a symptom must be present to be counted: "A…diagnosis is usually applied to the individual's current presentation and is not typically used to denote previous diagnoses from which the individual has recovered" (American Psychiatric Association, 1994, p. 2). In fact, we have found that the pictures from inpatients can change dramatically in a matter of days. Therefore, one must get the first drawing as close to admission as possible or risk having no evidence of the acute symptoms.

The FEATS for Use with Children and Adult Nonpatients

When we applied the FEATS to children's drawings, we had no difficulty using the same operational definitions we used with adults. In a preliminary study in which Carmello rated 322 pictures from a suburban elementary school, we found evidence confirming many of the observations made by Lowenfeld and other art educators. This sample included preschoolers through sixth graders. For example, the mean scores on the Prominence of Color scale increased gradually from a score of 1.4 in the preschool children's drawings to a peak of 3.5 in those of the third graders. The mean scores then stayed essentially the same in the fourth and fifth graders' drawings, declining slightly to a mean score of 3.1 in those of the sixth graders. Said in another way, the younger children were more likely to use color for outlining only while the older children used a combination of both outlining and filling in. However, as a group none filled in all the objects and background with color.

The scores on the scales of Color Fit, Integration, Logic, Realism, Developmental Level, Details, Line Quality, and Person showed a similar pattern with the mean scores gradually increasing with age as the scores assumed a normal distribution around the third grade. However, there were a few scales for which this was not the case. The distribution of scores on the scale for Implied Energy was quite similar across the grades. We think this reflects the underlying biological nature of this variable. The mean score on Space was high for the preschoolers, and is in keeping with Lowenfeld's observation that younger children use more of the picture plane while slightly older children concentrate their drawing on the center. Gradually, the drawing spreads out again with age as the children move into the schematic stage. So far, it appears that the scales for Rotation and Perseveration are not normally distributed. Rather, these variables are more likely to be found in the art of the very young and the organically impaired. In the former, they are normal, but in the latter, they are pathological. We will repeat the scoring with raters blind to our hypotheses so that we are confident that there is no bias in the scoring and report our findings in another article. The children's pictures are the beginning of a collection that we can eventually use for norming purposes.

At this point in the FEATS development, we must consider that we have a research rather than a clinical scale. No high or low score on any single scale should be considered by itself. Nor should a single score be viewed as indicative of pathology or disorder. Rather, the scores should be collected and compared against norms we have yet to establish. As more art therapists use our system and collect drawings from both child and adult nonpatients, we will be able to determine norms against which we can compare patients' scores. Establishing norms is crucial to future art therapy research, especially for any studies that deal with psychiatric disorders.

The Individual Scales and Their Applicability to Other Art

While we developed the FEATS specifically for the PPAT, many of its 14 scales can be used with other assessments and with "free" (nondirected) art. Below I offer suggestions for adapting specific scales to particular types of

drawings. Using the FEATS across several different types of pictures will permit greater generalizability of results.

Prominence of Color

"Prominence of Color" refers to the way in which color is applied to objects and/or areas of the drawing. If color is used only for outlining a form or object, then a rater will score the art as having a "1" on this scale. If the entire surface is covered with color, the rater will score a "5" on this scale. This scale can be used with any drawing in which the use of color is permitted, including scribbles such as the ones used by Cane (1983), Kwiatkowska (1978), and Ulman (1975).

Artistic convention for drawing permits some of the paper ground to show in drawings. In painting, the convention is to cover the entire canvas. One would first have to conduct a pilot study on a sample from a wide range of people in order to see if this scale has any utility for studying paintings. If the majority of paintings in the pilot study were rated as fours and fives, the scale would not have the breadth needed to make fine discriminations on this variable.

Color Fit

"Color Fit" measures the way in which conventional or realistic color is used. One could apply this scale to any drawing or painting in which a relatively realistic object is included. However, it is not useful for abstract or nonrepresentational art. If a researcher is working with a drawing of specific object(s), he or she can modify the FEATS directions to the raters to denote the appropriate colors or color range. If a person names a particular object or objects as being in the picture, then the researcher should make note of it and include that information with the drawing so that the raters may make their judgment.

It is important that low scores on this scale not be considered pathological. The expressive use of color in and of itself occurs in several different groups, as does the random use of color (as Lowenfeld observed in young children). Many examples of unusual color fit are found in the work of the German expressionists and the Blau Rider School—for example, think of the "color fit" in Henri Matisse's portrait of his wife with a green face!

