Identification of Factors of Affective Meaning in Four Selected Activities

(psychosocial function, activity analysis, semantic differential, occupational therapy)

The premise that activities have inherent meanings is basic to the theory and practice of occupational therapy. In this study the investigators hypothesized that different activities would elicit different kinds of affective meanings in their participants. The subjects in this study were 59 students beginning their training in occupational therapy. On their first day in an activities class, and before instruction in activity analysis, the subjects were presented with four selected activities. Immediately after performing each activity, the students were requested to rate the activity according to Osgood's 12-scale short-form semantic differential. The data generated were reduced subsequently to Osgood's three factors of affective meaning: "evaluation," "power," and "activity" (in this study called action). Results indicated that the four activities elicited significantly different responses on all three factors. Specific results and implications of this study's methodology for future occupational therapy research are discussed.

An essential proposition of occupational therapy is that purposeful activity promotes health and facilitates function (1). The traditional method of determining the potential impact of activity on human beings is through the process of activity analysis (2, 3). The therapist breaks down an activity into its component features and considers the effects of these features on the participants in the activity. Historically, activity analysis has been grounded on theory and on clinical observations of the effects of activities on clients in therapy programs (2, 4-6). Needed is a systematized research base that can document the effects of different activities on their participants (7).
A review of the literature revealed a limited number of studies in which a controlled, quantitative, and replicable approach to activity analysis was used. Focusing on physical function, Trombly and Cole conducted electromyographic studies and found different levels of participation of 4 hand muscles during 16 activities known to be used by therapists for the improvement of hand function (8). In the field of psychosocial function, Allard (9) and Fox and Jirgal (10) conducted quantitative studies on the degree of consensus among occupational therapists in analyzing activities for common inherent characteristics and inferred psychological attributes. Allard found that occupational therapists generally achieved a greater degree of inter-rater reliability than art teachers, and Fox and Jirgal found a high degree of agreement in the way that therapists have rank-ordered 10 sets of activities according to 15 predefined activity characteristics. Nystrom began the construction of an “activity meaning” scale based on a study of activity patterns and leisure concepts in an elderly population (1).

A major difficulty in developing a behavioral science of the meaning of activity is the fact that much of the impact of activity is covert and unobservable. This problem of measurement is shared by several fields of psychology. One methodology developed over the past 40 years to overcome this obstacle is the semantic differential created by Osgood (12). The semantic differential is designed to measure the affective meanings assigned by subjects to selected concepts. For example, the concept authoritarianism might be analyzed in terms of its affective meanings and might be compared to other concepts in terms of their affective meanings. The method of the semantic differential requires that the subject rate the concept in terms of a set of scales consisting of paired opposites. For example, the subject would be asked to rate authoritarianism as “good” or “bad” on a 7-point scale, and would be asked to rate the same concept as “sharp” or “dull” on another 7-point scale, and so forth, until a full set of scales was completed. Extensive research has revealed that such scales can provide a valid and reliable method of comparing different concepts in terms of their affective meanings to participating subjects (13).

In 1959, Smith and colleagues administered scales based on Osgood’s semantic differential to identify inferred psychological attributes in arts and crafts (14). Given a list of nine commonly used activities, three groups of patients in tuberculosis, psychiatric, and medical-surgical services, and one group of occupational therapists rated the activities by means of 20 scales of paired opposites. The investigators assumed that these 20 scales could be reduced to four factors: appeal, potency, difficulty, and cleanliness. They found that certain differences existed from group to group in terms of affective responses to activities, and that many commonalities existed across groups in terms of how the entire group of subjects responded to different activities. Specifically, they found that different crafts elicited clearly distinguishable responses in terms of the appeal, potency, and difficulty factors.

This project builds upon the work of Smith and colleagues and extends the use of the semantic differential in the study of activity. Whereas the earlier study relied on the subjects’ affective responses to the names of activities, the present study depends upon data collected immediately after the subjects’ actual participation in the activities. With the exception of the order of presentation, the activities were experienced in an identical manner by all four groups of participants. Another difference is that only those three factors of affective meaning identified by Osgood as having the most universal significance were used in this study: evaluation, power, and activity (re-labeled action in order to distinguish this quality from occupational therapy’s much broader concept of activity).

