# DISCREPANT SELF-PERCEPTIONS AND COGNITIVE COMPLEXITY

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ABSTRACT

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It was hypothesized that persons whose self-perceptions resist change within a context of realistic feedback about such perceptions are less cognitively complex than persons whose self-perceptions accommodate to feedback.

Members of interpersonal growth groups exchanged ratings of self and others after both 21 and 48 hours of interaction. Members whose self-perceptions were substantially discrepant (positively or negatively) from how co-participants perceived them on both occasions were labeled either Self-Overraters or Self-Underraters. Both groups were compared on several measures of cognitive articulation and dimensionality with all other group members and also with those highly discrepant initially, but who subsequently shifted toward congruity.

The findings differentially linked cognitive complexity with difficulties in integrating discrepant ratings

by peers and self. Specifically, Self-Overraters evidenced low cognitive articulation while Self-Underraters scored exceptionally high in articulation. Self-ratings importantly influenced these findings. Cognitive dimensionality measure yielded no significant findings.

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# INTRODUCTION

What is the meaning and import of the group phenomenon in which a group member describes himself or herself in a substantially different way than others in the group do, and persists in this self-depiction despite contrary feedback from the others? This inability or unwillingness to make use of interpersonal feedback could be socially maladaptive.

## Discrepant Self-Perception

There have been few prior studies of this phenomenon. McGreevey (1962) found that advanced nursing students with high discrepancies between self and peer ratings on a personality questionnaire were rated by projective test "experts" as significantly less well adjusted than their lower disparity classmates in their responses to projective instruments. Donovan and O'Leary (1976) reported that depressed patients whose self-perceptions differed most markedly from how they were perceived by peer patients within a therapeutic community "appeared to be significantly more anxious, obsessional, socially immature and alienated,

less insightful" (p. 18) than patients whose self-perceptions were minimally discrepant from peers' views of them.

Neither of these studies distinguishes between discrepant self-perceptions which favored the self and those which underrated the self. One exploratory study, however, did make this distinction. Among the members of groups of professional group therapists, Hurley and Rosenthal (1976) found that subjects who rated themselves much more favorably than they were rated by others were rated markedly below average on measures of interpersonal competence by other group members. Furthermore, their inflated self-estimation increased at follow-up, while the other group members' perceptions of these self-overraters became even more unfavorable. Contrarily, peers rated self-underraters substantially above average on both occasions, although their self-ratings were consistently below average. Both self-overraters and self-underraters showed greater discrepancies between self-perceptions and how peers perceived them at follow-up than they had earlier in the group experience.

These observations contrast with other findings which suggest a general pattern of increasing congruence over time between the way most people see themselves and the way they are seen by knowledgeable others. Burke and Bennis (1961) found that members of interpersonal training groups showed less discrepancy between self-perceptions

and perceptions by others after two and a half weeks of intensive interaction than they did after only a couple days of interaction. Force (1969) found that self-scores tended to drop by the end of an intensive eight-day laboratory training period, while the group scores tended to increase, resulting in a reduced disparity between the two sets of scores. These studies did not make a differentiation between underraters and overraters.

Further exploration of the two varieties of discrepant self-rating (self-overrating and self-underrating) may add to our understanding of the role of interpersonal feedback in the development of social competence and of the personality variables which influence the efficacy of group treatment.

## Cognitive Complexity

The present study attempts to relate persisting disparity between self-description and consensual description to cognitive complexity, a concept empirically associated with the individual's responsiveness to conflicting information in social judgement situations. Cognitive complexity refers to the differentiation of the cognitive structures with which we conceptualize the environment.

The basic unit of cognitive structures is the construct (Kelly, 1955). As a person perceives the elements of the environment, there is awareness of aspects which are

characteristics of some elements and not others. Such an abstracted notion of similarity and contrast is called a construct. An individual has a variety of construct systems appropriate to different domains of objects and events. This study concerns only the perceptual domain of qualities related to interpersonal behavior. A construct system for persons is the set of concepts which implicitly differentiates one personality from another.

In terms of the perceptions of persons, constructs may be traits that are attributed to persons, such as warm, smart, dominant, etc. Such attributed traits form the framework for understanding how people are alike or different. The construct can be thought of as a bipolar scale, with different perceived persons placed conceptually on different parts of the scale. Thus, in the perception of persons, a construct is a trait or attribute that is a dimension of perceived similarity/contrast among persons--a means of usefully organizing perceptual information.

A set of traits or attributes comprises the particular cognitive structure with which an individual organizes perceptions of persons. One way that cognitive structures vary from person to person is in regard to which particular traits they use to characterize and discriminate among people. For example, one person may think of people very much in terms of how bright they are, but for another person brightness may not be at all central in conceptualizing and discriminating among people.

Other important differences among person's cognitive structures have to do with the way the attributes are employed and organized. For example, those who conceptualize persons in terms of brightness vary in how many points they use on the brightness scale. One individual may perceive that people are either bright or dull, and so use only a two point scale. Another person may perceive many gradations of intelligence among people. In other words, any attribute of a cognitive structure may be used only for black-white sorts of distinctions, or it may be used to discriminate among shades of gray. This is the notion of articulation, one of the two ways in which cognitive structures are differentiated (Bieri, 1966).

Another way in which cognitive structures vary is in terms of the number of traits that are central in one's conceptualizing of people. Consider the attributes warm and generous. For some individuals, if they think of a person as warm, they invariably think of them as generous. For that individual, warm and generous are not independent traits, but highly associated. In terms of cognitive structure, these highly associated traits constitute a single dimension. In general, if a set of attributes is highly associated, they can be represented by a single dimension in the cognitive structure. If, on the other hand, two traits are quite independent, they will be represented as separate dimensions in the cognitive structure. Dimensionality

(number of dimensions in the cognitive structure) is the other kind of cognitive complexity with which we are concerned in this study.

The amount of articulation and the number of dimensions of a person's cognitive structures are measures of the cognitive complexity of that individual. Kelly (1955) argues that higher levels of cognitive complexity are adaptive because they allow greater flexibility in integrating perceptual information and more accurate perception over a wide range of perceived events. The functional purpose of the cognitive structure is to anticipate events, to be prepared to apprehend events. The more extensive the set of dimensions in a person's construct system, the more types of life experiences can be conveniently and accurately apprehended. Similarly, the greater the level of articulation on attributes in the construct system, the greater is the perceptual "resolution," and the greater are the prospects for accurate discrimination among events.

