ACKNOWLEDGEMENTS

The author is extremely grateful to Dr. Jane Stewart and Dr. John Christian, who, by their considerable help and interest, made this thesis a pleasure.

Sincere thanks also go to Jim Winslow, Jan Mohammed and Diane Ludlow, for introducing the author to the wonders of the computer.

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# INTRODUCTION

The experiment to be reported in this thesis has two basic aims. The first is to explore the hypothesis that emotional response or affective value is a fundamental organizing agent in the cognitive structure underlying the perception of situations. The second aim is to compare the affective organization of subjects showing different levels of cognitive differentiation as measured by the number of dimensions they use in such perception.

In the introduction that follows, trait and situational models of personality will be contrasted with developing cognitive and motivational models. While the cognitive model stresses the perception of situations as a major determinant of behavior, the motivational model puts more emphasis on the affective or incentive valence of the situation. An approach which combines the concepts of perception and affect will be argued for.

Research in the area of the dimensions of perception and meaning will be reviewed, and the possible role of affect in these dimensions will be discussed. Problems in the study of the dimensions of situation perception will be presented in the context of a review of the literature in this area.

Models of Personality - The Interaction Between the Person and the Environment

A central problem in the field of personality has been to discover the factors underlying the apparent consistency over time of individual behavior. Indeed, it is the consistency and predictability of the behavior we observe in ourselves and others that leads us to postulate the existence of an entity or structure called "personality." Trait theorists (e.g., Allport, 1937; Cattell, 1950, 1957, 1965; Guilford, 1959) have attributed the consistency of behavior to stable, internal tendencies or traits. Thus behavior is explained by such constructs as achievement striving, dependency and introversion, which are thought to function in the same manner across different situations. "Personality" is seen as the constellation of different degrees of such traits or stable dispositions, and the assessment of them allows the prediction of behavior in different circumstances.

Psychodynamic theory also posits an internal stable psychological structure as the source of consistency. Freud (1953-1964), for example, postulated three central constructs, the id, ego and superego, forces that interacted with each other in lawful ways to produce behavior. While the main thrust of psychodynamic theory is on internal determinants of behavior, it is of interest to note, however, that in the concept of the "cathected object", i.e., one which has attained emotional significance for a person (Fine, 1973), there is an implicit recognition that there is an interaction between internal forces and objects in the external environment in the determination of behavior.

In contrast to the internalist perspectives of trait and psychodynamic theories, the situationist or external approach of behavioral

psychology ascribes the source of behavioral consistency to the previous reinforcement history of an individual in each specific situation he encounters. Thus the degree to which behavior can be predicted across situations depends upon the degree of similarity between stimulus configurations in each situation.

Both internalist and situationist views represent extreme alternatives that are gradually being replaced by changing theoretical ideas arising not only from cognitive approaches to personality (e.g., Bowers, 1973; Endler & Magnusson, 1976; Mahoney, 1974, 1977; Mischel, 1973), but also from contemporary motivational theory (see Bindra, 1976, 1977). The key concept in this developing model is that behavior results from an interaction between external situational factors, and internal cognitive and organismic ones. The precise nature of this interaction has for the most part yet to be clearly delineated, but the underlying principle is that of reciprocal causation in which the environment can be found to influence the organism, which in turn can influence the reaction to the environment, which then affects the organism, and so on.

Cognitive theorists tend to describe this interactive cycle in terms of perceptions and cognitions and their influence on behavior (Mahoney, 1977). In an elaboration of such a model, Neisser (1976) uses the construct of the "schema," as the internal organizing agent which specifies what kind of information will be taken in and interpreted. Schemata operate within the context of a "cognitive map" of the environment, and they direct behaviors such as perceptual exploration, locomotion and action. These in turn selectively sample the actual available situational information and modify the environment, thus producing changed perceptual input.

The consistency that is found in behavior thus becomes a function of stable and consistent ways of selecting, interpreting and treating situational information, all being considered "cognitive" activity. While cognitive theorists acknowledge the influence of motivational and emotional activity, there has as yet been little attempt to integrate in any explicit way this important realm of human functioning into contemporary cognitive personality theory.

In contrast, recent writings by motivational theorists (Bolles, 1972; Bindra, 1976, 1977; Solomon & Corbit, 1974) have emphasized the importance of knowledge about incentive objects in the prediction of behavior. For example, Bindra (1976, 1977) proposes a model which, although it contains many of the basic interactive elements of the cognitive model described above, is enriched by the explicit inclusion of motivational and emotional factors. He describes behavior as the result of the interaction between cognitive, acquired knowledge (including recognition of denotative aspects of the situation and a prediction of what is likely to occur in it) and affective and motivational processes that are stimulated by predicted incentive events and that also prime the organism selectively to attend to particular environmental cues. Thus "the selective observation of, and action in relation to a situational stimulus would depend on the momentary valence /meaning/ of that stimulus relative to other stimuli in the situation; and the value of this valence would depend on the type of central motive state generated in the animal by its momentary organismic state and the incentive stimuli predicted by the events in the situation" (Bindra, 1977, p.29).

A somewhat similar outlook - at least to the extent that the best

prediction of behavior is expected to arise from an assessment of both situational and intrapersonal variables - is held by Endler and Magnusson (1976) and other "Interactional" psychologists. In their case, the recognition of an interaction between organism and environment was derived from research into the cross-situational stability of anxiety as a "trait" (Endler & Hunt, 1966, 1968, 1969; Endler, Hunt & Rosenstein, 1962). Endler et al. (1962) had subjects rate a series of verbally described stressful situations on a number of items thought to be representative of anxiety responses. A variance components analysis of the resulting three-dimensional matrix (Persons x Responses x Situations) assessed the relative importance of the contributions to the variance of individuals, situations, responses and interactions. In this and ensuing research, it was found that the two-way interactions, particularly the interaction between persons and situations, contributed to more of the variance than did the person, situation, or response variables taken separately.

These findings, and similar findings obtained in studies of social behavior in children in different settings (Raush, 1965; Raush, Dittman & Taylor, 1959) have led Endler and Magnusson (1976) to the following theoretical formulations:

1) Actual behavior is a function of a continuous process or multidirectional interaction (feedback) between the individual and the situation that he or she encounters.
2) The individual is an intentional active agent in this interaction process.
3) On the person side of the interaction, cognitive factors are the essential determinants of behavior, although emotional

factors do play a role.

4) On the situation side, the psychological meaning of the situation for the individual is the important determining factor. (p.968)

Included among the person side-cognitive factors suggested by Endler and Magnusson are such things as behavior-outcome and stimulus-outcome expectancies in particular situations, and subjective stimulus values. On the situation side, they consider that it is the psychological meaning that a situation has for the individual that is the essential determinant of behavior.

It is not at all clear in what way subjective stimulus values and outcome expectancies can be differentiated from the psychological meaning of a situation. It has been known for some time that one, if not the primary, dimension along which judgements about the meaning of objects and events are made is evaluative, and concerns the "goodness" or "badness" of the stimulus for the perceiver. The second dimension appears to involve a judgement about the power of the stimulus relative to the perceiver, and must thus be based on some expectancies about how the stimulus will behave (Osgood, Suci & Tannenbaum, 1957). It is thus difficult to understand why the authors make a distinction between situation perception (in which the little research to date supports the relevance of Evaluative and Potency dimensions) and other "cognitive" factors.

Another questionable, although less surprising, element in Endler and Magnusson's formulations is their distinction between cognition and emotion. They imply, for example, that the subjective stimulus value is a cognitive factor, and therefore more essential in determining

behavior than an emotional factor would be. As will be argued later in this paper, the dimensions of perception, in particular the Evaluative dimension, appear to have a considerable affective-motivational component, analogous to Endler and Magnusson's subjective stimulus value factor. While the distinction between perception/cognition and affect/motivation is undoubtedly useful, it has for too long obscured the nature of the relationship between these two processes. The implication that one is more important than the other in determining behavior is, to say the least, premature.

Notwithstanding these problems, the model of Endler and Magnusson shares with the other interactional models that have been discussed a conviction that the meaning of a situation has for an individual is a major determinant in his behavior in it. While there is to date little research into the perception of situations, a methodology has been developed to study the perception of other, less complex, stimuli, and these methods and some of the resulting information have relevance for the study of situation perception.

## The Dimensions of Perception

Research into perception, whether it be psychophysical or phenomenological, has a long tradition of conceptualizing perception as something that could be described in terms of a limited number of dimensions. Titchener (1 ) viewed all sensation as reducible to three primary attributes: Quality, Intensity and Duration. Wundt (1897) proposed a three-dimensional structure of feelings: Pleasantness, Activation and Intentionality. More recently, considerable research using the Semantic Differential technique of Osgood, Suci and Tannenbaum (1957) has

consistently pointed to the existence of three dimensions of meaning: Evaluation, Potency and Activation.

As revealed by many different kinds of multivariate techniques, the number of cognitive dimensions used by individuals does appear to be quite limited. Shephard (1972) notes that "most applications of multidimensional scaling /MDS/ have yielded interpretable and sometimes even enlightening representations in no more than three and indeed quite often, in only two spatial dimensions" (p.2). Factor analytic techniques tend to yield more factors, sometimes as many as ten, but the number of such factors is still limited.

Although it is the content of cognitive dimensions that has received the most attention, there is evidence that the number of dimensions an individual uses has some significance. "Cognitive differentiation" is a term used to refer to the "number of cognitive categories with which an individual perceives or gives meaning to his world" (Christian, 1976, p.1). Using a multidimensional scaling task with significant others as stimuli, Christian (1976) found a significant positive correlation between cognitive differentiation as reflected in the number of MDS dimensions used by subjects, and ego development, as measured by Loevinger and Wessler's (1970) and Aronoff's (1971) sentence completion tests. Christian also found significant negative correlations between the number of dimensions and self-reported reliance on external cues for self-definition, and between the number of dimensions and performance speed on the Embedded Figures Test (Witken, Dyk, Faterson, Goodenough & Karp, 1962), another measure of the degree of external orientation. The number of dimensions used by subjects ranged from one to four.

The content of the dimensions of meaning derived from the Semantic

Differential technique of Osgood, Suci and Tannenbaum (1957) have, as a result of their apparent generality, become almost prototypical representations of the content of the cognitive dimensions that have been found in later studies. Osgood et al.'s method was to have subjects rate stimuli (words and concepts) on a large number of 7-point bipolar scales, each with polar adjectives such as "strong-weak" and "pleasant-unpleasant" at each end. (In the initial research, a very wide range of descriptive scales was drawn from Roget's Thesaurus, to avoid a priori conceptualizations of the "semantic space".) The rater marked the point in each scale that most nearly indicated the meaning of the stimulus concept for him. Across several studies, the subject populations were varied, as were the concepts judged, the type of judgements made, and the type of factor analysis used to treat the data. Despite these modifications, the same primary factors kept reappearing, and have since shown up in cross-cultural studies as well (e.g., Jakobovits, 1966; Osgood, 1962, 1964). The names of the factors or dimensions have been derived intuitively from looking at the common characteristic of the descriptors grouped into each factor.

The three dimensions, Evaluation, Potency and Activation, have been found not only with different statistical techniques, but also with a wide range of different stimuli. These include trait words (Rosenberg, Nelson & Vivekananthan, 1968), emotional response adjectives (Bush, 1973), interpersonal relations (Wish, 1976), musical excerpts (Wedin, 1972) and paintings (Berlyne, 1974).

Bush (1973) reported a study in which a total of 762 college students had scaled a total of 264 adjectives denoting feelings, giving ratings of similarity between all possible pairs of stimuli for analysis

by the Individual Differences Multidimensional Scaling (INDSCAL) method of Carroll and Chang (1970). INDSCAL provides a solution consisting of coordinates for a set of stimuli in a cognitive space of k dimensions, which is the task performed by all MDS analysis. In addition to this, however, INDSCAL provides a measure of the importance each individual subject gives to the dimensions found for the group.

The three dimensions found for the adjectives denoting feelings were interpreted as Pleasantness-Unpleasantness, Level of Activation, and Level of Aggression. Although a four-dimensional solution was indicated statistically, the fourth dimension was not interpretable, and even the third dimension was somewhat unclear. This problem is not uncommon in MDS research. Bush noted that the results were more in line with MDS studies of facial expression (e.g., Abelson, R.P. & Sermat, 1962; Osgood, C.E., 1966) than of self-reports of feelings (e.g., Nowlis & Green, 1965) which have typically yielded between 5 and 10 dimensions.

The measure of psychological relatedness which is the basic datum of MDS can be represented not only by similarity ratings, but also by the degree of co-occurrence that pairs of stimuli have in a sorting task. This approach was used by Rosenberg, Nelson and Vivekananthan (1968) to study the structure of personality impressions as reflected by trait adjectives. Sixty-nine subjects were asked to describe 10 different persons whom they knew, by selecting personality trait names from a list supplied by the experimenter. The matrix of trait co-occurrences thus obtained was treated with a MDS program developed by Kruskal (1964). Solutions of both two and three dimensions were considered possible. The two dimensions were labelled Good-Bad and Hard-Soft, with alternative denotative interpretations of Social Desirability and Intellectual

Desirability. The three-dimensional solution included Good-Bad, Hard-Soft and Active-Passive as the named dimensions.

In a study of the perceived dimensions of interpersonal relations, Wish, Deutsch and Kaplan (1976) asked 87 subjects to rate 44 different kinds of interpersonal relations (e.g., "between personal enemies," "between nurse and patient") on 25 bipolar scales (e.g., "very tense" versus "very relaxed"). Each scale provided a 44 x 44 matrix representing differences between all possible pairs of stimuli on that particular scale. These 25 matrices were then analysed by an INDSCAL program which yielded a four-dimensional solution. These dimensions were interpreted as cooperative/friendly vs. competitive/hostile, equal vs. unequal, socioemotional/informal vs. task-oriented/formal, and intense vs. superficial.

As is typical in studies of perceptual dimensions, the first dimension in the study by Wish et al. is basically evaluative. However, since the scales with the highest weights dealt with the degree of conflict in the relations, a more specific denotative interpretation, cooperative/friendly vs. competitive/hostile, was assigned. This draws attention to the important distinction that must be made between denotative and connotative levels of meaning, and to the fact that, as Osgood (1964, p.173) commented: "Contrary to my early expectations, these factors /the Semantic Differential factors/ are more reactive in nature than sensory, more broadly affective than discriminatively cognitive, and thus closer to connotative than to denotative aspects of meaning."

