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The Journal of Mind and Behavior
Autumn 1989, Volume 10, Number 4
Pages 373–392
ISSN 0271-0137

Numerically Aided Methods in Phenomenology: A Demonstration

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Phenomenological psychology has emphasized that experience as it is immediately "given" to the experiencing individual is an appropriate subject matter for psychological investigation. Consideration of the methodological implications of this stance suggests that certain text analytic and cluster analytic methods could be used to discern the identifying properties of different types of experience. We present results of a study in which (a) textual analysis was used to identify recurrent properties of participants' verbal accounts of their experience, (b) cluster analysis was used to classify participants' accounts according to the similarity of their profiles of properties, and (c) the resulting clusters were examined for their more or less characteristic properties. Using these methods, three distinct types of experience of a Renaissance painting were identified and described. This demonstration of numerically aided phenomenological methods indicates the compatibility of rigorous and sensitive descriptions of experiential accounts.

After in-depth review, Koch (1959) concluded that behaviorally oriented psychology had inspired wide-spread avoidance of the methodological issues involved in objective and discriminative study of human experience. Since the time of his review, psychology has become a cognitively oriented discipline. Contemporary cognitive psychologists affirm the theoretical importance of mental events, and, compared to their behaviorally oriented predecessors, they might be expected to give greater attention to the methodological issues that arise in a serious attempt to study experience. In fact, there have been several promising developments, including (a) reconsideration of the use of verbal reports in psychological research (Ericsson and Simon, 1980) and (b) innovations in the assessment of mental activities, e.g., thought sampling (Klinger, 1978), thought listing (Cacioppo and Petty, 1981), and task analysis (Ericsson and Simon 1984).

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However, in one respect, contemporary cognitive psychologists offer little—if any—improvement over their behaviorally oriented predecessors. Specifically, there has been little progress in the development of research methods that are faithful to *experience from the point of view of the person studied*. In current cognitive studies, the person's discriminations are still displaced by the theoretical concepts of the investigator, resulting in the selection of content analytic categories, rating scales, etc., that assess dimensions important to the researcher but not necessarily to the person being studied. In the language of phenomenology, psychologists have yet to study experience as it is immediately given to the experiencing person (Giorgi, 1970, 1985). We have yet to develop methods by which experience as given may be both rigorously and sensitively investigated.

Of course, the argument that neither behaviorally oriented nor cognitively oriented psychologists have adequately studied experience is one aspect of a continuing critique of psychological methods by phenomenological psychologists, i.e., by psychologists whose efforts are rooted in Husserl's phenomenological philosophy. Their critique typically includes one of two alternatives for reshaping investigative methods in order to more faithfully study experience as immediately given. One alternative, which emphasizes Husserl's (1913/1967) early understanding of the relations between phenomenological philosophy and psychology, is that phenomenological psychology would provide analyses of fundamental psychological concepts (e.g., emotion). Such analyses would require an active effort to intuit the essence of core concepts, i.e., to identify those invariant properties without which the phenomenon would not be what it is. That effort is not simply speculative clarification of definitions because it involves reflection on concrete experiences of the phenomenon. Also, it is not simply empirical description because it involves imagined variations of such concrete experiences. That is, by systematically imagining possible modifications of the concretely given phenomenon, the investigator articulates an idealized conception of it (analogous to the idealized concept of a point mass in physics). In this early view, phenomenological psychology would provide the discipline with a regional ontology, basically a philosophical project.

Husserl's (1954/1970) later understanding of the relations between phenomenology and psychology took a different form. His goal remained to intuit the essential properties of a particular phenomenon, but, consistent with his increased recognition of the historical and situational context of all experience, actual (as opposed to imagined) variations in experience became important. Phenomenological psychology would now involve systematic examination of a set of actual entities within the life-world. The *de facto* variations in entities of a certain kind are examined in order to identify the invariant properties that make each the kind that it is (Zaner, 1978). In this later view, the intuition of essences is comparable to induction (Merleau-Ponty, 1964)—suggesting a greater affinity between phenomenological and empirical psychology.

However, development of an effective liaison between phenomenology and empirical psychology has been complicated by misunderstandings of phenomenology (Giorgi, 1983; Graumann, 1988) and by the lack of clear examples of phenomenological studies. Perhaps such a liaison can be furthered by presenting specific methods that embody significant aspects of Husserl's later—and more empirical—conception of phenomenological psychology. In what follows, we will argue that numerically aided phenomenological methods can be used to discern the identifying properties of different types of experience. This proposal will be supported by the results of a study in which (a) textual analysis was used to identify recurrent properties of participants' verbal accounts of their experience, (b) cluster analysis was used to classify participants' accounts according to the similarity of their profiles of properties, and (c) the resulting clusters were examined for their more or less characteristic properties. Using these methods, distinct types of experience of a Renaissance painting were identified and described.