Kelly views the development of more complex cognitive structures and the ability to apprehend and integrate new experiences as mutually enhancing, reciprocal processes. When unexpected events are perceived, the cognitive structure must expand or adjust to accommodate these events, or else anticipations will become less and less realistic. New experiences serve to provide validation for, or the impetus to change existing cognitive structures. When an individual

fails in the course of development to make structural adjustments appropos to his experience, more and more experiences will not be apprehended clearly and fully. " . . . One does not learn certain things merely from the nature of the stimuli which play upon him; he learns only what his framework is designed to permit him to see" (Kelly, 1955, p. 79).

## Cognitive Complexity and Inconsistent Information

The problem of apprehending new information is closely related to the problem of integrating inconsistent information because each requires cognitive accommodation. To the cognitively simple person, inconsistent information is more likely to be perceived as a unidimensional disparity or conflict in need of resolution (balance); resolving the disparity in this case is likely to mean loss of information. For the cognitively complex person, the inconsistency can be resolved without loss of information because it can be apprehended as a multi-dimensional event. Consider a cognitively simple person, for whom warmth and generosity are always associated and a complex person for whom they are not always associated. If someone who is not perceived as warm behaves in a generous manner, the cognitively simple observer may decide that the person is really warm, or he may conclude that the person was not really behaving generously. In either case, the cognitively

simple person must lose information that the cognitively complex person can retain because to him warm and generous do not always go together.

Cognitive complexity researchers have provided numerous studies, reviewed by Bieri (1961) and Streufert (1972), which support the idea that cognitively complex people learn and respond to inconsistent information better than cognitively simple subjects. Press, Crockett, and Rosencrantz (1969) asked simple and complex subjects to explain the like-dislike relationships among four-person groups. Some of the stimulus groups had balanced relationships, and some had imbalanced relationships among the members. Simple subjects learned the balanced structure more rapidly than the unbalanced structure. Complex subjects did not show consistent differences in speed of learning the balanced and unbalanced relationships. Ware and Harvey (1967) showed subjects slides depicting (pre-rated) desirable or undesirable acts by a stimulus person. After viewing a number of acts by stimulus persons, they stated how plausible other depicted behaviors would be for the stimulus person. Consistent inputs and depicted behaviors led to greater generalization of induced impressions for simple subjects than complex subjects. When the inputs and depicted behaviors were inconsistent, complex subjects generalized them further.

Harvey and Ware (1967), in a comparable study, described the past behavior of a stimulus person in either

favorable or unfavorable fashion. Subjects were then presented with that person's present behavior which ran counter to the previous behavior. Subjects were asked to write short explanations of the apparent inconsistency. Less complex subjects found greater inconsistencies. Moreover, less complex subjects found the inconsistencies bothersome, and were less able to provide integrated explanations.

Bieri (1955) found a significant but modest relationship between complexity and the accuracy of prediction of the behavior of known others. Closer inspection of the data indicated that the result was a consequence of the ability of complex subjects to recognize when others' responses would be different than their own. Campbell (1960) and Leventhal (1957) found comparable results. Campbell (1960) also reported that low complexity subjects were more likely to categorize people as good or bad than high complexity subjects. Crockett (1965), similarly, found that low complex subjects made more one-sided descriptions of people than did high complex subjects.

Investigating the relationship of complexity to impression formation with an Acsh-type paradigm, Nidorf (1961) found that more complex subjects reconciled potentially contradictory adjectives better than less complex subjects. Tripodi and Bieri (1964), in a study concerned with clinical judgements, found that when subjects were presented with incongruent stimuli, the judgements of more complex subjects reflected more of the information contained

in the stimuli. Mayo and Crockett (1964) reported that in an adjective checklist judgement task, high complexity judges resolved conflicting information better than did low complexity judges by producing more multivalent final impressions. Streufert, Suedfeld, and Driver (1965) showed that more complex subjects were less influenced by changes in information load on them and utilized information gained through search better than less complex subjects.

## Judgements of the Self

We have considered some evidence that high complexity persons utilize complex, inconsistent information more flexibly and thoroughly than do low complexity persons. Will these relationships hold up if the information to be processed is about the self? Clearly, self-perception is a special case of person perception. One experiences oneself as both subject and object. But the way in which we conceptualize ourselves is very similar to the way in which we conceptualize others (Epstein, 1973); at times we are "objectively self-conscious" (Duval and Wicklund, 1972), and view ourselves as a person like other persons.

This study attempts to extend the finding that high complexity subjects better integrate conflicting information when making social judgements to include judgements of the self. The primary source of information about the self is information received from other persons, especially from those who know us well and/or are important to us. This

information can take the form of social comparison or social feedback (Wenger and Vallacher, 1977). Social comparison is a more complex and developmentally advanced process than simply receiving social feedback because the former implies an already developed cognitive structure which provides the criteria for comparison. Social feedback is the first source of information use by the child in forming a self-conception. Significant others have the greatest impact on the child (Mead, 1934), and are the primary source of a relatively stable self-concept. Social feedback retains its importance because it provides necessary cues for comfortable and adaptive functioning in social situations.

At times, information received as social feedback will conflict with existing self-conceptions. How an individual responds to such a situation depends not only on his ability to utilize conflicting information, but on his ability to function independently of external feedback. Witkin (1962) distinguished between field dependent and field independent persons. A field independent person has a well-developed sense of his own identity and separateness from other people; his emphasis on his separateness from other persons makes him somewhat resistant to influence via social feedback. Field independence is a generally adaptive trait which may serve as a competing explanation for an individual's failure to integrate social feedback.