In general, the three dimensions appear to reflect an orienting process remarkably similar to the concept of "appraisal" developed by Lazarus (e.g., Lazarus & Averill, 1972; see also, Arnold, 1970) within

the field of motivation and emotion, and to have some similarity with Bindra's (1976, 1977) cognitive-motivational model of the organism-environment interaction. Lazarus describes appraisal as involving first an evaluation of the relevance/irrelevance of the stimulus and a judgement about its potential benefit or harmfulness. The second step involves a judgement about the forms of coping available for mastering anticipated harm or for facilitating potential benefits. Although it "cuts up the pie" differently, these two steps involve all the basic elements included in the three dimensions.

Lazarus, Opton and Averill (1970) state that emotions should be regarded as a function of the cognitive activity involved in the appraisal process. Leeper (1970, p.156) stated bluntly that "emotions are basically perceptions of situations." This viewpoint is clearly in disagreement with that of Endler and Magnusson (1976), who differentiate between cognition and emotion, and consider cognitive factors to be of more importance in the person-situation interaction (see p.5). It may be that when Endler and Magnusson make a distinction between cognitive and person factors on the one hand, and situation perception and situation factors on the other, they may really be making a distinction between "mind" and "emotion", between denotative and connotative levels of meaning.

## The Perception of Situations

Although the study of situation perception is relatively new, there are a few studies that have attempted by various methods to deal with the issue. These will be outlined in the next section. One of the primary tasks in such research has been to define what is meant by a

"situation." Pervin (1975) has pointed out that the terms "stimulus," "situation" and "environment" have tended to be used interchangeably in situation perception research. However, these terms can be more specifically defined in terms of the scale of analysis that is implied by each. A stimulus generally refers to a specific object to which an organism is attending or responding. A situation contains a configuration of stimuli and engages the organism's attention and behavior over a limited span of time. Thus a situation can be defined by who is involved, where the action is taking place, and the nature of the action or activities that are going on. In contrast, an environment consists of the total collection of situations that an organism encounters, and the relationships among them.

Another issue in the study of situation perception is that of stimulus sampling. Having defined a situation as something that has a specific time, place, participants and action, where does one look for a representative collection of situations that will be relevant to the population sample to be studied? Most psychological research in this area, because of the requirements for experimental control, has relied upon a standard set of conditions provided by the experimenter to be evaluated by all subjects. Thus in situation perception research, the experimenter draws up a list of situations he feels are relevant and presents them to his group of subjects. This approach has been used by Magnusson and others (Ekehammar, Schalling & Magnusson, 1975; Magnusson, 1971; Magnusson & Ekehammar, 1973; Magnusson & Ekehammar, 1975). In their studies, the experimenter provided a list of situations from a carefully defined and limited domain of situations, namely those thought likely to occur to a particular subgroup of subjects. For

example, Magnusson (1971) drew up a list of 36 situations students were likely to encounter in their academic life (e.g., "You are sitting and listening carefully to a lecture but do not understand a thing", "You are carrying out a joint group task together with fellow students"). Ekehammar, Schalling and Magnusson (1975) used a list of 24 situations assumed to represent four types of stressful situations, denoted: anticipation ("lining up for a vaccination"), pain ("having a wound stitched"), thrill ("seeing a horror movie") and boredom ("peeling ten pounds of small potatoes"). In this case the subjects were male army conscripts, aged about 20.

When it is the researcher who provides the sample of situations, the problem inevitably arises that not all of these situations will have relevance to any one subject. Thus, the researcher is asking the subject to reveal how he ascribes meaning to situations that may have little or no meaning for him. One way to deal with this problem is to have each subject generate his own list of situations. Another approach seeks to combine the benefit of a standard set of stimuli with that of using situations relevant to the subject. This is done by having a sample of subjects from the population to be studied provide a list of situations that occur to them, and the frequently occurring situations from this list are then employed as stimuli for another sample of subjects from that population.

An example of the use of this method can be found in Forgas's (1976) research on the perception of social episodes or situations. The goal of his study was to explore an empirical method for classifying social episodes on the basis of individuals' perceptions of them, in addition to comparing the perceptions of two different subcultures.

He first obtained a sample of representative episodes by asking subjects to give a detailed account of their interactions during the past 24 hours. For each interaction listed, subjects were asked to give at least two descriptive adjectives to be used later in the interpretation of dimensions. The subjects were 25 housewives and 25 undergraduates. For both groups, a collection of 25 of the most frequently nominated episodes was compiled, and a second sample of subjects from each group was asked to perform a similarity sorting task of these 25 episodes.

Using as a measure of similarity the number of times a pair of episodes was put into the same category, a multidimensional scaling and a hierarchical clustering analysis were performed on the data. In the scaling solution, perceived intimacy or involvement, and subject self-confidence of "knowing how to behave" were the two most important attributed differentiating episodes for both groups. It is important to remember here that the stimulus samples for both groups were different. That any similar dimensions should emerge from both is indicative of the generality of such dimensions.

Forgas compared the clustering or categorical analysis with that of MDS, and found the two representations to be closely related. He concluded that they could be regarded as complementary ways of interpreting the same episode structures, rather than as "correct" or "incorrect" alternatives.

Another approach to stimulus sampling, that of allowing individual subjects to supply their own samples, was described by Pervin (1976). He used free response methods originally developed in the area of person perception (Rosenberg, 1975). Four undergraduate subjects

were asked to make up four lists each. The first was a list of situations that had occurred fairly frequently over the past year, and that were of some importance to the subject. The second was a list of adjectives and traits describing each situation. The third was a list of how the subject felt in each situation, and the fourth list, how the subject behaved in each situation. Finally, using the last three lists, subjects were asked to rate the applicability of each situation trait, feeling and behaviour to each of the 25 or so situations in the first list. Thus each subject generated his or her own descriptive vocabulary of personally relevant feelings and behaviors which could then be applied to the unique list of situations.

The major purpose of Pervin's study was to investigate the ways in which a subject would change or remain constant in his feelings and behaviors across situations. Four factor analyses were performed for each subject - one of situations based on trait ratings, one based on feeling ratings, one based on behavior ratings, and one based on all three types of rating. It was found that subjects reported consistency across situations in some feelings and behaviors, but with other feelings and behaviors, the occurrence was highly situation-specific.

Most of the situations encountered by subjects could be objectively classified into one of a small number of categories: home-family, friends-peers, relation-recreation-play, work, school and alone. An analysis of the factors for trait ratings of situations suggested that subjects used a limited range of dimensions to perceive situations, and that there was considerable similarity across subjects in the nature of these dimensions, which were: friendly-unfriendly, tense-calm, interesting-dull and constrained-free.

In the studies of Forgas (1976) and Pervin (1976), there has been an attempt to tailor the stimuli, to a subcultural group in one case, and to individual subjects in the other. Although the studies are quite different from each other, it is of interest that the dimensions revealed in each study are similar to the original three Semantic Differential dimensions.

The final group of studies to be discussed in this section are those of Magnusson. He approached the problem of situation sampling by providing the situations for his subjects. In one of the first studies, Magnusscn (1971) performed a factor analysis on the similarity judgements made by three undergraduates of 36 situations within the academic setting. The study was later replicated with 12 subjects (Magnusson & Ekehammar, 1973).

It was found that the dimensions derived from the similarity judgements were similar across subjects, with both individual and group factor structures showing a clear and interpretable solution. Factors I and II contained, respectively, situations which were positive and rewarding, e.g., "Receiving praise for a report", and situations which were negative in character, e.g., "Having just been returned a lab report with negative criticism." Factor III contained situations characterized by passiveness, e.g. "Resting during a break in lectures," while Factor IV appeared to have social interaction as the common feature, e.g., "Eating lunch with some fellow students." Factor V, in the first study, appeared to involve the activity of the individual, alone or in a group, while in the second study this factor was ambiguous.

As is typical in such studies, the first factor or factors are

primarily evaluative, in the sense that there is an underlying pleasant-unpleasant polarity. In the two studies by Magnusson just described, almost all the situations in the first two factors could also be characterized as having to do with competence and achievement versus failure and performance demand. This points up one of the problems arising from the fact that, to date, studies of dimensions of perceptions have relied on the intuitive judgement of the researcher to supply an appropriate label for the dimensions found. It is easy for the reader of this literature to go through the situations grouped into one or another of the dimensions found in a study and come up with a completely different and subjectively more appropriate label for the dimension in question. It is perhaps time to find a way of studying the problem that will allow for a more quantitative approach to the content of the dimensions of perception.

The last study of situation perception to be reviewed here bears more directly than the others on the aims of the study to be described in this thesis. Working under the assumption that it is the meaning or significance of the situation for the individual that is of importance to an understanding of his behavior, Magnusson and Ekehammar (1975) hypothesized that there would be a systematic relationship between an individual's perceptions of a set of situations and his reactions to the same situations.

Subjects were 40 ninth-grade adolescents. The stimuli were 12 stressful situations classified a priori into four groupings: threat of punishment, e.g. "have just been caught pilfering"; threat of pain, e.g., "going to have an injection that will hurt"; inanimate threat,

e.g., "getting lost in the woods at nightfall"; and ego threat, e.g., "giving an oral report before the class." The perception of situations was assessed by a factor analysis treatment of a matrix of similarity judgements made on all pairs of stimuli. The resulting four factors corresponded with the four a priori groupings of situations. Thus subjects appeared to be agreeing with each other and with the experimenters on certain denotative aspects of the situational stimuli.

Reactions to situations were assessed by having subjects rate each situation according to how anxious they would feel in such a situation. A factor analysis of the data produced a three-factor solution in which the first three a priori groupings (punishment, pain and inanimate threats) were present, but situations associated with ego threat were spread out across the other three factors.

The hypothesis had been that reaction factors would match perception factors. The authors explained the discrepancy between the two by pointing out that the ego-threat situations all had in common a demand for achievement. While subjects could easily distinguish situations with a common feature of demanding achievement, they obviously differed in their reactions to such demands. They concluded on the basis of this study that since individuals differ in reactions to a situation which they perceive similarly, it is not always possible to predict an individual's reaction to a situation only from knowledge about his perception of it.

This study presents several difficulties. A major methodological problem is that subjects were asked to imagine how they would react in situations that they may never have encountered. The fact that adolescent subjects were used who may have had very little knowledge

about how they might react further complicates the problem. In addition, given that it was known at the outset that individuals differ in their reactions to the same situation, it might have been more appropriate to use an individual instead of a group analysis.

A second problem concerns the reaction inventory itself. It consisted of ten five-point scales representing "psychic anxiety" (e.g., "get feelings of insecurity") and "somatic anxiety" (e.g., "heart beats faster"). The reaction datum for each situation was the sum of all the ten scales, taken as a measure of the intensity of anxiety the subject thought he would feel in the situation. Quite apart from the problem of the validity of such anxiety scales, it seems questionable whether anxiety is a likely or an appropriate response to all the situational stimuli. Even the authors admit that not all subjects are likely to respond to situations demanding achievement in the same way.

There are, therefore, several practical reasons why this study was unable to demonstrate very satisfactorily a systematic relationship between perceptions of and reactions to situations, should such a relationship exist. On a theoretical level, the manner of execution of this study reflects the questionable cognitive-emotional dichotomy made by Endler and Magnusson (1976) in their exposition of "Interactional" psychology.

Magnusson and Ekehammar posit a causal relationship between perception and emotional response. Another point of view sees emotional response as an intrinsic part of perception. And with regard to situation perception in particular, Pervin (1976) noted that affect emerged in his study as an important basis for the organization of situations into perceived groups. He suggested that "we may organize situations not so

much in terms of cognitively perceived similar attributes but in terms of bodily experiences associated with them" (p.971). Pervin notes that Plutchik (1974) has also remarked on the role of affects as the basis for categorizing phenomena.

The Present Study

The purpose of the present study was to test the hypothesis that affect is a fundamental organizing agent in the "cognitive structure" underlying the perception of situations. Previous research in the area of situation perception has implicitly recognized the organizing role of affect; but has not dealt with the issue directly.

A major methodological feature was the use of a free-response approach to the problem of situation-sampling. This ensured that subjects had as stimuli situations that were relevant to them, and ones that they had already experienced.

Subjects were asked to describe briefly 13 interpersonal situations that they had experienced in the past year. They then made similarity judgements between all the possible pairs of situations; a multidimensional scaling analysis was performed on these data. After making the similarity judgements, subjects were asked to rate each situation on an inventory of emotional responses designed to tap how the subject had felt in that situation. The emotional response data for the group were factor analysed and each subject's raw scores for each situation were transformed into the reduced number of factor scores. Finally, for each subject, each set of factor scores was correlated with the situation positions of each dimension in that subject's MDS solution.

It was hypothesized that there would be significant correlations

between perception data derived from the MDS of situations and reaction data indicating the subjects' emotional responses in these situations. Such a relationship is to be thought of as reflecting the involvement of affect in the cognitive organization of situations.

An additional task was to assess whether the dimensions differed with respect to the amount of affect apparently involved in them, and to establish the content of these dimensions in terms of the specific factors derived from the affective response data.

The MDS program employed in this study provided an estimate of the error or "consistency" with which a subject treated each of the situational stimuli being scaled. The existence of a possible systematic relationship between stimulus error and particular affective responses was investigated.

Finally, groups of subjects using different numbers of dimensions in the MDS task were assessed for differences in their apparent use of affect in these dimensions.

## METHOD

### Subjects

The 27 female and nine male volunteers were drawn from summer evening classes in psychology, religion, English, and sociology at Concordia University. Many of them were employed full-time. Both the average and the median ages were 31 years, with a range from 19 to 52 years.

The subjects were told that they were participating in a study of how people perceive interpersonal situations, and that they would be given feedback about their own perceptions.

### Procedure

Subjects were tested individually, with an average testing time of two hours. They were told that the information they gave was confidential and that any written information would be identified by a code number only.

A session began by having the subject describe briefly 13 different interpersonal situations in which he or she had been involved with one to three other persons. The domain was restricted to interpersonal situations involving four people or less because it had been found in pilot work that dimensions resulting from the scaling procedure were more easily interpretable when this was done. Magnusson (1971) has made a similar recommendation, on the basis of his work.

A situation was defined for the subject as having a specific time, a specific place, major participants and a main action (Pervin, 1976). Subjects were asked to choose situations that were typical or representative of their interpersonal interactions, and each situation was rated on a scale of one to 11 on how typical it was for the subject. This rating, though not used in subsequent analyses, served to help ensure that the situations fell within a certain homogenous range of familiarity for the subject. Subjects were asked to choose situations that had occurred in the past year, and to identify all participants by their sex, age and relationship to the subject (e.g., husband, close friend, business acquaintance, etc.). An attempt was made to have subjects describe the main action as concretely as possible.