Assumptions of Phenomenological Psychology

In some respects, the phenomenological approach to psychological research is compatible with more familiar research *praxis*. These points of convergence are frequently obscured by more controversial aspects of phenomenological studies. Specifically, phenomenological psychologists and at least some nonphenomenological psychologists agree that experience per se is an appropriate subject matter for psychological study. Generally, they also agree that investigative methods should enable study of *conscious* (rather than unconscious) experience. Finally, they agree that appropriate investigative methods are those which enable *general* (rather than individual) conclusions about conscious experience.

In other respects, the phenomenological approach to psychological research diverges from more familiar research strategies. Fundamental to this divergence is the descriptive rather than explanatory goal of phenomenological studies (Giorgi, 1986). One rationale for descriptive studies is that causal explanation, and by implication, experimental manipulation, is inappropriate to the extent that humans are not determined beings (Sartre, 1956). Another, less controversial, rationale is that a phenomenon must be adequately described in order to provide a firm basis for subsequent study of its causes (Dilthey, 1976).

Neither of these arguments has been persuasive with psychological researchers among whom "mere" description has less value than causal explanation. Most researchers assume that the goal of psychological investigation

is to provide a causal explanation of a phenomenon—an explanation usually couched in a probabilistic version of the covering-law schema for evidential statements (Hempel, 1966). When conscious experience is regarded as inadequate or unnecessary in such causal explanations (cf. Nisbett and Wilson, 1977), the empirical study of conscious experience is naturally discouraged. But even when conscious experience of some type (e.g., anger) is regarded as a legitimate part of a causal account, contemporary investigators are more inclined to manipulate causal antecedents of that experience than they are to *empirically examine their assumptions regarding the defining qualities of that type of conscious experience.*

To appreciate the methodological alternative proposed from a phenomenological perspective, it is necessary to consider the nature of description in more detail. The goal of phenomenological description is to describe the essential properties of a particular kind of phenomenon. The investigator attends to the properties of the phenomenon, setting aside those properties that are contingent and secondary, and noting those properties that are invariant, i.e., the essence of the phenomenon. More specifically, a number of individual examples of a certain kind of phenomenon are successively considered in order to discern the complex of properties that identify each as an instance of that phenomenon. As a simple example, an array of triangles, either actual or imagined, might be considered in order to discern the invariant properties that are necessary to identify any instance as a triangle, e.g., three-sidedness with each side a straight line.

Husserl stressed that what is general in an array of actual instances of a phenomenon need not be essential. For example, if all of the actual instances of triangles being considered were also red, this would not warrant inclusion of redness as an essential property of triangles. Through free imaginative variation, e.g., imagining a green triangle, redness would be excluded as an essential property, whereas attempts to imagine a two- or four-sided triangle would reveal that three-sidedness is an essential property of triangles. In this respect, phenomenological reduction is not merely induction, since general properties of an array of actual instances of a phenomenon need not be essential properties.

When Husserl said that discerning the essence of a phenomenon allows us truly to speak of variations of one and the same thing, he was being consistent with traditional prescriptions for defining class membership. That is, a concept is defined as the complex of properties that are individually necessary and jointly sufficient for membership in the class. Discerning an essence, then, is neither more nor less than discerning the complex of properties that define a phenomenon when instances of that phenomenon are already known. The procedures by which this goal is pursued define the phenomenological approach to psychological research.

One aspect of these procedures is that the study of a certain class of experiences begins *before* the identifying properties of that class are known. That is, originally the investigator must have access to the full range of properties of an experience so that the essential properties may be differentiated from secondary or contingent properties. Thus, the object of study in phenomenological psychology is the full, structured complexity of experience as it is immediately given to the experiencing person. Phenomenological psychologists rely on the individual's unrestricted phenomenal description for access to this complexity. For example, "I clearly see a cat in the window" expresses the meaning of a mental act from the point of view of the experiencing person. "A cat in the window" expresses the object meaning of the act and "I clearly see" expresses the way that meaning is given to the person. Such phenomenal description in the linguistic form is the medium for phenomenological research.

At issue in the choice of this medium is whether the complexity of experience as given is more effectively provided by unrestricted phenomenal description than by any other means. Most traditional research assumes knowledge of the identifying properties of certain classes of experience. Consequently, it is justifiable to ask pointed questions, e.g., "What did you see in the window?", or to ask for ratings of known attributes of the experience, e.g., "How clearly did you see it?" In contrast, phenomenological psychologists insist on the full complexity of phenomenal descriptions so that those aspects of experience which do not fit the investigator's preconceptions are not prematurely removed from consideration as possible identifying properties of a class of experiences.

There is no reason to pretend that minimally restricted verbal descriptions of experience will always provide optimal protrayals of immediately given experience. Although exactly when phenomenal descriptions are valid is a question to be answered empirically rather than in principle, Ericsson and Simon (1980) provided a preliminary outline of those circumstances. For example, retrospective descriptions that tax memory and concurrent descriptions that alter ongoing experience may not be optimal for the phenomenological enterprise.

