COMPOSITION EFFECTS ON LEADERLESS GROUPS

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CHAPTER I

STATEMENT OF THE PROBLEM

Purpose of the Study

The purpose of the present study is to determine the effects of intragroup compatibility (group composition) as determined by the Fundamental Interpersonal Relations Orientation-Behavior (FIRO-B) test on affective verbalizations in a leaderless group setting. In addition, the effects of compatibility within different interpersonal dimensions of personality will be evaluated.

Group Composition

Group research is a demanding task due to the complexity of interpersonal relationships involved and the subsequent problems of adequately measuring significant aspects of the group process. In some areas, such as the objective measurement of goal attainment for task oriented groups, there has been considerable progress, but assessment techniques for many other significant areas of group functioning continue to be either beyond current capability or achieved with great difficulty. The measurement of interpersonal processes as it relates to psychotherapeutic outcome, for instance, is still a relatively undeveloped area. There is some consensus, however, that group composition is strongly implicated as a factor influencing group process, but

experimentation has not yet produced conclusive results regarding the effects of composition. Within the general context of this issue, there are apparent a number of proponents for both homogeneity on the one hand and heterogeneity of group membership on the other which are used to measure such variables as composition, age, sex, psychopathology and other personality characteristics. For the present effort, a personality measure (Fundamental Interpersonal Relations Orientation-Behavior) is used to assess group composition and some attention will now be given to other studies which have addressed the issue of composition effects, in order to establish the atmosphere of group research in this area.

Various authors have focused on many different combinations of composition and outcome. Harrison (1965) and Harrison and Lubin (1965), for instance, investigated the effects of group composition on learning in sensitivity groups. Harrison believes that heterogeneity of personalities is vital for group change, because he feels that it is necessary for group members to receive both support and confrontation in order for changes to occur. Heterogeneity of group composition, such that members' basic feelings, attitudes, or manner of relating are challenged, ensures the confrontation which is basic to the process of change. Homogeneous groups lack these built-in aspects and are less productive as a result. Harrison provides evidence that persons incompatible with each other (i.e., those who confront each other) more readily explore alternative modes of behavior in group discussions than interpersonally compatible persons. He argues that heterogeneity is desirable for groups. His point of view is supported by Hoffman and Maier (1966) who presented evidence that diversity of

personality profiles facilitates group problem solving. It is important to note that Harrison (1965) defined heterogeneity in terms of his own personality types. He mixed his heterogeneous groups with "low structure" and "high structure" personalities, while Hoffman and Maier (1966) described personality with the Guilford-Zimmerman Temperament Survey (GZTS) and defined heterogeneity in terms of GZTS profiles.

Another study in this vein, conducted by Stern and Grosz (1966), related group member scores on Extraversion, Neuroticism and External Control as determined by the Maudsley Personality Inventory to group verbal behavior. These authors ran ongoing psychotherapy groups in which they recorded the frequency of patient-to-patient verbal interactions initiated by each member, in order to relate this activity with personality dimension scores. Groups varied in size, membership, and duration, for each participant as a result of discharges and admissions within the psychiatric treatment unit at the Veterans Administration Hospital in Indianapolis. Three therapists, each with more than 5 years' group experience, conducted the sessions in rotation. Results were that low scorers on neutroticism and extraversion (introverts) tend to interact more with other low scorers, and that high scorers tend to interact more with other high scorers. This trend was statistically significant with only the introverts, however, and was not found on the neuroticism dimension. An opposite trend was apparent relative to the external control dimension, in that high scorers interacted significantly more with low scorers, and conversely that low scorers interacted more with high scorers. The lack of experimental control over group size, duration, and the familiarity of members with one another renders these results somewhat tenuous; however, there is

some substantiation that both similarity and dissimilarity of certain personality traits may be desirable in groups according to this study.

In the context of sensitivity training, Joure et al. (1972) demonstrated the effects of personality composition on group change scores following a workshop which consisted of two three-hour sessions on succeeding days. Groups were composed of males scoring either one standard deviation below or above the mean on Rokeach's Dogmatism Scale, Form E, resulting in a High Dogmatics and a Low Dogmatics group. Pre-post tests were the Tennessee Self-Concept Scale, the Dogmatism Scale and Rokeach's Value Survey. Both groups exhibited change as a result of the experience, although the Low Dogmatic group had a larger pre-post difference. The authors relate the results to Rokeach's theory of dogmatism, but also demonstrated a differential effect of outcome based on personality characteristics. The High and Low Dogmatic individuals changed in opposite directions on the Tennessee Self-Concept Scale, becoming higher and lower, respectively.

Personality effects were also the object of study for Grosz and Wagoner (1971) who made use of the Minnesota Multiphasic Personality Inventory (MMPI) and the Edwards Personality Profile Scale (EPPS). Using a methodology similar to the study by Stern and Grosz (1966) cited previously, the verbal initiations of patient-to-patient verbal interaction were recorded for ongoing psychotherapy groups in a hospital setting. The MMPI L and K validity scales and the EPPS Order scale were all significantly and negatively correlated with the number of verbal initiations, while the MMPI Mania (Ma) scale and the EPPS Aggression scale were significantly and positively correlated with initiations. It was interpreted that patients who on the basis of

psychometrics appear defensive are unlikely to interact with other group members as often as patients who score low on the trait of defensiveness. On the other hand, patients whose test results indicate a forceful, vigorous, aggressive and candid individual are likely to interact with other group members more often than patients scoring low on these characteristics. The Aggression scale on the EPPS indicates a willingness to pit oneself against others verbally and attack contrary points of view, which is a result in support of Harrison (1965) who asserts that confrontation is vital to productive groups. Harrison (1965) and Harrison and Lubin (1965) state that heterogeneity of composition will produce productive verbal interactions necessary for group change to occur. Stern and Grosz (1966) demonstrated positive correlation of desirable verbal interactions with both similarity and dissimilarity of various personality traits, in contrast to Harrison who found positive correlations of learning only with heterogeneity. Although there is disagreement as to specific characteristics, the effects of group composition have been repeatedly demonstrated (Grosz & Wagoner, 1971; Hoffman & Maier, 1966).

The object of composition studies ultimately is to understand the variables mediating group behavior and to possess the ability to predict the process of group interaction through measurement of member characteristics. This would be a significant achievement since there is growing evidence that groups are an effective agent in producing client improvement. In their review of empirical research in group psychotherapy, Bednar and Lawlis (1971), for instance, find an increasing number of studies consistent with the view that group therapy is a viable instrument of change. Theorists and practioners such as

Yalom (1970) speculate as to the conditions conducive to group therapy. Yalom suggests that a group provides a social microcosm which allows for a corrective emotional experience, and trying-out of new behaviors. For this to occur, however, he believes that an amount of interpersonal security and group cohesion must exist that allows an individual the latitude to take certain risks. According to Yalom, interpersonal attraction (cohesion) and the establishment of meaningful interpersonal relationships are essential components of well-functioning groups.

Interpersonal Attraction

Interpersonal attraction has been the object of considerable study in and of itself. Some of the work in this area has implication for the investigation of group processes. Tedeschi, Schlenker, and Bonoma (1973), for example, reviewed the consequences of liking, and concluded that it arouses the expectancy for cooperation in interactions, induces actual cooperation in mixed-motive situations, renders a target individual more susceptible to persuasive communications, induces conformity to group judgments and demands, mediates more imitation of a model, increases the effectiveness of social reinforcers, and reduces the probability that another will use coercion or mediate harm. Since little would happen in groups if members did not exert some influence over each other (Yalom, 1970), it appears that interpersonal attraction is importantly related to group process and subsequently to group outcome. Inasmuch as this area of research merits attention, a selection of studies concerning interpersonal attraction will be presented.

Knecht (1973) investigated the relationship of similarity, attraction and self-disclosure in dyads. Subjects completed an attitude

questionnaire and then were given a bogus questionnaire which they believed had been completed by another subject who would be their partner later in the experiment. The fake questionnaire was experimentally manipulated to be either similar or dissimilar to the subject's. The subjects were then asked to complete Byrne's Interpersonal Judgment Scale (IJS), indicating how much they liked their partner, and how much they expected to like working with him. Finally, the subjects selected from a prepared list, items varying in levels of self-disclosure that they felt willing to discuss with their partner. It was found that subjects assigned to a dissimilar-partner condition liked their partners less than did subjects in the similar-partner condition. Also, subjects with similar partners indicated that they would disclose more items of a particular intimacy level than subjects with dissimilar partners. Of particular interest was the fact that items of a more intimate level were selected as disclosure items for similar partners. It was suggested that their attraction toward the unseen partner had determined subject's willingness to disclose intimate information about themselves. These results rather directly imply a relationship between group composition and the quality of interpersonal relationship, in that attitude similarity positively predicts attraction and self-disclosure, and reaffirms the role of composition in group process.

In another attraction study, Good and Nelson (1971) had subjects evaluate mythical three-person stimulus groups in terms of perceived group attractiveness and group cohesiveness. Both the proportion of attitude similarity among the subject and the mythical group and the proportion of similarity within the mythical group itself was varied, using the Byrne-Nelson attraction function as the criterion for

similarity. Group attractiveness was measured by scales for liking and desire to work with the group, and the group's cohesiveness was assessed with scales asking for evaluations of the group's probable level of productivity, efficiency, feelings of belongingness, and morale. The results were that perceived group attractiveness was a positive function of the subject to mythical group similarity, and that perceived group cohesiveness was a positive function of the mythical group's similarity among members. An individual's expectancy for his behavior in a group and his attitude toward a group is clearly affected by perceived similarity of group participants. While Knecht (1973) demonstrated a connection between similarity and quality of interpersonal relationships, Good and Nelson relate similarity specifically to group cohesion, suggestion the use of composition similarity as a means of achieving cohesion.

Using a different approach to the study of attraction, Canfield and LaGaipa (1970) conducted a factor analytic study of the expectations associated with friendship. The experimenters derived 80 Likert-Type items from 1800 friendship statements, which were the product of 150 open-ended interviews with college students. Over 1000 high school and college students evaluated the 80 statements in terms of each one's relevance to these five levels of friendship: best friends, close friends, good friends, social acquaintances, and casual acquaintances. Eight major factors were found across ratings and people: (1) Genuineness (2) Intimacy potential (3) Acceptance (4) Utility potential (the willingness to endure high costs as the intensity of the relationship increases) (5) Ego-reinforcement (6) Admiration (7) Similarity (8) Ritualistic social exchange (exchanging gifts). An inspection of

these eight dimensions reveals that Byrne's (1969) contention that similarity is an important part of attraction is supported by factor 7.

Interpersonal Influence

Tedeschi, Schlenker, and Bonoma (1973) reviewed the factor analytic studies of small group behavior and of influence settings in order to identify the underlying variables which mediate interpersonal influence. They concluded that expertise, prestige, status, trustworthiness, and attraction account for most of the variance in interpersonal influence interactions. According to their definitions, expertise refers to special abilities; prestige is related to power, and includes capability of action along with willingness to act; status refers to a recognized position in the role structure; trustworthiness indicates that a person intends to communicate a valid message. Attraction is once again implicated as a determinant of the quality of interpersonal relationships and in addition, is one of several variables which are specifically related to interpersonal power. There are undoubtedly a host of variables contributing to one's attractiveness, some of which have been explicated through experimentation and are deserving of attention. Blau (1964), for instance, noted that experts are generally liked. It has also been shown that higher status persons are more liked than lower status persons (Masling, Greer & Gilmore, 1955; Petersen, Komorita & Quay, 1964), and that a person who has the capability of rewarding others along with the intention to do so (prestige) is generally liked more than someone without these characteristics (Pepitone & Kleiner, 1957). Tedeschi (1973) noted that attraction and trust are related to each other and produce separate effects

in mixed-motive situations, and a relationship between interpersonal trust and learning how to roleplay positive, interpersonal behaviors was demonstrated by Piper (1972). Many factors are related to interpersonal attraction, including interpersonal power. By inference these factors are also related to group composition and require consideration when evaluating the interpersonal processes that occur in groups.

Interpersonal Need

It appears well substantiated that both group composition and interpersonal attraction affect group process. In addition, group composition and interpersonal attraction are strongly associated. Increased understanding of the inter-relationships of these dimensions and the ability to manipulate them experimentally will facilitate the achievement of increased precision of control over the variables affecting group process. One attempt to integrate composition and attraction on the basis of interpersonal needs has been the theory of interpersonal behavior postulated by Schutz (1960).

According to Schutz's (1960) theory, the interpersonal needs of Inclusion (I), Control (C), and Affection (A) constitute a sufficient set of areas of interpersonal behavior for the prediction and explanation of interpersonal phenomena. The interpersonal need for Inclusion is defined in behavioral terms as the need to establish and maintain a satisfactory relation with people with respect to interaction and association. The interpersonal need for Control is defined in behavioral terms as the need to establish and maintain a satisfactory relation with people with respect to control and power. The interpersonal need for Affection is defined in behavioral terms as the need to establish

and maintain a satisfactory relation with others with respect to love and affection.

The Fundamental Interpersonal Relations Orientation-Behavior Test (FIRO-B) is designed to measure how an individual acts in interpersonal situations and to allow predictions about the interaction between people, within the schema just discussed (Schutz, 1960). The scores from the FIRO-B describe what behavior an individual expresses (e) toward others; and how he wants (w) others to behave toward him in each of the areas of interpersonal needs. This results in six behavioral scores: expressed inclusion (eI), wanted inclusion (wI), expressed control (eC), wanted control (wC), expressed affection (eA), and wanted affection (wA). An individual may be described by a set of six scores in terms of the FIRO-B. The FIRO-B profiles of individuals can be compared with one another and an assessment of the compatibility of their behaviors can be made. Schutz (1960) invokes the concept of compatibility to explain the interaction of individuals. He states that compatibility leads to mutual satisfaction of interpersonal needs and harmonious coexistence. It is important to note that compatibility does not necessarily imply liking in this conception, although they are probably often linked. Rather, compatibility may best be described sociometrically by the relation "works well with." A quantitative measure of compatibility for a dyad can be computed on the basis of FIRO-B scores. It is contended that predictions about the relative satisfaction of interpersonal needs between two persons can be made on the basis of FIRO-B scores as reflected by a compatibility score. Further, it is believed that group compatibility is positively related to the goal achievement of a group.

Dyadic compatibility may occur within each interpersonal need area (I, C or A) independently. For any particular dyad, there could be mutual satisfaction of the interpersonal need of I, for instance, and little mutual satisfaction of C and A needs. Compatibility or incompatibility in the areas of I, C, and A can occur in any combination. A complete description of the compatibility of a dyad would necessarily include a separate compatibility score for I needs, C needs, and A needs.

Currently Schutz (1960) describes and provides quantitative descriptions for three types of compatibility: reciprocal (rK), originator (oK) and interchange (xK). Each type reflects a different aspect of need satisfaction. Reciprocal compatibility can be understood by examining individual i's description of how he likes to be acted toward (i.e., wanted Inclusion for i, wI_i) in relation to individual j's description of how he likes to act toward people (i.e., expressed Inclusion for j, eI_j) and vice versa. If j exhibits the behavior that i desires, then they possess reciprocal compatibility. This compatibility type is expressed quantitatively by: $rK = |e_i - w_j + e_j - w_i|$. Originator compatibility refers to the degree that i originates behavior (i.e., $eI_i - wI_i$) in relation to the degree that j wishes to receive it (i.e., $eI_j - wI_j$). If i originates or initiates certain behaviors (i.e., eI_i) more than he wishes others to initiate that behavior (i.e., wI_i), and j initiates that behavior (i.e., eI_j) less than he wishes others to initiate the behavior (i.e., wI_j) and this discrepancy is equally large for both i and j, then they possess originator compatibility. For example, within the area of Inclusion needs, individual i would have a preference for always being involved

in interpersonal activities but not wanting to be asked in by others, while j would prefer not actively participating but wait to be invited to join. Originator compatibility is quantitatively described by: $oK = (e_i - w_i) + (e_j - w_j)$. Interchange compatibility refers to the mutual expression of the "commodity" in a given need area. If i prefers to experience a particular amount of one area of behavior (i.e., $eI_i + wI_i$) and j also prefers to experience the same amount of this behavior (i.e., $eI_j + wI_j$) then they possess interchange compatibility. Within the Inclusion area, individual i would have a preference to join and be asked to join in interpersonal activities to the same extent that individual j would prefer joining and being asked to join in such activities. This aspect of compatibility is expressed quantitatively by: $xK = \left|(e_i + w_i) - (e_j + w_j)\right|$. All three types of compatibility can be calculated for dyads only.