In this project meaning is defined constitutively as the process conducted by a person in interpreting symbolic information, and affective meaning denotes an interpretation influenced by the individual’s feelings toward the information as opposed to an interpretation based solely on logical grounds. Evaluation is defined as the factor of affective meaning that summarizes the degree to which the person feels positively or negatively about something. Power is the factor of affective meaning that summarizes the person’s feelings in terms of the magnitude of effect something potentially has on its environment. Action is the factor of affective meaning that represents the person’s feelings about the degree of movement or volatility associated with something. The three factors may be more or less present in any combination, depending upon the individual and the information. For example, a person could “evaluate” the information in the word elephant as high, could rate its “power” high, and could rate its “action” low. On the other hand, the same person could give the word chimpanzee a high rating in the “evaluation” factor, a low rating in the “power” factor, and a high rating on the “action” factor.
No assumption is made that Osgood's three factors of affective meaning are the only relevant qualities of affective meaning elicited by participation in different activities. The decision to study only these factors was based on the recognized need to begin the study of activities within the context of a fully developed methodology found by other researchers to be practical, reliable, and valid.

This research poses the following question: Do four selected activities elicit different responses in terms of Osgood's affective factors of "evaluation," "power," and "activity"? Furthermore, since all subjects are to experience all activities, is there evidence that the order in which the activities are experienced affects the way in which subjects respond to them?

Method

Subjects. Fifty-nine undergraduate students (58 females, 1 male) participated in the study. Subject selection was based on attendance as an occupational therapy student at the first meeting of an introductory course in activities at Boston University. The class consisted of four sections: 1. a group of 13 sophomores meeting on a Thursday afternoon; 2. a group of 17 entering juniors meeting on the subsequent Tuesday afternoon; 3. a group of 12 sophomores meeting on Wednesday morning of the same week; and 4. a group of 17 entering juniors meeting on Wednesday afternoon of the same week.

Instrument. The semantic differential used in this study consisted of 12 scales recommended by Osgood and colleagues for English usage (15, p 172). Subjects were asked to assign a rating on a 7-point scale for each of the 12 scales (see Figure 1).

Procedure. After the subjects were welcomed to the first day of class, they were told that they would be introduced to four different activities that had been taught traditionally on the first day of the activities course. The activities were experienced first, and later in the period there was a discussion about the activities. The difference this year was that after performing each activity the students were requested to complete one semantic differential form and to indicate on the form whether or not they had had previous experience with the activity.

The activities had been selected for use in this class because they were thought to vary from each other in terms of their characteristics and because they were sufficiently brief. A description of the activities and their characteristics, as well as the orientation to the activities given the students, are presented below.

Balloon Bat. Students were oriented by being told that they would play a game. Four people were asked to volunteer to be "counters." Instruction was given verbally and by demonstrating how to arrange the chairs. Players were directed to arrange the chairs to be facing each other in two rows; they were to sit on the chairs so that the chairs touched side-to-side and each player was touching the opposing player knees-to-knees. They were
told that on a signal from the instructor the counters would drop the balloons (about 35-40) into the space between the players. Players were to bat or swat the balloons up and past the players in the opposite row. Each balloon that fell on the floor would be counted. Counters were to pick up balloons and count them as they returned them to the middle for continued play. When the signal was given to stop, players would stop swatting and counters would pick up and count the remaining balloons. The game was timed for 45 seconds of play. After the first round of play, a request was made for four players to change places with the counters so that all would play the game. The second game was stopped after 45 seconds of play.

Some characteristics of this activity are: performing as a team member; maintaining body contact with another; following structured directions; repeating one basic step; making quick, forceful movements at an irregular pace; having no choice in materials, variations of steps, or outcome; having an outcome that is not tangible and not known until after the activity is completed; and participating in an activity of very short duration (45 seconds).

**Origami.** Students were oriented to this Japanese paper-folding activity by being told of its history and ways the activity could be expanded. They were shown an origami sailboat and a mobile composed of origami birds. Printed diagrams of step-by-step directions for the first product, a sailboat, were given to each student. Students were directed to select a paper of the color and size they desired. The difference between two basic origami folds was indicated in the printed directions and explained verbally. The instructor then displayed a poster board on which were mounted examples of the results of each of the steps in the procedure. She explained that she would demonstrate each step and that students could watch the demonstration and also check their progress against either the printed diagrams or the three-dimensional step-by-step samples. The students then performed each step immediately after its demonstration. When all had completed the first product, they were given the same type of instruction in making a more advanced product, a nightingale like the ones in the mobile. The activity was concluded after 20 to 25 minutes, when all students had completed the bird.

Some characteristics of this activity are: performing as individuals; sitting near but not touching others; following highly structured directions; making small, deliberate movements; performing repeated steps over and over; pacing own work and having options to change yarn and to include two variations; producing a tangible outcome that could be judged and monitored in process; and participating in an activity of short duration (20 to 25 minutes).