A second aspect of phenomenological procedures that follows from the goal of phenomenological research is that instances of a class of phenomenal descriptions must be examined for general, and perhaps, essential properties. It is necessary to determine whether phenomenological descriptions are essentially the same, i.e., share the same meaning. There are several liabilities in the reliance upon unrestricted phenomenal description to assess shared meanings. One liability is omitted information. For example, if one person's phenomenal description is "I clearly see a cat in the window" and another person's description is "There is a cat in the window," the latter omits reference to the sensory modality by which the cat is detected in the window. The

animal in the window may be either seen or heard, and, therefore, the reported experiences may differ in the manner in which the object meaning is given in experience. Another liability is the context dependence of meaning. In the preceding example, knowing that both persons are looking toward the window might warrant the conclusion that both *see* the cat in the window. A different context—perhaps where one person is looking away from the window but sitting close enough to hear distinctive feline sounds —might call for a different conclusion. Still another liability is uncertain synonymity. For example, if one person says, "I see a cat in the window," and another says "I see a feline in the window," even knowing context allows some uncertainty about whether "cat" is semantically equivalent to "feline."

A conservative analytic strategy for expressing semantic similarity in phenomenal descriptions is to form a paraphrase of two or more such descriptions that includes as many as possible of the semantic features that are shared or immediately implied (Kuiken and Wild, 1988). For example, one person's phenomenal description might be "I see a cat sunning itself in the window" and another might be, "There is a cat sitting in the window." Since the sensory modality by which the cat in the window is given in experience is not explicitly stated in the latter description, and, since seeing a cat sunning itself immediately implies seeing a sitting cat, the shared meanings might be paraphrased as, "There is a cat sitting in the window." Although phenomenologists vary in the extent to which they rely on context to infer implicit meanings, such a conservative strategy has much to recommend it.

A third aspect of phenomenological procedures follows from the fact that phenomenal descriptions of interest to psychologists are likely to be diverse and complex—so much so that there may be no readily identifiable, homogeneous class of experiences whose essential properties we wish to describe. Instead, even when a class of phenomenal descriptions has been cautiously identified, perhaps by a thoughtful investigator looking for similarity, the basis for inclusion in a class appears to be what Wittgenstein (1953) called "family resemblances." In other words, there may be no general or essential properties of a class of experiences; there may be only more or less characteristic properties of members of a class. Although Husserl (1913/1967) acknowledged the problem of more or less characteristic properties of certain classes of phenomena, he did not provide a formalization of procedures by which this problem could be addressed.

It is possible to resolve this problem by giving a formal definition of classes that have properties compatible with family resemblances. For example, consider a class of objects (K) such that (a) each has a large but unspecified number of properties [F(1), F(2), F(3) . . . F(n)] from the set of properties (G); (b) each F in G is a property of a large number of objects in the class; and (c) no F in G is a property of every object in the class (Beckner, 1959). Note that by

virtue of (c) no property is strictly invariant. Classes defined in this way are called *polythetic classes* (Sneath and Sokal, 1973). Techniques of numerical analysis exist for the formation of such classes and detection of their more or less characteristic properties. Briefly, if members of a set (which might include K as well as other such classes) are scored for the presence or absence of each of a range of properties (which might include the properties in G and more), functions such as a correlation coefficient or distance coefficient may be used to express the degree of similarity between any two members of the set. A number of cluster analytic algorithms are available that will classify together members that have a certain degree of mutual similarity. These steps form classes (including K) whose more or less characteristic properties may then be examined.

When cluster analysis is incorporated into phenomenological methods, a set of phenomenal descriptions may be systematically analyzed. Kuiken (1981) outlined the steps involved. Assuming that each phenomenal description includes several statements, e.g., "I see a cat sitting in the window; the cat is sleeping," an entire set of descriptions may be reviewed to find statements having a shared meaning, e.g., a meaning paraphrasable as "There is a cat in the window." Next, each phenomenal description may be represented by an array of dichotomous variables, each variable indicating the presence or absence of one type of statement. Then, a correlation coefficient or distance coefficient may be used to express the degree of similarity between any two phenomenal descriptions in the set, and cluster analytic algorithms (cf. Everitt, 1974) may be used to classify descriptions that have a certain degree of family resemblance. The statements that are more or less characteristic of each class of experiences may then be determined by comparing their frequency of occurrence across classes.

In research reported below, the preceding form of numerically aided phenomenological method was applied to a set of phenomenal descriptions provided by individuals viewing a particular work of art. Phenomenal descriptions of aesthetic experience were chosen for study because basic classes of experience in this domain are not established.

Method

Procedures

Twenty-six introductory psychology students participated in the study. Participants, run individually, were informed that they would be shown a slide reproduction of a painting and then asked to report aloud on their exprience of that painting. A practice slide was presented (on a rear projection screen approximately one meter in front of the participants' chair) to ensure that

participants understood the instructions to continually attend to the painting and concurrently report their experience of it. Participants were instructed to describe all aspects of their experience, including any reactions to the task per se. Then the test painting was presented for four minutes while participants' reports were tape recorded. The painting was a portrait of *Guilliano de'Medici* circa 1476 by the Florentine artist, Botticelli.