Dyadic Compatibility

An examination of the types of compatibility described by Schutz (1960) reveals that he described only three of a logically possible set of fifteen formulae. The complete set is presented in Table I. Each formula comprises a different comparison among the expressed and wanted FIRO-B scores for two individuals. Since only three of these indices have been previously described (i.e., rK, oK, and xK) it is necessary to examine some of their characteristics in order to determine their usefulness. An initial evaluation of these indices is appropriately done by examining their mathematical properties. To begin with, the formulae exhibit differences in range. Indices I through IX range from zero to 18, and indices X through XV range from

TABLE I

FORMULAE FOR FIFTEEN LOGICALLY POSSIBLE
FIRO-B COMPATIBILITY INDICES

I	$\lvert e_i - e_j \rvert + \lvert w_i - w_j \rvert$
II	$\lvert e_i - w_j \rvert + \lvert w_i - e_j \rvert = rK$
III	$\lvert e_i - w_i \rvert + \lvert w_j - e_j \rvert$
IV	$\lvert +e_i + w_i - e_j - w_j \rvert = sK$
V	$\lvert +e_i - w_i - e_j + w_j \rvert$
VI	$\lvert -e_i - w_i + e_j + w_j \rvert$
VII	$\lvert -e_i + w_i + e_j - w_j \rvert$
VIII	$\lvert +e_i - w_i + e_j - w_j \rvert$
IX	$\lvert -e_i + w_i - e_j + w_j \rvert$
X	$+e_i + w_i - e_j - w_j$
XI	$+e_i - w_i - e_j + w_j$
XII	$-e_i - w_i + e_j + w_j$
XIII	$-e_i + w_i + e_j - w_j$
XIV	$+e_i - w_i + e_j - w_j = oK$
XV	$-e_i + w_i - e_j + w_j$

e expressed behavior
w wanted behavior
i individual i
j individual $\overline{j}$

-18 to 18. It will be noticed that index XIV corresponds to oK as defined and discussed by Schutz (1960). Schutz addresses the issue of interpretation of negative versus positive arithmetic sign in relation to oK. Both -18 and 18 represent extreme incompatibility in comparison to zero which represents extreme compatibility. Schutz provides a differential interpretation to account for the arithmetic sign, but explains that both - 18 and 18 indicate equal degrees of originator incompatibility. An extension of his logic to indices X, XI, XII, XIII and XV yields that each represents a dimension of compatibility with two possible interpretations for incompatibility on that index (i.e., a differential interpretation for -18 and 18). For the purposes of mathematical description, however, this differential interpretation is irrelevant and can be ignored, since the theoretical implications of differences in sign for interpersonal need theory are not within the domain of interest for a purely mathematical analysis. Furthermore, an inspection of formulae X through XV reveals that any one of the indices would be expected to produce as many positively signed values as negatively signed values. This effect (equal numbers of positive and negative values) is logically justified assuming that each constituent of the formulae (i.e., e_i, w_i, e_j, and w_j) has an identical and independent distribution. Considering that Schutz (1960) reports relatively low intercorrelations among the FIRO-B scores and presents data that the scores are all roughly rectangularly distributed, it appears justified to ignore sign, and expect that the distribution for the negative values for any given index would be essentially identical to the distribution for the positive values. It will be remembered that to ignore sign is to attend only to the absolute value. A review of Table

I reveals that formulae IV through IX are in fact the absolute value of formulae X through XV respectively. Therefore, formulae IV through IX should be distributed essentially identically with formulae X through XV. On this assumption, when evaluating the exact form of these distributions, it was sufficient to describe only formula I through IX. In addition to range, it is important to examine the mean of a distribution as well as the shape or form of the distribution around the mean. In order to acquire that information, a computer program listed in Appendix A was developed which provided a description of compatibility indices distributions. These distributions were derived from 216 FIRO-B tests obtained from students enrolled in introductory psychology courses at Oklahoma State University. The computer program first analyzed the distribution of the FIRO-B raw scores within one interpersonal area at a time (i.e., e^A and w^A) and then converted this data to a statement of the probability of obtaining each possible raw score (FIRO-B raw scores range from zero to nine) for both the e and w dimensions, independently. On the basis of this probabilistic description of raw score distribution, the probability of obtaining each possible score within the range of a compatibility index (i.e., zero to 18) was calculated for formulae I through IX. The probabilistic frequency distribution of compatibility scores was plotted and scrutinized by a visual examination for both the mean and the form of the distribution. Two sets of curves with distinctly different attributes resulted. The first set consisted of formulae I, II, and III, which exhibited a mode of approximately 6 and were mesokurtically distributed. The second set consisted of formulae IV through IX which exhibited a mode of approximately one, and an approximately linear distribution,

negatively sloped. Refer to Figure 1 for a representation of these mathematical distributions. It was judged that indices I, II, and III possessed mathematical distributions more useful than indices IV to IX. This judgment was based on the fact that compatibility is purportedly useful as a discriminatory index among dyads with varying degrees of interpersonal need satisfaction (Schutz, 1960). In this context, it would be expected that some dyads exhibit compatibility and that others exhibit incompatibility. In addition though, when describing a population of scores such as the population of dyadic compatibilities, the distribution is typically conceptualized as consisting of an average score with progressively fewer scores occurring above and below the mean. Therefore, extremely compatible dyads as well as extremely incompatible dyads would be expected to be statistically rare combinations of individuals. The implications of compatibility as initially described by Schutz (1960) are consistent with this expectation, that very compatible dyads exhibit an uncommonly high level of satisfaction of interpersonal needs relative to dyads of average compatibility, and conversely that very incompatible dyads exhibit an uncommonly low level of satisfaction relative to dyads of average compatibility. Studies using compatibility have often used FIRO-B compatibility in this way, comparing various effects of extreme compatibility to average compatibility (Frandsen & Rosenfield, 1973; Kerckhoff & Davis, 1962). Figure 1 suggests that indices IV to IX are not appropriate for this kind of comparison, by virtue of the fact that extreme compatibility is the most frequent score in the population. This fact seems to violate an underlying assumption of the compatibility behavior (Schutz, 1960). Upon this consideration, it was decided that

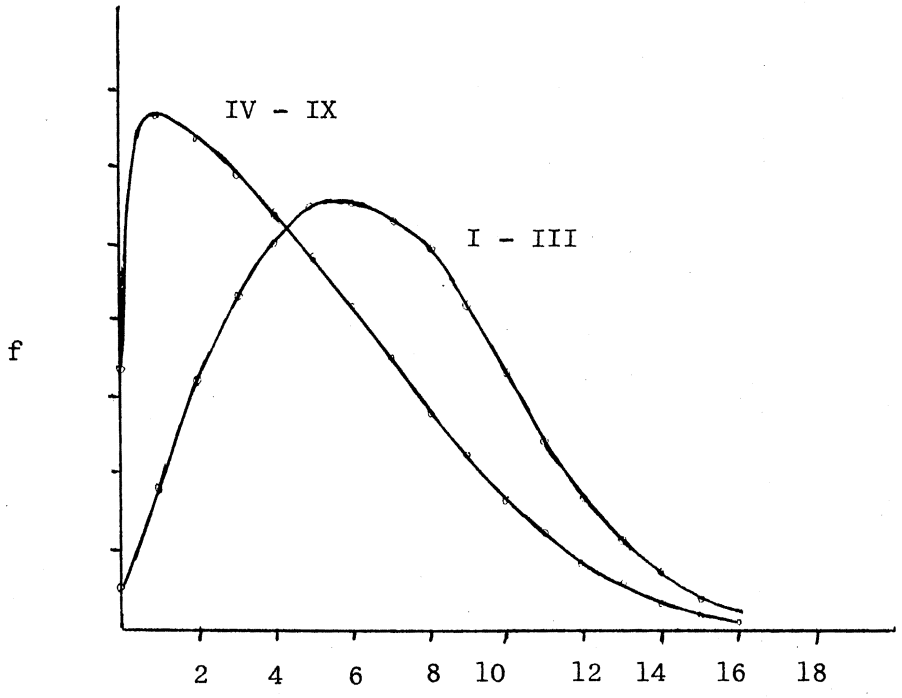


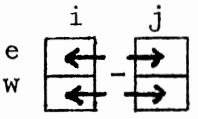
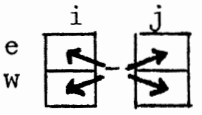
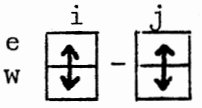
Figure 1. Probabilistic Frequency of Compatibility Scores for Indices I to IX

indices IV to IX (which includes xK and oK) should be eliminated from consideration as measures of group composition in the present study. It was noted, additionally, that indices I, II and III may possess distributions sufficiently approximating normality to allow tests of statistical significance between compatibility scores, using standard deviations and common parametric statistical techniques, although the validity of this approach was not evaluated in this study.

A schematic representation in Table II illustrates the relationships among FIRO-B raw scores for indices I, II and III. Index I, termed here similarity compatibility, provides a measure of the discrepancy between the expressed scores of individuals i and j combined with the discrepancy between the wanted scores of individuals i and j. Index II, termed here complementarity (reciprocal) compatibility, provides a measure of the discrepancy between the expressed score of individual i and the wanted score of individual j combined with the discrepancy between the wanted score of individual i and the expressed score of individual j. Index III, termed here intraindividual conflict, provides a measure of the discrepancy between the expressed and wanted scores for individual i combined with the discrepancy between the expressed and wanted scores for individual j. The latter index corresponds to the degree of conflict and/or frustration that an individual experiences relative to a particular area of interpersonal need (i.e., I, C, or A). The larger the expressed-wanted discrepancy, the greater the probability that an individual behaves in ways incompatible with his needs. "A person may want to be involved socially, for example, (high w^I) but is either unskilled or uncomfortable initiating such contacts (low e^I); others may not seek him out because they perceive him

TABLE II

SCHEMATIC REPRESENTATION OF THE FIRO-B RAW SCORE RELATIONSHIPS FOR THREE MESOKURTICALLY DISTRIBUTED COMPATIBILITY INDICES

I	$\left\|e_i - e_j\right\| + \left\|w_i - w_j\right\|$	
II	$\left\|e_i - w_j\right\| + \left\|w_i - e_j\right\|$	
III	$\left\|e_i - w_i\right\| + \left\|w_j - e_j\right\|$	

e expressed behavior
w wanted behavior
i individual $\underline{i}$
j individual $\underline{j}$

as being shy, distant, or not interested" (Ryan, 1970). Since index III apparently represents a measure of individual maladjustment summed across both members of a dyad, it is not very directly a measure of compatibility, but more an indication of the combined intrapersonal conflict for a dyad. Considering the present emphasis on compatibility, this index was not included as a variable of group composition.

Examination of indices I and II makes it apparent that they seem very appropriate definitions for similarity and complementarity, respectively. These definitions are presented schematically in Table III. A score of zero on index I (extremely compatible) indicates exact similarity of FIRO-B profiles: $e_i = e_j$ and $w_i = w_j$. A score of 18 on this same index (extremely incompatible) indicates maximum dissimilarity: $e_i \neq e_j$ and $w_i \neq w_j$. Zero on index II (extremely compatible) reflects exact complementarity of FIRO-B profiles: $e_i = w_j$ and $w_i = e_j$. When 18 is obtained on this index (extremely incompatible) maximum discomplementarity is indicated: $e_i \neq w_j$ and $w_i \neq e_j$. Reciprocal compatibility (rK) as defined by Schutz (1960), corresponds to index II. For the purposes of this study it will be relabeled complementarity. For simplicity, index I and II will be subsequently referred to as sK (similarity-dissimilarity compatibility) and cK (complementarity-discomplementarity compatibility) in this study. Figure 2 presents the mathematical relationship between sK and cK.

These indices, sK and cK, were constructed to provide a quantitative description of dyads, and must be adapted for use in groups. Presently, groups of four individuals each are used, which are comprised of six dyads. A composite score defined as sK group is defined by: sK group = $(sK_{ij}+sK_{ik}+sK_{il}+sK_{jk}+sK_{jl}+sK_{kl}$. Correspondingly, cK group is defined by: cK group = $(cK_{ij}+cK_{ik}+cK_{il}+cK_{jk}+cK_{jl}+cK_{kl})6$. A

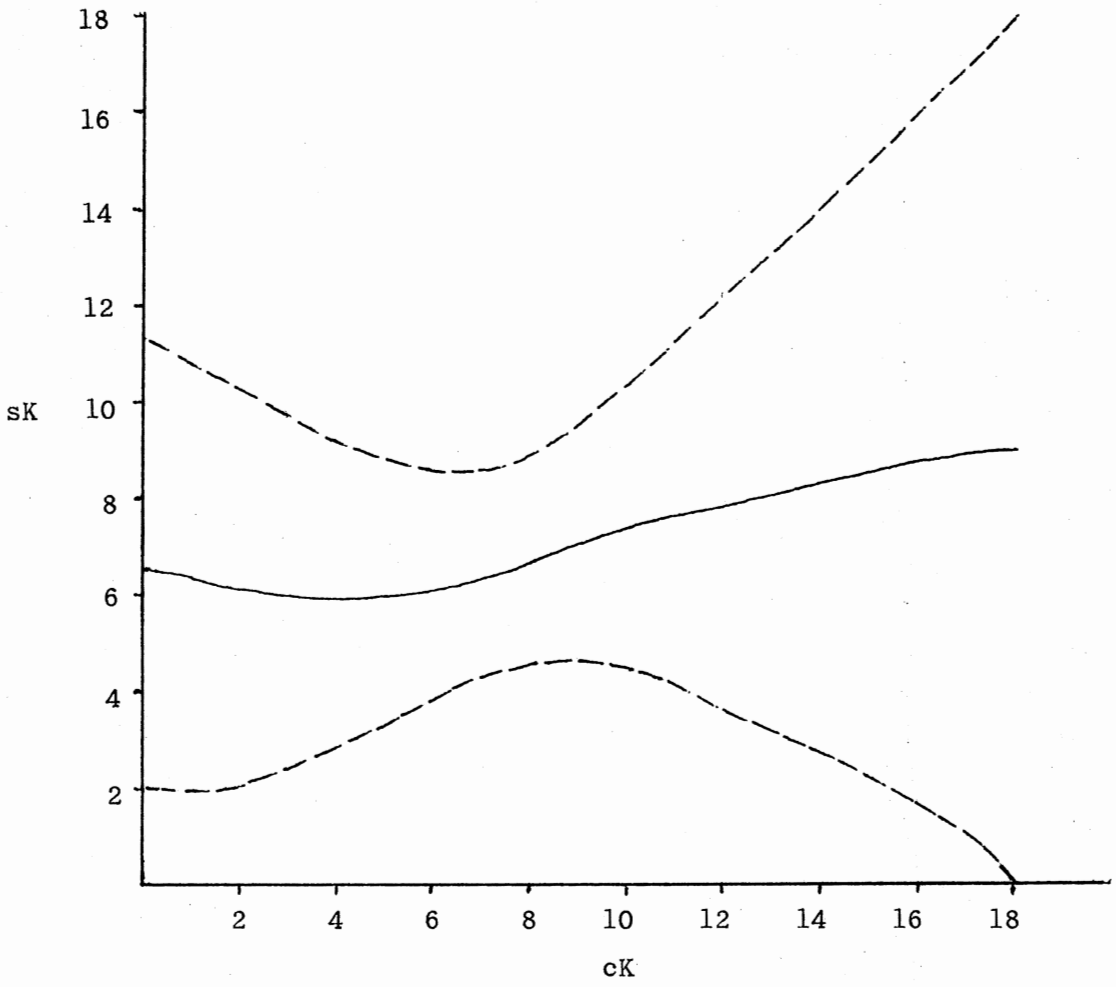
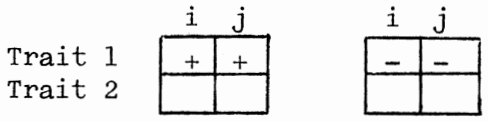


Figure 2. Mean Value of Similarity and One Standard Deviation Range for Each Value of Complementarity Compatibility for Retangularly Distributed FIRO-B Raw Scores

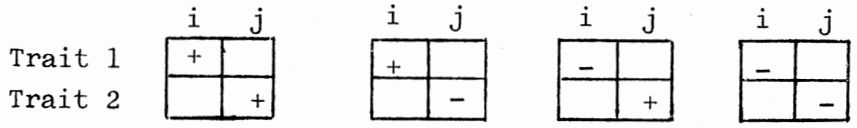
TABLE III

SCHEMATIC REPRESENTATION OF SIMILARITY AND COMPLEMENTARITY RELATIONSHIPS

SIMILARITY



COMPLEMENTARITY



i individual i
j individual j
\+ relative presence
– relative absence

meaningful description of a group's compatibility would include not only its mean dyadic compatibility, but also the variability among the six dyadic scores comprising the group index. Therefore, the standard deviation for the sK group and cK group indices was calculated and regarded as an integral part of the description of a group's compatibility.

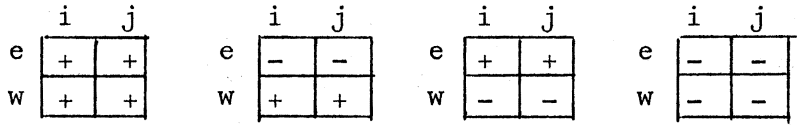
For any given dyad there simultaneously exists a value for both sK and cK, and consequently the same is true for any given group. An adequate description of a particular group's compatibility would necessarily include both types, and would preclude the investigation of one index exclusive of the other. Therefore, a study of the similarity and complementarity of traits would of necessity use both sK and cK; values on each may be varied independently to investigate their individual effects. Table IV presents patterns of FIRO-B raw scores which produce similarity-dissimilarity and complementarity-discomplementarity.

An investigation of these two dimensions would seem to be done adequately by establishing groups of every possible combination. To simplify labeling, a "Low" condition is used to denote similarity or complementarity, and "High" is used to denote dissimilarity or discomplementarity. So abbreviated, then a group's possible compatibility characteristics could be described as Low-Low, Low-High, High-Low, and High-High, where these labels correspond to levels of similarity and complementarity, respectively. There would conceivably be then, a similar complementary group, a dissimilar/complementary group, a similar/discomplementary group, and a dissimilar/discomplementary group.

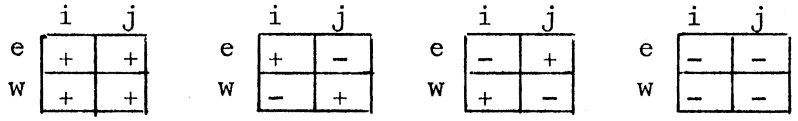
TABLE IV

SCHEMATIC REPRESENTATION OF SIMILARITY AND COMPLEMENTARITY FIRO-B COMPATIBILITY

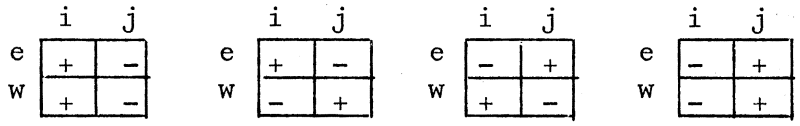
SIMILARITY



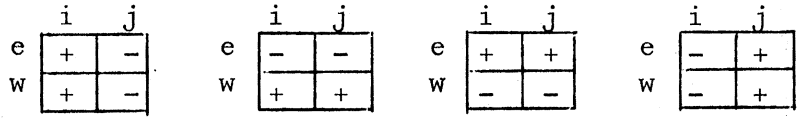
COMPLEMENTARITY



DISSIMILARITY



DISCOMPLEMENTARITY



e expressed behavior
w wanted behavior
i individual i
j individual j
\+ relative presence
− relative absence

Group Compatibility

It happens that all of these combinations (i.e., LL, LH, HL and HH) are possible for dyads, but all of them are not possible for groups. The particular patterns of scores necessary to accomplish these compatibility profiles for dyads can be obtained with varying combinations of FIRO-B expressed and wanted scores. These combinations are presented in Table V. Group compatibility, however, involves assessment of the many dyads existing within a group and this greatly complicates the patterns of scores necessary for achieving the desired compatibility profile. Within four member groups it happens that the High-Low condition is nearly impossible to achieve and the High-High condition is achieved with considerable difficulty. These conditions are increasingly less feasible as the size of the group increases. The difficulty arises from the fact that both the High-Low and High-High situations require two individuals with different or dissimilar trait patterns (i.e., dissimilarity compatibility). The particular way in which they are dissimilar, or their type of difference, determines whether the dyad is also simultaneously complementary or discomplementary, or of High-Low or High-High compatibility, respectively. In either of these cases, the integrity of the specific type of difference (complementarity or discomplementarity) must be preserved in order to ensure the desired compatibility profile (High-Low or High-High). The difficulty in maintaining a particular compatibility profile in a group is exemplified by what occurs when a third individual is added to an existing dyad. A three member group has three dyads (i-j, i-k, j-k), all of which must have an identical relationship of traits to have an

TABLE V

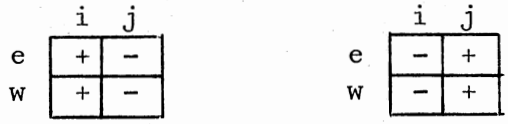
POSSIBLE COMBINATIONS OF SIMILARITY-COMPLEMENTARITY
FIRO-B COMPATIBILITY FOR DYADS

SIMILARITY-COMPLEMENTARITY

SIMILARITY-DISCOMPLEMENTARITY

DISSIMILARITY-COMPLEMENTARITY

DISSIMILARITY-DISCOMPLEMENTARITY



e expressed behavior
w wanted behavior
i individual i
j individual j
\+ relative presence
\- relative absence

internally consistent compatibility profile. The High-Low and High-High conditions require that the dyad consist of two individuals exhibiting dissimilarity of their trait patterns. A third member must, mandatorially, be dissimilar to both existing members and in addition, must preserve the type or style of difference (i.e., complementary or discomplementary) existing in the original dyad. To explain, it is possible to have two individuals, i and j, who are related to each other in a High-Low fashion. A third individual, k, needs to preserve the i-j High-Low relationship so that all dyads (i.e., i-j, i-k, and j-k) are related in a High-Low fashion, but this is not possible. It j is different from i, and k is also different from i, then individuals j and k become similar to each other. That is, i-j and i-k dyads can be dissimilar/complementary (i.e., High-Low) in their relationship, but the j-k dyad would exhibit similarity, thus destroying the dissimilar/complementary profile. Refer to Table VI for a description of this process. A corresponding problem occurs for the High-High conditions, although it is not quite so severe for four member groups. The result is that only the Low-Low, Low-High, and High-High conditions are empirically a reality.