**Collage.** Students were directed to distribute themselves in roughly equal numbers and to sit at one of two large tables. On these tables were pieces of tag board and one pair of scissors per student, cups of glue to be shared, various implements for spreading glue, and in the middle, a pile of assorted materials for collage: yarn, string, raffia, flat balloons, foil, construction paper, and magazines. Students were directed to make “any kind of collage” they pleased. This activity was concluded after 25 minutes.

Some characteristics of this activity are: performing as individuals; sitting near but not touching others; following unstructured directions; making small, deliberate movements; performing four steps in any sequence; searching, cutting, arranging, and pasting; having a wide choice in the design of product and in materials; working on a
Table 1
Order in Which Activities Were Presented (in accordance with a Latin Square design)

<table>
<thead>
<tr>
<th>Group</th>
<th>Balloon</th>
<th>Bat</th>
<th>Origami</th>
<th>God's Eye</th>
<th>Collage</th>
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<tbody>
<tr>
<td>1</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td></td>
</tr>
<tr>
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<tr>
<td>4</td>
<td>3</td>
<td>4</td>
<td>1</td>
<td>2</td>
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Table 2
Evaluation Factor (Newman-Keuls post-hoc comparison matrix across all four groups)

<table>
<thead>
<tr>
<th></th>
<th>Balloon</th>
<th>God's Eye</th>
<th>Collage</th>
<th>Origami</th>
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</thead>
<tbody>
<tr>
<td>Means</td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Balloon</td>
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<td>2.1*</td>
<td>2.9†</td>
<td>3.1†</td>
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<td>1.0</td>
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<td>Origami</td>
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<td>—</td>
<td>0.2</td>
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<tr>
<td>Collage</td>
<td>18.6</td>
<td>—</td>
<td>—</td>
<td>—</td>
</tr>
</tbody>
</table>

*Significantly different mean differences at .05 level.
†Significantly different mean differences at .01 level.

Table 3
Power Factor (Newman-Keuls post-hoc comparison matrix across all four groups)

<table>
<thead>
<tr>
<th></th>
<th>God's Eye</th>
<th>Origami</th>
<th>Balloon</th>
<th>Collage</th>
</tr>
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<td>Means</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>God's Eye</td>
<td>11.7</td>
<td>—</td>
<td>3.0*</td>
<td>3.8*</td>
</tr>
<tr>
<td>Origami</td>
<td>11.8</td>
<td>—</td>
<td>2.9*</td>
<td>3.7*</td>
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<tr>
<td>Balloon</td>
<td>14.7</td>
<td>—</td>
<td></td>
<td>0.8</td>
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<td>Collage</td>
<td>15.5</td>
<td>—</td>
<td></td>
<td>—</td>
</tr>
</tbody>
</table>

*Significantly different mean differences at .01 level.

A tangible product that can be judged and monitored in process; and participating in an activity of short duration (20 to 25 minutes).

Orientation, directions, quantity, and variety of supplies, and duration for each activity were identical for each group, and the same instructor met with each group. The only variation was the order in which the activities were presented. To control for order effects, activities were presented to each group in a different sequence in accordance with a Latin Square design (see Table 1). As soon as each activity was completed, one page of scales was presented to each student for response. When the subjects had completed the form, the next activity was introduced.

With each subject completing a 12-scale semantic differential form for each activity, the responses to the activities could be compared with each other in terms of their relative standing on each of Osgood’s three factors of affective meaning. Specifically, an “evaluation” score, a “power” score, and an “action” score could be derived for each subject in each activity by adding up the ratings assigned to the four scales identified with each factor. For example, a subject’s “evaluation” score for a particular activity would consist of the sum of ratings on the “nice-awful,” “good-bad,” “sweet-sour,” and “helpful-unhelpful” scales. Thus the range of scores varied from 0, the lowest possible score, to 24, the highest, on each factor in each activity.

Results
All results are based on the responses of 56 subjects, because 3 of the original subjects filled out the scales improperly.

Evaluation Factor. Two-way analysis of variance with repeated measures (activities X groups) revealed significant differences among the four activities on the evaluation factor, $F (3, 156) = 7.6, p < .01$. Subsequent post-hoc analysis (see Table 2) showed that the Balloon Bat activity was rated significantly lower on this factor than any of the other three activities. On this factor there were no significant differences among the four groups of subjects, $F (3, 156) = 0.9, p > .05$, and there was no interaction between activities and groups, $F (9, 156) = 1.3, p > .05$.