Who gives the social feedback is also an important determinant of a person's response to the feedback. Social feedback is more impactful when the source knows the person well, is perceived to be like the person, and provides feedback that is different than what is ordinarily expected (Harvey, 1962). Experiential groups are well suited for providing impactful social feedback. Group members come to know a great deal about one another in a short time. Members are similar in some respects by virtue of having common interest in this form of social developmental activity, and the similarity can be enhanced by selection from a homogeneous population. And the group mores encourage feedback that is more direct and less circumstantially induced than in most social situations. Thus, experiential groups provide a systematic source of social feedback which can serve as a stimulus for discriminating those who are more effective in utilizing inconsistent information from those who are less effective.

## Present Study

The present study is based upon data from ten small interpersonal growth groups in which each member made ratings of self and of all others on eight semantic differential scales tapping interpersonal qualities. The ratings were made at two times during the life of these groups and in both instances the ratings were made available as feedback in the group process.

It was hypothesized that subjects who did not integrate and reduce discrepancies between self-perception and perceptions by others would be low in cognitive complexity. Overraters and Underraters were defined and selected by these criteria: (1) a relatively large disparity between a subject's self-ratings early in the study and the ratings made of him/her by others early in the study; and (2) the persistence of this relatively large discrepancy at about thirty-hours later in the group experience despite feedback regarding the perceptual incongruence.

The disparity referred to in part one of this definition was the difference between the average of a subject's self-ratings on the eight scales and the average of ratings received by the subject from all other members of the same group on the eight scales. Two alternative conceptualizations of part two of the definition were employed. In the first, the later disparity was between mean self-ratings at the time of the second rating and the mean ratings received at the first rating. It was not clear, however, that the first ratings by others adequately represented, in themselves, the feedback to the subject regarding his/her departure from concensus in his/her self-assessment. Interpersonal exchanges in the many hours (about 30) of group experience between the two rating times also constitute feedback regarding the deviation from concensus in self-assessment. This "process" feedback

might be well represented by the ratings given to the subject on the second occasion. Thus, the alternate version of the later discrepancy was the difference between the mean ratings of self at the second assessment and mean ratings received at the second assessment.

In addition to providing measures of discrepancy of self-perception, the ratings made in this study were also used to investigate the complexity of the participants' personal construct systems. Measures of both articulation and dimensionality were computed from the subjects' ratings of others in the group.

Although the variance of a persons ratings of others on semantic differential scales has been used as a measure of articulation, I am proposing a new measure based on the deviation from maximum differentiation as a more sensitive measure of articulation. Scott (1969) defines dimensionality to be "the number of 'dimensions-worth' of space utilized by the attributes with which the person comprehends the domain." Several prominent cognitive complexity theorists have used factor analysis of an individual's patterns of response to adjective lists as a measure of dimensionality (Sarbin, Taft, and Banly, 1960; Osgood, Suci, and Tannenbaum, 1957; Kelly, 1955). The two measures of dimensionality used in this study were likewise based on factor-analyses of subject's ratings of other group members.

All measures are described in detail in the method section.

## METHOD

### Subjects

Subjects were 140 junior and senior college students at Michigan State University who were enrolled in an upper-level, credit course aimed at experiential learning about interpersonal process. The 72 males and 68 females were assigned to small groups primarily on the basis of scheduling convenience, though efforts were made to balance the proportions of men and women in each group. The ten groups varied in size from eight to eleven members. The only further stipulation was that close friends could not join the same group. Each group had two (or in five cases, three) facilitators, who had previously taken the course and who were selected for further training by the administering professor.

### Measures and Procedure

Rating Scales. The scales used for interpersonal ratings were Self-Acceptance/Rejection (SAR) and Acceptance/Rejection of Others (ARO) (Hurley and Rosenthal, 1976). These scales were developed in an attempt to operationalize the conception that much of interpersonal process perception can be represented by two principal,

independent dimensions (Hurley, 1976b). Evidence of the construct validity and reliability of an earlier version of this instrument was presented by Hurley (1976a). However, in this study SAR and ARO were used only because they provided a plausible set of constructs for representing interpersonal perceptions. Since their theoretical origins are largely irrelevant to present purposes, the SAR and ARO scales were not analyzed separately in this study, but were treated as a set of eight modified semantic differential scales: Warm-Cold, Helps others-Harms others, Involved-Detached, Accepts others-Rejects others, Shows feelings-Hides feelings, Expressive-Guarded, Active-Passive, and Independent-Dependent. In each case, scale values had a possible range of ten points (zero to nine).

Procedure. The subjects met in groups of 8, 10, or 11 persons for approximately 50 hours over a ten week term (twice a week for 90 minutes, and for 12 hour extended sessions near both the third and seventh week-ends of the term). Each group's activity was focused on the exploration of the ongoing interpersonal processes with the goals of developing better interpersonal skills and more accurate perception of self and others.

As part of the group process, each group member rated himself or herself and every other member of the group (including facilitators) on the eight semantic differential scales described above; these ratings were

made twice in each group, once after about 18 hours (Time One) and again after about 46 hours (Time Two). The subjects were instructed to base their ratings solely on their experiences in the group. The ratings were made in booklets, with the ratings for all members on one scale on a page. The first page of the booklet asked for ratings of each member on a ten-point Like-Dislike scale. These Like-Dislike ratings, though not part of the analyzed data, were included in the hope that, if subjects were given a chance to express such sentiment first, any extraneous and irrelevant influence of liking or disliking on the immediately following ratings would be minimized (Hurley, 1976).

Within a week after these data were collected, the matrix of all the specific scale ratings (including Like-Dislike) was provided to each member. In addition, each member received a graphic summary of the discrepancies between each person's self-rating and the ratings given to them by others. This feedback was discussed in all the groups, but in some more than others, depending on the preference of the particular group leaders. The purpose of this exchange of information was to encourage and enhance communication about the interpersonal process within the group.

All variables in this study were computed from the ratings matrices described above. Examples of both this matrix, called the Inventory of ratings, and the graphic summary of such ratings, are given in Hurley (1978).

Measures Derived from Ratings: Averages and Discrepancies. Four averaged rating variables were computed for each subject: two based on self-ratings, two on ratings received from others. S1 was the mean of the self-ratings of an individual on the eight semantic differential scales at Time One. An individual's O1 score was the average score received at Time One over the eight scales from all others in the group. Similarly, S2 was the mean of the self-ratings of an individual at Time Two, and O2 the average of ratings received by an individual at Time Two.