Table VII demonstrates the comparisons among FIRO-B scores that are evaluated for compatibility in groups of four individuals. All comparisons must be taken into account simultaneously to ensure uniformity of compatibility for all dyads. Similarity compatibility demands that e_i be compared with e_j, e_k, and e_l, and that w_i be compared with w_j, w_k, and w_l. All of these comparisons must result in a lack of discrepancies in order to have established a state of similarity (i.e., $e_i = e_j = e_k = e_l$ and $w_i = w_j = w_k = w_l$). Complementary

TABLE VI

THIRD MEMBER EFFECTS ON DYADIC DISSIMILARITY/
COMPLEMENTARITY COMPATIBILITY

High-Low

	i	j
e	+	−
w	−	+

	k
	−
	+

High-Low

	i	j
e	+	−
w	−	+

High-Low

i	k
+	−
−	+

Low-High

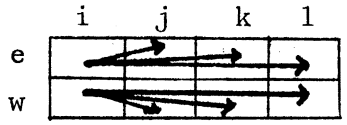
j	k
−	−
+	+

e expressed behavior
w wanted behavior
i individual i
j individual j
\+ relative presence
− relative absence

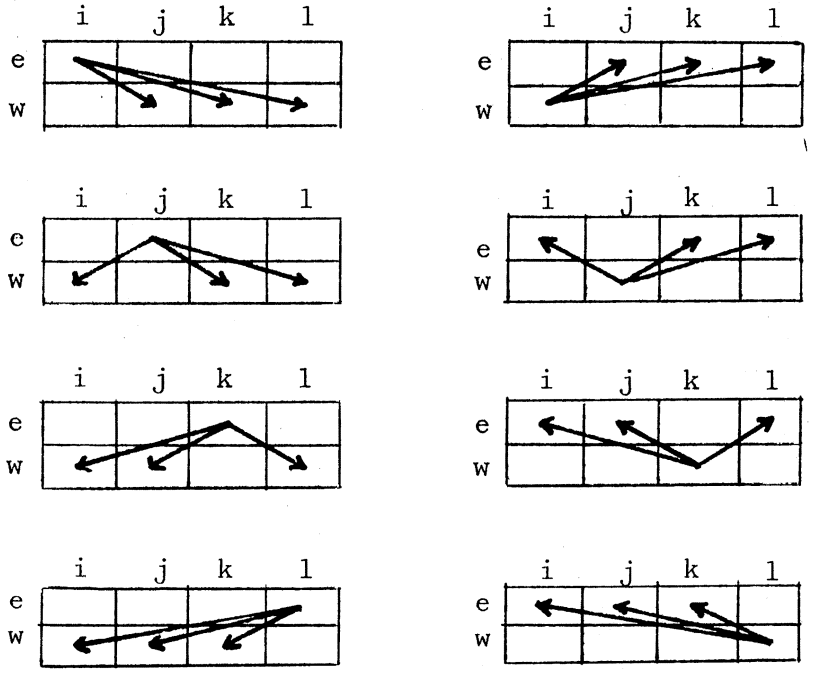
TABLE VII

COMPARISONS OF FIRO-B RAW SCORES ASSOCIATED WITH SIMILARITY AND COMPLEMENTARITY COMPATIBILITY

SIMILARITY



COMPLEMENTARITY



e expressed behavior
w wanted behavior
i individual i
j individual j
k individual k
l individual l

compatibility demands that e_i be compared with w_j, w_k, and w_l; e_j be compared with w_i, w_k, and w_l; e_k be compared with w_i, w_j, and w_l; and that e_l be compared with w_i, w_j, and w_k. This set of comparisons must result in a lack of discrepancies in order to have established a state of complementarity (i.e., $e_i = w_j = w_k = w_l$, $e_j = w_i = w_k = w_l$, $e_k = w_i$, w_j, w_l, $e_l = w_i = w_j = w_k$, and $w_i = e_j = e_k = e_l$, $w_j = e_i = e_k = e_l$, $w_k = e_i = e_j = e_l$, and $w_l = e_i = e_j = e_k$). The arrows in Table VII illustrate these comparisons. The achievement of uniform dyadic compatibility is obviously a complex process, but one that is necessary in order to have a well defined group compatibility atmosphere, and a comprehensive description of group composition. For a discussion of similarity and complementarity compatibility generalized to personality descriptions using three or more traits in comparison to the two trait FIRO-B personality description (i.e., e and w traits) refer to Appendix B.

Within the present study, only FIRO-B similarity and complementarity compatibility are used. According to Schutz (1960), all types of compatibility, including sK and cK, exist simultaneously within each of the interpersonal areas of Inclusion, Control, and Affection. The significance of area compatibilities (i.e., I, C and A) for group process, however, are not equal at any one given time, but vary in a systematic manner. Schutz states that groups focus on these areas individually and sequentially as they develop and mature. Initially, groups interact primarily with regard to Inclusion issues and remain at this stage until satisfactory resolution allows progression to the next, or Control stage, and finally to the Affection stage. He contents that groups repeat this sequence, I-C-A, indefinitely at progressively more intense levels of interaction for the life of the group. There is evidence,

however, that these interpersonal areas are not all of equal consequence to group process. Fromme and Close (1976) found that only Control and Affection compatibility demonstrated effects in 50-minute, four member leaderless groups. They measured verbal behavior that is related to the type of statements Yalom (1970) outlines as conducive to therapeutic group process. Compatibility consisted of an overall group score averaged across reciprocal, interchange, and originator compatibility and measured independently for Inclusion, Control and Affection needs. Only for the Inclusion area did incompatibility groups exhibit no decrement in performance compared to compatible groups. The authors speculate that inclusion phenomena may be more likely to emerge in large groups and relatively unstructured situations. The use of a small group with potent incentives for member involvement may have emphasized the effects of Control and Affection on compatibility.

Snider (1970) undertook an exploratory factorial study of the major dimensions of behavioral interactions in autonomous patient groups. Using the Group Behavior Questionnaire (GBQ) and the Group Member Evaluation (GME) as rating scales, he obtained measurements on 402 consecutively admitted participants in a Patients' Training Laboratory at a Houston Veterans Administration Hospital. Varimax rotated factors were derived which were stable over time and corresponded closely to Love-Hate and Dominance-Submission dimensions. Snider suggests that they may be best interpreted as response tendencies rather than subject attributes, but they appear to be consistent and reliable factors. Similarly, extensive reviews of factor analytic studies by Carson (1969) and Swensen (1973) confirm that the two apparent major dimensions of interpersonal behavior are dominance and affiliation.

On the basis of these previous efforts, FIRO-B determined Control

and Affection areas are to be evaluated in the present study, excluding the Inclusion area. Considering the restrictions on similarity and complementarity compatibility in four member groups as previously discussed, then the following groups comprise the possible combinations of group composition to be studied:

LL^A	similarity/complementarity of Affection needs
LH^A	similarity/discomplementarity of Affection needs
HH^A	dissimilarity/discomplementarity of Affection needs
LL^C	similarity/complementarity of Control needs
LH^C	similarity/discomplementarity of Control needs
HH^C	dissimilarity/discomplementarity of Control needs

Compatibility Evidence

Several studies have investigated the relationship of FIRO-B scores to group behavior, such as Liddell (1970), who composed groups according to their expressed Control and wanted Control scores. There were three experimental conditions of compatibility type: (1) compatible, (2) random, and (3) incompatible. In the compatible condition a high expressed Control, low wanted Control subject was placed in the central position and four low expressed Control high wanted Control subjects were placed in the peripheral position in a centralized wheel communication network design. In the incompatible condition, a low expressed Control, high wanted Control subject was in the central position and four high expressed Control, low wanted Control subjects were in the peripheral positions. The random condition placed subjects without regard to their FIRO-B scores. The author reports that the compatible condition groups solved problems faster than

incompatible groups. In addition, this same pattern emerged for the number of errors per group, with the compatible group exhibiting the least number of errors.

Baum (1971) studied the effects of FIRO-B Inclusion and Affection scores on self-disclosure in four member groups. Groups consisted of three sets: High Inclusion and Affection (HIA), Low Inclusion and Affection (LIA), and mixed composed of both HIA and LIA subjects. Self-disclosure ratings came from tape recordings, and revealed that LIA groups exhibit higher self-disclosure rates than HIA groups. The results generally support the view that group composition is an important variable in group research, as well as substantiating that self-disclosure is affected by group composition.

One important distinction to make for any definition of group composition is whether the concept refers to the absolute value of personality traits among group members (i.e., the relative presence or absence of a trait or traits across individuals), or to the characteristics of the interpersonal relationships (i.e., the comparisons of absolute values of personality traits within a group). These two definitions have very different implications. Homogeneity and heterogeneity are often used to denote the characteristics of absolute value of personality traits. Homogeneity refers to identical levels of value on some specified personality traits, and heterogeneity refers to variability of the levels of personality traits across individuals. The nature of the interpersonal relationships resulting from homogeneity or heterogeneity can only be implied or sometimes secondarily derived, not directly evaluated. Compatibility, on the other hand, is a direct measure of the interpersonal relationship, but has complex and

ambiguous implications regarding the absolute value of traits. Since it is the quality of interaction of personalities or the quality of interpersonal relationship that seems to be a vital element in groups, there may be some advantage to assessing the relationship directly in preference to an assessment of individual personality characteristics. In any case, an understanding of the homogeneity-heterogeneity as it relates to compatibility will aid the interpretation of composition studies and may help explain discrepancies. It appears that the homogeneity-heterogeneity dimension corresponds directly to similarity-dissimilarity, even though the unit of analysis for these two dimensions is different. Identical absolute values of traits across individuals (homogeneity) results in identical relationships of traits across individuals (similarity), since comparisons among several identical values would all be identical. Conversely, while the unit of analysis is the relationship for similarity compatibility, identical relationships would require identical individuals. This same reasoning applies to heterogeneity and dissimilarity. Therefore, homogeneity-heterogeneity and similarity-dissimilarity, in effect, describe the same dimension. As previously noted, complementarity-discomplementarity varies independently of similarity-dissimilarity in dyads, and varies in a restricted fashion in groups. It follows then that complementarity is to some extent independent of homogeneity-heterogeneity. A description of group composition based solely on homogeneity-heterogeneity leaves unmeasured and uncontrolled the value of complementarity discomplementarity. Assuming that the latter dimension is important to group functioning, then some of the unexplained variability in groups classed as homogeneous or heterogeneous may be the

result of complementarity-discomplementarity compatibility.

Another important distinction to make regarding group composition, pertains to the degree of uniformity of relationships within groups. For instance, a group may be classified heterogeneous, and described as being composed of individuals varying widely in their scores on some personality dimension. It is entirely possible if not likely that a few dyads in that group are similar or homogeneous. In a group of ten individuals there are forty-five dyads, which offers many opportunities for a similar dyad to occur. The point is that a complete description of group composition entails analysis of every possible dyad, and that the specification of a homogeneous group in a rigorous sense demands near perfect uniformity among dyads. In the present study, not only is the mean dyadic compatibility determined, but the variability of scores around this mean is also determined and then minimized. The result is a group with a composition specification such as similarity/complementarity, and with concurrent uniformity of specification such that each dyad within the group attains as nearly as practically possible the same compatibility values.

A variety of investigators have used compatibility as a measure of group composition, but with discrepant results. Centers and Granville (1971) administered FIRO-B questionnaires to 251 married and unmarried college student intersexual dyads at UCLA in order to examine the correlation of compatibility with degree of intimacy, determined at four levels: married, engaged, going steady, dating frequently. Compatibility scores were computed for couples at each level and compared with compatibility scores of couples created by random matching of males and females within each intimacy level. An average score across reciprocal,

interchange and originator compatibilities comprised the overall compatibility index for each couple. The authors found some substantiation of compatibility effects for married couples but none for the other intimacy levels. The lack of detailed information regarding each type of compatibility separately renders these results difficult to interpret, however, they conclude that mild support for Schutz's (1960) theory of compatibility was established.

Another study regarding mate selection was done by Kerckhoff and Davis (1962) in which an abbreviation of the FIRO-B questionnaire determined need complementarity for couples. To this end, reciprocal compatibility was computed within the interpersonal areas of Inclusion, Control and Affection and related to the progress toward permanence in the relationship over a seven-month interval. Conclusions were that need complementarity operates significantly only in the later stages of mate selection. They found effects only for the Inclusion and Control areas, although the Affection scores exhibited a similar trend. Bernard Farber's "index of consensus" was used as a measure of similarity of values for the couples, and exhibited significant differences across different levels of progress toward permanence. No measure of need similarity was used, which may have simultaneously contributed to the mate selection process, although the data does not allow an evaluation of this variable.

As previously discussed, compatibility is implicated in the therapeutic process. Costell and Koran (1972) attempted to relate FIRO-B interchange compatibility to group cohesiveness after one meeting and after twelve meetings. Compatibility failed to correlate with cohension measured by the Hill Interaction Matrix, Behavior at either

stage of group maturity for either Inclusion, Control or Affection needs. Interchange compatibility for a group was the average score for all dyadic combinations.

A related effort by Edwards (1968) attempted to relate reciprocal, originator, and interchange compatibility within all three interpersonal areas to group outcome determined by a Group Opinion Questionnaire. A complete matrix of product-moment correlations for all compatibilities and six outcome measure scores produced no significant results. In both of the last two studies compatibility was measured for randomly selected groups. This method should produce compatibility scores clustered around the mean of the compatibility index distribution, which does not allow for wide variability of scores. The result is that there would be small compatibility influences operating within a group. Considering what must be a myriad of variables affecting group process, the chances are small that compatibility alone would demonstrate significantly high correlations, particularly with a relatively small number of cases. In addition, as previously discussed, the distributions of originator and interchange compatibility are of questionable mathematical usefulness, so that the use of these indices probably dilutes the strength of results.

Reddy (1971) used interchange compatibility in ten member sensitivity groups and did find a compatibility effect, although incompatible groups performed better than compatible groups according to the Personal Orientation Inventory (POI). Outcome was determined by the magnitude of gain on selected aspects of self-actualization on the POI. Composition definition for incompatible groups was the simultaneous presence of individuals with high combined expressed and wanted Affection scores

on the FIRO-B, and other individuals with low combined expressed and wanted Affection scores. One compatible group was composed of individuals who had low expressed and wanted Affection scores, and the other was composed of individuals who had high expressed and wanted Affection scores. Even though Reddy demonstrated effects, compatibility within the interpersonal areas of Inclusion and Control was unaccounted for. Again, interchange compatibility is not the mathematically preferable index compared to reciprocal compatibility, leaving open the question as to what effects a potentially more powerful form of compatibility may have had on the results.

Compatibility Summary

The most general conclusion to be drawn from the literature is that group composition does affect group behavior. The operational definitions of composition variables differ and there is no generally accepted measure of group outcome or behavior. The result is a lack of comparability of experimental design across studies and many contradictory results. It is apparent, however, that personality dimensions as they relate to composition often demonstrate effects on group behavior, and that verbal behavior has repeatedly shown its usefulness as being indicative of group process. There are no consistent demonstrable effects on verbal behavior as a dependent variable resulting from experimental manipulation of personality composition, but verbal behavior nevertheless appears to be a promising variable. Measures of composition vary from relatively imprecise groupings of similar personality scores to the tightly controlled manipulation of group interpersonal relationship characteristics. Verbal behavior may be simply

a count of utterances or the exact measurement of specific categories of statements. Currently, these variables are different in nearly every study. A major controversy regarding the composition issue has been whether groups of similar individuals (homogeneity) is desirable or whether groups of dissimilar individuals (heterogeneity) is desirable, although there is no preponderance of data to support either position. It does appear substantiated, however, that FIRO-B determined compatibility is at times a useful predictor of group behavior. The current literature neither conclusively confirms or disconfirms Schutz's theory of compatibility, and it remains an attractive approach to composition measurement. The conceptual organization and ease of measurement of this technique make it a theory which deserves more extensive evaluation.

Although Schutz discussed compatibility primarily as a measure of the ability of persons to work well together, most studies have used compatibility to determine various types of personal or group growth. There is certainly some justification for this application, since compatibility is related to interpersonal attraction and its antecedents as well as working relations. In addition, interpersonal anxiety, which compatibility purportedly contraindicates, is undoubtedly a factor in sensitivity and therapy groups. The present study is concerned with group composition and its effects on the rate of elicitation of affective verbalizations which reflect group growth. Specifically, similarity and complementarity compatibility as desirved from the FIRO-B will be evaluated for its effects on group verbal behavior.

Operant Technique

Since about the time that Greenspoon (1955) demonstrated that he could verbally reinforce subjects for particular speech categories, there has been a growing interest in verbal conditioning in the literature. This interest has also shown up in reinforcement of verbal output in groups. Cohen et al. (1954) demonstrated that the use of personal pronouns (I, We) in small groups can be increased by a verbal reinforcement technique. Oakes, Droge, and August (1960) increased or decreased participation of subjects in a group discussion by using a light flash as a positive or negative reinforcer, respectively. Bavelas et al. (1965) increased the verbal output of a target person in a group by a similar reinforcement technique. A light flash signaled a subject privately that he was interacting in such a way as to aid the group in arriving at intelligent solutions. Zdep and Oakes (1967) increased the verbal output of a target person using the light flash reinforcement procedure, and noted that the sociometric status of the target person increased as well as his verbal output.

Attempts have been made to modify verbal response classes. Verbal initiations were investigated by Hauserman, Zweback, and Plotkin (1972), giving of opinions by Oakes (1962), order of speaking by Levin and Shepiro (1962), conclusions reached by Oakes, Droge, and August (1961), and personal or group references by Dinoff et al. (1960). Reinforcement is effective in not only increasing verbal output, but is also effective in modifying particular classes of verbalizations.

Salzinger, Portway, and Feldman (1963) and Ullmann, Krasner, and Gelfand (1963) demonstrated that affect words can be conditioned in an

individual setting. Ince (1968) increased the emission of positive self-reference statements with the use of a fixed-interval reinforcement technique. Three female college students were the subjects in a setting which simulated an actual counseling situation. Ullman, Krasner and Collins (1961) reinforced affect words while telling TAT stories, and found that this led to increased verbalizations in a subsequent group therapy session. Salzinger and Pisoni (1960) had a therapist reinforce affect behavior of subjects in a group therapy. This technique was effective for both normal and schizophrenic subjects. The reinforcer consisted of a verbal agreement by the therapist immediately following an affect statement.