Protocol Analysis

Transcriptions of each participant's reports were divided into simple meaning units focused around a single aspect of the participant's experience. Generally, these meaning units were single sentences (e.g., "The doorway seems to be very large") or single sentences and immediately related qualification or elaboration (e.g., "The bird doesn't fit the whole picture; it doesn't seem to have anything to do with the man"). The mean number of meaning units per complete phenomenal description was 19.

In a second step, groups of similar meaning units were examined for the occurrence of a sentence that would be an acceptable paraphrase for each of the similar meaning units. Alternatively, a paraphrase was constructed. For example, "It has the shape of a human but it just doesn't look real"; "It doesn't look realistic at all; the person at least"; and "Oh, it's . . . it doesn't look real at all; doesn't look like it could actually be a person" fit a paraphrase, "The figure doesn't look real." The paraphrases themselves were called constituents. There were 117 such constituents. An additional 16 constituents were based upon experimenter-perceived relations between meaning units within a participant's report (e.g., "returns to topic previously discussed," or "changes reaction to or interpretation of the painting or aspects of the painting"), bringing the total to 133.

In a third step, a binary array was formed for each participant by assigning the value *one* when the participant's transcript contained a meaning unit paraphrased by the constituent, and the value *zero* when it did not. Preliminary examination of these arrays indicated that 33 constituents were nearly idiosyncratic, i.e., shared by no more than two participants. On the other hand, 24 constituents were represented in more than one quarter of the transcripts, and four constituents were represented in more than one half of the transcripts. None was universal or invariant.

In a fourth step, the distribution of interparticipant similarities was tabulated and compared to the distribution of similarity matrices produced when the original data vectors were randomized within each subject (Baker and Derwing, 1981). Differences between the mean correlation in the data matrix and five replications of the random matrices indicated that the data were not random but structured in some way. Consequently, interparticipant similarity

Table 1

Nondifferentiating Constituents

The man looks arrogant.
I don't know the purpose of the bird.
The man is looking down.
The man has a big (long) nose.
The bird blends into the man's sleeve.
There is a window in front of the man.
There is a line in the man's forehead.
The red of his clothes is bright.
I didn't notice the bird immediately.
The man appears rich.
The painting is from the 16–17th century.
The bird contrasts with the man in the painting.
The painting is a portrait.
I notice color contrast in the painting.
The bird does not fit.
I attribute ethnicity to the man.
I don't like the painting.
The man appears to be actually looking down his nose.
This painting doesn't fit a style.

matricies were cluster analyzed using several similarity indexes and several cluster algorithms to determine the extent to which they produced convergent results. Considerable convergence was obtained and only the results of Ward's method applied to correlation coefficients (Wishart, 1978) will be reported.

The simulation analysis described earlier and visual inspection of the dendrograms indicated the presence of three significant clusters of six, ten, and ten members. To detect those constituents that more or less characterized each cluster, several criteria had to be met. Each characterizing constituent had to (a) be present in at least two members of the cluster, (b) have a ratio of at least 2.50 for within cluster to outside cluster occurrence, and (c) have a significant correlation with at least one cluster membership dummy variable or a difference in the correlations between two dummy variables in excess of .50. Items failing to meet any of these criteria were placed in the category of nondifferentiating items *if* the frequency of occurrence of the item in the sample as a whole was at least five. The results of these analyses are listed in Tables 1–4 with the items in each cluster ranked in terms of frequency of occurrence within the cluster.

Table 2

Constituents Differentiating Cluster 1

I attribute a momentary state to the man (5*).
I am uncertain about the expression on the man's face (3).
The man seems evil (6).
I am thinking about where the man is standing (1).
Changes reaction or interpretation of the painting as the experience has progressed (4).
The artist showed good technique.
The bird and the man are facing different directions.
I am explicitly evaluating the artist's technique.
I am interpreting this painting by trying to tell a story about the man's location, actions, and expression.
I am reflecting on my own thoughts and reactions to the painting.
The branch on which the bird sits is unusual.
The man is neat and clean (7).
This painting is a portrait but it is ambiguous.
The man looks feminine.
The clothing is strange (but not backwards).
I am interpreting the painting as a statement about the psychology of the man (2).
Returns to a topic or reaction previously unresolved.

*Parenthetic ( ) numerals refer to corresponding meaning units from the example presented in Table 5.

Results

An examination of nondifferentiating items (see Table 1) gives an indication of the general reaction of participants to this painting. They described it as a portrait of a rich, arrogant man wearing bright red and looking down through a window. Participants sometimes did not notice the bird immediately, thought it blended into the man's sleeve, and could not understand its purpose in the painting, although participants sometimes noted that it provided contrast with the man.

In addition, participants in Cluster 1 (see Table 2) tended to express uncertainty about various facets of their experience of the painting (e.g., "I am uncertain about the expression on the man's face"), changed their reactions to it, and sometimes returned to unresolved facets of it. They attended to the figure's orientation in space (e.g., "I am thinking about where the man is standing") and favourably evaluated the artist's technique. They also attributed feelings or motives to the man, frequently in the context of a story about him. For easy reference, these participants may be called the exploratory storytellers, although labels may be misleading.