The study focused on the following discrepancies between pairs of the mean rating variables just described:

1. S1 - O1, the difference between a subject's mean self-rating across the scales at Time One (S1) and the mean ratings made of him/her by others at Time One (O1);
2. S2 - O1, the difference between a subject's mean self-rating at Time Two (S2) and the mean ratings received by him/her at Time One (O1):
3. S2 - O2, the difference between a subject's mean self-rating at Time Two (S2) and the average of ratings given by others to him/her at Time Two (O2).

Measures Derived from Ratings: Cognitive Complexity Variables. Four measures of cognitive complexity were employed in this study--an original measure of articulation (REDUND), two measures of dimensionality (PFACT and SCOTT),

and one measure which included elements of both articulation and dimensionality (BIERI).

The matrix of ratings given to others by a subject constitutes a sample of that subject's personal construct system; it is from this matrix that all four cognitive complexity measures were computed. It should be emphasized that the cognitive complexity scores were derived from a matrix (ratings by self of others) which was wholly independent from the matrix which supplied the rating and discrepancy variables (ratings of self by self and by others).

REDUND was computed by a program that assessed the difference between the set of ratings given to others by a subject and a set of maximally discriminating (maximally articulated) ratings. In the case of maximum articulation, each possible scale value has the same probability of occurrence and the expected distribution of ratings of others on a scale would be rectangular or show equal frequency of occurrence at each scale value. REDUND is a measure of deviation in the distribution of the set of actual ratings from the flat distribution of a hypothetical maximally articulated set of ratings. The greater the REDUND score the more redundancy in the use of the scales and the lower the degree cognitive complexity; the lower the REDUND score, the closer to maximum artriculation and the higher the cognitive complexity. Specifically, if C

(count) is the frequency of occurrence of a specific scale value and EC (expected count) is the number of persons rated divided by the number of scale values, then:

$$\text{REDUND} = \sum_{j=0}^{9} \frac{(C_j - EC)^2}{EC}$$

where j indexes possible scale values.

PFACT, based on a factor analysis of a subject's matrix of ratings of others, was the number of factors required to account for seventy-five percent of the variance of the ratings given to others. The factor analysis was performed on the matrix of correlations of the eight scales with each other across persons being rated. The higher the score the higher the dimensionality of the matrix and the greater the cognitive complexity of the subject. PFACT always takes positive, integral values.

SCOTT (Scott, 1969) was computed from the same matrix of interscale correlations across persons being rated as is PFACT. Scales with negative correlation are eliminated and the intercorrelations of the remaining scales are corrected for attentuation. If m is the number of scales with positive correlations and R is the sum of the squared correlations in the triangular half-matrix, then:

$$SCOTT = \frac{m^2}{m + 2R}$$

This measure was expected to correlate highly with PFACT, but may be somewhat more sensitive since it can take non-integral values. The higher the SCOTT score, the higher the cognitive complexity.

BIERI measures both dimensionality and articulation and, like REDUND, is reverse scored (the higher the BIERI score, the lower the cognitive complexity). A subject's BIERI score is computed as follows:

$$BIERI = \frac{\sum_i R_i}{M \times I}$$

where $\underline{R}$ is the number pairs of ratings having the same scale value (0-9) in the set of ratings given the $\underline{i}$th person rated, $\underline{I}$ is the number of individuals rated by the subject, and $\underline{M}$ is the maximum possible number of pairs having the same scale value among the eight scales used to describe an individual. Thus, if a subject used only one scale value in his ratings of each other group member, his BIERI score would be 1.00; if he never used the same scale value twice in describing any individual, his BIERI score would be 0.

PFACT, SCOTT, and BIERI were computed using the SCORES program created at the Computer Institute for the Social Science at Michigan State University.

Subjects' scores on all of the cognitive complexity variables were averages of measurements at Time One and Time Two.

Defining Criteria for Overraters and Underraters. The term Overrater is used here as shorthand for persisting extreme self-Overrater and Underrater refers to persisting extreme self-Underrater. An Overrater was defined to be a group member who rated himself considerably more favorably than the group rated him and who persisted in this disparity despite feedback regarding the incongruence. Similarly, an Underrater rated himself much less favorably than did the group and continued to do so despite contrary feedback. In this study, the Over/Underrating process was conceptualized in two ways because it as not apparent which of two sets of definitions was the most meaningful. In the first set of definitions, the feedback to which the Over/Underraters had the opportunity to respond to was considered to be the ratings received from others at Time One; in the second, the feedback to which the Over/Underrater had the opportunity to respond to was considered to be not only the initial ratings received from others but also evaluative information received in the group process. Feedback received in the group after Time One were assumed to be reflected in the ratings received from others at Time Two. The groups of Underraters and Overraters selected by the first set of

definitions were expected to overlap for the most part with the corresponding group selected by the second set of definitions.

The specific defining criteria were as follows:

(Ia) Overraters (initial feedback) scored one standard deviation or more above the mean on both S1 - O1 and S2 - O1;

(Ib) Underraters (initial feedback) scored one standard deviation or more below the mean on both S1 - O1 and S2 - O1;

(IIa) Overraters (process feedback) scored one standard deviation or more above the mean on both S1 - O1 and S2 - O2;

(IIb) Underraters (process feedback) scored one standard deviation or more below the mean on both S1 - O1 and S2 - O2.

Over/Underrating Changers. For purposes of comparison with the persistent extreme Over/Underraters, groups of Changers were identified who at Time One showed extremely discrepant self-ratings, but who were not extremely discrepant at Time Two. As was true for Overraters and Underraters, the criterion discrepancy at Time Two was defined in two ways: for the "Initial" Under/Overrating Changers, the Time Two discrepancy was S2 - O1; for "Process" Under/Overrating Changers the Time Two discrepancy was S2 - O2.

Level of Statistical Significance Used. The .05 level was in general the standard of statistical significance used in this study. However, since the numbers involved in the groups of extreme raters was expected to be very small, results at the .10 level were considered for discussion in order to reduce type II errors. All statistical tests in this study were two-tailed.