Although the frequency of affective verbalizations have been increased in groups, little attention has been given to modifying specific kinds of affective responses in groups. Only a few attempts are known to the author (Fromme, Whisenant, Susky & Tedesco, 1973; Fromme, Stommell & Duvall, 1974; Fromme & Close, 1976). An audible click from a cumulative counter was the reinforcer. All members in a group of four persons had their own counter (reinforcer) although all persons in the group could hear the click from any counter and identify which member received the reinforcement. Using this technique, affective verbalizations corresponding to specified response categories were effectively modified. Fromme et al. (1973) provided evidence that these categories could be reliably judged and therefore reinforced in a consistent manner. The verbal responses that were selectively reinforced were suggested by Yalom (1970), as those responses which are conducive to interpersonal learning in a group therapy setting. A distillation of Yalom's comments yielded these responses as

desirable: (a) expressions of feelings toward other group members as they arise ('here and now'), (b) feedback and consensual validation of behavior, and (c) expressions of understanding others' feelings and behaviors (empathy). Yalom views groups as a social microcosm in which members exhibit the behaviors that characterize their actions outside the group. This allows examination in the group of the maladaptive behaviors that they exhibit in their interpersonal relationships with others. The re-evaluation of interpersonal behavior in a group and subsequent change also allows a person to carry his new knowledge out into his other social relationships and alter his extra-group behavior. The production of verbalizations in the above categories seems to mediate this process. Conditioning of these verbal responses would then be desirable in order to facilitate interpersonal learning in groups. Fromme et al. (1973) demonstrated that these verbal responses can be conditioned by his instrumentation technique.

Yalom's (1970) discussion included a therapist as the facilitator of the desirable verbal responses and the group proces. Fromme et al. (1973) used led and leaderless groups. They attempted to simulate the desirable group process as described by Yalom with the operant technique. There are differences of opinion regarding the efficacy of having group leaders. Wolf (1961) suggested that an antitherapeutic dependence on the therapist impedes personal growth. Some investigators found that differences in emotional climate between led and leaderless groups was slight, although those with therapists exhibited more depression and tension, and slightly less warmth (Harrow et al., 1967). Slavson (1964), however, feels that disruptive acting out may occur in leaderless groups. There are certainly both

advantages and disadvantages to therapist led groups. In the context of experimental investigation of variables affecting group processes and outcome, the task may be considerably simplified and facilitated by conducting research with leaderless groups. Elimination of the therapist can be regarded as an experimental control which reduces the number of variables affecting the group process. This approach is particularly attractive considering the present lack of sophistication in group research.

Summary of the Problem

This study investigated the effects of similarity and complementarity compatibility within the interpersonal areas of Control and Affection, on the production of affection, feedback, and empathetic statements in groups, which can reasonably be expected to reflect productive group behavior (Yalom, 1970). To the extent that compatibility affects these responses, then it may be useful in predicting group productiveness. It is hypothesized: (a) Within the interpersonal area of Affection, a similarity/complementarity compatibility group will be associated with a significantly higher level of desirable verbalizations than a similarity/discomplementarity group, and a similarity/discomplementarity group will perform significantly better than a dissimilarity/discomplementarity group, (b) Within the interpersonal areas of Control, a similarity/complementarity group will be associated with a significantly higher level of desirable verbalization than either a similarity/discomplementarity or a dissimilarity/

discomplementarity group, and (c) Similarity/complementarity compatibility will be associated with a significantly higher level of desirable verbalizations when it pertains to the Affection area rather than the Control area.

CHAPTER II

METHOD

A completely randomized 2 x 3 x 2 factorial analysis of variance will be used to evaluate the main effects and interactions of factors: (1) interpersonal area (i.e., C and A), (2) compatiblity-type (i.e., LL, LH, and HH), and (3) group replication (i.e., replication one and two). It is hypothesized that Affection compatible groups (i.e., LL^A) will perform better than Control compatible groups (i.e., LL^C). In addition, higher levels of group compatibility will predict better performance than lower levels of group compatibility (i.e., LL > LH > HH). Rejection of the null hypothesis will require a significance level of $p < 0.01$.

An initial randomly selected pool of 71 male and 145 female subjects were given the FIRO-B as a part of their classroom activity in an introductory psychology course. The intercorrelations, means and standard deviations for all 216 subjects are presented in Tables VIII and IX, respectively. There was an average interval of two months between the test administration and subject participation in the experiment. Subjects were aware that their FIRO-B scores were a prerequisite for participation, although the significance of scores for the experimental design was unknown to them.

These 216 subjects were divided into eleven groupings of about 20 subjects each. Within each grouping, all possible combinations of

TABLE VIII

FIRO-B SCORE INTERCORRELATIONS FOR THE INITIAL POOL OF 216 EXPERIMENTAL SUBJECTS

		Expressed Behavior			Wanted Behavior		
		Inclusion	Control	Affection	Inclusion	Control	Affection
Expressed Behavior	Inclusion	1.00	0.19	0.47**	0.59**	0.15	0.33**
	Control		1.00	0.13	0.27*	0.03	0.11
	Affection			1.00	0.38**	0.09	0.56**
Wanted Behavior	Inclusion				1.00	0.15	0.50**
	Control					1.00	0.11
	Affection						1.00

*p .01

**p .001

TABLE IX

FIRO-B SCORE MEANS AND STANDARD DEVIATIONS
FOR THE INITIAL POOL OF 216 STUDENTS

Expressed Behavior						Wanted Behavior					
Inclusion		Control		Affection		Inclusion		Control		Affection	
$\bar{x}$	SD	$\bar{x}$	SD	$\bar{x}$	SD	$\bar{x}$	SD	$\bar{x}$	SD	$\bar{x}$	SD
5.26	2.17	2.48	2.29	4.13	2.29	5.20	3.11	3.68	2.36	5.41	2.49

four subjects were generated as one step in a computer program. Group similarity and complementarity compatibility scores for the FIRO-B dimensions of Control and Affection (i.e., sK^{C}_{ijkl}, cK^{C}_{ijkl}, sK^{A}_{ijkl}, cK^{A}_{ijkl}) were computed for each four person group. Appendix C lists the entire computer program. A visual scan of group compatibilities on a computer print-out, located those groups which best fit the group selection criteria. These compatibility scores theoretically range from zero (extremely compatible) to 18 (extremely incompatible), although no groups exhibited these extreme scores. Grand mean scores for similarity and complementarity compatibility within the areas of Control and Affection in the total subject population were determined by computing these compatibilities for all possible groups of four for randomly selected 20 member subgroups from the pool of 216 subjects. Selection criteria were chosen so as to obtain groups with extreme characteristics of similarity, dissimilarity, complementarity, and discomplementarity in the following combinations:

LL	similarity/complementarity
LH	similarity/discomplementarity
HH	dissimilarity/discomplementarity

While a group exhibited one of the patterns within one interpersonal area (i.e., LL^{C}), the values of similarity and complementarity compatibility would be very near their respective means within the other interpersonal area (i.e., MM^{A}). The following groups were thus chosen:

LL^{C}	MM^{A}
LH^{C}	MM^{A}
HH^{C}	MM^{A}

LL^A	MM^C
LH^A	MM^C
HH^A	MM^C

Selection in this manner instituted total experimental control of compatibility. While the experimental effect of compatibility within one interpersonal area was being evaluated (i.e., Control), interference or confounding due to the other area (i.e., Affection) was kept to a practical minimum. Two groups exhibiting each of the six previously delineated compatibility patterns were chosen. The 12 resulting groups were composed of 26 males and 22 female subjects. Tables X and XI represent intercorrelations, means and standard deviations, respectively, of the six FIRO-B scores for these 48 subjects. A visual comparison of Table VIII and IX with X and XI indicate that the intercorrelation, means and standard deviations of FIRO-B scores of the original and experimental pool of subjects are similar. The mean age of experimental subjects was 19.3 years with a standard deviation of 1.1. The compatibility characteristics of the experimental groups are contained in Table XII. Additional descriptive information including demographic data and FIRO-B scores are contained in Table XIII in order to elucidate possible differences among groups.

Response Categories

The three factors in the experimental design are: (1) interpersonal area on two levels (Control and Affection), (2) compatibility-type on three levels (LL, LH, and HH), and (3) group replication on two levels (replication one and two). Groups within each of the interpersonal area and compatibility-type conditions were randomly assigned

TABLE X

FIRO-B SCORE INTERCORRELATIONS FOR THE 48 EXPERIMENTAL SUBJECTS

		Expressed Behavior			Wanted Behavior		
		Inclusion	Control	Affection	Inclusion	Control	Affection
Expressed Behavior	Inclusion	1.00	0.19	0.49*	0.74**	0.16	0.35
	Control		1.00	0.20	0.30	0.13	0.22
	Affection			1.00	0.51*	-.05	0.54*
Wanted Behavior	Inclusion				1.00	0.08	0.58**
	Control					1.00	0.21
	Affection						1.00

*p .01
**p .001

TABLE XI

FIRO-B SCORE MEANS AND STANDARD DEVIATIONS
FOR THE 48 EXPERIMENTAL SUBJECTS

Expressed Behavior						Wanted Behavior					
Inclusion		Control		Affection		Inclusion		Control		Affection	
$\bar{x}$	SD	$\bar{x}$	SD	$\bar{x}$	SD	$\bar{x}$	SD	$\bar{x}$	SD	$\bar{x}$	SD
5.52	2.42	3.04	2.64	4.48	2.44	5.88	2.98	3.73	2.68	5.94	2.68

TABLE XII

COMPATIBILITIES FOR THE 12 EXPERIMENTAL GROUPS

Replication	Index III^{I}	cK^{I}	sK^{I}	Index III^{C}	cK^{C}	sK^{C}	Index III^{A}	cK^{A}	sK^{A}
				LL^{C} GROUP					
1	2.0	9.0	8.7	2.0	1.7	1.7	3.0	5.7	5.7
2	2.0	3.7	4.0	1.5	1.5	1.2	2.0	5.3	5.3
				LH^{C} GROUP					
1	3.0	2.3	2.3	12.5	12.5	2.8	3.5	5.8	5.8
2	1.0	7.0	7.0	12.0	12.0	1.7	4.0	6.3	5.3
				HH^{C} GROUP					
1	2.5	3.2	3.5	6.0	9.7	10.0	2.5	5.8	5.5
2	0.5	9.2	9.2	4.0	10.3	10.7	4.0	6.3	5.7
				LL^{A} GROUP					
1	4.5	6.2	6.2	6.5	5.2	5.5	1.5	1.5	1.2
2	1.5	5.8	4.0	5.3	4.7	1.0	0.7	0.7	1.0
				LH^{A} GROUP					
1	6.5	6.5	2.5	5.5	5.8	4.8	11.0	11.0	1.7
2	4.5	9.5	7.8	4.5	5.8	4.5	3.5	10.2	1.3
				HH^{A} GROUP					
1	2.0	8.7	9.0	4.5	5.5	5.8	1.0	10.3	10.3
2	5.0	6.3	6.7	4.5	4.8	5.2	1.0	10.3	10.3

TABLE XIII

MEAN AND STANDARD DEVIATION OF SELECTED DEMOGRAPHIC VARIABLES FOR EACH EXPERIMENTAL GROUP

				Eysenck Percentile							
Age		Grade Point		Introversion		Extroversion		Neurotism		Subject Score	
$\bar{x}$	SD	$\bar{x}$	SD	$\bar{x}$	SD	$\bar{x}$	SD	$\bar{x}$	SD	$\bar{x}$	SD
					LL^C GROUP REPLICATION 1						
18.75	0.96	3.13	0.35	53.25	37.77	57.25	30.27	46.50	17.16	3.75	3.40
					LL^C GROUP REPLICATION 2						
19.25	0.96	3.08	0.82	67.75	32.83	55.25	25.38	22.00	18.50	18.75	9.95
					LH^C GROUP REPLICATION 1						
18.50	0.58	3.08	0.74	59.75	23.84	72.25	34.33	41.00	20.20	6.00	2.94
					LH^C GROUP REPLICATION 2						
20.25	1.50	2.93	0.21	87.25	17.17	43.25	16.36	21.75	18.75	9.75	4.57
					HH^C GROUP REPLICATION 1						
19.25	0.96	3.13	0.54	56.25	29.01	97.00	36.00	56.00	18.00	4.00	1.41
					HH^C GROUP REPLICATION 2						
19.25	0.50	2.80	0.22	70.00	26.92	47.50	34.00	45.75	35.10	4.75	1.71
					LL^A GROUP REPLICATION 1						
18.25	0.50	2.50	0.25	66.75	19.10	69.25	11.06	64.25	39.71	14.25	2.87

TABLE XIII (Continued)

Age		Grade Point		Eysenck Percentile: Introversion		Extroversion		Neurotism		Subject Score	
$\bar{x}$	SD	$\bar{x}$	SD	$\bar{x}$	SD	$\bar{x}$					
				LL[A] GROUP REPLICATION 2							
18.25	9.50	2.30	0.39	59.25	27.85	87.50	8.50	50.00	29.60	24.5	9.75
				LH[A] GROUP REPLICATION 1							
19.75	1.26	2.70	0.24	53.75	32.56	59.00	30.97	70.00	17.09	9.5	4.43
				LH[A] GROUP REPLICATION 2							
21.00	0.82	3.25	0.66	30.00	15.41	65.50	29.60	41.50	11.00	18.00	2.94
				HH[A] GROUP REPLICATION 1							
19.50	1.29	2.33	1.61	37.00	17.32	38.00	42.34	60.25	30.54	9.25	6.18
				HH[A] GROUP REPLICATION 2							
20.00	0.00	3.18	0.62	58.75	33.99	65.00	21.94	76.25	19.96	15.50	4.43

to either replication one or replication two. The verbal categories which were reinforced were taken from Fromme et al. (1973) and are as follows: (1) feeling - labeling one's internal, subjective, affective state, produced by interaction with other group members; (2) giving feedback - labeling one's perception of another's current behavior; (3) seeking feedback - seeking information concerning one's own current behavior; (4) empathy I - attempting, successfully or not, to clarify the nature or source of another's current affective state; (5) empathy II - seeking information regarding another's current affective state. On a total of 681 statements, Fromme et al. (1973) found an inter-judge agreement of 96% between the experimenter's protocol for actual reinforcements and the consensus of three independent judges. Accepting the consensus as criteria, most of the experimenter's errors in their study were in omitting reinforcements, thus further strengthening conclusions concerning the reliability of experimenter's judgments. They did not make distinctions among categories for reliability purposes, which were present mainly to provide task definition. Fromme et al. (1973) did note, however, that categories (3) and (5) were under-represented in their experimental protocols, relative to other categories.

Fromme et al. (1973) discussed the effects of false positives, false negatives and delay of reinforcement on a subject's responses; they will be briefly considered. False negatives or omissions were the most frequent errors. They would, in effect, introduce an intermittant reinforcement schedule, which should not seriously alter any conclusions drawn about the effectiveness of the technique, particularly since experimental extinction was not included in the present design.

False positives should reduce the power of this technique to increase the frequency of responses. If experimental effects due to reinforcement are not present, false positives could be partially responsible. Delay of reinforcement should have an experimental effect similar to false positives. In the present study, the experimenter judged the frequency of the two latter errors to be very low in relation to false negatives. In nearly every case reinforcement occurred one to two seconds after the response.

Verbal responses which fit any of these five categories were recorded for each group number. The dependent variable was the total of all such responses given by all four group members. This was a single index of each group's behavior, which reflected the cumulative number of all five categories of verbal responses given by the group.

Apparatus

The experimental room was 9 feet by 15 feet with a one-way mirror centered in one of the 15-foot walls. Subjects were seated in a semicircular arrangement around a small table, facing the one-way mirror. A 5 x 8 inch card was taped on the table in front of each subject's position with the five response categories enumerated. Each experimental group's conversation was tape recorded and simultaneously monitored by experimenter via the one-way mirror and headphones. A four channel relay control panel, with push buttons operating digital counters and a multiple event recorder, was used to record those instances where the experimenter judged that a group member's statement fit one of the reinforcable response categories.

In all compatibility conditions a digital counter placed in front

of each subject was simultaneously advanced, producing an audible click. In addition to providing feedback to a subject concerning his performance, it was expected that the clicks would provide information to the other subjects for modeling or vicarious learning. A red light attached to each subject's counter was also used to provide two types of discriminative cues: (1) all four lights were automatically flashed on by an interval timer whenever three minutes elapsed with no reinforcements being given to the group; (2) when a subject fell 10 or more counts behind the leader, his particular light was switched on until he caught up to within nine counts. Subjects were instructed that when all four lights flashed on, this was a signal that their conversation was not conducive to developing close interpersonal relations and that they should change the topic. They were also informed that when one light was switched on, that person was having difficulty in expressing himself and required help from the others. It was thought that this latter procedure, together with the counters, would enhance subject's motivation by encouraging a moderate degree of competitiveness. Finally a 50-minute interval timer, started at the beginning of the experiment, was used to signal the end of each group session.

Procedure

As subjects arrived they were told to wait in an outer room. The experimenter then requested that they complete a questionnaire consisting of demographic data as well as the Eysenck Personality Inventory, which is presented in Appendix D. Tables XIV and XV present intercorrelations, means and standard deviations, respectively, for the Eysenck within the experimental group of 48 subjects. When all four

TABLE XIV

INTERCORRELATIONS OF EYSENCK PERCENTILE SCORES

	Introversion	Extroversion	Neuroticism
Introversion	1.00	-0.05	-0.15
Extroversion		1.00	0.03
Neuroticism			1.00

TABLE XV

MEANS AND STANDARD DEVIATIONS OF EYSENCK PERCENTILE SCORES

Introversion		Extroversion		Neuroticism	
$\bar{x}$	SD	$\bar{x}$	SD	$\bar{x}$	SD
58.31	27.77	59.73	28.17	49.60	26.99

subjects were present, they were led into the experimental room and told to seat themselves in any order they desired around the experimental table. The experimenter then gave instructions suggesting the social desirability of sharing one's feelings, being empathetic, and providing feedback. Each subject was provided with definitions of the response categories on notecards, shown in Appendix E. Subjects were told that expressing themselves in this fashion would provide a more rewarding group experience.

Before beginning the 50-minute session, an instructional exercise was undertaken by the experimenter which is listed in Appendix F. A five minute videotape was viewed by the participants which presented a segment of an on-going four member group. This mock group demonstrated the use of the response categories both correctly and incorrectly in order to allow subjects to discriminate between desirable and undesirable responses. After the group viewed the videotape, questions and discussion were invited from the group participants. The experimenter asked each subject in random order to demonstrate a statement fitting one of the response categories of his choice. Its correctness or incorrectness was briefly discussed for each participant and a final opportunity for questions was given. The subjects were then told that they would be observed through the one-way mirror and tape recorded for purposes of data analysis. This procedure was typically of 15-minute duration, at which time the experimenter stated that he was leaving and would return in 50 minutes. At the end of this interval the experimenter came back into the room and gave the group the option of continuing if they desired more closure before leaving, although no

groups wished to do so.

The 12 groups were run by the experimenter in a random order. The experimenter was unaware of the status of any group's compatibility.

CHAPTER III

RESULTS

Mean frequencies of reinforcable statements for each of the experimental conditions are presented in Table XVI. A completely randomized 2 x 3 x 2 factorial analysis of variance (AOV) resulted in significant main effects for interpersonal area ($F = 29.11$, $df = 1/36$, $p < .001$), compatibility type ($F = 7.58$, $df = 2/36$, $p < .005$), and group replication ($F = 8.29$, $df = 1/36$, $p < .01$). A significant interaction was obtained between compatibility type and group replication ($F = 10.40$, $df = 2/36$, $p < .001$). The AOV solution was derived from the Bio-Med Computer Programs (1964), program 08V. Table XVII contains the AOV solution summary.