Table 3

Constituents Differentiating Cluster 2

I am stuck again (for the second time) (3*).
Moves from aspect to aspect without returning—in an organised, jumpy, descriptive manner (6).
I am stuck again (for the third time) (5).
The man appears religious.
The painting is simple.
I have dated the painting (1).
I note the white of the collar.
The figure fills the picture.
The man's clothes are trimmed with fur (4).
The man has a humorous expression.
The man is looking at something in particular.
I am considering what the wall is made of.
The man is stern.
I am stuck again (for the fourth time).
The man appears to be in the army (2).
The man's nose is a family characteristic.

*Parenthetic ( ) numerals refer to corresponding meaning units from the example presented in Table 6.

Participants in Cluster 2 (see Table 3) tended to have difficulty during their experience, repeatedly reporting temporary inability to continue the task (e.g., "I am stuck again") and otherwise showing discontinuity during their responses. They found the painting simple, and their comments were largely about specific picture fragments (e.g., "I note the white of the man's collar"). It should be noted that the group of items identifying this cluster appeared to contain incongruities (e.g., "The man has a humourous expression" and "The man is stern"). While this is consistent with these participant's difficulty in forming a unified interpretation of the painting, it also suggests that differentiable subclasses might have emerged in a larger sample. These participants may be called the disrupted particularists.

Participants in Cluster 3 (see Table 4) were united in finding the painting or its features odd or strange—even to the point of saying the man's head was backwards. This group also tended to focus on the formal features of the painting, especially colour, and refer to the painting as abstract. Comments on the artist's symbolic intentions were also frequent. This group may be called the abstract symbolists.

Table 4

Constituents Differentiating Cluster 3

The painting is strange.
The striking red is the first thing you see (4*).
The clothes are on backwards.
I am considering the color characteristics of the painting (2).
The artist had a purpose in painting this picture (8).
I note the blue of the background (sky).
The facial features are strange (3).
The open door has a symbolic significance.
The painting is odd (1).
The painting is unrealistic.
The bird is a symbol (9).
I am considering the red portion of the painting as a color characteristic of the painting (6).
The background of the painting is dim (7).
The man is closed (resisting).
The painting is a portrait influenced by the patron.
The facial area is painted with good technique.
My attention is drawn to the central figure (5).
The man's head is backwards.
This is an abstract painting.
I am interpreting the painting as a complex symbol of the artist's and looking for latent meaning.
I am considering the artist's perspective and/or sensibilities (independently of his ability).
Comments about structural technical aspects of the painting as a whole in an analytic manner.

*Parenthetic ( ) numerals refer to corresponding meaning units form the example presented in Table 7.

Tables 5–7 include the complete phenomenal descriptions of three participants, one from each of the three clusters. Each table allows comparison of segments from the original report with the corresponding constituents in Tables 2–4. Such comparisons indicate that the paraphrases defining the constituents maintained a great deal of the concreteness represented in participants' original descriptions. Also, comparison of the phenomenal descriptions in Tables 5–7 reveals that the discriminability of the classes of experiences identified here is subtle but definite. The reader may confirm whether discrimination of these three phenomenal descriptions is enhanced by familiarity with the emprically derived discriminating properties listed in Tables 2–4.

Table 5

A Phenomenal Description from Cluster 1

Well, there's a man standing right there(1*). He seems to be quite proud . . . seems to be very confident, but . . . not a very gentle person . . . seems to be quite cold (2). And . . . the door is open and it seems to me that he refused to go somewhere or something like that. And there's a bird there, which is a funny place for a bird. And then the man . . . he is not very handsome, with a big nose and . . . but something's very confident and . . . (3). It seems to me that he is in a very small place. Oh no, that's not the door, I guess; that's a window . . . looks like it (4). He turns his back against the window . . . seems to be refusing to do something (5). He seems to know what he is doing, I guess, because he looks very confident. And there is a . . . little bit of evil in him (6). I don't know, maybe he's up to something very obnoxious, very unfriendly. He reminds me of some, some, some villains in those old movies . . . movies about the nineteenth or sixteenth century. Guess that's about all I can think of. Let's see . . . he seems to be a nobleman of some kind. His dress is quite . . . quite elegant and his hair is very well combed and . . . (7). I don't know, I just don't like this person . . . seems to me that he despised everything; he looks down on everything in this world . . . he's too proud. Just don't like his character I guess. That's about all I can say right now. That bird is just not in the right place I guess. . . . It's there; I just don't know why it's there. Seems . . . seems to me that it is . . . I don't know, for no reason, you know, that the artist shouldn't put the bird in there, in the picture.

*Parenthetic ( ) numerals following selected sentences refer to corresponding characterstic constituents in Table 2.