## RESULTS

Tests of Hypotheses. T-tests of differences on cognitive complexity measures were made between the persistent extreme self-rating groups and the group of participants not included in either extreme group. The results partially supported the hypothesis that persisting self-Overraters would score low on cognitive complexity but contradicted the hypothesis that persistent self-Underraters would score low on cognitive complexity.

Table 1 shows the results obtained for Initial Over/Underraters (definition I), those subjects whose self-ratings at Time One were very high/low in relation to how others rated them at Time One and whose Time Two self-ratings remained very high/low in comparison to how others rated them at Time One. Initial Overraters ($n$ = 6) showed lower cognitive complexity than non-extreme raters ($n$ = 128) on REDUND ($p < .05$). Initial Underraters ($n$ = 6), however, scored higher in cognitive complexity than did non-extreme raters on BIERI ($p = .062$).

In further comparisons suggested by one-way analyses of variance, Initial Underraters evidenced greater cognitive complexity than Initial Overraters on both

Table 1

Mean Cognitive Complexity Scores of Three Classes of Self-Raters by Initial and Process Definitions*

| | | REDUND | BIERI | PFACT | SCOTT |
|---|---|---|---|---|---|
| **Initial: (S1-O1 and S2-O1)** | | | | | |
| Overraters | (n = 6) | 116.76[b,c] | .32[a] | 2.50 | 2.80 |
| | | (23.6) | (.06) | (.45) | (.46) |
| Others | (n = 128) | 79.59[c] | .28[d] | 2.18 | 2.53 |
| | | (41.6) | (.07) | (.54) | (.63) |
| Underraters | (n = 6) | 56.19[b] | .22[a,d] | 2.33 | 2.63 |
| | | (45.0) | (.04) | (1.17) | (1.47) |
| **Process: (S1-O1 and S2-O2)** | | | | | |
| Overraters | (n = 11) | 102.28[d] | .31[d] | 2.31 | 2.59 |
| | | (25.6) | (.06) | (.46) | (.50) |
| Others | (n = 123) | 78.35[d] | .27[d] | 2.17 | 2.53 |
| | | (42.8) | (.07) | (.56) | (.64) |
| Underraters | (n = 6) | 77.24 | .24 | 2.50 | 2.75 |
| | | (40.8) | (.06) | (1.00) | (1.40) |

*Standard deviations given in parentheses.

Differences between designated groups:

[a] $p < .001$ [b] $p < .01$ [c] $p < .05$ [d] $p < .10$

REDUND ($p < .05$) and BIERI ($p < .01$). Note that statistically significant effects were found only for measures of the articulation aspect of cognitive complexity. The measures of dimensionality (PFACT and SCOTT) never yielded statistically significant differences between groups of raters.

Process Under/Overraters (definition II) yielded similar but less clear results. These groups were defined to be persons whose self-ratings at Time One were very high/low in relation to how others rated them at Time One and whose Time Two self-ratings were also very high/low in comparison to how others rated them at Time Two.

Results for these groups are found in Table 1 (lower half). Process Overraters ($n = 11$) showed less cognitive complexity than non-extreme raters ($n = 123$) on REDUND ($p = .07$) and on BIERI ($p = .09$). Process Underraters ($n = 6$) evidenced greater cognitive complexity in mean scores than non-extreme raters, but perhaps because of very small n's these differences did not approach statistical significance.

Process Overraters showed less cognitive complexity than Process Underraters on both REDUND and BIERI, but the results of one-way analyses of variance did not justify more detailed statistical comparisons.

Over/Underrating Changers. Post hoc tests compared Overraters and Underraters with persons (Changers) who had

large Time One discrepancies between self-ratings and ratings by others, but whose later self-ratings were less discrepant. Results of the comparisons of Initial and Process Over/Underraters with Initial and Process Over/Underrating Changers are presented in Table 2. REDUND and BIERI scores in the former case, and BIERI scores in the latter case all followed the same four-step pattern: persistent self-Overraters were least complex, followed by Overrating Changers, Underrating Changers and finally (most complex) by persistent Underraters. The magnitude of differences between Over/Underraters and Changers were similar in magnitude to Table 1 findings which reached statistical significance, but apparently fell short of that level because of the small number of subjects involved.

Correlations of Cognitive Complexity with Ratings Measures. Table 3 shows the correlations of the cognitive complexity measures with the rating and discrepancy variables; these correlations were included because of the light they might shed on the relationship between cognitive complexity and discrepancies in self-perception. Discrepancies between self-ratings at Time One and ratings received at Time Two (S1 - O1) correlated significantly with REDUND ($r$ = .25, $p$ < .001) and with BIERI ($r$ = .24, $p$ < .01). Even stronger is the association of self-ratings late (S2) with REDUND ($r$ = .30, $p$ < .001) and with BIERI ($r$ = .34, $p$ < .001). No relationship greater than $r$ = .08

Table 2

Over/Underraters and Over/Underrating Changers Compared on Articulation Cognitive Complexity Measures

| | | REDUND | | BIERI | |
|---|---|---|---|---|---|
| | | Mean | SD | Mean | SD |
| **Initial (S1-O1 and S2-O1)** | | | | | |
| Over-raters | (n = 6) | 116.76[a] | (23.6) | .32 | (.06) |
| Over-rating Changers | (n = 12) | 80.06[a] | (29.0) | .28 | (.06) |
| Under-rating Changers | (n = 16) | 71.62 | (35.6) | .26 | (.06) |
| Under-raters | (n = 6) | 56.20 | (45.0) | .22 | (.04) |
| **Process (S1-O1 and S2-O2)** | | | | | |
| Over-raters | (n = 11) | 102.28[b] | (25.0) | .31[b] | (.06) |
| Over-rating Changers | (n = 7) | 76.59[b] | (37.3) | .26[b] | (.06) |
| Under-rating Changers | (n = 16) | 63.73 | (37.5) | .25 | (.06) |
| Under-raters | (n = 6) | 77.24 | (40.8) | .24 | (.06) |

Differences within columns:

[a] $p < .05$ [b] $p < .10$

Table 3

Product-moment Correlations between Cognitive Complexity Measures and Rating Measures

| | REDUND | BIERI |
|---|---|---|
| S1 | .18* | .20** |
| S2 | .30*** | .34*** |
| O1 | .01 | .04 |
| O2 | .14 | .16* |
| S1-O1 | .25*** | .24** |
| S2-O2 | .17* | .19* |
| S2-O1 | .21** | .21** |

***$p < .001$ ** $p < .01$ * $p < .05$

was found between any of the rating or discrepancy measures with either of the dimensional complexity indices (SCOTT and PFACT).