The interpersonal area main effect indicates that the scores for Affection groups averaged across the LL, LH and HH compatibility conditions were significantly different from Control groups averaged across the LL, LH and HH compatibility conditions. That is, the average compatibility effect for the LL^A, LH^A AND HH^A groups (or the effect of some linear combination of these three conditions) is significantly different from the average compatibility effect for the LL^C, LH^C and HH^C groups (or the effect of some linear combination of these three conditions). Figure 3 illustrates this relationship among groups. Simple effects did not reach significance as determined by the Newman-Keuls method ($p < .05$) (Winer, 1971).

TABLE XVI

MEAN FREQUENCIES OF DESIRABLE STATEMENTS
FOR EACH EXPERIMENTAL GROUP

LL		LH		HH	
Replication 1	Replication 2	Replication 1	Replication 2	Replication 1	Replication 2
		AFFECTION			
14.25	26.50	9.50	18.00	11.50	15.50
20.38		13.75		13.50	
		CONTROL			
3.75	18.75	6.00	9.75	4.00	4.75
11.25		7.88		4.38	

TABLE XVII

ANALYSIS OF VARIANCE FOR THE EXPERIMENTAL GROUPS

Variable	df	MS	F	f
Interpersonal area (I)	1	776.02	29.11	0.001
Compatibility type (C)	2	202.08	7.58	0.005
Group Replication (R)	1	221.02	8.29	0.001
I x C	2	14.08	0.53	
I x R	1	35.02	1.31	
C x R	2	277.33	10.40	0.001
I x C x R	2	72.58	2.72	
Error	36	26.66	-----	

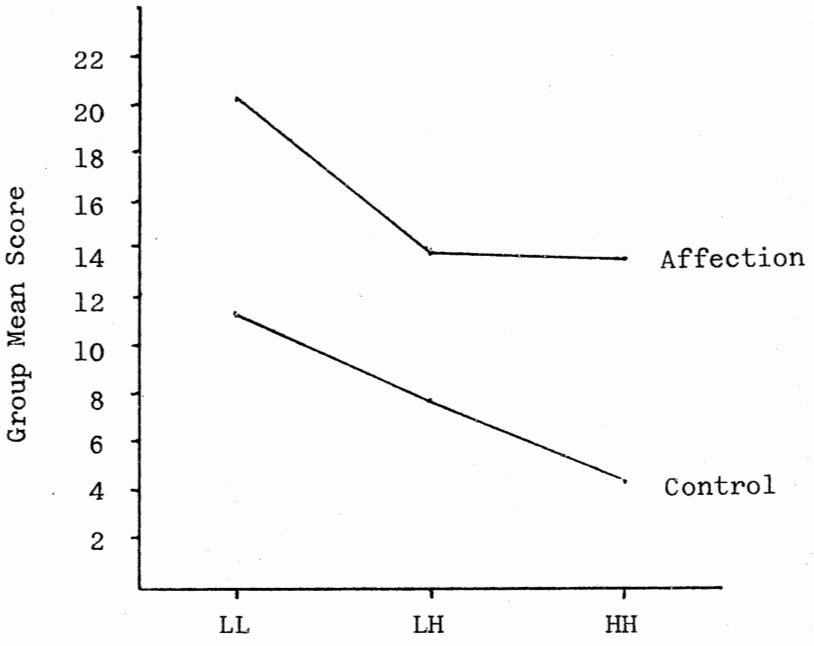


Figure 3. Mean Frequencies of Desired Verbalizations for the Interpersonal Area and Compatibility-Type Main Effects

The compatibility-type main effect indicates that there are significant differences among the compatibility effects of the LL, LH and HH conditions. The mean number of desirable group verbalizations can be significantly altered through the specification of compatibility-type. Figure 4 illustrates the relationships among groups across the LL, LH and HH conditions. Simple effects did not reach significance. Mean frequencies for the compatibility-type by group replication interaction are presented in Figure 5. The mean number of verbal responses which fit the response categories was significantly different between levels one and two on the group replication factor for the LL (similarity/complementarity) compatibility condition. The mean number of responses was not significantly different for the two levels on group replication for the LH and HH (similarity/discomplementarity and dissimilarity/discomplementarity compatibility, respectively) compatibility conditions.

A principal components analysis using a Varimax rotation was individually completed on the 216 subject pool, the 126 subject pool, and the combined 342 subject pool for the 54 questions comprising the FIRO-B. The factor loadings for these three analyses are presented in Tables XVIII, XIX, XX, respectively. In addition, a principal components analysis and Varimax rotation was completed for each scale of the FIRO-B, e^I, w^I, e^C, w^C, e^A, and w^A for the 342 subject pool using the 54 questions on the FIRO-B. Table XXI represents the factor loadings for these six factor analyses. The factor analyses for the 216 and 126 subject pools both yielded the same first three factors. As a result of the similarity of these two subject pools, they were combined and factored. The combined pool of 342 subjects yielded the same

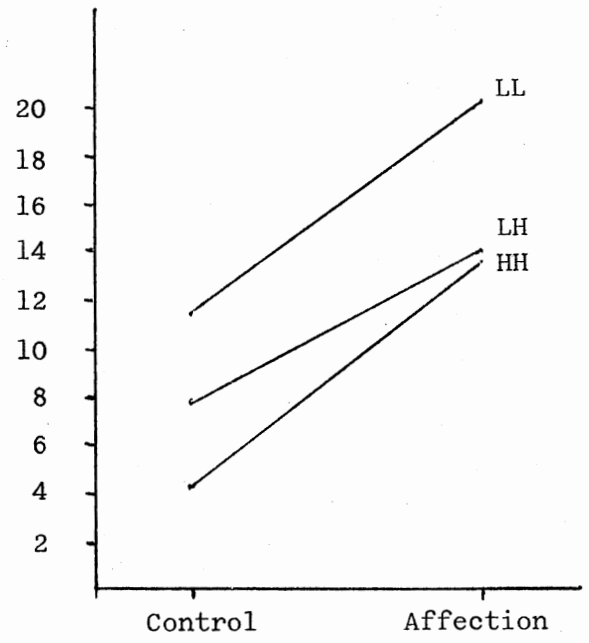


Figure 4. Mean Frequencies of Desired Verbalizations for the Interpersonal Area and Compatibility-Type Main Effects

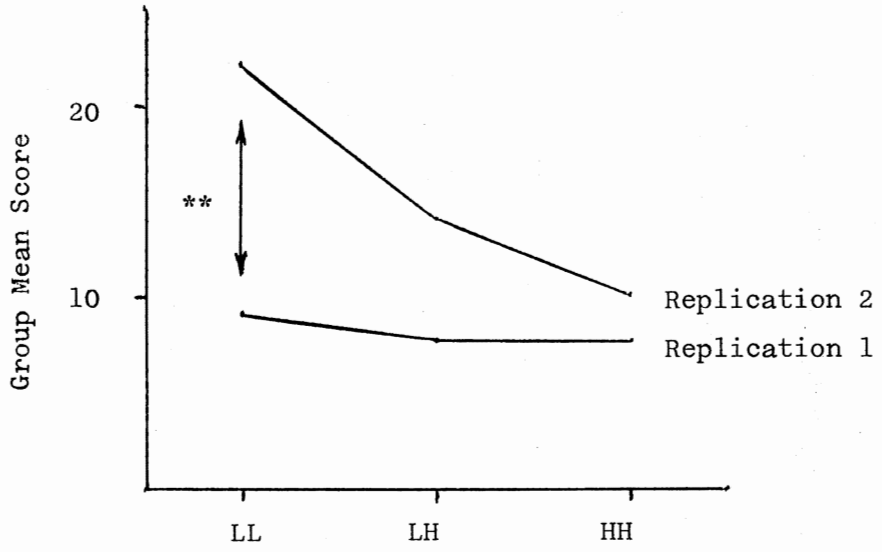


Figure 5. Mean Frequencies of Affective Verbalizations for the Compatibility-Type by Group Replication Interaction

** p .01

TABLE XVIII

FIRO-B FACTOR LOADINGS AFTER VARIMAX ROTATION
FOR THE 216 SUBJECT POOL

Variable	Factor 1	Factor 2	Factor 3
1	0.41064	-0.03188	0.03482
2	0.00405	-0.20871	0.55680
3	0.19543	0.14962	-0.01783
4	0.10220	0.02000	0.08741
5	0.22264	0.19799	0.02077
6	0.10960	0.11563	0.69472
7	0.29399	0.11796	0.14417
8	0.03802	0.05941	0.08757
9	0.30698	0.04834	0.05682
10	0.04806	0.10646	0.69636
11	0.48359	0.05583	0.09407
12	0.12525	0.08970	0.13874
13	0.39047	0.10517	0.00622
14	0.07673	0.08450	0.73918
15	0.17682	0.12424	0.08934
16	0.36582	0.12917	-0.01299
17	0.19807	-0.11962	-0.04444
18	-0.02322	-0.16610	-0.52978
19	0.03849	0.00306	0.19662
20	0.06625	-0.14939	0.62539
21	0.19824	0.08818	0.06916
22	0.05174	0.23510	0.70426
23	0.14681	0.13281	0.07408
24	0.05461	0.19094	0.78788
25	-0.02178	-0.00398	0.13579
26	0.03420	0.11447	0.73941

TABLE XVIII (Continued)

Variable	Factor 1	Factor 2	Factor 3
27	0.17536	0.15976	0.01700
28	0.77905	0.06763	0.09536
29	0.53433	0.23052	0.07317
30	0.14078	0.74492	0.04820
31	0.82670	0.13330	0.01763
32	0.60649	0.16183	0.07582
33	0.04475	0.77422	0.00843
34	0.79870	0.13609	-0.00036
35	-0.13009	0.05074	-0.03331
36	0.05100	0.73258	0.02152
37	0.47207	0.15524	0.04153
38	0.38168	0.01418	-0.07437
39	0.81899	0.14300	0.06664
40	-0.16649	0.07076	-0.02096
41	0.10487	0.79556	-0.02135
42	0.74249	0.07447	0.15450
43	0.39304	0.02051	0.14190
44	0.10411	0.66063	0.10107
45	0.75552	0.13176	0.08066
46	-0.16949	0.14853	0.03829
47	0.03653	0.83630	0.01681
48	0.73964	0.10120	0.09940
49	0.42724	0.09453	0.05816
50	0.15157	0.85967	0.01567
51	0.85826	0.13834	0.04153
52	-0.19364	0.09242	-0.00129
53	0.07548	0.79429	0.07237
54	0.22441	0.73618	0.03013

TABLE XIX

FIRO-B FACTOR LOADINGS AFTER VARIMAX ROTATION
FOR THE 126 SUBJECT POOL

Variable	Factor 1	Factor 2	Factor 3
1	0.34226	-0.05050	-0.40040
2	0.02883	-0.23297	0.04698
3	0.37618	0.15021	-0.22871
4	0.64411	-0.08084	-0.09206
5	0.29694	0.17908	-0.22954
6	-0.09196	-0.16484	0.02109
7	0.11563	-0.04010	-0.52477
8	0.19862	-0.16995	-0.11003
9	0.19862	-0.15995	-0.34905
10	0.07407	-0.13148	-0.03811
11	0.37160	0.06735	-0.41271
12	0.80257	0.03156	-0.10246
13	0.29433	0.03592	-0.50359
14	0.05553	-0.20066	0.00362
15	0.25558	0.04395	-0.15023
16	0.18274	-0.01765	-0.53606
17	-0.05105	0.12492	-0.19730
18	0.06327	-0.09830	-0.07361
19	-0.15606	0.10074	0.23702
20	0.02819	-0.18790	-0.00817
21	0.75353	0.00782	-0.16087
22	0.06362	0.02047	0.01467
23	0.81510	0.07089	-0.14563
24	0.04254	-0.05939	0.00514
25	-0.14257	0.05208	0.16923
26	0.02130	-0.17475	-0.13347

TABLE XIX (Continued)

Variable	Factor 1	Factor 2	Factor 3
27	0.82903	0.05175	-0.15246
28	0.20214	0.14873	-0.73435
29	0.70742	0.22820	-0.27969
30	0.19087	0.64255	-0.05496
31	0.14731	0.13446	-0.87670
32	0.71383	0.12537	-0.37260
33	-0.02063	0.67180	-0.18534
34	0.12109	-0.00632	-0.83038
35	-0.10662	0.07550	0.07725
36	0.04885	0.75371	0.01490
37	0.05643	0.24790	-0.36731
38	0.08485	0.15823	-0.40972
39	9.17685	0.06372	-0.78330
40	-0.12427	0.10040	0.10256
41	0.04773	0.65708	-0.12101
42	0.17032	0.03762	-0.77301
43	0.70403	0.00271	-0.27531
44	0.01784	0.59924	-0.00669
45	0.16949	0.00770	-0.86245
46	-0.09444	0.09516	0.13015
47	0.02973	0.67537	0.03158
48	0.20093	0.00919	-0.83623
49	0.78960	0.08350	-0.19922
50	0.07110	0.79561	-0.04758
51	0.16941	0.07217	-0.83066
52	-0.06336	0.01485	0.15377
53	-0.04952	0.81151	0.01823
54	-0.00238	0.75698	00.11765

TABLE XX

FIRO-B FACTOR LOADINGS AFTER VARIMAX ROTATION
FOR THE 342 SUBJECT POOL

Variable	Factor 1	Factor 2	Factor 3
1	0.43005	-0.04736	-0.00758
2	-0.00516	-0.22420	0.49254
3	0.26193	0.17315	-0.04363
4	0.11285	-0.02345	0.04549
5	0.27796	0.21664	-0.00663
6	0.03319	0.00572	0.70304
7	0.41073	0.07109	0.14284
8	0.07705	-0.01442	0.05031
9	0.35277	-0.04830	0.05926
10	0.02591	0.01321	0.68744
11	0.47536	0.04100	0.06727
12	0.12982	0.06205	0.08754
13	0.46498	0.08937	-0.00863
14	0.02521	-0.01318	0.73082
15	0.18529	0.09336	0.08528
16	0.46795	0.09587	-0.00358
17	0.21729	-0.02297	-0.09875
18	0.03141	-0.14945	0.44130
19	-0.08956	0.04347	0.15140
20	0.05978	-0.16170	0.57053
21	0.20966	0.05421	0.04881
22	0.02786	0.15434	0.73802
23	0.15605	0.10443	0.08002
24	0.02944	0.10255	0.76377
25	-0.11215	0.02159	0.12436
26	0.06909	0.00737	0.73940

TABLE XX (Continued)

Variable	Factor 1	Factor 2	Factor 3
27	0.17898	0.11366	0.00319
28	0.76737	0.10166	0.06540
29	0.42911	0.22682	0.09564
30	0.10804	0.70384	0.03888
31	0.85427	0.12239	0.02753
32	0.49963	0.15343	0.09121
33	0.10995	0.72450	-0.00950
34	0.81849	0.06764	0.00682
35	-0.11569	0.05850	-0.00984
36	0.01804	0.71897	-0.00351
37	0.44587	0.19316	-0.07734
38	0.39409	0.04463	-0.02856
39	0.81419	0.09346	0.07753
40	-0.14952	0.08333	-0.04612
41	0.13363	0.74413	-0.09814
42	0.76070	0.07253	0.05886
43	0.34395	0.01923	0.13121
44	0.05884	0.64757	0.02048
45	0.80988	0.08892	0.05206
46	-0.16151	0.13810	-0.01153
47	0.00976	0.79514	-0.03145
48	0.78577	0.07001	0.05661
49	0.33776	0.09774	0.05504
50	0.12714	0.84173	-0.03570
51	0.84770	0.10422	0.05672
52	-0.18748	0.07027	-0.02072
53	0.03114	0.80486	0.00218
54	0.19967	0.74362	-0.03148

TABLE XXI

INDIVIDUAL FIRO-B SCALE FACTOR LOADINGS AFTER VARIMAX ROTATION FOR THE 340 SUBJECT POOL

Variable	Expressed Inclusion Factor 1	Wanted Inclusion Factor 1	Expressed Control Factor 1	Wanted Control Factor 1	Expressed Affection Factor 1	Expressed Affection Factor 2	Wanted Affection Factor 1	Wanted Affection Factor 2
1	0.70047	0.78239	0.70964	0.47369	0.74529	-0.15256	-0.05101	0.81827
2	0.73061	0.87737	0.73334	0.70061	0.83100	-0.13966	-0.06663	0.83815
3	0.72558	0.84449	0.71404	0.69880	0.81976	-0.09827	0.85835	-0.10773
4	0.58563	0.50151	0.75828	0.74112	0.11050	-0.27318	-0.22828	0.27237
5	0.60487	0.82611	0.65163	0.42034	-0.14642	0.75070	0.78771	-0.12727
6	0.70663	0.82580	0.78912	0.54971	0.76385	-0.22017	-0.18957	0.77239
7	0.73210	0.86872	0.86269	0.74071	0.83156	-0.18537	0.88211	-0.09914
8	0.49370	0.86073	0.79506	0.76955	-0.07360	0.78467	-0.13345	0.83903
9	0.78839	0.89521	0.77132	0.73684	0.78603	-0.22009	0.81678	-0.15571

three factors, in the same order, as those obtained from the 126 and 216 subject samples. For the 342 subject pool, factor one accounted for 25 per cent of the total variance, factor two accounted for 10 per cent of the variance and factor three accounted for 8 per cent of the variance. Factor one represents an index of sociability, and is comprised of the items that determine the e^I and w^I scales. The presence of this factor apparently indicates a need to establish and maintain a satisfactory relation with people with respect to social interaction and social discourse. The absence of this factor would indicate a lack of this need. The behaviors related to this factor are related to relatively transient and superficial relationships compared to intimate relationships based on love and affection. Persons with these characteristics would presumably appear very sociable and eager to enter socially based relationships. A person without these characteristics would not necessarily seem unsociable, withdrawn or unfriendly, but just not very interested in relationships that are socially based. Factor 2 is composed of those items comprising the e^C scale on the FIRO-B. The presence of this factor indicates a willingness to take responsibility and assume a dominant role in decision making. Extremely high values may indicate a compulsive need to dominate and take control of interpersonal interactions. The absence of this factor seems related to an unwillingness to take responsibility and assume a dominant role in decision making. The lack of this trait would not necessarily indicate submissiveness, but just a lack of interest in taking control of interpersonal interactions. An extreme score in this direction might be indicative of a compulsive avoidance of responsibility. Factor 3 is composed of those items comprising the w^C scale on the

FIRO-B. The presence of this factor indicates dependency and the avoidance of making decisions, although the capacity for making decisions and taking responsibility is not precluded if someone else provides direction. Extremely high values may indicate marked dependency and avoidance of decisions. The absence of this factor seems related to an unwillingness to accept direction and control from others. An extreme score in this direction may be indicative of an apparent independence which is the result of defensiveness concerning underlying dependency needs.