The task was somewhat structured in order to give subjects help in generating situations, and in order to sample different areas of their interpersonal lives. They were asked to describe situations from each of the following categories: home, family (if not living at home), friends, work and school. These categories were derived from Pervin (1976). The order of the categories was varied across subjects, but for any one subject an order was maintained, with one situation from each category being described in turn, with a repetition of the list up to a total of ten situations. For the final three situations, subjects were free to choose from any area of their lives. Although many subjects worried at the beginning that they would never be able to think up 13 situations, this was never a problem, and most subjects appeared to enjoy the task. It usually took about 45 minutes.

After the subject had described a situation, the experimenter gave it a brief descriptive title which was mutually agreed upon with the

subject. These titles were chosen so that they did not contain affective references, and were later used as the stimuli for the similarity judgements.

When 13 situations had been described and named, subjects were told about the similarity judgement task. They were asked to rate all possible pairs of situations for similarity/dissimilarity, using a nine-point scale in which 1 meant "very similar", 9 meant "very different", and 5 meant "no more similar than different". Subjects were told they could use any criteria at all for making their decisions, and that it was not necessary to try to be consistent when a pair of situations was judged for the second time (with stimuli being given in reverse order). They were asked to try to use all the numbers in the scale.

The similarity judgement task usually took about 45 minutes and involved a total of 156 judgements. Subjects were asked to request a break if they felt they were becoming tired or confused, and in addition the experimenter checked with the subject two or three times during the task to see if he or she would like to stop and take a rest.

Subjects were told that their response latencies would be timed, but that there was no need for them to try to respond in a hurry. In spite of these reassurances, it is possible that some subjects felt they had to answer quickly. Any effects from this would be likely to bias the data against the hypothesis. (Response latency data were not used in the present study.)

When the similarity judgement task was finished, subjects were asked to complete 13 questionnaires, each one carrying the descriptive title of one of the subject's situations. There were six different forms of the questionnaire, in which a total of 26 affective and other response

scales were given in a different randomized order.

The first side of each questionnaire consisted of 18 11-point scales representing possible affective responses that the subject might have experienced in the situation. These scales were spatial rather than numerical, consisting of eleven unnumbered slashes in a line, going from "not at all" at the left end to "extremely" at the right end of the line. These scales were introduced as follows: "Please describe your feelings in this particular situation by circling the appropriate slash in the line for each emotional response."

The 18 adjectives used were:

| | |
|---|---|
| angry | unloved |
| frustrated | happy |
| sad | friendly |
| depressed | loved |
| bored | pleased with yourself |
| anxious | amused |
| afraid | relaxed |
| helpless | confident |
| confused | involved |

The adjectives chosen for the questionnaire were based loosely on Nowlis's (1970) list of 12 mood factors, excluding those factors that did not seem to be basically affective (e.g., skepticism, etotism).

The reverse side of the questionnaire contained eight bipolar, 11-point scales, also unnumbered. These were:

"To what extent was this situation:"

| | |
|---|---|
| Pleasant . . . . . | Unpleasant |
| Formal . . . . . | Informal |
| Exciting . . . . . | Calm |
| Task-oriented . . . . . | Social |

"In this situation, to what extent did you feel:"

| | |
|---|---|
| You were getting what you wanted . . . . . | You were not getting what you wanted |
| Other people were reacting negatively to you . . . . . | Other people were reacting positively to you |
| You were in control of the situation . . . . . | Someone or something else was in control of the situation |
| You did not feel free to express your real feelings . . . . . | You felt completely free to express your real feelings |

These scales were in bipolar form primarily because it had been found that the task was too long otherwise. In this form it took about 20 minutes to complete. In the analysis, each of these bipolar scales was split into two scales which could be treated in the same way as the first 18 scales, making a total of 34 instead of 26 variables.

When testing was completed, subjects were asked to telephone the experimenter after about a week, when the computer analyses would be ready. At this time a second appointment was set for a feedback session, consisting of a discussion of the dimensions used by the subject. Information from these sessions was not used in the analysis.

Data Analysis

Of the various multivariate approaches that have been used to

study perceptual data, multidimensional scaling (MDS) has certain advantages not held by other methods. The data suitable for MDS analysis can be derived from simple similarity judgements between pairs of stimuli. The subject is not required to make his judgements according to experimenter-imposed criteria, and is in fact free to make his judgements in any way he wishes. He need not articulate, or even be aware of, the criteria he is using.

These similarity judgements, which are made between all possible pairs of stimuli, are treated as distances in Euclidean space. Given a set of n stimuli, a perfect representation or model of the distances between all pairs of points or of stimuli would require a structure of n-1 dimensions. This information is hard to visualize and is, in fact, of little more use than the raw data themselves. The purpose of MDS is to reduce these n-1 judgements to the underlying structure in a rigorous, quantitative way.

The dimensions in a MDS analysis are similar to the more traditional scales, such as those of temperature or mass, in that they attempt "to capture fundamental properties of the objects under study solely by setting them into correspondence with positions within a spatial continuum" (Shephard, Romney and Nerlove, 1972, p.1). To allow for the full complexity of the data, however, usually more than one, but less than five, dimensions are required.

One of the problems associated with using MDS is to decide how many dimensions should be retained to maximize the goodness of fit of the model, while keeping the number of dimensions as low as possible to maximize the interpretability of the structure. Unlike the MDS techniques of Shephard (1962) and Kruskal (1964), Ramsay's (1977) Maximum

likelihood Estimation Multidimensional Scaling method (MLMDS) allows for a statistical test to establish the model that best fits the data. In addition, since it makes more rigorous assumptions about the data, it can use the data more efficiently, providing a more suitable treatment of single subject matrices.

This method is also unique in permitting an estimate of the overall error involved in fitting the model to the data that is independent of dimensionality, i.e., one that does not decrease inevitably as the number of dimensions increases. An alternative form of MLMDS provides error estimates for each stimulus taken separately, thus reflecting the amount of consistency with which the subject treats each stimulus.

The major assumption made by MLMDS is that the error of the data points d around the predicted or fitted points d* is lognormally distributed. This means that the log of d assumes a normal distribution with a mean of log d* and a standard deviation $\sigma$. It happens that as the value of d* decreases, i.e., as perceived similarity increases, so does the dispersion or spread of the observations d around d*. This seems to reflect the fact that subjects are usually much surer of their judgements when two stimuli are nearly identical than when they are very different (Ramsay, 1977a).

The MLMDS program provides a plot of the relation between the observations d and the fitted values d*. When the lognormal distribution assumption is not being violated, the line is straight and the dispersion of the points about this line increases in proportion to the value of d*. This provides a check on the appropriateness of the model for the data.

An additional check is provided by a plot of the normalized

residuals against the quantiles of the distribution. The normalized residuals $(\log d - \log d^*)/\sigma$ can be ordered from smallest to largest, and they should have a normal distribution with a mean of zero and a standard deviation of one. When the ordered normalized residuals are plotted against the quantile distribution of a true normal curve, a straight line will be displayed if the lognormal distribution assumption has not been violated.

Although more difficult to verify, the MLMDS model also makes the assumption that replications and judgements from one pair of stimuli to another are independent.

With respect to the problem of whether the fit in k dimensions is significantly better than that in k-1 dimensions, Ramsay (1977b) found that $-2(\log L_{k-1} - \log L_k)$ has an approximate chi square distribution with n-k degrees of freedom. Log L, or the log likelihood, is the quantity that the MLMDS procedure seeks to maximize during the process of finding the best fitting solution for the data. Thus, for a three-dimensional solution to be accepted as more appropriate than a two-dimensional one, $-2(\log L_2 - \log L_3)$ would have to be larger than the chi-square value for n-3 degrees of freedom (n is the number of stimuli).

The unbiased standard estimate of error provided by the MLMDS model gives a measure of the degree of deviation of the data points d from the predicted points d*, and is unaffected by the number of dimensions. This error estimate reflects the overall degree of consistency maintained by the subject in his set of dissimilarity judgements. It was found by Christian (1976) to be negatively correlated with the number of dimensions used, the stage of ego development, and the degree of external orientation, in a study in which the stimuli were self and

significant others.

An alternative form of the MLMDS program permits, instead of an overall estimate of error, an estimate of the error associated with each single stimulus used in the scaling task. A large error associated with a stimulus indicates a high degree of "inconsistency" in the subject's treatment of that stimulus. In other words, the subject is not judging the stimulus in the way that would be predicted given all the other similarity relations in the scaling matrix.

In the present study, each subject produced his own list of 13 stimulus situations. The choice of 13 for the number of stimuli was a result of the decision to use a full matrix of similarity judgements, which provided two replications of all judgements made by a subject, thus increasing the reliability of the statistical analysis. It was found in pilot work that 156 similarity judgements based on 13 situational stimuli was more than enough to ask of any one subject.

Each subject's matrix of judgements was treated by an MLMDS analysis. A stopping rule for dimensionality was used in which a three-dimensional solution was retained in $-2(\log L_2 - \log L_3)$ was greater than the criterion of 23 ($p \leq .01$, $df = 10$). The two dimensions were retained where $-2 (\log L_1 - \log L_2)$ was greater than the criterion of 24 ($p \leq .01$, $df = 11$).

## RESULTS

A two-dimensional MLMDS solution best fit the similarity judgements of 18 subjects and three dimensions were required to fit the data best for the other 18. In the two-dimensional group (2D) the unbiased standard error estimate ranged from .199 to .395, with a mean of .312. The range for the three-dimensional group (3D) was .194 to .457, with a mean of .292. For all 36 subjects, the data appeared to adhere satisfactorily to the requirements of the assumptions made by the MLMDS model.

Once the dimensions had been extracted, the degree of association between these dimensions and the affective response data was determined. The first step was to reduce the number of variables in the affective response data. A principal component factor analysis (SPSS, type PA2) was performed on the group affective response data, using a varimax rotation. All factors were retained that had Eigenvalues greater than or equal to 1.0. In the unrotated solution, seven factors accounted for 65% of the variance. Figure 1 contains the Eigenvalues of the seven factors in the final rotated solution. In Table 1, each factor is listed with those variables that had a loading of .40 or more within it (see Appendix 1 for full table).

Factor 1 (F1) was characterized by anger and the absence of positive feedback from others. Factor 2 (F2) was clearly associated with the distinction between formal, informal, task-oriented and social situations. This factor was primarily cognitive and denotative rather

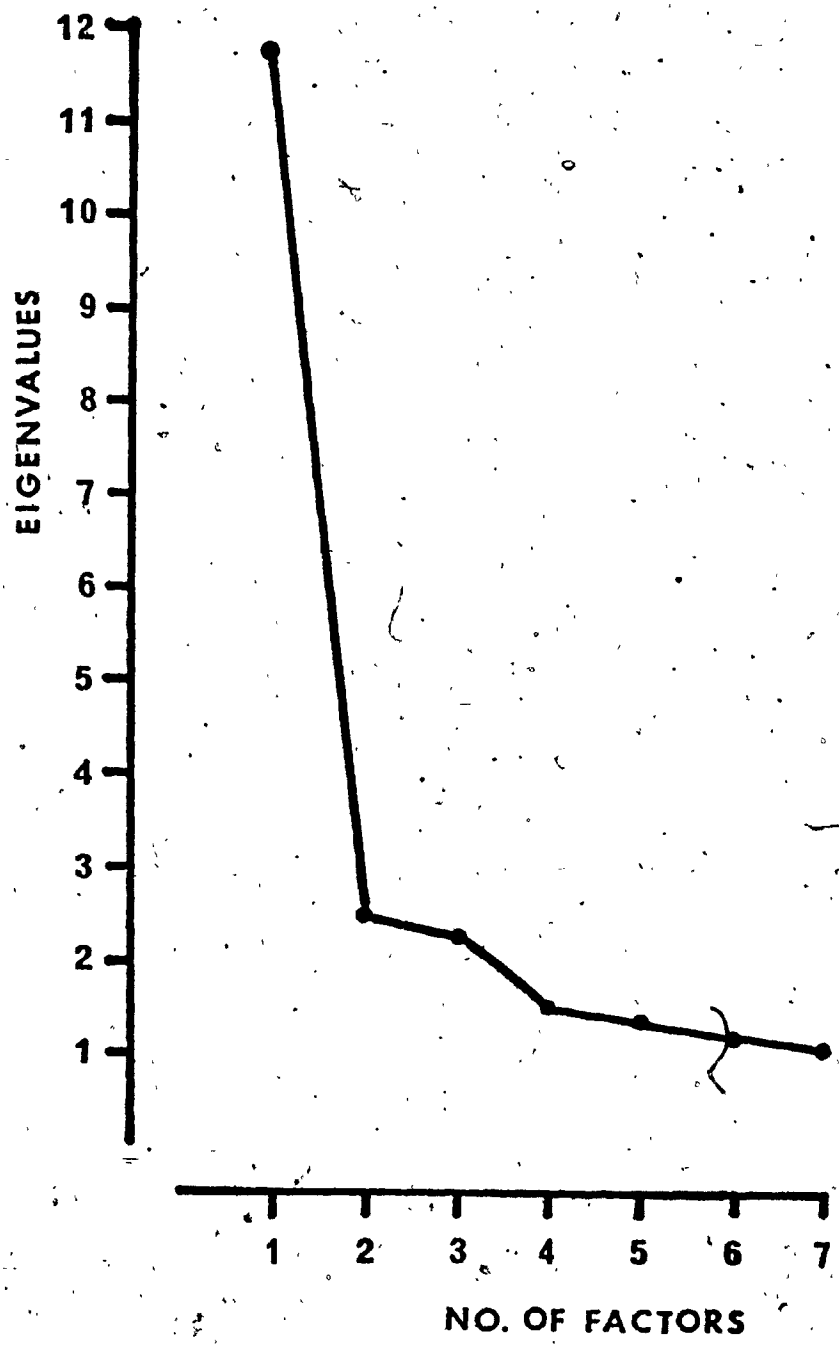



FIGURE 1: Plot of eigenvalues for principal components (PA2) factor analysis of 34 affective response variables.