Sex and Leadership of Over/Underraters. Overraters (Initial and Process) were more likely to be female than male ($p < .05$) and more likely to be non-leaders than leaders ($p < .05$). (These probability levels are based on the binomial distribution.) Under-raters were more evenly distributed between the sexes and between leaders and non-leaders.

Rating and Discrepancy Measures. Descriptive statistics for ratings and discrepancies can be found in the Appendix, Table A (p. 50). Both self-ratings and ratings given others increased in positivity but decreased in variability from Time One to Time Two. The discrepancies between self-ratings and ratings received from others remained stable with regard to both size and variability from Time One to Time Two.

Data in Table 4 clarify the components of Overraters' and Underraters' discrepancies from concensus. At Time One, Overraters' self-ratings were nearly identical to the mean of all subjects' self-ratings, but peers rated them more negatively than they rated the average group participant. At Time Two, Overraters' self-ratings increased to a point substantially higher than the sample's mean self-rating, but peers continued to rate them below average, although less negatively than at Time One. Underraters, at Time One, rated themselves less favorably than the norm, while peers rated them above the norm. At Time Two Underraters' self-ratings were even lower compared to the mean self-rating while their ratings received dropped to be very close to the mean of ratings received.

A different picture is presented by the self-ratings and ratings received of Over/Underrating Changers (also Table 4). Though their self-ratings at Time One were even more extreme than those of persisting Over/Underraters, at

Table 4

Mean Ratings of Initial Over/Underraters and Over/Underrating Changers by Self and Others[a]

| | Overraters (n = 6) | Overrating Changers (n = 16) | Underrating Changers (n = 12) | Underraters (n = 6) |
|---|---|---|---|---|
| Time One | 6.19 ( .01) | 7.55 ( 1.37) | 4.59 (-1.61) | 5.54 (- .66) |
| SELF-RATINGS | | | | |
| Time Two | 7.56 ( .63) | 6.99 ( .06) | 7.02 ( .09) | 5.67 (-1.27) |
| Time One | 3.89 (-1.96) | 5.85 ( .00) | 5.80 (- .05) | 6.85 ( 1.00) |
| PEER'S RATINGS | | | | |
| Time Two | 5.49 (-1.07) | 6.27 (- .29) | 6.49 (- .07) | 6.57 ( .01) |

[a]Deviations from total sample (n = 140) means in parentheses.

Time Two the Over/Underrating Changers rated themselves very close to the mean. Ratings received by the Over/Underrating Changers also contrast with those of the persisting Over/Underraters: Over/Underrating Changers were rated close to the mean at both Time One and Time Two.

Table 5 lists the correlational relationships among the rating and discrepancy measures. Over the four week test-retest interval, the correlations of the mean ratings given others was modest ($r$ = .41), but greater than that of self-ratings ($r$ = .29). Early in the group, self-ratings (S1) correlated strongly ($r$ = .74) with ratings received from others (O1). This relationship was not as high at Time Two ($r$ = .53). Discrepancy early, S1 - O1, associated only modestly with discrepancy late, S2 - O2, ($r$ = .35).

Cognitive Complexity Measures. As indicated in Appendix Table B (p. 51), test-retest correlations for the cognitive complexity measurements ranged between .30 and .34 when all subjects are included, and between .25 and .30 when leaders were excluded. Cognitive complexity measures showed no relationship to sex or group size, but leaders tended to score lower than non-leaders in dimensionality but not in articulation (Appendix, Table C, p. 52).

Table 6 contains the correlations among cognitive complexity measures. The strongest association was, as expected, between PFACT and SCOTT ($r$ = .91). The two

Table 5

Correlations among Rating and Discrepancy Measures

| | S2 | O1 | O2 | S1-O1 | S2-O2 | S2-S1 |
|---|---|---|---|---|---|---|
| S1 | .29*** | .74*** | .26*** | .51*** | .04 | -.75*** |
| S2 | | .19* | .53*** | .19* | .50*** | .41*** |
| O1 | | | .41*** | -.20** | -.23** | -.58*** |
| O2 | | | | -.15* | -.47*** | .12 |
| S1-O1 | | | | | .35*** | -.35*** |
| S2-O2 | | | | | | .31*** |

*** $p < .001$ ** $p < .01$ * $p < .05$

Table 6

Correlations among Cognitive Complexity Measures[a]

| | PFACT | SCOTT | BIERI |
|---|---|---|---|
| REDUND | .39*** | .42*** | .75*** |
| PFACT | | .91*** | -.04 |
| SCOTT | | | -.08 |

*** $p < .001$, two-tailed test.

[a]BIERI and REDUND are reverse scored.

measures of articulation, BIERI and REDUND, also intercorrelated highly ($r$ = .75). No relationship was evident between BIERI and the dimensionality measures. Most interesting, perhaps, were the correlations between REDUND and the dimensionality measures, which suggested that the greater the cognitive complexity in the sense of articulation the lower the complexity in terms of dimensionality.

Descriptive statistics for the cognitive complexity measures can be found in the Appendix, Table D (p. 53). Their meaning is limited by the fact that cognitive complexity scores are not only a function of the complexity of the subjects cognitive structures but also of (1) the capacity of the rating scales to transmit the kind and amount of information in the subjects' perception and (2) the complexity of the perceived stimuli.

## DISCUSSION

Hypotheses. The general hypothesis that low cognitive complexity is associated with relative inability to integrate conflict between self-perceptions and perceptions by others did not entirely fit the present findings. The persistent self-Underraters consistently evidenced supranormal articulation in their ratings of co-participants, although the persistent self-Overraters consistently displayed the expected subnormal articulation. No results were found with the dimensionality measures.