The factor analysis of the individual FIRO-B scales yielded only one factor for the e^I, w^I, e^C, and w^C scales, but yielded two factors each for the e^A and w^A scales. These results indicate that the e^I, w^I, e^C and w^C scales are internally consistent and represent a single personality dimension. Both the e^A and w^A scales consist of two factors and seem to be measuring two personality dimensions rather than one. An inspection of these two scales reveals that they consist of two types of items. One type of item is scored for the e^A or w^A scale when the respondent answers using the lower end of a six point scale. For instance, in answering the statement "I try to be friendly to people," a scorable response typically consists of responding "1. most people" or "2. many people." The second type of item is scored for the e^A or w^A scale when the respondent answers using the upper end of a six point scale. For instance, in answering the statement "My personal relations with people are cool and distant," a scorable response typically consists of responding "5. one or two people" or "6. nobody." These two types of items comprise factors 1 and 2 for both scales e^A and w^A. Factor 1 on the e^A scale seems to indicate an individual's tendency to behave in a very friendly, intimate fashion to many or most

people with whom he interacts. The absence of this factor would be associated with a lack of this tendency to behave in a very friendly, intimate fashion with many people. Factor 2 on the e^A scale seems to indicate an unwillingness to admit that one acts cool and distant toward a few people. The mean value for answers to the items on this scale, FIRO-B questions 19 and 25, are 4.04 and 4.35, respectively. Since scores of 4 or larger result in their addition to the e^A scale raw score, more than fifty per cent of respondents score positively on Factor 2. The absence of Factor 2 indicates a willingness to admit cool and distant behaviors to at least some people. Factor 1 on the w^A scale seems to indicate an individual's desire that many people or most people behave in a very friendly, intimate fashion toward him. The absence of this factor would indicate a lack of desire that many or most others behave in a very friendly, intimate fashion toward him. Factor 2 on the w^A scale corresponds to an unwillingness to admit that an individual wants others to act cool and distant toward him. The mean value for answers to the items on this scale, FIRO-B questions 35, 40, 46 and 52, are 5.00, 5.04, 5.04 and 5.19, respectively. Since scores of 5 or larger result in their addition to the w^A scale raw score, more than fifty per cent of respondents score positively on Factor 2. The absence of Factor 2 indicates a willingness to admit that an individual wants at least a few others to act cool and distant toward him. These principal component analyses with Varimax rotation were derived from the Bio-Med Computer Programs (1964), program 05M.

CHAPTER IV

DISCUSSION

Before a discussion of the results is attempted, some comments regarding the experimental subject characteristics are appropriate. It is important to consider the representativeness of the subjects to the population from which they were drawn, in order to justify the generalization of results to this larger pool. In the present study, 48 subjects were chosen for experimental participation on the basis of their FIRO-B scores from an initial pool of 216 randomly selected students enrolled in introductory psychology courses. A large percentage of the total college population enrolls in these courses, and as a result these students are fairly representative of college students in general. Providing that the selection process is unbiased, the 48 experimental subjects should be similar to the initial pool. Inspection of Tables VIII and IX with Tables X and XI, which present characteristics of the initial pool and experimental subjects, respectively, reveals that the FIRO-B score distributions for the two groups are similar. This is somewhat surprising considering the complexity of the selection process, but indicates that the present groups are attainable from general college populations without requiring individuals with unusual FIRO-B personality characteristics. The critical property in this investigation was the comparisons of profiles, so that the attainment of very specific compatibility characteristics did not

necessarily require unique absolute values of FIRO-B scores. Of course, each particular experimental group is selected according to stringent criteria and could not be expected to reflect random characteristics, although the combined population of 48 experimental subjects does appear representative of the total subject population.

Compatibility Effects

The first result to be considered is the significantly higher rate of verbal elicitation for all of the experimental Affection groups relative to the experimental Control groups. The scores for Affection groups averaged across the LL, LH and HH compatibility conditions were greater than Control group scores averaged across LL, LH and HH compatibility conditions. Initially, this result seems paradoxical, in that the average compatibility for the LL, LH and HH conditions would appear to be approximately the mean of the compatibility distribution, neither compatible nor incompatible. Since the LL^A, LH^A and HH^A groups all possess MM^C (mean similarity and complementarity Control compatibility) then it would appear that averaging across the compatibility conditions would result in MM^A/MM^C groups. A similar effect for the LL^C, LH^C and HH^C groups would result in MM^C/MM^A groups. If that was true then MM^A/MM^C groups and MM^C/MM^A groups would have the same compatibility characteristics and therefore the same group performance. This is obviously not the case, however. The explanation for this phenomenon would most parsimoneously be that the average compatibility across LL^A, LH^A and HH^A groups does not equal the average across LL^C, LH^C and HH^C groups, and that specifically, the average compatibility across LL^A, LH^A and HH^A groups is greater than the average across LL^C, LH^C and HH^C groups; the LL^A, LH^A and HH^A combined groups obtained higher scores than the LL^C, LH^C and HH^C combined groups. An inspection of Figure 3 and the means in Table XVI reveals that the LL^A condition

enhances group production and that the HH^C condition is detrimental to group production. Additionally, it is apparent that the HH^A condition is not particularly detrimental to group functioning compared to the grand mean group score of 11.85, nor is the LL^C condition particularly enhancing to group functioning compared to the grand mean. This pattern seems to express that similarity/complementarity compatibilities of Affection needs has the capacity to enhance or facilitate the group process, but that dissimilarity/discomplementarity of Affection needs has little effect. Conversely, dissimilarity/discomplementarity of Control needs has the capacity to inhibit the group process, but that similarity/complementarity of Control needs has little effect. This interpretation would lead to the conclusions that higher levels of group effectiveness would rely on the establishment of smooth interpersonal relationships regarding Affection needs and that the least effective groups would not yet have established smooth interpersonal relationships regarding Control needs. The establishment of smooth relationships within the area of Control alone would not result in particularly effective groups, compared to the establishment of smoothly functioning interpersonal relationships regarding Affection needs.

Schutz (1960) addresses this issue indirectly, in his description of group process. According to his theory, groups focus on different areas of interpersonal needs as they progress, beginning with Inclusion needs and proceeding sequentially through Control and then Affection needs. Resolution of conflicts in each area is a prerequisite for moving on to the next level of interaction and continuing the development of more intense relationships. The present study utilizes a group paradigm which focuses on affective verbalizations and specific

categories of responses for which intimacy and security of relationship are presumably a prerequisite. It may be then that the demand characteristics in this study are such so as to necessitate a significant degree of interpersonal interaction within the sphere of Affection needs. In that case, a lack of resolution concerning Control needs might very well inhibit that process and preclude group members' ability to effectively relate within the affectively laden response categories. Once these Control needs are successfully dealt with, then Affection needs would become the predominant issue. A lack of Affection compatibility at this point might not necessarily be strikingly detrimental in that the ground of interaction within this area is in a sense "unbroken." Affection incompatibility might, however, prevent or seriously deter any further progress at this point, and disrupt the normal progression toward increasing intimacy and cohesion.

There are a few studies that may shed some light on this issue. Schutz (1960), for instance, related compatibility and group cohesion in five-man task and discussion groups; he found significant correlations with a cohesion scale of his own design. Cohesion is considered to be a vital pre-condition for group success, and therefore, the establishment of interpersonal bonds with a degree of intimacy are essential components of therapeutically successful groups (Yalom, 1970). The success of Affection compatible groups in this study may be due to this effect in that these groups may have been particularly cohesive. A rigorously designed study by Clark and Culbert (1965) demonstrated a significant relationship between quality of intermember relationships (cohesion) and outcome in a T-group of eleven subjects, that met twice for a total of sixty-four hours. Outcome was correlated with

intermember relationships rated by the Barrett-Lennard Relationship Inventory. The authors found that members who entered into the most two-person mutually therapeutic relationships showed the most improvement during the group. In addition, the perceived relationship with the group leader was unrelated to change. The conclusion was that the quality of the intermember relationship (cohesion) is the prime determinant of individual change in group experience.

Yalom (1970) states his belief that cohesiveness is the prime mode of help in the group experience from patient perspective, and cites evidence that cohesiveness is related to many group characteristics such as better group attendance, greater participation of members, greater influenceability of members and other effects. Schutz (1960) explains that compatibility lessens interpersonal anxiety and allows cooperation among individuals, which seems to also allow the development of cohesion. Fromme and Close (1976) found that participants in compatible groups reported that they enjoyed their experience and expected it to be of more benefit to them than participants in incompatible groups. Kerckhoff and Davis (1962) related compatibility (i.e., need complementarity) to progress toward permanence in dating couples, and in so doing, indicate a relationship between compatibility and interpersonal cohesion. If Affection needs are relevant to intimacy and cohesion, then the establishment of Affection compatibility may enhance cohesion and increase group productiveness, as evident in this study. On the other hand, a lack of Control compatibility has demonstrated detrimental group effects, such as in the study by Liddell (1970), in which task groups incompatible on a modified reciprocal compatibility index completed problems at a slower rate and with more

errors than compatible groups. There is some support, subsequently, for the compatibility effects demonstrated in the current study, in both the sense that Affection compatibility may enhance cohesion and group outcome, and that Control incompatibility may be detrimental to group outcome.

Some of the discrepancy among studies may be related to the demand characteristics involved in various settings. The evidence that Schutz (1960) cites regarding improved outcome resulting from compatibility is within task oriented paradigms. The current study may in some senses also be task oriented, in that immediate cooperation within a 50-minute time period is needed in order to learn the response categories and use them effectively. In addition, however, the task involves emotionally laden material which inherently has the potential for a significant emotional impact on members, and necessitates a degree of cohesion and intimacy as well. The combination of these particular characteristics may have important implications for the results in this particular study. It is interesting to note that Reddy (1971), in observing positive outcome as related to incompatibility rather than compatibility, was studying sensitivity groups which exhibit a relative lack of structure and task orientation in comparison with the present study. Harrison (1965) and Harrison and Lubin (1965) also investigated group composition effect on sensitivity groups and found that conflict engendered by heterogeneity proved to correlate positively with group outcome. The general trend in these studies was a relationship of positive outcome with incompatibility for sensitivity groups. The current study and others by Schutz (1960) relate compatibility with positive outcome in groups that are more task oriented than sensitivity groups.

This difference in the degree of structure relating to the specificity of group goals and the degree of task orientation may be an important variable in determining whether compatibility or incompatibility produces positive group outcome. The need for immediate cooperation and the immediate presence of smoothly working relationships in task achievement may require inherent compatibility within the group. For people to report a rewarding experience in sensitivity groups, however, diversity of relationship and incompatibility may be of some advantage in providing a stimulus for conflict and a highly emotionally charged interaction, which is generally considered highly desirable in sensitivity groups. It would be too much of a sweeping generalization, however, to state unequivocably that incompatibility is desirable for therapeutic groups. There is evidence that compatibility is related to group cohesion, which is a very important part of group functioning (Schutz, 1960; Fromme & Close, 1976). Other studies have related compatibility to mate selection and the development of intense, intimate interpersonal relationships (Kerckoff & Davis, 1962; Centers & Granville, 1971). Intimacy and a lack of defensiveness are surely important characteristics for group outcome, and compatibility is thereby implicated as a desirable characteristic for groups. It is likely that greater specificity in the type of groups will be necessary before statements about the desirability of compatibility versus incompatibility can be made with absolute confidence. The demand characteristics of the groups appear to be very significant in determining the effects of compatibility on group outcome. The current study, however, substantiates that similarity/complementarity (compatibility) produced higher elicitation rates of affective verbalizations than dissimilarity/discomplementarity (incompatibility); compatibility positively predicts group behavior believed to be related to both therapeutic

outcome and task achievement.

Within the current paradigm, Affection compatibility facilitates the group process and Control incompatibility inhibits the group process. An optimal composition then would avoid Control incompatibility and maximize Affection compatibility, such that this type of group could be described as LL^{A}/MM^{C} or LL^{A}/LL^{C}. The more intense levels of group interaction and the freest interchange of affective statements occur under a condition of Affection compatibility and a lack of conflict surrounding affectional needs. The most non-interactive and slow progressing states occur in groups under a condition of Control incompatibility, and the presence of conflict concerning control needs.

A better understanding of the effects of compatibility may be gained through a more detailed examination of Schutz's (1960) compatibility theory. Schutz states that compatible groups will have a greater goal achievement than incompatible groups, and experience a higher level of mutual need satisfaction. He explains that compatibility facilitates goal achievement through a lack of interpersonal anxiety which allows communication and cooperation. Thus, goal achievement is increased through the beneficial effect of compatibility on the interaction process. Compatibility seems to have a peculiar two-fold effect on goal achievement in the present experiment. First, compatibility facilitates the use of affective verbalizations because the production of these responses is the group goal. Compatibility aids communications necessary for group cohesiveness and cooperation, and for the accomplishment of a group goal. Second, compatibility facilitates the use of affective verbalizations directly, because they are an integral part of the interaction process itself. Since

compatibility facilitates productive communication, it also directly facilitates the use of the categorized responses, the use of which is a direct measure of meaningful, productive interactions. Therefore, compatibility aids the elicitation of the categorized responses as a result of the fact that: (1) affective verbalizations are included in the group goal, and (2) affective verbalizations are involved in the communication process that is facilitated by compatibility. The effect of compatibility, as a result, is a dramatic increase in production of these responses for reinforced groups.

A comparison of the present study by Fromme et al. (1973) shows the compatibility effect very nicely. They found a mean response frequency of 9.75 for their random composition reinforced groups, while the LL^{A} and HH^{C} groups (best and worst performance, respectively) obtained mean response frequencies of 20.38 and 4.38, respectively. The effect of similarity/complementarity Affection compatibility was to increase the mean rate of response by 10.6, while dissimilarity/discomplementarity Control compatibility decreased the rate by 5.4, in relation to the response rate of the random composition groups in Fromme et al.'s (1973) study. An atmosphere of mutual supportiveness derived from Affection compatibility seems to allow subjects to feel free enough to express feelings and work toward the group goal. Control incompatibility apparently inhibits such expressions due to the interpersonal conflict (psychological defensiveness) which is generated.

The second result to be considered is the interaction between compability type and group replication. The interpretation of this effect must take into account the fact that group replication is not an

independent variable in the usual sense. That is, level one on the group replication factor has no particular significance relative to the second level on this factor. Usually, each level indicates a different experimental condition, such as on the compatibility-type factor in which levels one, two and three correspond to LL, LH and HH compatibilities, respectively. Each of these levels has a different meaning and introduces a different experimental effect in the design. In contrast, levels one and two on the group replication factor have identical meaning. These two levels would be expected to have exactly the same experimental effect since the two groups comprising level one and level two are essentially identical with respect to similarity and complementarity compatibility characteristics. The observed interaction, however, indicates that some of the groups assumed to be identical behaved significantly differently from each other. It must be kept in mind, though, that there is no particular meaning attached to which group scores were higher (i.e., level one or level two) within group replication; the direction of their difference was due to chance only. The existence of statistically significant differences between replications is important to understand, however, but they should be interpreted only in the context of variability among groups that were for the purposes of the experiment, defined as identical.

With this understanding of the group replication factor in mind, then, the results indicate that there was a significant difference between replication groups for the LL compatibility condition, and essentially no observed differences between replication groups for the

LH and HH conditions. It appears that there was some variable, selectivity operating in the LL condition that caused this large discrepancy between replication groups. In considering this differential effect, it is apparent that the LL condition by virtue of its definition maximizes compatibility and is believed to contain groups with the least interpersonal anxiety, the highest level of mutual need satisfaction, and the greatest potential for goal achievement (Schutz, 1960). This is apparently substantiated by the demonstrated trend of increasing group scores for compatibility types HH, LH and LL (increasing in that order). The groups possessing the greatest potential for goal achievement exhibit on the average the highest group scores, and also the largest variation in performance, while groups with less potential exhibit lower group scores and much less variability in performance. This effect may be interpreted as a manifestation of varying degrees of utilization of the potential for goal achievement. Highly compatible groups have the capacity to work very well with each other, and therefore are potentially extremely productive, as the results indicate, because interpersonal conflict is reduced to a minimum and there is very little to interfere with intragroup cooperation. As a result of this lack of interpersonal conflict in conjunction with a high level of mutual supportiveness, compatible groups may experience a lack of psychological defensiveness which allows them to very successfully attain the experimentally imposed group objectives. In contrast, incompatible groups may experience a considerable degree of psychological defensiveness which precludes their ability to achieve the group goals. If this is the case, the question arises then as to why very compatible, undefensive groups exhibit a wider range of

variability in performance than incompatible, defensive groups (i.e., LL and HH conditions, respectively).

An examination of this phenomenon may be profitably accomplished through consideration of and contrast with the concepts regarding group composition expressed by Harrison (1965), Harrison and Lubin (1965), and Hoffman and Maier (1966). These authors suggest that heterogeneity of group composition provides impetus for interpersonal exploration through the differences among members. Group members' varying perspectives and opinions provide a growth producing atmosphere for the trying-out of new behaviors. Conversely, homogeneity results in a lack of productive conflict, and after an initial period of quickly attained cohesiveness and confirmed mutual supportiveness may result in stabilization at a level of complacency and arrested growth (Yalom, 1970). Compatibility in this study (i.e., similarity/complementarity) defined a very homogeneous group composition. In fact, this composition resulted in individuals with nearly identical scores for both expressed (e) and wanted (w) FIRO-B raw scores (i.e., $e_i^A = w_i^A = e_j^A = w_j^A = e_k^A = w_k^A = e_l^A = w_l^A$). In addition these scores for all LL groups for both Control and Affection needs were typically very near the center of their range (i.e., 4 in a range of 0 to 9), as described in Table XXII. According to Schutz (1960) and Ryan (1970), individuals with these scores would be well adjusted individuals with an intrinsically low level of intraindividual anxiety and interpersonal conflict. It might be hypothesized then that individuals in these groups experience the immediate level of mutual supportiveness and lack of anxiety described by Yalom that leads to a lack of productivity. As Yalom (1970) states, some anxiety among group members

TABLE XXII

FIRO-B RAW SCORES FOR EACH MEMBER OF THE 12 EXPERIMENTAL GROUPS

	Control				Affection			
	i	j	k	l	i	j	k	l
	LL^C GROUP REPLICATION 1							
expressed	3	3	2	2	6	5	9	7
wanted	4	3	3	3	4	5	9	9
	LL^C GROUP REPLICATION 2							
expressed	1	1	0	1	8	8	3	4
wanted	2	0	1	2	9	5	5	4
	LH^C GROUP REPLICATION 1							
expressed	1	0	1	1	4	1	4	2
wanted	6	6	8	7	6	1	7	6
	LH^C GROUP REPLICATION 2							
expressed	7	5	6	9	4	9	3	8
wanted	1	0	1	0	7	8	5	9
	HH^C GROUP REPLICATION 1							
expressed	0	0	8	9	8	3	5	3
wanted	5	1	9	4	9	5	6	4
	HH^C GROUP REPLICATION 2							
expressed	1	9	5	0	2	6	7	3
wanted	0	9	9	3	3	8	7	8
	LL^A GROUP REPLICATION 1							
expressed	2	2	5	3	5	5	5	2
wanted	1	4	5	2	5	4	5	2

TABLE XXII (Continued)