TABLE 1

AFFECTIVE RESPONSE FACTORS

| Variable | Loading |
|---|---|
| **FACTOR 1** | |
| Angry | .718 |
| Frustrated | .627 |
| Negative reaction from others | .602 |
| Depressed | .578 |
| Not getting what you want | .568 |
| Unloved | .532 |
| Sad | .528 |
| Unpleasant | .461 |
| Positive reaction from others | -.432 |
| Friendly | -.419 |
| Pleasant | -.417 |
| **FACTOR 2** | |
| Task-oriented | -.798 |
| Social | .690 |
| Informal | .602 |
| Formal | -.531 |
| **FACTOR 3** | |
| Happy | .703 |
| Friendly | .689 |
| Pleased with oneself | .661 |
| Pleasant | .614 |
| Loved | .601 |
| Relaxed | .584 |
| Positive reaction from others | .575 |
| Getting what you want | .487 |
| Amused | .482 |
| Confident | .441 |
| **FACTOR 4** | |
| Not in control | .708 |
| In control | -.522 |
| **FACTOR 5** | |
| Anxious | .682 |
| Afraid | .621 |
| Confused | .534 |
| Helpless | .509 |
| Depressed | .497 |
| Sad | .490 |
| Frustrated | .428 |
| **FACTOR 6** | |
| Free expression of feeling | .746 |
| Not free expression of feeling | -.647 |
| **FACTOR 7** | |
| Exciting | .723 |
| Calm | -.696 |

than affective. Factor 3 (F3) consisted of positive emotional responses, including both feelings of acceptance and of accomplishment. Factor 4 (F4) reflected whether or not the subject felt in control of the situation. Factor 5 (F5) was characterized by negative responses associated with anxiety and problems with coping effectively in a situation. Factor 6 (F6) represented whether or not the subject felt free to express his feelings in the situation. Factor 7 (F7) reflected the degree of excitement or calmness experienced in a situation.

There were three major affective factors in this solution, F1 (Angry), F3 (Happy) and F5 (Anxious). The fact that there were two different kinds of negative affect factors and only one of positive affect may in part result from a larger number of negative than positive response variables in the initial data. However, it may also reflect a tendency for subjects to make more discriminations between feelings when they are unpleasant than when they are pleasant.

For each subject, seven factor scores were computed for each situation. A Pearson r was then computed between each dimension in a subject's MDS solution and each of these seven factor scores.

Each subject's group of correlations between dimensions and factor scores represents, in a way, a separate experiment. To display the findings of all 36 subjects or experiments, a frequency count of all correlations of p less than or equal to .05 was made, across subjects, within each of the 2D and 3D groups. Table 2 shows that there was an average of 2.94 (of a possible total of 7) significant correlations per subject for the first dimensions of the 2D group (p less than or equal to .015). For the second dimensions of this group, the average

TABLE 2

MEAN NUMBER OF PEARSON CORRELATION COEFFICIENTS BETWEEN DIMENSIONS AND FACTORS WITH PROBABILITY LESS THAN .05.

| Group | Dimension | Mean Number | Probability* |
|---|---|---|---|
| 2D | 1 | 2.94 | ≤.010 |
| | 2 | 2.00 | ≤.040 |
| 3D | 1 | 2.72 | ≤.016 |
| | 2 | 1.88 | ≤.060 |
| | 3 | 1.67 | ≤.070 |

*Probability associated with obtaining that number of correlations with $p \leq .05$ when maximum possible = 7.

number of significant correlations per subject was 2 (p less than or equal to .040). For the 3D group, the average number of significant correlations in the first dimension was 2.72 (p less than or equal to .016). For Dimension 2, the average was 1.83 (p less than or equal to .06), and for Dimension 3 the average was 1.67 (p less than or equal to .07). It can be seen that all subjects, on average, showed more than one significant correlation between each dimension and the factors.

The Pearson correlation is able to measure the degree of association between only two variables. However, it seems likely that the dimensions extracted from MDS would be complex enough that a better prediction of them would be obtained from a method such as multiple regression. This technique summarizes the relation between several predictor variables and a predicted variable. In the context of the present study, in which there was a low number of observations (13) relative to the number of predictor variables (7), multiple regression had to be used with some caution. For this reason, only the first two variables extracted from a stepwise multiple regression were considered.

Table 3 shows that, for the 2D group, the average multiple R between Dimension 1 and the first two variables extracted was .81 (p less than or equal to .004). For Dimension 2 the average multiple R was .74 (p less than or equal to .017). For the 3D group, the average multiple R for each of the three dimensions respectively was .82 (p less than or equal to .003), .75 (p less than or equal to .016) and .70 (p less than or equal to .034).

In both the Pearson correlation and the multiple regression analyses of the data, it is apparent that it is the first dimension that

TABLE 3

MEAN MULTIPLE REGRESSION COEFFICIENTS

BETWEEN DIMENSIONS AND FACTORS

| Group | Dimension | R | Probability |
|---|---|---|---|
| 2D | 1 | .81 | ≤.010 |
| | 2 | .74 | ≤.017 |
| 3D | 1 | .82 | ≤.003 |
| | 2 | .75 | ≤.016 |
| | 3 | .70 | ≤.034 |

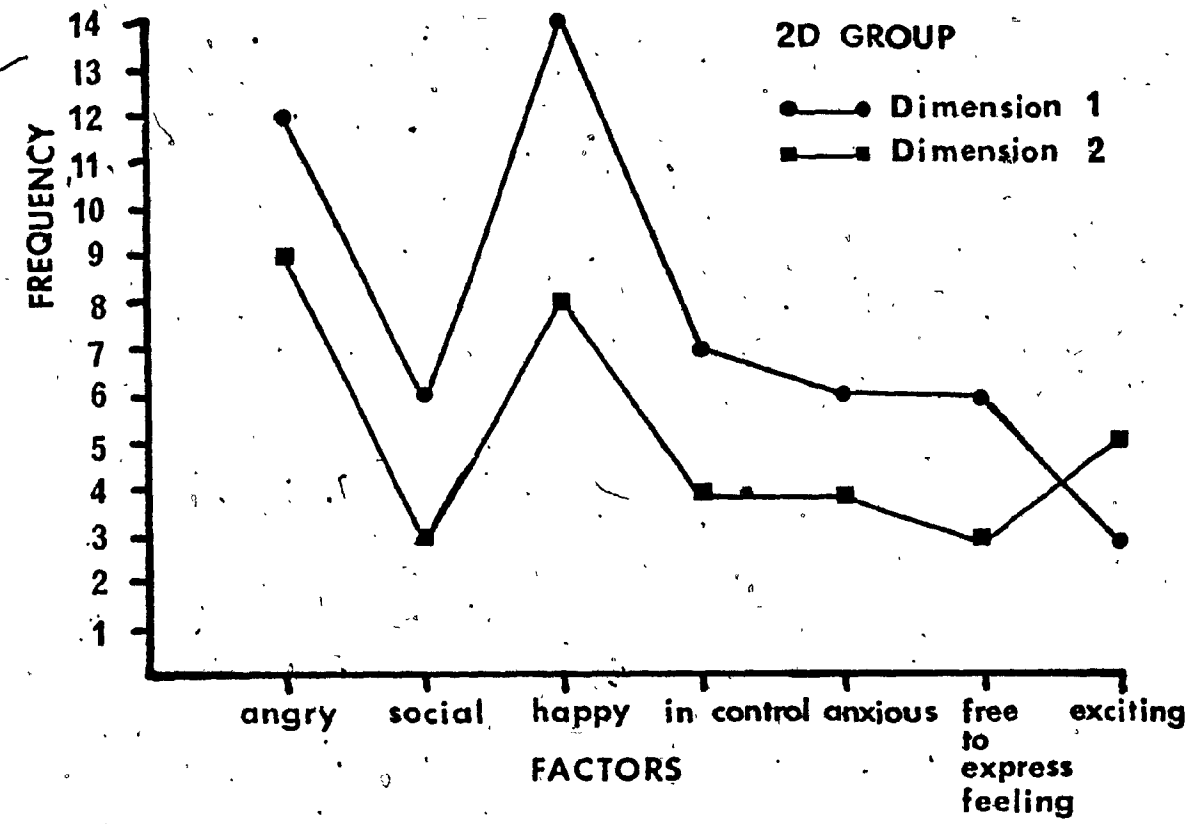
Note: Multiple regression coefficients are based only on the first two variables extracted from the stepwise solution.

has the strongest relation with affective response. There is a considerable decrease in both the average multiple R and the frequency of significant Pearson r's from Dimension 1 to Dimension 2 of both groups. There is a further slight decrease in both these measures from Dimension 2 to Dimension 3 of the 3D group.

A more detailed analysis of the content of the dimensions was provided by a consideration, for each factor within a dimension, of the frequency of significant Pearson r's between that factor and the dimension. For the multiple regression results, a frequency count was made of the number of times within a dimension each factor occurred as one of the first two variables extracted from the stepwise analyses. The two approaches to the question of dimension content showed several similarities, as can be seen in Figure 2.

In the 2D group, in both approaches, F3 (Happy) and F1 (Angry) show the highest frequencies of all the factors in Dimension 1. Dimension 2 showed almost an identical pattern to that of Dimension 1, except that in the Pearson r approach there was an additional slight emphasis on F7 (Exciting), while in the multiple R approach there was an additional slight emphasis on F5 (Anxious).

In the 3D group, in both approaches the highest frequencies occured for F1 (Angry), F2 (Social) and F3 (Happy) in the first dimension. In addition, the multiple R pattern also emphasized F5 (Anxious). In Dimension 2, both approaches showed the highest frequencies for F1 (Angry) and F7 (Exciting), with a high frequency also for F2 (Social) in the Multiple R pattern. The content of the third dimension is most clearcut from the multiple R results, which show the highest frequencies for F4 (In control) and F7 (Exciting). In the Pearson r results for the



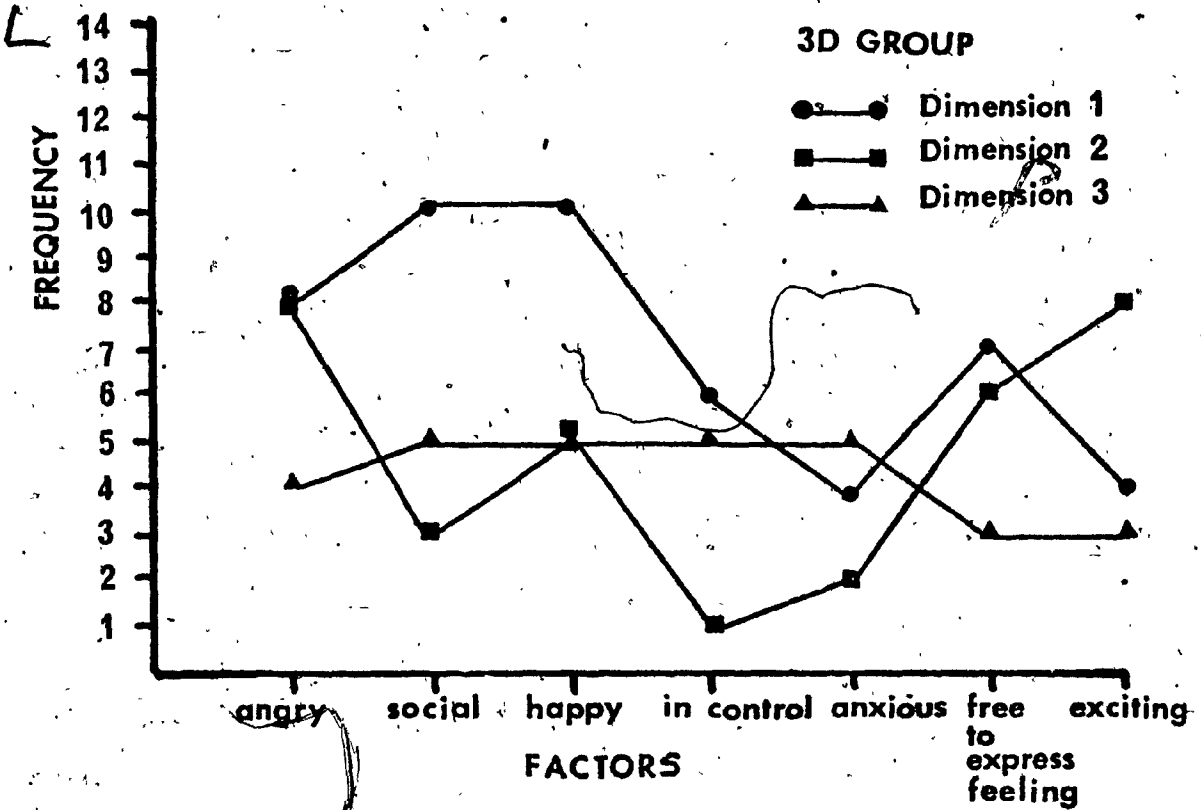




FIGURE 2a: Frequencies of Pearson correlation coefficients of probability less than .05, for each factor.

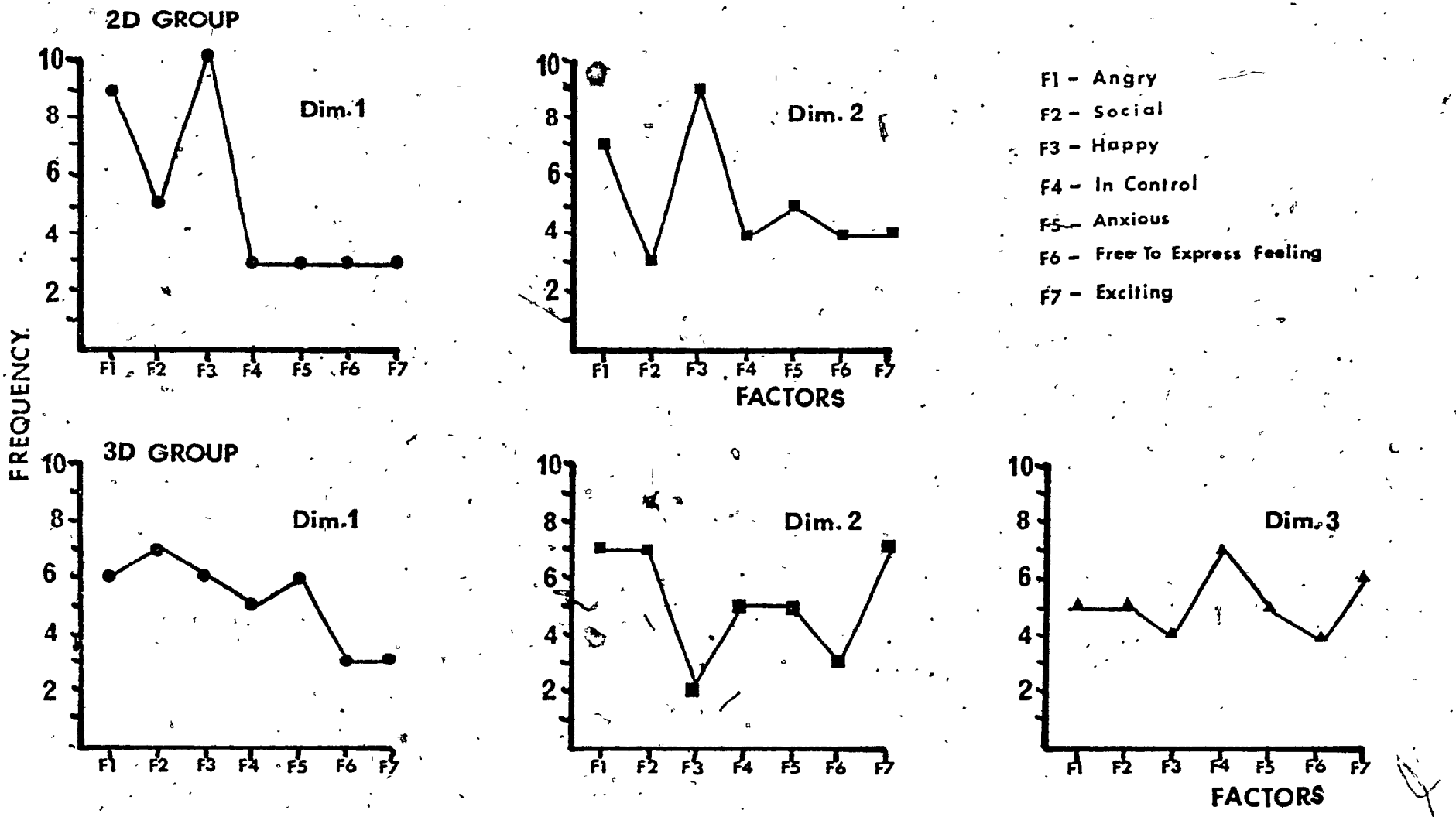



FIGURE 2b: Frequencies of occurrence of each factor as one of the first two variables in the stepwise multiple regression analyses.

third dimension, there is little difference among the frequencies of the seven factors.