Table 6

A Phenomenal Description from Cluster 2

Looks like it's a picture of the olden days, about the sixteenth or seventeenth century (1*). And there's a kind of bird in the bottom left hand corner of the picture. And the man is looking downwards; he looks like an officer of the army in the olden days . . . probably of the . . . some sort of French . . . revolution (2). In the background there's an open window. From my past experience, the man in the picture is probably at a loss . . . maybe he's an officer, and he couldn't figure out what he should do next for the army. I think that is all I can say about this picture for the time being. There's a long kind of . . . depression in his forehead and his nose is very hooked up. I think he's sort of . . . kind of cunning and foxy. He doesn't seem too truthful, looks more like a kind of crook. Right now I think I'm at a loss for words again. I feel I can't say any more about this picture (3). I can say that he's from the sixteenth or seventeenth century by looking at his clothes and his hairstyle. It looks pretty obvious that he's wearing a kind of cloak over his uniform of some sort. The colors are very pleasant; they're not that harsh. The colors are very well balanced. Shows a lot of contrast. On his clothes I notice that he has quite some bit of fur trimmings, some fur like on his shoulders and around the collar (4). I'm at a loss for words again. I don't think I have much to say (5).

*Parenthetic ( ) numerals following selected sentences refer to corresponding characteristic constituents in Table 3. Note that the complex constituent designated as (6) in Table 3 was also scored as present for the participant described here.

Table 7

A Phenomenal Description from Cluster 3

Well . . . it definitely would catch the eye. It's quite bizarre actually because it . . . well, everything's so exaggerated in this picture (1); the man's face, all the features on his face seem to be so exaggerated (2). It's highly unattractive . . . initially. . . . It appears he's . . . I think he's standing at a window frame and there's a bird sitting on the sill right, I notice, by him. It's not an unattractive picture actually. The colors seem more muted than the last one; they are . . . definitely the red frock is quite bright and the guy . . . your attention is drawn to that (3, 4, 5, 6) but the rest of the picture is really muted (7) . . . or the color. . . . And . . . it's more pleasant, I think, more pleasing with something like that . . . to back up, back it up. About the man himself, he's . . . his expression seems quite haughty, perhaps a bit snobbish . . . and I think this painting must have been done perhaps in the early seventeen hundreds but . . . the artist, even though they do not catch perhaps perfect features of the face, they caught the expression very well because he seems to be . . . each feature is radiating an expression of haughtiness, I think, . . . I'm a bit stuck right now. . . . Well I definitely like this picture, this painting, a great deal more than the last one . . . and I think perhaps it is because I can see more of the man's face, I see more expression than the last one; he seems to have some purpose . . . the characters in the other painting just radiated nothing (8). Let's see . . . I can't quite figure out what the purpose of the bird is. . . . It's funny the way, oh, the feathers are muted right into the sleeve of the man. Perhaps that has some bizarre symbolism but I don't think I could describe what it would be (9). . . . Right now I see . . . I think I'm getting more and more nervous as I get more and more stuck here. . . . It just occurs to me how greatly the styles of painting change, because this painting was probably very, very popular when it was done or within a recent era of when it was done but . . . today anything like this would be considered quite obsolete in the art world.

*Parenthetic ( ) numerals following selected sentences refer to corresponding characteristic constituents in Table 4.

Discussion

The numerically aided phenomenological methods presented here facilitate discovery of classes of experience which are not preconceived by the investigator but which, when identified, suggest meaningful hypotheses for subsequent study. For example, the interpretive stories characteristic of Cluster 1 may be more frequent when participants become empathically involved with the figure in the painting. Also, the confused particularism of Cluster 2 may be increased by manipulations of evaluation apprehension during the task or, conversely, decreased by the cultivation of aesthetic disinterestedness, as described in some contemporary theories of aesthetics (Bullough, 1963). Finally, the symbolic interpretations of participants in Cluster 3 may be related to stereotyped conceptions of aesthetic appreciation.

That such explanatory speculation comes easily and with some a priori plausibility is a function of two features of numerically aided phenomenology. First, the heuristic richness of the classifications derived in the present study depends upon the fact that the summary set of constituents characteristic of each cluster remains quite faithful to participants' experience as it was immediately given to them. The abstracted characterization of participants' experience is still sufficiently concrete for the investigator to easily elaborate possible determinants of these types of experience. Second, the heuristic richness of the types of experience derived here depends upon the fact that cluster analysis tends to derive natural rather than arbitrary classes (Sneath and Sokal, 1973). That is, cluster analysis (a) maximizes within-cluster relative to between-cluster similarity and, hence, discriminability between classes, and (b) creates polythetic classes with several correlated properties that may separately or jointly suggest relationships with other psychological states or events.

The Importance of Polythetic Classes

Numerically aided phenomenological methods also represent an improvement over previous attempts to characterize the essential properties of a set of phenomenal descriptions. First, the present study confirms that cluster analytic procedures provide classes of experience bearing a coherent family resemblance. In contrast, in a study which relied on intuitive judgments to form classes of protocols, Collier and Kuiken (1977) found that some frequently occurring constituents were flatly contradictory (e.g., "I liked the painting," "I disliked the painting"). Such incoherence suggests that their protocols were not instances of the same class of experiences. In the present study, such incongruities occurred only in Cluster 2 where participants indicated perplexity and confusion in other ways as well.