	Control				Affection			
	i	j	k	l	i	j	k	l
	LL^A GROUP REPLICATION 2							
expressed	0	5	2	0	6	4	4	5
wanted	2	2	7	3	5	5	5	6
	LH^A GROUP REPLICATION 1							
expressed	4	4	3	0	3	2	3	4
wanted	5	7	2	6	8	8	9	9
	LH^A GROUP REPLICATION 2							
expressed	4	4	4	1	2	3	6	4
wanted	5	9	4	5	9	9	9	8
	HH^A GROUP REPLICATION 1							
expressed	4	4	3	0	9	2	7	0
wanted	1	5	6	2	9	2	5	0
	HH^A GROUP REPLICATION 2							
expressed	2	3	3	8	2	5	0	9
wanted	2	5	0	4	0	5	0	9

is desirable as a spur to exploration and change; the similarity/complementarity compatibility groups might have lss than an optimal level of anxiety. Subjective observations of the groups during the experimental 50-minute period, when evaluated retrospectively, contradicts this conception. It was the experimenter's perception (without knowledge of any group's compatibility characteristics) that the similarity/complementarity (compatible) groups experienced considerable anxiety. They subjectively appeared to possess potential for intimacy and cohesiveness (a lack of psychological defensiveness) as well as a sensitivity to each other's affective experiences (interpersonal anxiety). Both LL^{A} groups verbalized their anxiety and discussed its significance. This interpersonal atmosphere was in stark contrast to other less compatible groups (i.e., HL and HH conditions) which subjectively appeared much more psychologically defensive and much less willing to take interpersonal risk (strive for intimacy) and experience the concomitant anxiety. It may be then that extremely compatible groups (i.e., similarity/complementarity) experience an amount of interpersonal security than allows them the latitude to approach intimacy much more readily than less compatible groups (i.e., similarity/discomplementarity and dissimilarity/discomplementarity) and tolerate the experience of anxiety. On the other hand, if the compatible group experiences too much anxiety, its capacity to achieve the experimentally introduced group goal (i.e., use of the specified verbalization categories may be diminished. Less compatible groups, with more psychological defensiveness and less mutual supportiveness, may be less capable of achieving the imposed group goals, but also less likely to be extremely affected by anxiety aroused through risk taking (exhibit less between replication variability). The intervening variables which might have determined a compatible group's level of anxiety are not apparent

in the present study. But subjective observation and group composition theory lend credence to the existence of a lack of interpersonal conflict and psychological defensiveness in conjunction with a high degree of mutual supportiveness in highly compatible groups (Yalom, 1970; Harrison, 1965; Harrison & Lubin, 1965; Hoffman & Maier, 1966; Schutz, 1960). Retrospective analysis of subjective observations indicates a higher level of anxiety for the less successful, compatible groups compared to the more successful compatible groups. All compatible groups, however, appeared to be potentially intimate, meaningful groups which experienced anxiety. The conditions or variables responsible for more than an optimum level of anxiety that appeared to interfere with group performance were not apparent. It is conceivable, however, that anxiety level may have significantly contributed to the observed effects, that highly compatible groups (i.e., similarity/complementarity compatibility) varied significantly more among replicated groups, than less compatible groups (i.e., similarity/discomplementarity and dissimilarity/discomplementarity compatibility). These results contradict Schutz's (1960) assertion that compatible relationships are distinguished by a lack of anxiety. In this study, compatible groups exhibited anxiety and were concomitantly the most productive; compatibility appeared to contraindicate interpersonal conflict, not interpersonal anxiety.

Factor Analysis

Some attention will now be given to the exploratory factor analysis of the 54 items which comprise the six scales of the FIRO-B. Factor 1 apparently measures a personality dimension related to interest-disinterest in socially based relationships and social interchange. This factor is comprised of essentially all the items which determine the simultaneous membership on one single factor, and

indicates that to a large extent these two scales behave as if they were just one scale. In other words, e^I and w^I scores are highly intercorrelated. Such a strong relationship implies that there is little discriminatory ability between these two scales, because an individual obtaining a large score on e^I is very likely to also have a large score on w^I. Conversely, it would be relatively rare to have a large discrepancy between e^I and w^I scores. With such a strong covariance it may be best to interpret these two scales as defining only a single personality dimension. That unitary dimension is herein defined as Factor 1. In terms of the FIRO-B, individuals seem to exhibit either a general interest in social interaction or a general disinterest in social interaction. In contrast, the expressed and wanted behaviors within the Control and Affection interpersonal areas are relatively independent measures. With respect to Control needs, an individual may possess a high or low e^C need without being expected to possess any particular value for w^C needs. These two needs are neither mutually exclusive or mutually inclusive. Similarly, with respect to Affection needs, an individual may possess neither a high nor low e^A need without being expected to possess any particular level of w^A needs. Subsequently, these two scales are neither mutually exclusive nor mutually inclusive. The peculiar intercorrelation between e^I and w^I would imply substantial effects upon compatibility indices. Compatibility is related to the discrepancy or lack of discrepancy between the e and w scores within any particular interpersonal area (i.e., I, C and A). An inspection of Table V reveals that the LH compatibility condition can be achieved only on the basis of e - w discrepancies. Since the e^I and w^I scales are highly correlated, then the LH compatibility condition would be very difficult to obtain, because of the scarcity of individuals exhibiting e - w discrepancies. In addition to this problem, however, is the question of whether the compatibility concepts are relevant to

the Inclusion area of needs, because it seems to describe a single or unitary dimension of compatibility. Complementarity compatibility is based on the concept of the simultaneous presence of trait 1 (i.e., e^I) in individual i, and trait 2 (i.e., w^I) in individual j. If the e^I and w^I scales are actually the same dimension, then it would not be theoretically sound to compare the e^I score for one individual to the w^I score for another individual, and then imply that this is a comparison between two different dimensions. Complementarity compatibility implies the comparison of two different traits across two different individuals. It may be justified to use similarity compatibility, however, if it is understood that it stands for the comparison of the relative presence or absence of a single trait across individuals.

Factor 2 for the 54 item factor analysis corresponds to a dimension of responsibility and need to take charge or control of interpersonal interactions. A high intercorrelation of essentially all the items comprising the e^C scale resulted in this factor. This strong interrelationship of items seems to indicate a highly internally consistent scale. This factor substantiates the e^C scale as a methodologically sound personality dimension.

Factor 3 for the 54 item factor analysis corresponds to a dimension of dependency and willingness to accept only delegated responsibility. A high intercorrelation of essentially all the items comprising the w^C scale resulted in this factor. This strong interrelationship of items seems to indicate a highly internally consistent scale which is methodologically sound. In addition, factors 2 and 3 substantiate the independence of the e^C and w^C scale, respectively. They appear to measure two distinct personality dimensions,

in contrast to scales e^I and w^I which, by virtue of their intercorrelation, comprised factor 1.

The independent factor analysis of the six FIRO-B scales (i.e., e^I, w^I, e^C, w^C, e^A, and w^A) revealed that all except e^A and w^A were undimensional scales. The two factor structure for the Affection scales (i.e., e and w) suggests that additional elaboration on the interpretation of these two scales is needed in order to incorporate the existence of two factors on each scale.

The intent of the factor analyses was to make a preliminary investigation of the FIRO-B's construction. The results indicate that further work is necessary to determine the characteristics of the six scales. For the present, it may be best to not use the Inclusion area of interpersonal need as a basis of compatibility measurement. It is encouraging, however, that the remaining FIRO-B scales appear to measure relatively independent personality dimensions, much as they were described by Schutz (1960) at the inception of his theory of interpersonal needs.

Compatibility Covariants

The final area of discussion regards general characteristics of compatibility in terms of associated variables or covariants, and speculation about the implications of compatibility for groups. It has been previously stated that compatibility is a descriptor of the relationship among FIRO-B profiles, rather than the absolute values of profiles. There is some observed relationship, however, between compatibility and raw score values. Reference to Table V may aid understanding of the following discussion, which elucidates these relationships. Consideration of the Low-Low compatibility condition reveals that the raw scores among the individual profiles comprising this

condition are identical. Every trait measured across every group member exhibits identical values (i.e., $e_i = w_i = e_j = w_j = e_k = w_k = e_l = w_l$). There is obviously no intraindividual trait discrepancy, nor any interindividual trait discrepancy. Within the domain of the particular test used to measure traits, these individuals possess identical personalities. That does not mean, though, that the "group" personality does not vary from group to group. The simultaneous absence of every trait of interest across every group member comprises a Low-Low compatibility profile, but so does a group with the simultaneous presence of every trait (i.e., $e_i = w_i = e_j = w_j = e_k = w_k = e_l = w_l = 0$ and $e_i = w_i = e_j = w_j = e_k = w_k = e_l = w_l = 9$, respectively). These two extreme configurations of Low-Low compatibility are equally compatible, but are composed of individuals with different absolute values of traits and different "personalities." Both configurations exhibit a lack of intraindividual trait discrepancy (i.e., $e_i = w_i$), which Ryan (1970) suggests is indicative of a relative absence of conflicts associated with need satisfaction for any given interpersonal area (i.e., I, C, or A). Although these groups vary in their collective level of interest in a particular area of need, they are equivalent in terms of their lack of conflict regarding these needs. A group exhibiting $e_i^C = w_i^C = 0$ apparently has little interest and interpersonal interaction in the area of Control needs, whereas a group with $e_i^C = w_i^C = 9$ is very involved in interaction concerning Control needs. It is worth considering that this variability in raw scores constitutes a variable with some effects on group process, and is therefore worthy of assessment in conjunction with compatibility, although it was not apparently related to the outcome in the present study.

The Low-High compatibility condition also places certain constraints on the absolute values of FIRO-B raw scores. This compatibility profile depends on large discrepancies between an individual's traits (i.e., $e_i \neq w_i$). This discrepancy could result from large values on trait 1 relative to trait 2, or from large values on trait 2 relative to trait 1 (i.e., $e_i > w_i$ or $w_i > e_i$, respectively). Therefore, a group which exhibits Low-High compatibility, simultaneously possesses relatively large expressed-wanted discrepancies which are indicative of intraindividual conflict, according to Ryan (1970). This lack of trait comparability results in conflicts of need satisfaction within a particular interpersonal area, because the individual's expressed behavior is considerably different from the behaviors wanted from these individuals. For example, an individual might exhibit expressed behaviors that suggest a high degree of interest in establishing meaningful, intimate relationships (i.e., high e^A), while there would be little or no interest in others' reciprocating with interest in intimacy (i.e., low w^A). Low-High condition groups, although similar with respect to the presence of e-w discrepancies, may be of two general types previously mentioned. One type of group has a high degree of expressed behaviors and little wanted behaviors which presents a different "group" personality than a group with a low degree of expressed behaviors and a high degree of wanted behaviors. An individual with high expressed behavior and low wanted behavior in all interpersonal areas (i.e., I, C, and A) is described as "...characteristic of the smooth, sophisticated 'manipulator,'" while an individual with low expressed behavior and high wanted behavior in all interpersonal areas is described as "...withdrawn, inadequate, and cautious

in his interpersonal behavior; at the same time he places excessive demands upon others for fulfillment of his needs" (Ryan, 1970). Both types of Low-High conditions are equally incompatible and exhibit similar degrees of expressed-wanted score discrepancies, but may exhibit different styles of personality within this framework. It may be desirable, therefore, when describing group compatibility, to also take into account the characteristics of the individual profiles and their implied personality attributes, in order to take the possible effects of personality into consideration when evaluating group performance.

The High-Low compatibility condition also demands expressed-wanted score discrepancies. Similarly, this condition produces intraindividual conflict regarding need satisfaction. High-Low compatibility, however, can only practically be produced in dyads, and not in groups. As Table V illustrates, this condition is the result of high expressed and low wanted scores in one individual (i.e., $e_i > w_i$), and low expressed and high wanted scores in another individual (i.e., $e_j < w_j$). There is essentially only one "dyadic" personality for High-Low compatibility in contrast to the two "group" personalities possible for the Low-High condition, since for the High-Low case, it is irrelevant whether $e_i > w_i$ and $e_j < w_j$ or $e_j > w_j$ and $e_i < w_i$. In terms of personality composition, the two individuals just alternate their score pattern, or alternate "personalities," keeping the "dyadic" personality intact.

The final compatibility pattern, the High-High condition, demands equivalency of expressed-wanted behaviors, as does the Low-Low compability condition. Group members exhibit no intraindividual trait

discrepancy (i.e., $e_i = w_i$), but none if the members' trait values may be alike (i.e., $e_i = w_i \neq e_j = w_j \neq e_k = w_k \neq e_l = w_l$). These individuals would be described as not having intraindividual conflict of need satisfaction. Across groups, the "group" personality would be relatively similar, in that each group would consist of a selection of widely varying individual trait scores (i.e., $e_i = w_i = 0$, $e_j = w_j = 3$, $e_k = w_k = 6$, $e_l = w_l = 9$) which maximize the attainable differences across individuals. The personality attributes vary considerably, from the conspicuous absence of traits (i.e., $e_i - w_i = 0$) to conspicuous presence of traits (i.e., $e_l = w_l = 9$). Within the interpersonal area of Affection, for instance, the former individual would be described as someone not only cautious about affection but suspicious of it; the latter individual would be described as someone who readily becomes emotionally involved with others and seeks such a large amount of affection that he is frequently disappointed (Ryan, 1970).

It is apparent that the FIRO-B raw score profiles within groups covary with the compatibility compositions: LL, LH, HL and HH. Table XXII includes the FIRO-B scores for the 12 experimental groups which illustrates some of the raw score-compatibility relationships just described. These relationships may have some bearing on group outcome measures since experimental manipulations of FIRO-B raw scores alone (disregarding compatibility formulae) has demonstrated significant effects on group outcome (Liddell, 1970). It may be useful to monitor raw scores and associated personality characteristics to assess their contribution to group outcome as well as the degree of intraindividual trait discrepancy. It will be remembered that compatibility formula

Index III in Table I is a direct measure of the accumulated expressed-wanted discrepancy within a dyad, or a group if summed across all group members. It would be possible to calculate a value for Index III in order to directly evaluate the total amount of intraindividual trait discrepancy within a group. The use of Index III as a distinct and exclusive means of classifying compatibility composition is probably not warranted, however, because of the strong association of Index III and similarity and complementarity compatibility (i.e., LL, LH, HL and HH conditions). It may be profitably used adjunctively, but it is considerably redundant to similarity and complementarity as descriptors of composition.

In order to allow a tentative assessment of variables other than similarity and complementarity compatibility which may have contributed to group outcome, selected measures were correlated with group score for the 12 experimental groups. Table XXIII presents intercorrelations of compatibility indices and the group factor loadings for Factor 1, 2 and 3 with group score. Factor loadings or each factor were averaged across the four members of a group to derive group factor loading. Table XXIV represents these factor structures. It will be noticed that similarity and complementarity compatibility (i.e., sK and cK, respectively) attain correlations with group score which range from -0.11 for sK^{A} to -0.44 for cK^{C}. Since the analysis of variance established the predictive significance of compatibility, these values may be used as a guide for comparison with other correlation values that may be sufficiently large to also have to group outcome. The values for $sK^{C,A}$ and $cK^{C,A}$ do not reach correlational significance ($p < .01$) with group score for at least two reasons, and does not

TABLE XXIII

INTERCORRELATIONS AMONG COMPATIBILITY INDICES, FACTOR LOADINGS, AND MEAN VERBALIZATION SCORES FOR THE 12 EXPERIMENTAL GROUPS

	Index III^I	cK^I	sK^I	Index III^C	cK^C	sK^C	Index III^A	cK^C	sK^C	Factor 1	Factor 2	Factor 3	Group Score
Index III^I	1.0	-0.07	-0.41	-0.01	-0.25	-0.06	0.45	0.44	-0.01	-0.14	0.06	-0.27	0.12
cK^I		1.0	0.86*	-0.37	-0.24	0.11	0.07	0.34	0.32	0.21	-0.36	-0.16	-0.02
sK^I			1.0	-0.35	-0.19	0.14	-0.40	0.07	0.42	0.51	-0.34	-0.01	0.03
Index III^C				1.0	0.83*	-0.14	0.16	-0.05	-0.11	-0.44	-0.59	-0.17	-0.29
cK^C					1.0	0.33	0.18	-0.01	-0.02	-0.45	-0.51	-0.17	-0.44
sK^C						1.00	-0.01	0.04	0.04	0.18	0.20	-0.08	-0.28
Index III^A							1.0	0.42	-0.32	-0.79*	-0.11	-0.14	-0.33
cK^A								1.0	0.68	-0.20	-0.25	-0.02	-0.24
sK^A									1.0	0.29	-0.27	-0.00	-0.11
Factor 1										1.0	0.34	-0.09	0.33
Factor 2											1.0	-0.20	0.19
Factor 3												1.0	0.31
Group Score													1.0

$p < .01$

TABLE XXIV

INDIVIDUAL MEMBER FACTOR LOADINGS FOR
THE 12 EXPERIMENTAL GROUPS

Individual	Factor 1	Factor 2	Factor 3
	LL^C GROUP REPLICATION 1		
i	-1.12	0.19	-0.86
j	0.23	-2.26	-1.55
k	0.14	0.19	-1.24
l	0.07	0.71	-1.14
	LL^C GROUP REPLICATION 2		
i	-0.78	0.54	0.58
j	-0.91	1.10	1.12
k	0.86	0.20	0.70
l	0.22	0.69	1.05
	LH^C GROUP REPLICATION 1		
i	-1.06	0.48	-0.76
j	-0.56	-0.86	0.33
k	0.34	-0.97	-1.45
l	-1.63	-0.84	-1.11
	LH^C GROUP REPLICATION 2		
i	-1.11	-1.77	0.59
j	-1.00	-1.00	2.17
k	-1.23	-0.84	1.86
l	-1.11	-2.26	1.08
	HH^C GROUP REPLICATION 1		
i	0.11	0.62	-0.87
j	-0.68	0.86	0.61
k	-0.06	0.13	0.00
l	-0.98	0.03	0.18
	HH^C GROUP REPLICATION 2		
i	0.36	-0.40	0.95
j	-0.27	-1.75	0.22
k	-1.08	-0.59	-1.54
l	-0.23	0.77	0.62

TABLE XXIV (Continued)

Individual	Factor 1	Factor 2	Factor 3
	LL^A GROUP REPLICATION 1		
i	-0.02	-0.04	0.82
j	1.23	0.58	-0.63
k	0.12	-1.06	-1.43
l	0.98	0.48	0.64
	LL^A GROUP REPLICATION 2		
i	-0.71	0.76	1.07
j	0.37	-1.25	0.83
k	-0.32	-0.39	-1.64
l	0.98	1.16	0.34
	LH^A GROUP REPLICATION 1		
i	-0.75	-0.63	-0.73
j	-1.39	-0.79	-0.01
k	-1.80	-0.31	0.61
l	-1.50	0.56	-0.85
	LH^A GROUP REPLICATION 2		
i	1.35	-1.21	-0.65
j	-0.02	-1.06	-1.62
k	-1.51	-0.51	0.94
l	-1.10	0.44	-0.72
	HH^A GROUP REPLICATION 1		
i	0.29	-0.91	1.45
j	1.18	-0.70	-0.39
k	0.95	-0.73	-1.09
l	1.20	1.43	0.22
	HH^A GROUP REPLICATION 2		
i	-0.24	-0.01	0.91
j	0.29	-0.28	-0.53
k	1.39	-0.79	1.56
l	-0.66	-1.87	-0.06

necessarily contradict the results of the analysis of variance. First, the statistical power of correlation with only 12 cases is relatively low (high probability of type II error), and second, the analysis of variance evaluated the combined predictive ability of similarity and complementary compatibility through the comparisons of three compatibility conditions: Low-Low, Low-High, and High-High. The correlation table presents the independent predictive ability of sK and cK. It seems justifiable to speculate that other variables which exhibit comparable strengths of independent correlation with group score are worthy of consideration. It is apparent that Index III (intraindividual need conflict) for the interpresonal areas of Control and Affection correlates with outcome at approximately the same level as $sK^{A,C}$ and $cK^{A,C}$. Although the relationship of Index III to compatibility classification (i.e., LL, LH, and HH) probably explains to some degree of the observed relationship correlation of Index III to group score, the possibility that intraindividual conflict independently affects group outcome cannot be ruled out. It is probably best then, to not ignore Index III in future research.