To summarize the findings for the content of the MDS dimensions, the first point is that there was a much stronger association between a subject's affective responses in situations and Dimension 1 than between these responses and subsequent dimensions. In Dimension 1 for both groups of subjects, two of the major affective factors (F3 - Happy, and F1 - Angry) were the most frequent. In addition, F2 (Social) appeared to be important in the first dimension of the 3D group.

While the second dimension of the 2D group appeared to be much the same as the first dimension, for the 3D group there was an emphasis on F7 (Exciting) which had not appeared in Dimension 1. Dimension 3 of the 3D group showed an emphasis on F4 (In control). It is interesting to note that the multiple regression analysis of the data provided a pattern of the content of the dimensions which was more similar to the results of previous research than the Pearson r analysis, at least with respect to the third dimension. The three factors or dimensions frequently found in previous research are Evaluation, Arousal and Potency.

In order to deal with the question of a possible relation between individual stimulus error and affective response in a situation, the stimulus error estimates for each subject were correlated first with the seven factors, and then with each of the 34 response variables taken separately. Correlations of both types were not high, except for particular individuals. In spite of these low correlations, the group data provided some indication of a systematic relationship between affect and stimulus error that might bear further investigation.

Across the group of 36 subjects, it was found that all 15 negative affect variables taken together showed a higher frequency of positive correlations greater than .30 than of such negative correlations (twelve to three). On the other hand, the set of 13 positive affect variables showed a higher frequency of negative than positive correlations greater than .30 (ten to three). Thus although the effect was not marked, there was a greater tendency for error to increase when the stimulus situation had been described by negative affect than by positive affect. Conversely, error tended to decrease in the judgement of situations described by positive affect. The two variables that appeared to carry the most weight in this effect were Depressed, with the highest frequency of positive and no negative correlations greater than .30, and Relaxed, showing the converse pattern.

In order to see if stimulus error was associated with having ambivalent or "contradictory" feelings in a situation, two operational measures of ambivalence were obtained. These consisted of the absolute value of the difference between factor scores on F3 (Happy) and F1 (Angry), and F3 and F5 (Anxious). For each subject, these two new variables were correlated with the stimulus error estimates. Low numbers on the ambivalence variables indicate little difference between positive and negative affect factors, and thus a negative correlation is expected if ambivalence is associated with stimulus error. The average negative correlation across the two groups was -.25, indicating little association between ambivalence as measured here and stimulus error.

The correlation between affect and "cognitive" dimensions is one approach to the investigation of situation perception. Another approach

could be to ask the question, given different situations that are described by different individuals as being affectively similar, to what extent do they share common denotative or structural characteristics? In other words, are there any structural configurations common to situations that have been described as eliciting similar affect?

The data provided by this study present an opportunity for a preliminary exploration of this question. A total of 468 situations was described by the 36 subjects. In order to find a list of situations representative of the three major affective factors (F1 - Angry, F3 - Happy, F5 - Anxious), the one situation was drawn from each subject's list that had the highest factor score for that factor. Thus for each of these factors, a sample of 36 situations was obtained (see Appendix 2 for full list).

The 36 situations associated with each factor were grouped according to the apparent similarity of their denotative or structural characteristics. These groupings are not intended to be definitive nor mutually exclusive, and depend very much on the subjective biases of the author. Examples of situations from these groupings for each factor can be seen in Table 4. It is interesting to note that in only two cases did a situation fall into more than one factor grouping.

Eleven of the 36 situations rated high on F1 (Angry, Frustrated, Negative reaction from others) could be characterized as having the subject involved in an act of self-assertion of some sort. In 17 of the situations, the subject could be said not to be in control of the situation. This category could be further subdivided into: situations in which the subject was being "pushed around" by someone or something beyond his or her immediate control (eight situations); situations in

TABLE 4

EXAMPLES OF SITUATIONS FOR EACH AFFECTIVE FACTOR

Factor 1 - Angry, Frustrated, Negative reaction from others

| Subject | |
|---|---|
| | 1. Self-assertion |
| F 30 2D | Being assertive enough with work colleague (F 26) to ask her to do her share of work. |
| F 35 2D | S defends course description drawn up for a course she will be giving, challenged by colleague (M 35). |
| F 24 3D | S argues with fellow waitress (F 22) about whose orders are ready from the chef. Subject wins argument. |
| F 33 3D | Confrontation with supervisor (F 55), difference of opinion over budget. Supervisor finally admits S is right. |
| F 38 3D | Confrontation with rental officer (F 50) about being "ripped off" re. rent. |
| | 2. External control, 2.1 Being "pushed around" |
| F 31 2D | On the phone having to listen to mother talk on and on about her problems. |
| F 33 2D | Sister (39) tells S what she doesn't like about S's new boyfriend. |
| F 25 2D | Husband tells S what to do. S resents being ordered around. |
| F 26 2D | S feels obliged to be social facilitator in tense social situation at dinner with three flatmates. |
| | 2.2 Being "put down" |
| F 34 2D | Stepdaughter (17) refuses to obey S, is extremely rude to her. |
| F 21 3D | Seeing professor (M 33) about a paper. S is subjected to "putdown" by professor. |
| | 2.3 Frustration of plans |
| F 32 3D | In hospital after Caesarean birth of a son. Nurse (F 25) tells S she will have to wait to see baby. |
| M 29 3D | S about to do solo number at a concert (S in a folk group) when group leader (M 32) indicates set is over. |
| | 3. Rejection |
| F 30 2D | In a bar. Flatmate (F 24) and her boyfriend come in to bar, sit down without saying hello to S. |
| F 33 3D | Friend (M 31) tells S and her husband about a party given by mutual friends to which S and husband not invited. |
| | 4. "Moods", being hostile to another |
| F 21 2D | At wedding reception. Being rude to new acquaintance (M 24) and drawing attention to his stupidity. |

TABLE 4 (cont'd)

Factor 5 - Anxious, Afraid, Confused

| Subject | |
|---|---|
| | 1. Problem Solving |
| F 31 2D | Discussion about total amount of time husband should spend babysitting while S studies. |
| M 48 3D | Discussion with boss (M 56) about how to handle business crisis. |
| M 37 3D | Equipment from S's firm has failed. S gets facts straight about what happened, reassures client. |
| F 32 3D | Discussion with brother-in-law (38) about sister's drinking problem. |
| | 2. External Control, 2.1 Authority figures |
| F 20 2D | Long discussion with mother about S's wanting to leave home, which mother finds hard to accept. |
| M 33 2D | Music lesson with teacher (F 40). S submissive, suffers from performance anxiety, but accomplishes also. |
| M 29 3D | Having a job interview with potential employer (M 38). |
| | 2.2 Being told to do something |
| F 30 2D | Conflict with mother-in-law who felt S should call several people to tell them of S's father's death. S not ready to do this. |
| F 26 2D | Boyfriend (25) chastises S for not calling her mother on Mother's Day. S tells him not to tell her what to do. |
| | 3. Deprivation, potential loss |
| F 51 3D | A "one night stand". S feels deprived by this person (M 57) whose mind is entirely on sex. |
| F 24 3D | In hospital. Mother and S crying a few minutes after father's death after a lingering illness. |
| F 32 3D | S leaving city, has to give up her dog to a friend (F 34). |
| | 4. Not able to help with another's problem |
| F 35 2D | Discussion with close friend (F 60) about friend's marital problems. |
| M 37 2D | S unable to give emotional support to wife at a time when she needed it. |
| | 5. "Moods" or not interpretable |
| F 31 2D | A "one night stand". |
| F 33 2D | S expression frustration, lack of understanding, inability to be open to a teacher/friend (F 34). |

TABLE 4 (cont'd)

Factor 3 - Happy, Friendly, Pleased with oneself

| Subject | |
|---|---|
| | 1.1 Social Interactions with intimates |
| M 37 2D | Skinny-dipping and making love with girlfriend (33) on moonlit summer night. |
| M 33 2D | A quiet evening at home with wife (38) reading and talking. |
| F 32 3D | Flatmate (F 41) comes home tired from night course, is pleased to find S has planted petunias in flower box. |
| F 40 3D | On phone with sister (42) - a warm, loving, terrific conversation. (Sister calling from Holland where she lives.) |
| | 1.2 Social Interactions with friends |
| F 30 2D | A social evening getting "up to date" with sister (35) and sister's husband (33) whom S has not seen for a month. |
| F 21 2D | Getting stoned with friend (F 23), laughing and talking. |
| F 21 3D | An evening at a restaurant, eating, dancing and drinking with husband (24), and a couple of close friends (M 25, F 25). |
| | 1.3 Personal Discussions |
| F 31 2D | Discussion with husband (34) about setting a day for the whole family to be together. |
| M 28 2D | Driving home from movie with friend (F 25), discussing relevance of movie to own lives. |
| F 33 3D | At a restaurant with husband (34) and couple of close friends (M 35, F 33). Dinner and heavy discussion about politics and marriage. |
| | 2. Accomplishments |
| F 30 2D | S figures out how to solve a problem which supervisor (F 40) and manager (M 45) were sure could not be solved. |
| F 24 3D | S presents seminar to class of four students and seminar leader. S is confident, receives praise. |
| F 34 3D | Husband (35) decides to make supper as S hoped he would if she stalled long enough herself. |
| M 35 3D | A tape-recorded message from S's guru in India (M 52). Praise and recognition of S's spiritual efforts. |
| | 3. Being given something good |
| F 19 3D | S comes home, finds boyfriend has cleaned up apartment while she was gone. |
| | 4. Uninterpretable |
| F 20 2D | Little boy (8) from next door comes to visit, asks S if she loves him. S does not know what to say. |

which the subject was being "put down" or belittled in some way by another person, for example by having his or her wishes or opinions ignored (five); and situations in which there was some form of frustration of the subject's plans for gratification (six). Another smaller but still interpretable category was of incidents in which the subject was being rejected (five). A further three situations were primarily descriptions of the subject being hostile to another person without an indication of why.

The largest category for F5 (Anxious, Afraid, Confused) contained situations involving some form of "problem solving" behavior, usually in the form of a discussion with another person (ten situations). Five situations seemed to involve an authority figure of some sort, while in another four situations the subject was being told to do something by someone else. In six situations, the subject was suffering, or was about to suffer, a loss or deprivation. In five situations, another person had a problem with which the subject was unable to help very much. In four situations, the action was described only in terms of the subject's mood, or was not described in enough detail to establish the structure.

The situations in the F3 group (Happy, Friendly, Pleased with oneself) fell into two major categories: situations involving social interaction or communication with others (23); and situations in which the subject was accomplishing something (eight). The first grouping could be further subdivided into: social situations with intimates (eight); social situations with friends (seven), and discussions about personal feelings and ideas or involving personal honesty (seven). Another small category included situations in which the subject was

being given something good (two). A further four situations were not interpretable.

This attempt to group the situations associated with different affective factors was made primarily to suggest a methodology for establishing a taxonomy of situations. It introduced the problem of the possible difference between the "objective" structure of a situation and the structure as perceived by the subject. In addition, and certainly as important for the study of situation perception, is the question of whether there is a "prewired" lawful relation between certain structural characteristics of situations and the affective responses they tend to elicit, an idea not unlike that of the "releasing stimulus" of ethology.

Turning now to the comparison of the 2D and 3D groups, the first observation that can be made is that the average age of the 2D group was 27.3 years, while that of the 3D group was 31.7 years. Although this difference was not significant, it might be relevant if the number of dimensions used by a subject reflects his level of ego development (Christian, 1976), and if ego development is age-dependent, which seems likely.

Similar to findings by Christian (1976), the average unbiased standard error estimate was lower for the 3D group (average error, .292) than for the 2D group (average error, .312). One possible interpretation of this suggested by Christian was that the higher error for the 2D group reflected a generally less precise style of cognitive functioning. In addition, in the present study, the 2D group showed a higher frequency of significant correlations between stimulus error estimates

and affective response variables than did the 3D group (52 to 42). This could be interpreted as suggesting that the 2D group's consistency in making similarity judgements was more influenced by the affective associations of the stimuli being judged.

In terms of the content of the dimensions, it can be noted that there seemed to be less difference between the content of Dimensions 1 and 2 for the 2D group than for the 3D group (see Figure 2). In addition, the first dimension of the 3D group was more complex than that of the 2D group: as well as what appeared to be a basic affective evaluation in Dimension 1, the 3D group also showed an emphasis on F2 (social versus task-oriented) which is primarily a cognitive or denotative factor. This may be a reflection of a greater ability in the 3D group to make differentiations beyond the primary good-bad affective discrimination which seemed so pronounced in the 2D group.