Second, the present study confirms that there may be no constituents characteristic of all phenomenal descriptions in a set, precluding identification of their invariant properties. Although a number of constituents were fairly common in the total sample of phenomenal descriptions (see Table 1), no constituents could be found or safely inferred in the phenomenal descriptions of all participants. Similarly, within each of the derived clusters, although some constituents were common, again no constituents were invariant. These results are incompatible with a conception of essential description which rigidly requires property invariance (e.g., Colaizzi, 1973).

One limitation of the procedures used in this study is that the constituents identified as characteristic of each polythetic class are general rather than essential properties of members of the class. The numerical procedures for classification and identification of constituents characteristic of each class are purely descriptive—they do not provide a means by which an investigator may differentiate general from essential properties of a class. However, this is a problem with polythetic classes that is independent of numerical methods. Although Husserl (1913/1967) prescribed free imaginative variation to differen-

tiate essential from general properties of a class, this prescription cannot possibly be used to discern essential properties of polythetic classes. Since no property of a polythetic class is necessary for membership in the class, imagining a member of the class without that property will not reveal whether that property is essential to the phenomenon.

Rigor Imposed by Numerical Aids

The numerically aided phenomenological methods demonstrated here prompt consideration of whether the quantitative procedures facilitate or hinder assessment of the full complexity of phenomenal descriptions. To consider this question, it is necessary to review the intended function of these numerical procedures. The first important function of these numerical procedures is to maximize within relative to between class similarity so that classes of experience are as discriminable as possible. In the present study, the cluster analytic algorithm used for this purpose classified individuals on the basis of their similarity as indexed by the correlations between participants' arrays of present or absent constituents. The second important function of the numerical procedures is to facilitate identification of the constituents that are more or less characteristic of class membership. In the present study, the criteria for identifying these constituents included correlations between the presence/absence of a constituent and a dummy variable indicating class membership.

Both numerical functions depend, in part, upon systematic calculation of correlation coefficients rather than upon informal observation of association or contingency. These systematic calculations are important because human observers do not reliably assess correlated occurrences without observational aids. For example, identification of constituents correlated with class membership is basically a comparison of two conditional probabilities, i.e., the probability of a constituent occurring given membership in a particular class compared to the probability of a constituent occurring given membership in any other class. That this comparison is difficult is indicated by independent evidence that (a) people tend to ignore the comparison and utilize only the frequency of a constituent given membership in a particular class (Smedslund, 1963); (b) people tend to overemphasize confirming cases, i.e., when a constituent is present for a member of a class or absent for a member of another class (Ward and Jenkins, 1965); and (c) people tend to overemphasize instances that are readily recalled (Tversky and Kahneman, 1974). By facilitating the systematic assessment of constituents correlated with class membership, numerical analyses mitigate against these common biases in human judgment. This aspect of the demonstration study should enhance the reliability of the results and replicability of the procedures.

Numerical Methods and Essential Structure

Of course, it is necessary to ask at what price enhanced reliability and replicability are obtained. One risk is that numerically aided phenomenological methods hinder descriptions of the essential structure of the phenomonal descriptions. Assessment of this possibility is difficult. Although identification of essential structure is a widely acknowledged goal of phenomenological investigations, the concept of structure remains obscure. If we assume that structure entails relations among constituents (e.g., where one constituent justifies another), it becomes apparent that the methods used in the present study *enabled* identification of essential structure but did not directly *determine* essential structure. Specifically, the methods used here facilitated identification of (non-relational) constituents that were correlated with membership in a class of phenomenal descriptions. The list of constituents correlated with class membership may be regarded as the *un*structured *collection* of constituents that are characteristic of the class. As examination of Tables 2–4 confirms, numerical analyses provided the collection of constituents but the relations among the constituents are not explicit as would be required for consideration of essential structure.

However, accurate identification of the collection of constituents correlated with class membership is a prerequisite for considering their relations and, therefore, their structure. Since a constituent must be present in order to be related in *any* manner to another constituent, structural relations between constituents require the simultaneous presence of two or more constituents in a phenomenal description. This information is provided by the numerical analyses which, therefore, lay the groundwork for structural analysis.

It should be emphasized that structural (relational) constituents *could* have been included in the numerical analysis—at the risk of unreliability. Unfortunately, relational constituents are often implicit in discourse (cf. Mann and Thompson, 1986). For example, justificatory relations between constituents (e.g., "I missed the bird in the corner of the painting *because* it was the same color as the man's sleeve") are often not stated directly (e.g., "I missed the bird in the corner of the painting. It was the same color as the man's sleeve"). Therefore, attempts to infer the presence or absence of such relational constituents may have led to unreliability in their judged presence or absence in the set of phenomenal descriptions. Our conservative emphasis upon constituent explicitness, more than any other factor, accounts for the unrelatedness of the constituents assessed in the demonstration study. Perhaps too frequently the lists of constituents seem like lists of marginally related properties of the descriptions studied.