An alternative explanation of these results--that the level of articulation served a defensive function--can be based on the possible interpersonal events which are suggested by the ratings given to and received by both persistent extreme groups of raters, shown in Table 4 (p. 33). At Time One, Overraters described themselves ($\overline{O}$ = 6.2) quite similarly to the average participant, but they differed from the norm in being rated very unfavorably by others ($\overline{O}$ = 3.9). The mean rating that Overraters received was more than one and a half standard deviations below the all-participant mean ($\overline{AP}$ = 5.9). Apparently the Overraters had behaved in a uniquely abrasive manner up to this point.

At Time Two, the Overraters were still rated ($\overline{O}$ = 5.5) more than a standard deviation below the all-participant mean ($\overline{AP}$ = 6.6), yet their self-ratings averaged ($\overline{O}$ = 7.6) substantially above the all-sample mean ($\overline{AP}$ = 6.9). These results, considered with the low degree of articulation Overraters manifested in interpersonal perceptions, suggest that they were relatively insensitive to social cues. It seems that the persistent Overraters were inept at reading the signals of discomfort people rely upon in social situations to keep anxiety at a minimal level. Especially early in the group, when anxieties tend to be high, the Overraters seem to have been unable to engage others comfortably.

Underraters present a very different picture. At Time One, they described themselves quite modestly ($\overline{U}$ = 5.5), but were seen in a very positive light by others ($\overline{U}$ = 6.9). Taken with their relatively high articulation scores in the realm of interpersonal perception, this self-effacing quality suggests that Underraters were very sensitive to social cues and were inclined to respond compliantly to these cues. At Time Two the Underraters rated themselves only slightly more favorably ($\overline{U}$ = 5.7) than they had previously ($\overline{U}$ = 5.5) but these self-ratings were even farther below the all-participant mean ($\overline{AP}$ = 6.9) which had increased from its earlier 5.9. At Time Two, peers rated Underraters very near the overall mean of ratings given others, a drop from the highly favorable ratings they received at Time One--as though their self-effacing quality

had lost its attraction. While Overraters boosted their self-ratings in the face of negative feedback, Underraters reduced their self-ratings (relative to the self-ratings of others) in the face of positive feedback. The Underraters seem to have behaved in a self-deprecating, approval-seeking manner. They obtained approval early in the group, but lost most of it later.

The ratings given and received by the under/over-rating Changers, who outnumbered the persistent Overraters and Underraters, demonstrated the feasibility of adjusting self-ratings in response to feedback. Both the persistent Underraters and Overraters, however, appeared to be defensive in their self-perceptions in that their self-rating shifts were contrary to the feedback they received. The norms and expectations of the groups probably raise the self-esteem impact of judgements about interpersonal qualities. The ratings made in the groups, then, contribute to creating a potentially ego-threatening situation. McGreevey (1962) found that ego-threatened individuals showed a poorer match between self-perceptions and peers' perceptions of them, presumably due to defensive distortion.

Overraters might be tentatively depicted as rather insensitive persons with low self-esteem who intrusively and awkwardly engage others. When an approving response is not forthcoming, insensitivity grows to become denial, and self-ratings are boosted in a seemingly compensatory manner. Persons with large self-aggrandizing disparities

between self and peers' perceptions have been described elsewhere as offensive, ego-threatened, and lacking in interpersonal competence (Hurley and Rosenthal, 1976; Hurley, 1978).

Underraters, on the other hand, seem to engage others gingerly, careful to note signs of disapproval--and they are initially rewarded with approbation. But despite gaining the approval of others, they persist in underrating themselves. In other investigations of self-perception disparities, individuals who down-played themselves were characterized as having constructive interpersonal skills and being able to engage others in a non-threatening way (Hurley and Rosenthal, 1976; Hurley, 1978). However, it must be noted that the Underraters in the present study did not receive such highly and consistently favorable ratings as those described in these prior studies and this prior research concerned groups with only a total of eleven hours of interaction versus $45^{+}$ in the present investigation.

The two groups manifested quite different perceptual styles: Overraters were relatively insensitive to distinctions regarding interpersonal qualities; Underraters were relatively over-sensitive, or vigilant. However, both the Underraters and Overraters behaved rigidly, in the sense of showing difficulty in modifying their self-perceptions in a manner congruent with the communications sent to them by others. For these individuals, interpersonal feedback

did not seem to become integrated and lead to more consensually accurate self-perceptions. Rather, the incongruent feedback seems to have stimulated the formation of an even more subjectively-determined percept. Thus, it seems self-rating behavior of the Underraters and especially the Overraters had a clearly defensive function.

Based on data from all participants, articulation measures were not related to ratings received from others, but did show a relationship to self-ratings, especially at Time Two. High discrimination with regard to interpersonal process was associated with more modest self-description, low discrimination with grander self-depiction. The present data analyses leave it unclear if this represents a general trend among the participants or if it is only a reflection of the relationship between articulation and self-ratings for Under/Overraters. In either case the results indicate that the level of articulation itself was not an important factor in the high ratings received by Underraters or the low ratings received by Overraters, but was related to their self-rating behavior. Perhaps these correlations were higher at Time Two because by that time feedback received both in ratings and during less structured group interactions would have generated a greater need for coping or defensive response.

Interpreted in this way, these results suggest a relationship between cognitive complexity and perceptual defensiveness--the complexity with which an individual

perceives a certain domain or set of domains of concepts may be in part determined by defensive needs. This question merits further investigation, for here is a way in which subtle limitations in a person's perceptions can be clearly measured. Or, looked at from another side, the development of cognitive structures in the realm of interpersonal perception appears to be a function of the defensive needs of the individual.

Another possible interpretation of the data regarding Underraters has implications for the use of semantic differential data in assessing cognitive complexity. It may be that Underraters simply used more of the scale range (they did show high articulation), and as a consequence their self-ratings tended to be lower than the average participant, who used a smaller (and probably more favorable) part of the scale range. Further investigation of the data may lead to firm conclusions about this interpretation.