Another approach to the comparison of the two groups is to look at factor analyses of the affective response data for each group taken separately (see Table 5). Seven factors were extracted from the data for both groups (SPSS, PA2, Varimax rotation). Only those factors were retained that had an Eigenvalue of 1.0 or more. In the unrotated solution of the 2D group, seven factors account for 68% of the variance. For the 3D group, seven factors accounted for 67% of the variance. The Eigenvalues for each group's factors are plotted in Figure 3.

A major difference in the factor solutions between the two groups is the presence, in the 3D solution, of a factor primarily involved with the subject's control or lack of control in a situation. In the factor solution for the 2D group, the two "control" variables had low loadings generally, suggesting that the 2D group tended not to describe

TABLE 5

FACTOR ANALYSES OF AFFECTIVE RESPONSES FOR GROUPS 2D and 3D

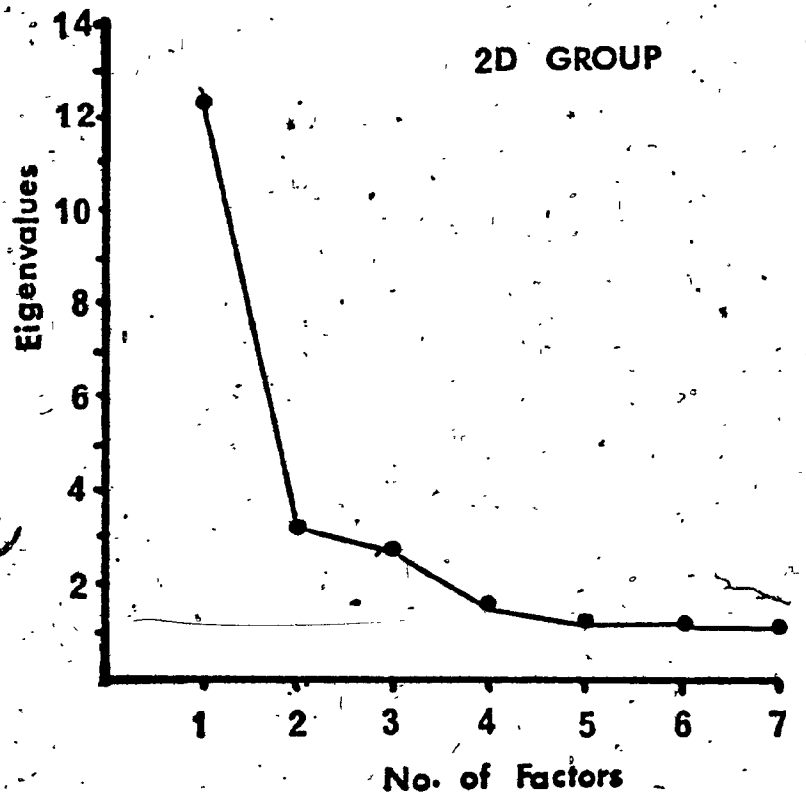
GROUP 2D

| | |
|---|---|
| **Factor 1** | |
| Depressed | .731 |
| Not getting what you want | .699 |
| Frustrated | .694 |
| Sad | .652 |
| Angry | .650 |
| Unloved | .650 |
| Negative reaction from others | .628 |
| Helpless | .615 |
| Confused | .480 |
| Unpleasant | .451 |
| Anxious | .423 |
| Positive reaction from others | -.406 |
| Not in control | .366 |
| **Factor 2** | |
| Happy | .789 |
| Friendly | .771 |
| Pleased with oneself | .737 |
| Pleasant | .721 |
| Relaxed | .643 |
| Positive reaction from others | .640 |
| Loved | .637 |
| Confident | .573 |
| Getting what you want | .545 |
| Amused | .502 |
| **Factor 3** | |
| Calm | -.705 |
| Exciting | .654 |
| In control | -.443 |
| **Factor 4** | |
| Free to express feeling | .692 |
| Not free to express feeling | -.627 |
| Getting what you want | .418 |
| **Factor 5** | |
| Anxious | .699 |
| Afraid | .558 |
| Confused | .437 |
| **Factor 6** | |
| Social | .698 |
| Task-oriented | -.666 |
| **Factor 7** | |
| Formal | .715 |
| Informal | -.492 |

TABLE 5 (cont'd)

GROUP 3D

| | |
|---|---|
| **Factor 1** | |
| Anxious | .655 |
| Afraid | .643 |
| Depressed | .627 |
| Sad | .613 |
| Confused | .571 |
| Helpless | .486 |
| Frustrated | .470 |
| Relaxed | -.448 |
| Happy | -.431 |
| Unpleasant | .412 |
| Amused | -.403 |
| **Factor 2** | |
| Task-oriented | -.810 |
| Social | .763 |
| Informal | .629 |
| Formal | -.555 |
| **Factor 3** | |
| Not in control | .684 |
| In control | -.536 |
| Pleased with oneself | -.401 |
| **Factor 4** | |
| Angry | .792 |
| Frustrated | .667 |
| Unpleasant | .531 |
| Depressed | .529 |
| Not getting what you want | .512 |
| Negative reaction from others | .483 |
| Friendly | -.473 |
| Sad | .462 |
| Pleasant | -.434 |
| **Factor 5** | |
| Free to express feeling | .710 |
| Not free to express feeling | .668 |
| **Factor 6** | |
| Loved | .588 |
| Pleased with oneself | .570 |
| Happy | .569 |
| Friendly | .567 |
| Positive reaction from others | .548 |
| Relaxed | .490 |
| Pleasant | .475 |
| Getting what you want | .412 |
| **Factor 7** | |
| Exciting | .691 |
| Calm | -.652 |



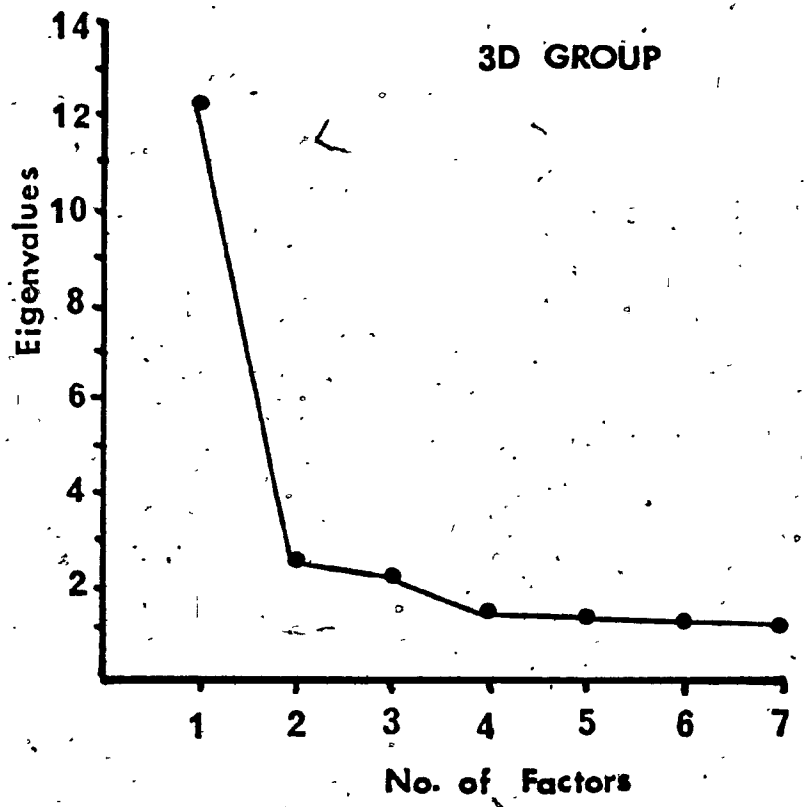




FIGURE 3: Plot of eigenvalues for principal components (PA2) factor analyses of 34 affective response variables for groups 2D and 3D.

situations systematically in these terms. One possible interpretation of this difference is that the 3D group tended to be more aware of the power relationships in situations than did the 2D group. This suggestion is reinforced by the high frequencies in the "control" factor in the third dimension of the 3D group, as revealed by the multiple R analysis of the data.

With respect to the relative lack of emphasis on F2 (Social) made by the 2D group compared to the 3D group, it might be thought that this resulted from a lack of a systematic use by the 2D group of the variables in these factors in the initial descriptions of the situations. However, the presence in the factor solution of the 2D group of two factors (Factor 6 and Factor 7) that involved these variables indicates that 2D subjects were able to use them in their descriptions of situations, but did not emphasize them in their criteria for judging similarities between situations.

Differences between the two groups may also be assessed by comparing the types of situations generated by subjects in each group. However, since a methodology for analyzing situations objectively has yet to be developed, this approach will have to remain a suggestion.

## DISCUSSION

Substantial correlations between the cognitive dimensions of situation perception and the descriptions of the affects elicited by the situations have been found in this study. Furthermore, the first dimension, of a total of two or three, appeared to be organized much more extensively in terms of affect than subsequent dimensions. Thus, it would appear that the cognitive dimensions of situation perception, obtained using a multidimensional scaling technique, are not homogeneous in the quantity of their affective content.

As has been found in previous research, this first dimension appeared to be a basic "it feels good" versus "it feels bad" evaluation, with "good" being associated with feeling happy, friendly, pleased with oneself and getting positive reactions from others in the situation. "Bad" was associated with being angry, frustrated and depressed, and getting a negative reaction from others. Another kind of "bad" - being anxious, afraid and confused, seemed relatively unimportant in the context of the first dimension.

Thus, in the first dimension of the perception of interpersonal situations, situations were being judged as similar or dissimilar on the basis of the positive or negative affect generated by the quality of the interpersonal interaction in the situation. In other words, the primary perceptual response to the stimulus situations was more emotional than cognitive. This gives weight to Leeper's (1970, p.156) statement, quoted earlier, that "emotions are basically perceptions of situations".

This statement must be qualified by a consideration of the effect of the number of cognitive dimensions used by an individual on the content of the first of these dimensions. From this study, it would appear that when a person uses three rather than two dimensions, the first dimension is in itself somewhat more complex than a simple bipolar affective discrimination. The affective assessment of the quality of the interpersonal contact appears to be enriched by a greater appreciation of the social nature and informality or task-oriented nature and formality of such situations. It should be pointed out, however, that social/informal and task-oriented/formal cannot be considered "purely" denotative in that both sets of terms imply particular affective-motivational sets.

The second dimension, and the third dimension from the 3D group, showed considerable decreases in the amount of affective involvement in them. In considering more closely the results of previous research, a decrease in affect in the second or third dimension could have been predicted if the "potency" dimension is interpreted as an assessment of the power balance in the situation based on learned expectancies of how the other person(s) in the situation will behave. Thus, the information required for this evaluation comes, not from a binary good-bad affective input, but from a more cognitively based input derived from past learning. That the assessment of control may be independent from an affective evaluation is suggested by the presence, in the factor solution of the affective response data of the 3D group, a factor concerned solely with control, with no associated evaluative affects loaded heavily on it.

The importance of the issue of control in situations can be

assessed from the samples of situations presented in Appendix 2. For both negative affect factors, a large proportion of the sample situations appeared to involve in their structure an attempt on the part of at least one participant to assert control. Examples of this include situations in which the subject is engaged in an act of self-assertion, "gaining control" over someone else, or problem solving, attempting to master a problem situation. In other situations, the "struggle" had already been lost and some external source of control was forcing an unwanted experience on the subject. (The growing emphasis on Assertion Training in clinical practice also bears witness to the fundamental importance of a person's need for a sense of competence and control in his life.)

To return to the issue of the relative importance of affect in cognitive dimensions, a major point to be made here is that it is perhaps time to stop looking at cognitive dimensions, at least as they are operationally defined by the use of multidimensional scaling techniques, as homogeneous scales for measuring meaning. An implicit attitude very common in research in this area is that the factors or dimensions of perception are homogeneous in the sense that they are analogous to, for example, different colors in a spectrum - the wavelength of light for each color may be different, but the "currency", i.e., light waves, is the same for all. While a distinction may be made between the connotative or denotative levels of interpretation of the content of dimensions (e.g., Rosenberg et al., 1968), each dimension is implicitly assumed to be drawn from the same source of information.

It is suggested here that the "currency" for cognitive dimensions is not the same for all dimensions. For the first dimension of

perception, the source of information appears to be primarily affective and motivational, and the basic currency is thus the quality of feelings and emotions. Another sort of information, usually present in the second or third dimension, is the quantity or intensity of affect. The source of such information may not necessarily be the same as for the quality of affect. Finally, a third sort of information is derived from the individual's previous learning of causal relationships in particular situational configurations. This provides a base from which action can be taken, given the information about the incentive characteristics of the situation with which such learning must be integrated for effective behavior.

When a subject is engaged in a series of similarity judgements of a set of stimuli, in a MDS task, these three types of information are blended into an immediate apprehension of the meaning of the stimulus for the subject. The subject does not usually consciously check, in turn, his feelings about the situation, the intensity of his feelings, and how he is going to cope with it, and so on. In the same way, when we see colors, we do not consciously check for the hue, saturation and brightness of the colors: this information is presented as an integrated whole, but has been built up from distinctly different types of information. An important question to be asked about cognitive dimensions is, what is the source and basic unit of the information contained in these dimensions? To continue to ask questions about the content of the dimensions, in the way that has predominated up to now, is unlikely to deepen our understanding of the perception of, and meaning of, meaning.

Nevertheless, questions about the content of the dimensions of

situation perception can be extremely meaningful in the context of individual assessment. In reporting a study such as this it is impossible to give the flavor of an individual interpretation of a dimensional structure as it is worked out by the person who created it. Many of the subjects who requested feedback on their MDS solutions found the discussion of the reasons for the clustering and spacing of situations in their dimensions to be extremely interesting and often revealing, causing them to think about their experiences in new ways. In addition, the initial similarity judgements provided some subjects with new perspectives on their experiences, by novel juxtapositioning of particular situations.

Multidimensional scaling has many potential clinical applications, in both therapy and assessment. As suggested above, the scaling task itself may be of benefit to some people. In addition, the freedom of the technique from the imposition of external criteria on a subject's judgements makes it very suitable in an assessment context. Undoubtedly, the discussion of a person's dimensional solution of a set of stimuli, such as situations or significant others, can be an important learning experience for both the subject and the therapist. In this sense, assessment and treatment are combined in a manner encouraged by Mischel (1977, p.248): "An increasing merging of personality measurement with therapeutic change-programs strikes me as one of the more promising elements in the field." In addition, the unique features in Ramsay's (1977) MLMDS programs, namely the overall unbiased estimate of error and the individual stimulus error estimate, also hold promise as assessment tools.