Implied Energy

The Implied Energy scale measures the degree of effort it would take the rater to do that same drawing. We ask raters to put themselves in the artist's place and consider the energy one would expend to make the drawing. The "least amount of energy possible" is a rating of "1," "an average amount" is a rating of "3," and an "excessive amount" is a rating of "5." One can easily apply this scale to scribbles, abstracts, or nonrepresentational art.

Space

Space is an easily used scale for all types of two-dimensional art. It is the only variable that can be measured on a true ratio scale (that is, a scale that has the properties to permit mathematical operations). Our scale assigns points to less than 25%, between 25% and 49%, between 50% and 74%, between 75% and 99%, and 100% of the space used. We could take much finer measurements, but we think that these gradations are sufficient for most studies.

Integration

Theoretically, this scale should have broad application to all types of art. Certainly, it is easier to apply this scale to a composition that consists of two or more objects and/or people. Presumably, one should be able to apply the criterion to a nonrepresentational composition. However, discerning the individual "parts" of such a composition might prove difficult if raters cannot agree on the specific parts as opposed to "parts of parts." Therefore, acceptable inter-rater reliability may be difficult to obtain. Researchers should conduct a pilot study with a varied sample of nonrepresentational art to determine if raters agree on the measurement of this particular variable before proceeding to use it in a larger study.

Logic

The Logic scale deals with the inclusion of bizarre or illogical elements that are not part of the requested response. We distinguish between intentionally humorous or satirical items and those items that seem to have no reason for being in the picture. For example, in one of our PPATs, the artist drew the person sitting on a branch of the tree using a pickaxe on an Apple computer. We consider this drawing to have several elements that are satirical rather than bizarre or illogical. Like the scale on Integration, this one should be applicable to many types of drawings and paintings. But, only further studies will demonstrate whether raters can use this scale in a reliable manner on nonrepresentational as well as representational art.

Realism

Clearly, one can use this scale only with drawings for which there is a directive to make a specific object or when the artist describes part of the drawing as being a specific object. Thus, if a person had been asked to make a scribble and declared the image to be "a dog," then the researcher would need to relay that to the raters. This variable may also be associated with education and artistic training so it is imperative that investigators consider this in their research designs.

Problem-solving

This scale measures the degree to which the artist shows the drawn person actually getting the apple out of the tree. It was a serendipitous result of the directive for the PPAT. In a small-scale validity study the scores on this scale discriminated all five groups (four diagnostic groups and a control group) from each other (Gantt, 1990). We have been looking for another drawing that might serve as an alternative

for the PPAT so that we might have the testing equivalent of a "Form A" and a "Form B." Until we develop or find such a drawing, this scale may be unique to the PPAT.

Developmental Level

In the original FEATS rating manual we used a rather broad interpretation of Lowenfeld's developmental levels (Lowenfeld & Brittain, 1978) for this scale. Since the points on all our scales range from "0" to "5," we needed to condense the number of stages he originally outlined. Those who are studying children's drawings may want to expand the number of points for the whole numbers or to retain our numbers and define specific half-points. Either way, it would be important to have a more finely graded scale to use with children's drawings. However, we are not certain that this scale will have as much utility as using an aggregate of several of the more specific ones such as Implied Energy, Space, or Details. While many art therapists can easily apply Lowenfeld's stages in a general way to children's art, it remains to be seen if this scale has discriminatory value with art done by adults. This scale does not relate specifically to a symptom in the four Axis I disorders we originally studied. However, abundant literature suggests that some disorders are the result of arrested psychological development. It will be vital to see if scores on this scale are correlated with a variable such as educational level or artistic training. If so, we may not need to retain this scale.

Details of Objects and Environment

One can use this scale when the directive requires identifiable objects, but not with abstract or nonrepresentative art. In the main, it measures whether the person simply followed the directions in a concrete fashion and only included the specific items in the directive, or added or embellished the initial stimulus to make a fuller picture. "Abundant and inventive details" are rated "5."

Line Quality

This scale looks at the overall line quality and the degree of control that the artist presumably exercised. Raters are asked to "average" the lines in the drawing. Excessively "fluid or flowing lines" are rated "5" while lines that "appear to be drawn with a shaking hand" are rated "3." One can use this scale with any drawing in which colored pencils, markers, or other relatively fine-tipped media are used. However, the process of laying down color when painting or using some pastels makes line quality difficult to judge.