Potential solutions to this problem come from sources that were only partly appreciated during the conduct of the present study. One approach to struc-

tural analysis involves development of constituents at different levels of abstraction. The constituents characteristic of clusters sometimes involve similar themes, e.g., "The man's clothes are trimmed with fur" and "I note the white of the collar." If several descriptions contain one or the other of these constituents but not both, separate scoring of the two constituents will introduce a negative relationship between them, resulting in separation of the descriptions in a cluster analysis. Since it is possible that the importance of these constituents is the meaning that they share ("I note details of his clothing"), the inclusion of a higher order constituent might be appropriate so that the descriptions would more likely cluster together. Although a small number (ten) of such higher order constituents were included in the present study, the inclusion of more higher order constituents might enhance detection of hierarchically related constituents and contribute to a structural analysis.

A second approach to structural analysis involves the development of constituents that describe fairly obvious relations between constituents (e.g., temporal relations). However, it should be noted that relations of this kind are frequently perceived by the investigator and dimly or not at all by the participant. We were initially reluctant to include such relational constituents because our goal was to remain as faithful as possible to experience as given to, and communicated by, the participants. Nonetheless, several (16) constituents were added which reflected some specifiable relations among constituents, e.g., "Returns to a topic previously discussed." In analyses not reported here, we found that these relational constituents did not alter the configuration of classes but did enhance their interpretability. These results suggest that further specification of the relations between constituents would be useful. One possibility is that recently developed procedures for discourse analysis (cf., Kuiken and Wild, 1988) will provide tools for systematically extending the structural complexity of the constituents considered for numerical analysis.

A third source of structural considerations may be causally related properties of the obtained classes of experiences. Brody (1980) has argued that the essential properties of a class are those inferred attributes which are causally related to other attributes of the class. For example, characterizations of biological classes have increasingly focused upon genetic makeup to define the essential properties of a species. Genetic makeup, of course, is causally related to the phenotypic attributes that enable superficial identification of the species. Before development of experimental genetics, biologists relied heavily on the assumption that more or less similar phenotypes were sufficient to infer a common genetic influence. More recently, experimental genetics has established the validity of many such inferences by identifying the nature of the causal links between genetic materials and phenotypic properties of species.

Although the success of the biologists' enterprise is no guarantee of similar success elsewhere, it is useful to consider the implications for phenomenological psychology. The search for essential properties of classes of experience may profitably begin with those inferred attributes which are causally linked to characteristic properties of phenomenal descriptions within the class. This, in fact, was the approach taken to clarify the polythetic classes identified in the present study. For example, both the particularism and dysfluencies of the participants in Cluster 2 may have been caused by evaluation apprehension. Evaluation apprehension was inferred because it provided a plausible account of the several properties characteristic of this cluster. However, only subsequent experimental study can establish whether evaluation apprehension is indeed causally related to the properties of this class of experiences. The present discussion suggests that hybrid experimental and descriptive studies may further phenomenological efforts to identify essential structure.

Conclusion

Despite these limitations, the results of the present study suggest three styles of experiencing art. It is unknown whether these styles of experience would also be found in a different population of participants, with additional paintings, etc. But, these issues in generalizability are inherent in all empirical research and not only in the type of research presented here. Perhaps numerically aided phenomenological methods will contribute to a rigorous and yet sensitive study of these more general questions.

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The Journal of Mind and Behavior
Autumn 1989, Volume 10, Number 4
Pages 393–412
ISSN 0271-0137

A Research Strategy for Studying Telic Human Behavior

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Numerous writers have recently called for reform in psychological theorizing and research methodology designed to appreciate the teleological, active agent capacities of humans. This paper presents three studies that probe individual's abilities to volitionally control their eating behavior. These investigations suggest one way that researchers might consider the operation of telic powers in human action. Rather than seeing teleological explanations as rivals to the more traditional causal explanations favored in psychological research, this paper elaborates a position that sees human volition as a causal force embedded in (and influenced by) the traditional causal influences studied in psychological research. Finally, the theoretical and methodological refinements suggested here and elsewhere are seen against the backdrop of a philosophy of science that sees change as a more gradual, evolutionary process, rather than the Kuhnian, revolutionary process.

New Ideas in Psychology recently devoted a subsection to Joseph Rychlak's challenge, "Can Psychology be Objective about Free Will?". Several important issues were raised in the ensuing dialogue that should be highlighted. First, Rychlak (1983a) elaborated upon several points he had articulated elsewhere (Rychlak, 1976, 1977, 1981), namely: the theory-method confound (closely related to the philosophical notion of the underdetermination of theory by evidence); the prevalent aversion in psychological research to telic theories as explanation of empirical findings; the preference for demonstrative rather than dialectical views of humans; and consequently, the failure by scientific psychology to be able to shed light on concepts such as free will, volition, consciousness, and so forth.

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