Given that one aspect of situation perception as revealed by

multidimensional scaling is an organization of stimuli according to their incentive value, one practical application of the technique might be in the area of Assertion Training. Situations in which the client is described in different roles where self-assertion would be appropriate could be used as stimuli to be scaled by the client. The resulting dimensional structure would reveal which situations are difficult and aversive for the client and those in which he is more comfortable. The technique could be used at a later time, after training has occurred, to assess changes in the affective value of previously difficult types of situations. Such an assessment would be an improvement over the more typical like-dislike checklist technique in that it involves fewer pressures from, for example, social desirability considerations, requiring only a judgement of the degree of similarity between stimuli, with no need to say why they might be similar.

Such a use of MDS would be considerably facilitated by the development of methods for analyzing situations denotatively in terms of their structure. The fact that we talk about putting together a list of situations in which self-assertion would be appropriate does suggest that whether or not we can at present describe these situations in terms of structure, they may well have common structural features, such as, for example, common power relations and contextual features, even though the actual situations and stimulus elements are quite different.

It was with the aim of trying to find such common structural elements that the analysis of situations associated with particular affective response factors was carried out in this study. Similar attempts to find the critical features of situations eliciting emotive

or motivated behaviors have been made by ethologists and those interested in emotional development. For example, in the area of the study of aggression, specifying the overall features of the environment in which the organism finds itself has proved very important. When an animal is at home, on its own territory, the sight of a stranger may elicit aggressive attack. The same stranger seen by an animal exploring a new environment may elicit fleeing or "cowardly" retreat. Likewise, those studying the responses of children to novel stimuli in their environments have been studying the effects of manipulations of the contextual cues on a child's tendency to explore. While recognizing that the effectiveness with which any particular environment will elicit a response will depend on individual differences based on both constitution and past experience, some general statements have emerged about the defining characteristics or critical stimulus feature of situations.

One possible preliminary approach to this question in the context of interpersonal situations has been suggested in the present study. Situations were described by subjects in terms of when, where, who and what features of them and then were described by the same subjects in terms of the affect they had elicited. Situations were then grouped together that had been described by subjects in similar affective terms. Such a method provided a collection of situations that could be further analyzed for structural similarities. For example, in these samples of situations, certain types of situations seemed to be particularly associated with certain types of affective response. A group of situations that had been described by subjects as eliciting anger and frustration could be characterized as involving the subject being

rejected by another person. Anxiety and fear, on the other hand, were associated with a group of situations in which it was the subject who had lost or was losing someone with positive value for him. Such associations are only suggestions, and need further research. It is possible that a theoretical base from which to begin work in this area might be Leary's (1957) interpersonal theory of personality, which also provides a system for coding interpersonal behavior. A major proposition of this theory is that particular categories of interpersonal stimuli tend to elicit particular types of responses. For example, helplessness would be predicted to elicit leadership responses in others.

Two major recommendations for the future of the study of situation perception have arisen from this study. The first is that situation perception, at least as revealed by multidimensional scaling, not be viewed primarily as "cognitive" activity. Instead, it should be seen as activity based to a considerable extent on emotion or affect. More precisely, judgements about situations are made primarily on the basis of the affect elicited by the situations. For individuals who use only one or two dimensions in such perception, emotional response may be the major component of their judgements. For others using more dimensions, information from non-affective, perhaps cognitive sources, appears to play an increasingly important role.

This restatement of the nature of situation perception represents one aspect of the "person" side of the person-situation interaction described by Endler and Magnusson (1976). On the "situation" side, research needs to be directed toward developing ways of analyzing the structure of situations that are independent of the subjective meaning of these situations. It may then become more possible to predict a

person's emotional-perceptual response to a situation from a knowledge of the structure of the situation only, and from this to predict the person's behavior in that situation.

# REFERENCES

Abelson, R.P. & Sermat, V. Multidimensional scaling of social expressions. Journal of experimental psychology, 1962, 63, 546-554.

Allport, G.W. Personality: a psychological interpretation. New York: Holt, 1937.

Arnold, M.B. Feelings and emotions. New York: Academic Press, 1970.

Aronoff, J. A test and scoring manual for the measurement of safety, love and belongingness, and esteem needs. Manuscript, Michigan State University, Department of Psychology, 1971.

Berglund, B., Berglund, U., Engen, T. & Ekman, G. Multidimensional analysis of twenty-one odors. Scandinavian journal of psychology, 1973, 14, 131-137.

Berlyne, D.E. Studies in the new experimental aesthetics: steps toward an objective psychology of aesthetic appreciation. New York: Wiley, 1974.

Bindra, D.B. Emotion and behavior theory: current research in historical perspective. In P. Black (Ed.), Physiological correlates of emotion. New York: Academic Press, 1970.

----------. A theory of intelligent behavior. New York: Wiley, 1976.

----------. The cognition-motivation connection: going beyond attention. Department of Psychology, McGill University, 1977.

Bolles, R.C. Reinforcement, expectancy and learning. Psychological review, 1972, 79, 394-409.

Bowers, K. Situationism in psychology: an analysis and critique. Psychological review, 1973, 80, (5), 307-334.

Bush, L.E. Individual differences, multidimensional scaling of adjectives denoting feelings. Journal of personality and social psychology, 1973, 25, (1), 50-57.

Carrol, J.D. & Chang, J.J. Analysis of individual differences in multidimensional scaling via an N-way generalization of "Eckert-Young" decomposition. Psychometrika, 1970, 35, 283-319.

Cattell, R.B. Personality: a systematic theoretical and factual study. New York: McGraw-Hill, 1950.

----------. Personality and motivation structure and measurement. Yonkers-on-Hudson: World Book, 1957.

----------. The scientific analysis of personality. Baltimore: Penguin Books, 1965.

Chaplin, J.P. Dictionary of psychology. New York: Dell Publishing Co., 1968.

Christian, J.D. Psychological differentiation and definition of the self: a multidimensional scaling approach. Ph.D. thesis, Department of Psychology, McGill University. August 1976.

Ekehammar, B., Schalling, D. & Magnusson, D. Dimensions of stressful situations: a comparison between a response analytical and a stimulus analytical approach. Multivariate behavioral research, 1975, 10, 155-164.

Endler, N.S. & Hunt, J. McV. Sources of behavioral variance as measured by the S-R inventory of anxiousness. Psychological bulletin, 1966, 65, 336-346.

----------. S-R inventories of hostility and comparisons of the proportions of variance from persons, responses, and situations for hostility and anxiousness. Journal of personality and social psychology, 1968, 9, 309-315.

----------. Generalizability of contributions from sources of variance in the S-R inventories of anxiousness. Journal of personality, 1969, 37, 1-24.

----------, & Rosenstein, A.J. An S-R inventory of anxiousness. Psychological monographs, 1962, 76. (17, whole no. 536.)

Endler, N.S. & Magnusson, D. Toward an interactional psychology of personality. Psychological bulletin, 1976, 83, (5), 956-974.

Fine, R. Psychoanalysis. In R. Corsini (Ed.), Current psychotherapies. Hasca, Illinois: F.E. Peacock Publishers, 1973.

Forgas, J.P. The perception of social episodes: categorical and dimensional representations in two different social milieus. Journal of personality and social psychology, 1976, 34, (2), 199-209.

Freud, S. The standard edition of the complete psychological works of Sigmund Freud. 24 vols. London: The Hogarth Press, 1953-1964.

Guilford, J.P. Personality. New York: McGraw-Hill, 1959.

Insel, P.M. & Moos, R.H. Psychological environments: expanding the scope of human ecology. American psychologist, 1974, 29, 179-188.

Jakobovits, L.A. Comparative psycholinguistics in the study of cultures. International journal of psychology, 1966, 1, (1), 15-37.

Kruskal, J.B. Multidimensional scaling by optimizing goodness-of-fit to a nonmetric hypothesis. Psychometrika, 1964, 29, 1-28.

Lazarus, R.S. & Averill, J.R. Emotion and cognition: with special reference to anxiety. In C.D. Spielberger (Ed.), Anxiety: current trends in theory and research, vol. II. New York: Academic Press, 1972, pps. 242-284.

Lazarus, R.S., Averill, J.R. & Opton, E.M. Towards a cognitive theory of emotion. In M. Arnold (Ed.), Feelings and emotions. New York: Academic Press, 1970.

Leary, T. Interpersonal diagnosis of personality. New York: Ronald Press, 1957.

Lupes, R.W. The motivational and perceptual properties of emotions as indicating their fundamental character and role. In M. Arnold (Ed.), Feelings and emotions. New York: Academic Press, 1970.

Loevinger, J. Ego development. San Francisco: Jossey-Bass, 1976.

Loevinger, J., & Wessler, R. Measuring ego development I: construction and use of a sentence completion test. San Francisco: Jossey-Bass, 1970.

Magnusson, D. An analysis of situational dimensions. Perceptual and motor skills, 1971, 32, 857-867.

----------. Consistency and coherence in personality. Reports from the Department of Psychology, The University of Stockholm, Number 472, June 1976.

----------, & Ekehammar, B. An analysis of situational dimensions: a replication. Multivariate behavioral research, 1973, 8, 331-339.

----------. Perceptions of and reactions to stressful situations. Journal of personality and social psychology, 1975, 31, 1147-1154.

Mahoney, M.J. Cognition and behavior modification. Cambridge, Mass.: Ballinger, 1974.

Mahoney, M. Reflections on the cognitive-learning trend in psychotherapy. American psychologist, 1977, 32, (1), 5-13.

Mehrabian, A. & Russell, J.A. An approach to environmental psychology. Cambridge, Mass.: MIT Press, 1974.

Mischel, W. Introduction to personality. New York: Holt, Rinehart & Winston, 1971.

Mischel, W. Toward a cognitive social learning reconceptualization of personality. Psychological review, 1973, 80, (4), 252-283.

----------. On the future of personality measurement. American psychologist, 1977, 32, (4), 246-254.

Neisser, U. Cognition and reality. San Francisco: W.H. Freeman & Co., 1976.

Nowlis, V. & Green, R.F. Factor analytic studies of the mood adjective checklist. (ONR Tech. Rep. No. 11) Washington, D.C.: United States Government Printing Office, 1965.

Osgood, C.E. Studies on the generality of affective meaning systems. American psychologist, 1962, 17, 10-28.

----------. Semantic differential technique in the comparative study of cultures. American anthropologist, 1964, 66, (3), 171-200.

----------. Dimensionality of the semantic space for communication via facial expression, Scandinavian journal of psychology, 1966, 7, 1-30.

----------. Exploration in semantic space: a personal diary. Journal of social issues, 1971, 27, 5-64.

----------, Suci, G.J. & Tannenbaum, P.H. The measurement of meaning. Urbana, Illinois: University of Illinois Press, 1957.

Pervin, L.A. Definition measurements and classifications of stimuli, situations, and environments. Princeton, New Jersey: Educational Testing Service, June 1975.

----------. A free-response description approach to the analysis of person-situation interaction. Journal of personality and social psychology, 1976, 34, (3), 465-474.

Plutchik, R. A structural model of emotions and personality. Paper presented at the meeting of the American Psychological Association, New Orleans, August 1974.

Ramsay, J.O. Maximum likelihood estimation in multidimensional scaling. Psychometrika, 1977(a), 42, (2), 241-266.

----------. MDS Manual. Department of Psychology, McGill University, 1977(b).

Raush, H.L. Interaction sequences. Journal of personality and social psychology, 1965, 2, 487-499.

----------, Dittman, A.T. & Taylor, T.J. The interpersonal behavior of children in residential treatment. Journal of abnormal and social psychology, 1959, 58, 9-26.

Reed, P.L., Lyman, B.E. & Koopman, R.F. Individual cognitive organization in the perception of live stimulus persons. Thesis, Simon Fraser University, 1972.

Rosenberg, S. A free-response description approach to implicit personality theory. Unpublished manuscript, 1975. Livingstone College, Rutgers University, New Brunswick, N.J.

----------, Nelson, C. & Vivekananthan, P.S. A multidimensional approach to the structure of personality impressions. Journal of personality and social psychology, 1968, 9, (4), 283-294.

Shephard, R.N. The analysis of proximities: multidimensional scaling with an unknown distance function. Psychometrika (I & II), 1962, 27, 125-139, 219-246.

----------, Romney, A.K. & Nerlove, S.B. Multidimensional scaling, vol. 1. New York: Seminar Press, 1972.

Solomon, R.L. & Corbit, J.D. An opponent-process theory of motivation: 1. Temporal dynamics of affect. Psychological review, 1974, 81, 119-145.

Titchener, E.B. Lectures on the experimental psychology of thought processes. New York: Macmillan, 1909.

Wedin, L. A multidimensional study of perceptual-emotional qualities in music. Scandinavian journal of psychology, 1972, 13, 241-268.

Wish, M. Comparisons among multidimensional structures of interpersonal relations. Multivariate behavioral research, 1976, July, 297-324.

---------, Deutsch, M. & Kaplan, S.T. Perceived dimensions of interpersonal relations. Journal of personality and social psychology, 1976, 33, (4), 409-420.

Witkin, M.A., Dyk, R., Faterson, H.F., Goodenough, D.R. & Karp, S.A. Psychological differentiation. New York: Wiley, 1962.

Wundt, W. Outlines of psychology. (Trans. by C.H. Judd.) Leipzig: Wilhelm Engelmann, 1897.