Person

If the directive asks for or implies a whole person, then this scale can be used. All FEATS scales ask for the *degree* to which the drawing meets the criteria. As we studied our archival pictures we realized that there are several aspects of this variable in which we were interested but which this scale did not capture (such as gender, age, orientation of face, and clothing). To remedy this, we developed content scales (nominal or categorical scales) to capture this information. Those researchers who are working with drawings that routinely contain a person may want to add these nominal scales to their ratings (Gantt & Tabone, 1998, pp. 47-51). Obviously, if the artwork does not have a person in it, one cannot use this scale.

Rotation

We derived the Rotation scale and the last scale, Perseveration, from the literature on the Bender-Gestalt Test (Lacks, 1984). However, in the art of very young children neither variable is pathological. Rotation measures any item that deviates from an expected position (vertical or horizontal) or from a presented design one must copy. Trees, people (unless they are placed in an unusual position by virtue of the directive), and houses are the objects most likely to be treated this way. One may measure horizon lines and groundlines on this scale if suitable modifications are made in the directions for the raters.

Perseveration

For our purposes, perseveration is a repeated motor act such as making a short line over and over without seeming to be aware of doing so. There are other types of perseveration (Morrongiello, 1996), but we are interested only in this one. On occasion, one might see perseveration in nonrepresentational or abstract art. For those who study children or adults with organic mental disorders such as Alzheimer's and other dementing illnesses, this scale will be of special interest. Unlike the other scales, Perseveration and Rotation do not seem to be normally distributed. It is our impression that scores of "1," "2," or "3" do not mean pathology in children.

In early pilot studies, raters tended to over-endorse these last two scales, resulting in unacceptable inter-rater reliability. We reworked both scales, added color plates to the rating manual, and were able to bring up the level of reliability so that it was acceptable. This process of checking inter-rater reliability before proceeding with a study is crucial to sound research.

Reliability of the FEATS when Applied to Other Assessments

As discussed above, there are some scales that may need to be modified before being used with abstract or nonrepresentational art and others that can be used only with representational art. Each scale, whether modified from the original FEATS or not, must be checked for inter-rater reliability before using it in the main part of a study. Also, we would urge that researchers try different types of raters before beginning a large-scale study. In one of our studies, there was no difference between art therapists, recreational therapists, and social workers (Gantt & Tabone, 1998, p. 44). However, this might not be the case with studies involving abstract or nonrepresentational art.

We have noticed, however, that art therapists seem to take longer to complete the rating, perhaps because they get interested in unusual details that we are not investigating.

Current Uses of the FEATS

Our principle use of the FEATS is with the PPAT. We continue to collect PPATs from a wide variety of patients in a psychiatric hospital as well as from nonpatients. We are interested in determining how our work can contribute to making a differential diagnosis, serve as a gauge of therapeutic response, and chart the course of an illness over a decade or more. One of our ongoing projects is monitoring response to electroconvulsive therapy (ECT). Carmello collects a baseline drawing and another one after each ECT treatment. We hope eventually to be able to use the drawings as a screen for appropriate ECT candidates.

Our archive presently contains drawings from over 5,000 people. We hope to get other researchers to collect pictures from samples we cannot get in our area. A few researchers in other countries have expressed an interest in our system and a pilot study on the FEATS has just been published in an art therapy journal in Russia.

We are excited about the possibilities that computer technology provides for further research. Since the individual scales of the FEATS are already operationalized, most of them will be easy to convert into computerized versions, making it possible to quickly measure large numbers of pictures. Through the use of computers, one can measure variables such as amount of space used, number and quantity of colors, and the ratio of the drawn person to tree instantly and accurately without rater bias or fatigue. Neural networking (in which the computer "learns" with each subsequent example it is given) is a powerful modeling process that will enable us to detect patterns of variables that discriminate among groups.

Conclusion

The FEATS measures global variables in "free" art as well as art created in response to specific instructions. The focus on structure rather than content provides an easily applied method that permits the comparison of pictures from two or more groups (whether those groups differ in ethnicity, age, treatment status, education, or gender). By emphasizing those variables that are of interest to artists, the FEATS can be used as a measurement tool in a wide variety of applications with clinical and nonclinical samples.

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