Power Factor. Two-way ANOVA also found significant differences among the four activities on this factor, $F (3, 156) = 17.7, p < .01$. The post-hoc analysis (see Table 3) demonstrated that Balloon Bat and Collage were both rated more powerful than Origami and God’s Eye. On this factor there were no significant differences among groups, $F (3, 156) = 0.8, p > .05$. However, there was a significant interaction between groups and activities, $F (9, 156) = 2.4, p < .05$. This interaction indicates the possibility that subjects may have responded in a mildly different way to activities depending upon their order of presentation. In general, it appeared that subjects tended to rate the activities that took...
place later in the sequence as somewhat more powerful than the activities that took place earlier.

**Action Factor.** As with the other two factors, this ANOVA also revealed significant differences among the activities, \( F(3, 156) = 177.3, p < .01 \). In this case (see Table 4), Balloon Bat was rated much stronger than the other three activities. Once again there were no significant differences among groups, \( F(3, 156) = 1.3, p > .05 \), but there was a mildly significant interaction between groups and activities, \( F(9, 156) = 2.4, p < .05 \).

**Age and Previous Experience.** Within this limited sample, which had a mean age of 20.4 with a standard deviation of only 2.5, the relationships between age and the ratings assigned to activities were weak. Furthermore, data analysis indicated that previous experience with the activities had little effect on the ways in which they were rated.

**Discussion**

**Specific Findings.** Contrary to expectations, Balloon Bat was rated lower than the other three activities on the evaluation factor, that is, it was rated less “nice,” “good,” “sweet,” and “helpful.” It may be noted that this activity is regularly associated with laughter and other indications of positive affect. Was the rating related to certain activity characteristics: the kind of motions made, the close proximity of players, an absence of choice of materials, an absence of tangible outcome, and an absence of opportunity to know the outcome until the activity was concluded? Was the low rating influenced by context, that is, did the aggressive or frivolous quality of the activity seem out of character with this population’s self-expectations on the first day of class?

Balloon Bat and Collage were both rated as more powerful—more “powerful,” “strong,” “deep,” and “big”—than the other two activities. In particular, this characterization as *powerful* of a loosely structured, potentially symbolic activity such as Collage supports the notion that the semantic differential taps a recognition of similarities. On all three factors Origami and God’s Eye received very similar ratings: a relatively high rating on the evaluation factor and relatively low ratings on the power and action factors. Traditional activity analysis would predict this since the two activities are so similar in activity characteristics. Both involve performing small, deliberate movements; following highly structured directions; and obtaining predictable, rather uniform products.

An additional matter of interest was the presence of mild order effects that suggest that subjects responded differently to activities depending upon their order of presentation. Such a finding might indicate in a preliminary way that participation in an activity can influence subsequent performance in other activities.

**Broader Implications.** Osgood’s short-form semantic differential proved to be a highly effective instrument in showing some of the ways in which activities mean different things to their participants. In this study it was more important to demonstrate a scientific quantification of this general principle than it was to point out the specific differences among these four activities. At its theoretical core, occupational therapy has long assumed that different activities have different affective meanings to people. This study suggests that it is possible to go beyond some of these assumptions toward establishing a quantitative basis for documenting the meanings of human activity.

Osgood’s semantic differential has certain strengths that support its usefulness in quantifying the affective dimensions of activity analysis. As Osgood, May, and Miron stated, “Human beings, no matter where they live or what language they speak, apparently abstract about the same properties of things

**Table 4**

<p>| Action Factor (Newman-Keuls post-hoc comparison matrix across all four groups) |
|---------------------------------|----------------|----------------|----------------|----------------|</p>
<table>
<thead>
<tr>
<th></th>
<th>Origami</th>
<th>God’s Eye</th>
<th>Collage</th>
<th>Balloon Bat</th>
</tr>
</thead>
<tbody>
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<td>Means</td>
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<td>11.9</td>
<td>12.5</td>
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</tr>
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<td>Origami</td>
<td>11.3</td>
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<td>0.6</td>
<td>1.2</td>
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<td>God’s Eye</td>
<td>11.9</td>
<td>—</td>
<td>0.6</td>
<td>8.7*</td>
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<tr>
<td>Collage</td>
<td>12.5</td>
<td>—</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>Balloon Bat</td>
<td>21.2</td>
<td>—</td>
<td>—</td>
<td>—</td>
</tr>
</tbody>
</table>

*Significantly different mean differences at .01 level.
Conclusion
Obtaining quantitative evidence that different activities elicit different affective responses is one step toward testing the assumptions made by occupational therapists when they analyze activities for use in therapy. This study demonstrates that the semantic differential has good potential application in the development of instruments especially geared to the study of psychological factors in activity analysis.

REFERENCES