# APPENDICES

## APPENDIX 1

### VARIMAX ROTATED FACTOR MATRIX OF AFFECTIVE RESPONSE VARIABLES

| | F1 | F2 | F3 | F4 | F5 | F6 | F7 |
|---|---|---|---|---|---|---|---|
| Angry | .72 | -.15 | -.06 | .05 | .21 | -.03 | .09 |
| Frustrated | .63 | -.14 | -.32 | .14 | .43 | -.12 | .01 |
| Sad | .53 | .01 | -.19 | .08 | .49 | -.13 | -.10 |
| Depressed | .58 | -.01 | -.14 | .13 | .50 | -.05 | -.05 |
| Bored | .27 | .05 | -.15 | -.13 | .14 | -.20 | -.17 |
| Anxious | .31 | -.21 | -.24 | .03 | .68 | -.12 | .18 |
| Afraid | .19 | -.13 | -.13 | .05 | .62 | -.08 | .10 |
| Helpless | .38 | -.06 | -.21 | .37 | .51 | -.12 | -.01 |
| Confused | .28 | -.09 | -.20 | .21 | .53 | -.04 | .06 |
| Unloved | .53 | -.02 | -.17 | .11 | .22 | -.15 | .11 |
| Happy | -.37 | .20 | .70 | -.12 | -.29 | .06 | .12 |
| Friendly | -.42 | .22 | .69 | -.05 | -.13 | .02 | -.07 |
| Loved | -.20 | .24 | .60 | -.05 | -.04 | .20 | -.05 |
| Pleased with yourself | -.22 | .05 | .66 | -.32 | -.22 | .12 | .04 |
| Amused | -.25 | .20 | .48 | -.07 | -.25 | -.02 | .17 |
| Relaxed | -.31 | .23 | .58 | -.14 | -.36 | .15 | -.12 |
| Confident | -.05 | .01 | .44 | -.22 | -.32 | .17 | -.11 |
| Involved | .19 | -.11 | .29 | -.16 | .00 | .25 | .30 |
| Pleasant | -.42 | .20 | .61 | -.12 | -.26 | .15 | .14 |
| Unpleasant | .46 | -.12 | -.23 | .12 | .23 | -.02 | .12 |
| Formal | .10 | -.53 | -.08 | -.01 | .10 | -.14 | .09 |
| Informal | -.02 | .60 | .24 | .02 | -.14 | .19 | -.04 |
| Exciting | .13 | -.09 | .13 | .10 | .11 | .14 | .72 |
| Calm | -.01 | .03 | .09 | 0.03 | -.08 | -.02 | -.70 |
| Task-oriented | .07 | -.80 | .01 | .03 | .02 | .10 | .03 |
| Social | -.03 | .69 | .21 | -.08 | -.06 | -.01 | .01 |
| Getting what you want | -.30 | -.01 | .49 | -.32 | -.11 | .26 | .23 |
| Not getting what you want | .57 | -.04 | -.25 | .38 | .16 | -.16 | -.00 |
| Negative reaction from others | .60 | -.08 | -.26 | .17 | .11 | -.08 | .16 |
| Positive reaction from others | -.43 | .13 | .58 | -.17 | -.07 | .23 | -.02 |
| In control | -.08 | -.03 | .24 | -.52 | -.12 | .07 | -.11 |
| Not in control | .31 | -.12 | -.15 | .71 | .17 | -.17 | .02 |
| Not free to express feeling | .26 | -.11 | -.11 | .23 | .19 | -.65 | -.11 |
| Free to express feeling | -.15 | .17 | .32 | -.12 | -.11 | .75 | .15 |

# APPENDIX 2

## SAMPLE SITUATIONS FOR EACH AFFECTIVE FACTOR

Column A - Subject number
Column B - Sex of subject
Column C - Age of subject
Column D - Membership in 2D or 3D group

### FACTOR 1 - Angry, Frustrated, Negative Reaction from Others

| A | B | C | D | |
|---|---|---|---|---|
| | | | | Group 1 - Self-assertion |
| 1. | F | 30 | 2D | Being assertive enough to ask colleague at work (F 26) to do her share of work. |
| 4. | M | 21 | 2D | S is caretaker of community house where he lives. Confrontation with another member (M 21), telling him not to throw frisbee in house, to respect communal property. |
| 6. | F | 30 | 2D | Telling husband (31) she wanted to go downtown on her own. Husband hurt. |
| 8. | F | 35 | 2D | S defends course description drawn up for course she will be giving. Challenged by colleague (M 35). |
| 23. | F | 24 | 3D | S argues with fellow waitress about whose orders are ready from the chef. S wins argument. |
| 27. | F | 32 | 3D | Flatmate (41) objects to S's wish to extend hospitality to a newly-arrived overseas student for her first night in the country. |
| 30. | F | 32 | 3D | Angry at colleague (M 35) for seeming to treat S as subordinate. S asserts self, tells him "where to go". |
| 31. | F | 33 | 3D | Confrontation with supervisor (F 55), difference of opinion over budget. Supervisor finally admits S is right. |
| 32. | F | 34 | 3D | Having to ask daughter (8) yet again to brush her teeth. |
| 33. | F | 38 | 3D | Confrontation with rental agent (F 50) about being "ripped off" re. rent. |
| | | | | Group 2 - External control |
| | | | | Group 2.1 - Being "pushed around" by someone/thing beyond S's control |
| 3. | F | 31 | 2D | On the phone having to listen to mother talk on and on about her problems. |
| 13. | F | 33 | 2D | Sister (39) tells S she doesn't like S's new boyfriend. |

| A | B | C | D | |
|---|---|---|---|---|
| 14. | F | 33 | 2D | S feels pushed/demanded to produce skills and involvement beyond her capacity. Finally loses temper. |
| 16. | F | 26 | 2D | S feels obliged to be social facilitator in tense social situation with flatmates (F 28, M 28, F 28). |
| 17. | F | 25 | 2D | Husband tells S what to do, S resents being ordered around. |
| 19. | M | 48 | 3D | Wife asks S to do gardening, which he does not enjoy. Quarrel ensues. |
| 20. | M | 33 | 3D | Working in a library, being under pressure during a busy time. |
| | | | | Group 2.2 - Being "put down" |
| 2. | F | 31 | 2D | Boyfriend (32) accuses S of baiting guest at a party, trying to make guest look foolish. |
| 12. | M | 28 | 2D | Argument with flatmate (F 22) over minor detail. S's opinion ignored. |
| 18. | F | 34 | 2D | Stepdaughter (18) refuses to obey S, is extremely rude to S. |
| 24. | F | 32 | 3D | Client (M 20) becomes abusive to S when S unable to grant him an appointment with doctor for whom she works. |
| 25. | F | 21 | 3D | S subjected to a "putdown" by professor (M 33) when she goes to see him about a term paper. |
| | | | | Group 2.3 - Frustration of plans for gratification |
| 9. | F | 30 | 2D | Husband (31) disrupts S's schedule by watching TV baseball game, having promised not to. |
| 11. | M | 33 | 2D | Political discussion at dinner, consciously trying to avoid expressing own opinion because this will lead to argument with stepfather (55). |
| 21. | F | 32 | 3D | In hospital after Caesarean birth of a son. Told by nurse (F 25) she would have to wait to see baby. |
| 26. | F | 19 | 3D | S has broken leg. Angry and frustrated listening to brother (24) and boyfriend (21) talk about going to play basketball because S unable to go. |
| 29. | M | 37 | 3D | On canoe trip. S expects brother-in-law to catch hold of canoe, which he does not. Canoe tips, S falls in icy water. |
| 35. | M | 29 | 3D | S about to do solo number at concert (S in a folk group) when group leader indicates set is over. |
| | | | | Group 3 - Rejection |
| 5. | F | 20 | 2D | Tells boss (M 40) she is quitting, is disappointed because he didn't try to convince her to stay. |

| A | B | C | D | |
|---|---|---|---|---|
| 15. | F | 30 | 2D | In a bar. Flatmate (F 24) and her boyfriend (M 24) come in and sit down without saying hello to S. |
| 22. | F | 51 | 3D | A "one night stand". S feels deprived by this person (M 57) whose mind was entirely on sex. |
| 28. | F | 33 | 3D | Friend (M 31) tells S and husband (35) about party given by a mutual friend to which S and husband not invited. |
| 36. | M | 35 | 3D | Friend (M 28) just returned from long absence, appears confused and distant when S tries to welcome him back. |
| | | | | Group 4 - "Moods" - being hostile to another |
| 7. | F | 21 | 2D | At wedding reception, S is rude to a new acquaintance (M 24), drawing attention to his stupidity. |
| 10. | M | 37 | 2D | S refuses to allow ex-wife to get some of her belongings from apartment locker. |
| 24. | F | 40 | 3D | Temper tantrum with husband (35). |

FACTOR 5 - Anxious, Afraid, Confused

| A | B | C | D | |
|---|---|---|---|---|
| | | | | Group 1 - Problem solving |
| 3. | F | 31 | 2D | Discussion with husband (34) about total amount of time husband should spend babysitting while S studies. |
| 17. | F | 25 | 2D | Serious constructive discussion with husband (25). |
| 19. | M | 48 | 3D | Discussion with boss (M 56) about how to handle a business crisis. |
| 21. | F | 32 | 3D | S has to clear up confusion after fellow teacher (M 35) has mistakenly told mother (32) of pupil about her "problem child", when in fact child belongs to someone else. |
| 26. | F | 19 | 3D | S not sure whether or not to switch majors at school. Discussion with boyfriend (21) about this. |
| 29. | M | 35 | 3D | Equipment from S's firm has failed. S gets the facts straight about what happened, reassures client (M 50). |
| 30. | F | 32 | 3D | Discussion with brother-in-law (38) about sister's drinking problem. |
| 32. | F | 34 | 3D | Discussion with husband (35) about whether or not they should move out of Québec. |
| 33. | F | 38 | 3D | S arranges her schedule so that it will fit in with that of her husband (33). |
| 36. | M | 35 | 3D | Discussion with daughter (7) about how she and S can improve their communication. |
| | | | | Group 2 - External control |
| | | | | Group 2.1 - Authority figures |
| 5. | F | 20 | 2D | Long discussion with mother about S's wanting to leave home, which mother finds hard to accept. |
| 7. | F | 21 | 2D | Professor (M 37) flirts with S, says he would like to make a pass at her. |
| 11. | M | 33 | 2D | Music lesson with teacher (F 40). S submissive, suffers from performance anxiety, but accomplishes also. |
| 13. | F | 33 | 2D | Discussion with boss about problems and benefits in working together. |
| 25. | F | 21 | 3D | S subjected to a "putdown" by professor (M 33) when she goes to see him about a term paper. |
| 35. | M | 29 | 3D | Having a job interview with potential employer (M 38). |
| | | | | Group 2.2 - Being told to do something |
| 6. | F | 30 | 2D | Conflict with mother-in-law who felt S should call several people to tell them of S's father's death. S not ready to do this. |

| A | B | C | D | |
|---|---|---|---|---|
| 9. | F | 21 | 2D | Husband (31) receives tearful phonecall from ex-employee (F 25) asking for marital advice. Husband tells S not to ask him questions about this, it is none of her business. |
| 16. | F | 26 | 2D | Boyfriend (25) chastises S for not calling her mother on Mother's Day. S tells him not to tell her what to do. |
| 31. | F | 33 | 3D | S's mother tries to persuade S to come on vacation with her, embarrassing S in front of mother's friend (F 60). |

Group 3 - Deprivation or loss or potential loss

| | | | | |
|---|---|---|---|---|
| 15. | F | 30 | 2D | Having to tell boss (M 36) she wants to quit, without hurting His feelings. |
| 22. | F | 51 | 3D | A "one night stand". S feels deprived by this person (M 57) whose mind is entirely on sex. |
| 23. | F | 24 | 3D | In hospital. Mother and S are crying a few minutes after father's death, after a lingering illness. |
| 24. | F | 32 | 3D | S leaving city, has to give up her dog to a friend (F 34). |
| 28. | F | 33 | 3D | Daughter (2½) says babysitter had "hit" her. S does not believe this but has to confront sitter (F 23) to be sure. Sitter very distressed, wants to quit, is finally reassured. |
| 34. | F | 40 | 3D | Husband (35) interrupts conversation between S and friend (F 24) just as real communication is beginning to happen. |

Group 4 - Not able to help with another's problem

| | | | | |
|---|---|---|---|---|
| 1. | F | 30 | 2D | Visiting father in hospital. Having to pretend ignorance about the seriousness of his condition. |
| 4. | M | 21 | 2D | S lives in community house. Girl (23) comes to house high on amphetamine, very upset about broken relationship. S tries to help, talks with her for two hours. |
| 8. | F | 35 | 2D | Discussion with close friend (F 60) about friend's marital problems. |
| 10. | M | 37 | 2D | S unable to give emotional support to wife at a time when she needs it. |
| 12. | M | 28 | 2D | Trying to help flatmate's mother (57) with her income tax return. |

Group 5 - "Moods" or not interpretable

| | | | | |
|---|---|---|---|---|
| 2. | F | 31 | 2D | A "one night stand". |
| 14. | F | 33 | 2D | S expressing frustration, lack of understanding, inability to be open to a teacher/friend (F 34). |
| 18. | F | 34 | 2D | Christmas dinner with brother and sister-in-law. |
| 20. | M | 33 | 3D | S at court, acting as witness for the prosecution. |
| 27. | F | 32 | 3D | Mother complaining that S's sister and her husband did not come to meet S and mother after transatlantic flight. |

FACTOR 3 - Happy, Friendly, Pleased with Oneself

| A | B | C | D | |
|---|---|---|---|---|
| | | | | Group 1 - Social Interactions |
| | | | | Group 1.1 - Social Interactions with Intimates |
| 10. | M | 37 | 2D | Skinny-dipping and making love with girlfriend (33) on moonlit summer night. |
| 11. | M | 33 | 2D | A quiet evening at home reading and talking with wife (38). |
| 16. | F | 26 | 2D | A relaxed evening at home watching boyfriend (25) play backgammon with a friend (M 24). |
| 21. | F | 32 | 3D | S is divorced, children live with father. First day of children's (M 8, F 6) first visit to Montreal to see mother. |
| 27. | F | 32 | 3D | Flatmate (F 41) comes home tired from night course, is pleased to find S has planted petunias in flower box. |
| 28. | F | 33 | 3D | Playing a word game with daughter (2½), watching her having fun, pleased she is learning. |
| 34. | F | 40 | 3D | On phone with sister (42) - a warm, loving, terrific conversation (sister calling from Holland where she lives). |
| 35. | M | 29 | 3D | An evening playing cards with potential girlfriend (27). |
| | | | | Group 1.2 - Social Interactions with Friends |
| 1. | F | 30 | 2D | A dinner getting caught "up to date" with sister (35) and her husband (33) whom S has not seen for a month. |
| 6. | F | 30 | 2D | Having a good time with friend (F 30) and children on a picnic. |
| 7. | F | 21 | 2D | Getting stoned with friend (F 23), laughing and talking. |
| 15. | F | 30 | 2D | In Jacques Cartier Square on St. Jean Baptiste day - old man shakes S's hand after she buys him a sandwich. |
| 19. | M | 48 | 3D | Conversation with colleague (M 45) at colleague's leaving party. |
| 20. | M | 33 | 3D | A dinner and evening spent with friends (M 31, M 29). |
| 25. | F | 21 | 3D | An evening at a restaurant with husband (24) and a couple of close friends (M 25, F 25). |
| | | | | Group 1.3 - Personal Discussions |
| 3. | F | 31 | 2D | Discussion with husband, setting a day for the whole family to be together. |
| 4. | M | 21 | 2D | Discussion with friend (F 20) about politics, religion, sexuality - generally being introspective. |
| 8. | F | 35 | 2D | Discussion with husband (35) about whether or not he would take a sabbatical for four months. |