Measures. It is difficult to tell from this study if dimensional complexity is associated Under/Overrating phenomena since so little variability occurred in the number of factors required to account for 75 percent of the variance of ratings across individuals. Several things contribute to this result. First, the scales used in this study are inherently low-dimensional; they were refined to represent a bi-dimensional conceptualization of person

perception (the average value of PFACT was 2.2). Secondly, the number of persons or entities (called concepts in the cognitive complexity literature) described by any participant was relatively small (seven, nine, or ten). The smaller the number of concepts described, the poorer is the resulting estimate of the level of dimensionality. Third, the particular scales used in this study represent a small domain of traits which do not necessarily include those traits preferred by the persons in this study to differentiate among individuals. A fourth reason for the low variability of dimensionality in this study may have been the homogeneity of the sample. Since the participants were so similar with regard to age, intelligence, social role and status, and interests, they constitute a relatively constricted set of concepts for assessing dimensionality. Clearly, further investigation would be required to judge the relevance of dimensionality to Underrating or Overrating.

There are a variety of positive and negative factors to be considered in assessing the strength of the findings concerning articulation. The effects are modest and sometimes marginally significant, but the overall pattern of results was the same for two distinct measures of articulation and for two sets of defining criteria for the extreme discrepant groups. However, it also must be noted that a number of aspects of the study worked against any

substantial effects showing through. To begin with, the extreme discrepancy groups were very small in number. Moreover, the homogeneity of the participants makes it less likely that relationships will be found even if they do exist. But most important, perhaps, is the fact that effects were identifiable despite low test-retest correlations on both the rating variables and the cognitive complexity measures.

The test-retest correlation of self-ratings was small ($r$ = .29). Mean ratings received from others were somewhat more consistent from Time One to Time Two ($r$ = .41). It is difficult to say how much of this inconsistency over time was due to unreliability in the measurements, and how much was due to real variations in perceptions. Additional confounding factors are interpersonal defensive processes and social demand influences that reduce the variability of these ratings, resulting in smaller correlations. Moreover, to the extent that the eight component rating scales do not tap a unitary construct, lower test-retest correlations can be expected. On the other hand, the stronger correlations between self-ratings and mean ratings received at Time One ($r$ = .74) and Time Two ($r$ = .53) indicate a general congruence between self-ratings and ratings received at the same point in time, and suggest that the low test-retest reliabilities of self-ratings and ratings received were due in part to differences in what is perceived across time.

Low test-retest correlations of cognitive complexity measures may have been in part due to restrictions in variation stemming from homogeneity in the sample and the previously described limitations of the rating scales.

Of all correlations among the cognitive complexity measures, that between the two measures of dimensionality, PFACT and SCOTT, was the highest ($r$ = .91), as expected. BIERI, which taps both aspects of cognitive complexity, correlated minimally with dimensionality measures, but strongly with the new articulation measure REDUND (r = .75). These BIERI relationships seem to be a consequence of the limited variation in dimensionality in this study. Most intriguing, however, are the statistically significant correlations between REDUND and both dimensionality measures. The implication is that the greater an individual's complexity in the sense of articulation the lower his dimensional complexity. Beyond a certain level additional complexity may make cognitive processes less efficient, and it may be that persons tend to develop either dimensional or articulational complexity. Thus, a person who employs many dimensions may not be highly articulated, or a person who makes finely articulated scalar distinctions may not use many dimensions. Evidence of a trade-off between articulation and dimensionality might prove important to cognitive complexity theory, and certainly merits further investigation. A study of the relationship of articulation to

dimensionality based on a broad set of ratings more completely mapping cognitive structures would be of interest.

Summary. This study has provided partial support for the hypothesis that the inability to integrate discrepant ratings by peers and self is related to cognitive complexity. Specifically, it was found that Overraters evidenced the predicted lower complexity, but that Underraters proved to be high in complexity. These results have raised some intriguing questions concerning possible functional trade-offs between articulation and dimensionality, and about the role of cognitive complexity in perceptual defensiveness. The study also marks the first use of a theoretically sound new measure of articulation.

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# APPENDICES

## APPENDIX A

### TABLE A

Descriptive Statistics for Ratings and Discrepancies

| Variable | Mean | Standard Deviation | Minimum | Maximum |
|---|---|---|---|---|
| S1 | 6.20 | 1.41 | 1.50 | 9.00 |
| S2 | 6.94 | 1.03 | 3.38 | 9.00 |
| O1 | 5.85 | 1.25 | 2.00 | 8.13 |
| O2 | 6.57 | 1.01 | 3.75 | 8.53 |
| S1-O1 | .35 | .96 | -2.15 | 2.94 |
| S2-O2 | .37 | .99 | -2.69 | 4.11 |
| S2-O1 | 1.09 | 1.46 | -2.43 | 6.63 |
| S2-S1 | .74 | 1.49 | -4.13 | 6.63 |

S1 - Mean of ratings given to self early

S2 - Mean of ratings given to self late

O1 - Mean of ratings received early

O2 - Mean of ratings received late

## APPENDIX B

### TABLE B

### Test-Retest Correlations for Cognitive Complexity Measurements

| Cognitive Complexity Measure | All Subjects | Leaders Excluded |
|---|---|---|
| REDUND | .32 | .28 |
| BIERI | .34 | .27 |
| PFACT | .30 | .25 |
| SCOTT | .34 | .30 |

## APPENDIX C

### TABLE C

Correlations between Cognitive Complexity Measures and Group Size, Sex, and Leader

| | REDUND | BIERI | PFACT | SCOTT |
|---|---|---|---|---|
| GROUP SIZE | .09 | -.04 | -.01 | .05 |
| SEX (F = 1, M = 0) | .14 | .15* | .07 | .05 |
| LEADER (1, member = 0) | -.06 | .07 | -.28*** | -.27*** |

*** $p < .001$ * $p < .05$

APPENDIX D

TABLE D

Descriptive Statistics for Cognitive Complexity Measures

| VARIABLE | MEAN | STANDARD DEVIATION | MINIMUM | MAXIMUM |
|---|---|---|---|---|
| REDUND | 80.18 | 41.89 | 2.38 | 213.00 |
| BIERI | .28 | .07 | .15 | .53 |
| PFACT | 2.20 | .57 | 1.00 | 4.50 |
| SCOTT | 2.54 | .67 | 1.44 | 5.57 |

Note: The above values are averages of early and late measurements.