Of particular interest, however, is the correlation of Factor 1 and Factor 3 with group score. Groups with higher loadings on these factors tended to produce more desirable verbalizations than groups with low factor loadings. In regard to Factor 1, this result suggests that groups with a relatively high degree of interest in social interchange and the establishment of socially based relationships tended to perform better in this experimental setting than groups with less interest of this nature. Since verbal interaction was the basis for determining group performance, a high degree of interest in social

interchange may have facilitated communication, and subsequently may have rendered verbal interaction of an affectively laden and intimate nature more easily accomplished. Factor 3 corresponds to a willingness to accept delegated responsibility. This factor indicates the tendency to follow direction rather than establish independent courses of action. Groups exhibiting higher levels of desirable verbalization, therefore, also were relatively willing to assume the responsibility to achieve an assigned task. This increased ability to produce affectively laden and intimate interaction may partially have been the result of a group characteristic of compliance as measured by relatively high loadings on Factor 3. An interpretation of these factors in tandem, results in the implication that groups with both an interest in establishing socially based interpersonal relationships and a willingness to comply with assigned tasks were particularly successful in producing the desired, affectively laden interpersonal verbalizations, relative to groups devoid of these two characteristics. This conclusion is not inconsistent with the previous interpretation that group performance is determined by the potentiating effects of Affection compatibility and the inhibiting effects of Control incompatibility. Correspondingly, the presence of interest in social interaction assists group performance and the absence of compliance impedes group performance.

It would not be surprising if other variables exhibit a relationship (covariability) with compatibility condition. Tight control of compatibility, such as that used in the current study, implies some extent of control over related factors through the strength of their association, which could result in an uneven distribution of these

variables across compatibility conditions. For example, it is likely that compatible groups generally possess more interpersonal attraction among their members than incompatible groups. Schutz (1960) suggested this relationship, and it was inadvertently substantiated by Canfield and La Gaipa (1970). They conducted a study which derived seven factors important to the maintenance of friendships. Their factors comprised a constellation of related attributes present in a friendship. Since compatibility and attraction seem related to one or more of these factors, this study presented evidence of a connection or covariance between the two.

On the basis of the above argument, Tedeschi et al.'s (1973) study, in effect, extended the implications of compatibility when they found that attraction is involved in interpersonal influence interactions. Compatibility is likely to be a factor in this type of interaction, too, due to its previously discussed relationship with attraction. Interpersonal attraction increases the amount of interpersonal influence subjects exert on each other, and so should compatibility. Subjects that are attracted to each other and therefore compatible to some extent, have a potentially higher reinforcing value for each other. Hence, compatible groups probably experienced more social reinforcement than incompatible groups.

In addition, people probably spend most of their time with others to which they are attracted. That is, people are more familiar with interpersonally attractive, compatible others. Since it is likely that familiarity increases the ability to understand or correctly interpret behaviors, emphathic statements may come easier to compatible groups. These groups would be less anxious, more supportive and more empathic

than incompatible groups if these conclusions are correct. Therefore, social reinforcement and empathy are aspects of group interaction which covary with compatibility and may increase its effects on group use of the categorized responses.

In addition to the possible contributing effects of the preceding variables on group outcome, the particular variability observed between replications for the Low-Low compatibility condition relative to the Low-High and High-High conditions may have been produced by other influences pertaining to group performance. The two most productive groups were Affection compatible (i.e., LL^A), both of which subjectively exhibited interpersonal anxiety and a tense group atmosphere. Next in productivity were Control compatible groups (i.e., LL^C), which were somewhat less tense than the Affection groups. Both of the above conditions (i.e., LL^A and LL^C) produced groups which appeared subjectively to have potential for intimacy and honesty, but they varied in their ability to attain this type of interaction. Both conditions produced one group that scores significantly better than the second (i.e., LL^A replication one LL^A replication two, and LL^C replication one LL^C replication two). The lower scoring groups appeared to experience high levels of interpersonal tension which were somewhat debilitating. It is speculated, therefore, that anxiety level may have accounted for some of the variability between groups of identical compatibility classification.

Future Research

Within the context of the present study, some possible determinants of group score besides similarity and complementarity compatibility have been discussed. A replication of this study in the future might attain a higher degree of experimental control by taking these

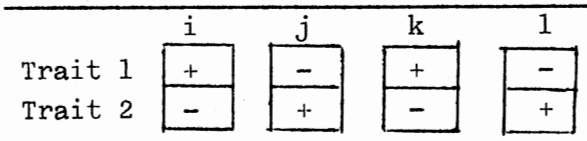
variables into account in the experimental design. It is worthwhile considering the possibility that in other group paradigms the effects of compatibility might be somewhat different. To that end, other investigations with varying demand characteristics may be useful in order to examine the stability of the observed compatibility effects across various types of group settings. For example, decision making groups might exhibit stronger compatibility effects for Control needs rather than Affection needs. It should also be noted that the present groups were indicative of compatibility effects for the first session of unacquainted groups. Other measures of group outcome besides rate of elicitation for prescribed verbalizations, taken at varying stages of group maturation, might elucidate additional relationships of compatibility to group process.

Another major alteration in the present experimental design that warrants investigation is the use of mixed group dyadic compatibilities rather than uniform dyadic compatibility. Two possible configurations of mixed compatibility are LH-HL groups and LL-HH groups. These patterns may be achieved by the group compositions illustrated in Table XXV. These configurations allow exact control of dyadic compatibility yet mix compatibility type. In the present study it appears that both the LH-HL and LL-HH groups would score lower than the LL groups. The latter mixed configuration introduces the lowest scoring compatibility condition (i.e., HH) in combination with the highest scoring condition (i.e., LL), which would logically be expected to be detrimental to the group performance exhibited by the uniform Low-Low compatibility group. Since the Low-High condition groups performed less well than the Low-Low groups, it is not expected that the LH-HL

TABLE XXV

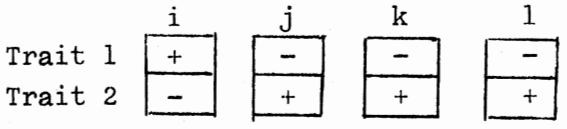
CONFIGURATIONS COMPRISING MIXED SIMILARITY-COMPLEMENTARITY GROUP COMPATIBILITY

LL - HL

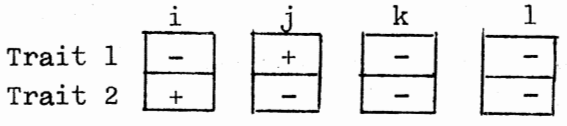


Dyadic Compatibilities

i-j	i-k	i-l	j-k	j-l	k-l
HL	LH	HL	HL	LH	HL



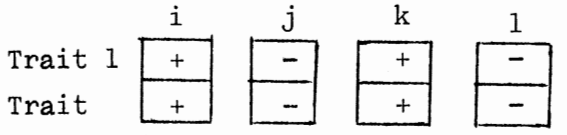
i-j	i-k	i-l	j-k	j-l	k-l
HL	HL	HL	LH	LH	LH



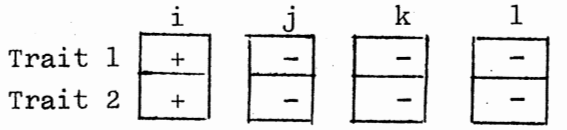
i-j	i-k	i-l	j-k	j-l	k-l
HL	HL	HL	LH	LH	LH

LL - HH

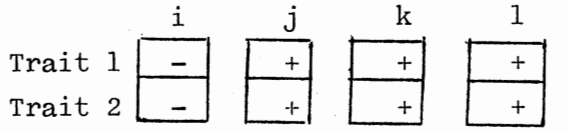
Dyadic Compatibilities



i-j	i-k	i-l	j-k	j-l	k-l
HH	LL	HH	HH	LL	HH



i-j	i-k	i-l	j-k	j-l	k-l
HH	HH	HH	LL	LL	LL



i-j	i-k	i-l	j-k	j-l	k-l
HH	HH	HH	LL	LL	LL

configuration would produce groups outperforming Low-Low groups. It must be remembered, though, that the measured effects in the present study represent the optimum compatibility composition for a specific paradigm tested after the first group session. The potential desirability of mixed compatibility configurations cannot be dismissed out of hand without a more extensive evaluation of compatibility effects.

A final comment on compatibility will complete the current discussion. There must be many variables affecting the choice of interpersonal relationships in natural settings. Friendships, marriage partners, and co-workers are examples of the various relationships for which compatibility is implicated as a determiner of selection (Tedeschi, Schlenker & Bonoma, 1973; Centers & Granville, 1971). It is also noticed that within groups, certain dyadic relationships are selected in preference to others for each group member, such that there is considerable variation in the quality of dyadic interactions (Clark & Culbert, 1965). It seems likely that some intervening variables mediate the process of selection, and compatibility has been implicated in this process (Schutz, 1960). On the basis of the current investigation it is reasonable to hypothesize that the maximization of FIRO-B compatibility, represented by similarity/complementarity compatibility, may be one of the important factors which determines the selection of interpersonal relationships; it is apparent that FIRO-B compatibility demonstrated very powerful effects on interpersonal relationships and group processes in the present study, and that compatibility is a very significant dimension of group composition.

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APPENDIX A

COMPUTER PROGRAM FOR GENERATION OF PROBABILISTIC FREQUENCY DISTRIBUTIONS OF COMPATIBILITY INDICES I THROUGH IX

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CARD
0001  // EXEC FORTHCLG,REGION.FORT=300K,REGION.GO=250K
0002  //FORT.SYSIN DD *
0003        DIMENSION FIRO(50,6),NR(3,50,50),ND(3,50,50),NI(3,50,50),NS(3,50,5
0004       1D),NT(3,50,50),NU(3,50,50),GR(3),GD(3),GI(3),GS(3),GT(3),GU(3),GRS
0005       1D(3),GUSD(3),IFIRO(50,6),X<(9),V(9),W(9),X(9),Y(9),Q(9),R(9),S(9),
0006       1T(9)
0007        INTEGER A,B,C,D,AA,BB,CC,DD
0008        DO 5 I=1,9
0009        V(I)=0.0
0010        W(I)=0.0
0011        X(I)=0.0
0012        Y(I)=0.0
0013        Q(I)=0.0
0014        R(I)=0.0
0015        S(I)=0.0
0016      5 T(I)=0.0
0017        TOTAL=0.0
0018        READ(5,100) N,((FIRO(M,MM),MM=1,6),M=1,N)
0019    100 FORMAT(I2,/,(3X,6F1.0))
0020        WRITE(6,200)
0021    200 FORMAT('1',43X,'RAW SCORES IN SEQUENCE 1 THROUGH 6 WHERE:',//,57X,
0022       1'I    C    A',/,55X,'E 1    3    5',/,55X,'W 2    4    6',//,1X,'123456
0023       1123456 123456 123456 123456 123456 123456 123456 123456 123456 123
0024       1456 123456 123456 123456 123456 123456 123456 123456',/)
0025        DO 10 M=1,N
0026        DO 10 MM=1,6
0027     10 IFIRO(M,MM)=FIRO(M,MM)
0028        WRITE(6,300) ((IFIRO(M,MM),MM=1,6),M=1,N)
0029    300 FORMAT(1X,6I1,1X,6I1,1X,6I1,1X,6I1,1X,6I1,1X,6I1,1X,6I1,1X,6I1,1X,
0030       16I1,1X,6I1,1X,6I1,1X,6I1,1X,6I1,1X,6I1,1X,6I1,1X,6I1,1X,6I1,1X,6I1
0031       1)
0032        WRITE(6,400)
0033    400 FORMAT('1')
0034        N1=N-1
0035        NEED=1
0036        DO 20 I=1,8
0037     20 X<(I)=0.0
0038        DO 1 NAREA1=3,5,2
0039        NAREA2=NAREA1+1
0040        NEED=NEED+1
0041        DO 1 M=1,N1
0042        N2=M+1
0043        DO 1 MM=N2,N
0044        NR(NEED,M,MM)=ABS(FIRO(M,NAREA1)-FIRO(MM,NAREA2))+ABS(FIRO(MM,NARE
0045       1A1)-FIRO(M,NAREA2))
0046        ND(NEED,M,MM)=ABS(FIRO(M,NAREA1)-FIRO(M,NAREA2)+FIRO(MM,NAREA1)-FI
0047       1RO(MM,NAREA2))
0048        NI(NEED,M,MM)=ABS(FIRO(M,NAREA1)+FIRO(M,NAREA2)-FIRO(MM,NAREA1)-FI
0049       1RO(MM,NAREA2))
0050        NS(NEED,M,MM)=ABS(FIRO(M,NAREA1)-FIRO(M,NAREA2)-FIRO(MM,NAREA1)+FI
0051       1RO(MM,NAREA2))
0052        NT(NEED,M,MM)=ABS(FIRO(M,NAREA1)-FIRO(M,NAREA2))+ABS(FIRO(MM,NAREA
0053       11)-FIRO(MM,NAREA2))
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      1234567890123456789012345678901234567890123456789012345678901234567890123456789 0
CARD
0054       1 NU(NEED,M,MM)=ABS(FIRO(M,NAREA1)-FIRO(MM,NAREA1))+ABS(FIRO(M,NAREA
0055        12)-FIRO(MM,NAREA2))
0056         READ(5,500) RMN2,RMN3,UMN2,UMN3
0057     500 FORMAT(4F5.1)
0058         Q(1)=1
0059         Q(2)=5.0
0060         Q(3)=5.0
0061         Q(4)=1
0062         Q(5)=1
0063         Q(6)=1
0064         R(1)=1
0065         R(2)=1
0066         R(3)=1
0067         R(4)=1
0068         R(5)=5.0
0069         R(6)=5.0
0070         S(1)=1
0071         S(2)=1.5
0072         S(3)=5.0
0073         S(4)=1
0074         S(5)=1
0075         S(6)=1
0076         T(1)=1
0077         T(2)=1
0078         T(3)=1
0079         T(4)=1
0080         T(5)=1.5
0081         T(6)=5.0
0082         V(1)=1
0083         V(2)=13.0
0084         V(3)=13.0
0085         V(4)=RMN2
0086         V(5)=RMN2
0087         V(6)=RMN2
0088         W(1)=RMN3
0089         W(2)=RMN3
0090         W(3)=RMN3
0091         W(4)=1
0092         W(5)=13.0
0093         W(6)=13.0
0094         X(1)=1
0095         X(2)=1.5
0096         X(3)=13.0
0097         X(4)=UMN2
0098         X(5)=UMN2
0099         X(6)=UMN2
0100         Y(1)=UMN3
0101         Y(2)=UMN3
0102         Y(3)=UMN3
0103         Y(4)=1
0104         Y(5)=1.5
0105         Y(6)=13.0
0106         N3=N-3
0107         N2=N-2
0108         N1=N-1
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      0001000200111111111122222222223333333333444444444455555555556666666666777777777 8
      1234567890123456789012345678901234567890123456789012345678901234567890123456789 0
CARD
0109        DO 3 A=1,N3
0110        AA=A+1
0111        DO 3 B=AA,N2
0112        BB=B+1
0113        DO 3 C=BB,N1
0114        CC=C+1
0115        DO 3 D=CC,N
0116        TOTAL=TOTAL+1
0117        DO 2 ND=2,3
0118        GO(ND)=(NO(ND,A,B)+NO(ND,A,C)+NO(ND,A,D)+NO(ND,B,C)+NO(ND,B,D)+
0119       1NO(ND,C,D))/6.0
0120        GI(ND)=(NI(ND,A,B)+NI(ND,A,C)+NI(ND,A,D)+NI(ND,B,C)+NI(ND,B,D)+
0121       1NI(ND,C,D))/6.0
0122        GS(ND)=(NS(ND,A,B)+NS(ND,A,C)+NS(ND,A,D)+NS(ND,B,C)+NS(ND,B,D)+
0123       1NS(ND,C,D))/6.0
0124        GT(ND)=(NT(ND,A,B)+NT(ND,A,C)+NT(ND,A,D)+NT(ND,B,C)+NT(ND,B,D)+
0125       1NT(ND,C,D))/6.0
0126        GR(ND)=(NR(ND,A,B)+NR(ND,A,C)+NR(ND,A,D)+NR(ND,B,C)+NR(ND,B,D)+
0127       1NR(ND,C,D))/6.0
0128        GU(ND)=(NU(ND,A,B)+NU(ND,A,C)+NU(ND,A,D)+NU(ND,B,C)+NU(ND,B,D)+
0129       1NU(ND,C,D))/6.0
0130        GRSD(ND)=(1./6.)*SQRT(6*(NR(ND,A,B)**2+NR(ND,A,C)**2+NR(ND,A,D)**2
0131       1+NR(ND,B,C)**2+NR(ND,B,D)**2+NR(ND,C,D)**2)-(6*GR(ND))**2)
0132      2 GUSD(ND)=(1./6.)*SQRT(6*(NU(ND,A,B)**2+NU(ND,A,C)**2+NU(ND,A,D)**2
0133       1+NU(ND,B,C)**2+NU(ND,B,D)**2+NU(ND,C,D)**2)-(6*GU(ND))**2)
0134        IF(GR(2).LT.V(1)+Q(1).AND.GR(2).GT.V(1)-Q(1).AND.GR(3).LT.W(1)+R(1
0135       11).AND.GR(3).GT.W(1)-R(1).AND.GU(2).LT.X(1)+S(1).AND.GU(2).GT.X(1)-
0136       1S(1).AND.GU(3).LT.Y(1)+T(1).AND.GU(3).GT.Y(1)-T(1))
0137       1         WRITE(6,600) A,(IFIRO(A,I),I=1,6),B,(IFIRO(B,I),I=1,6)
0138       1,C,(IFIRO(C,I),I=1,6),D,(IFIRO(D,I),I=1,6),(NO(I,A,B),NO(I,A,C),
0139       1NO(I,A,D),NO(I,B,C),NO(I,B,D),NO(I,C,D),GO(I),
0140       1NI(I,A,B),NI(I,A,C),NI(I,A,D),NI(I,B,C),NI(I,B,D),NI(I,C,D),GI(I),
0141       1NS(I,A,B),NS(I,A,C),NS(I,A,D),NS(I,B,C),NS(I,B,D),NS(I,C,D),GS(I),
0142       1NT(I,A,B),NT(I,A,C),NT(I,A,D),NT(I,B,C),NT(I,B,D),NT(I,C,D),GT(I),
0143       1NR(I,A,B),NR(I,A,C),NR(I,A,D),NR(I,B,C),NR(I,B,D),NR(I,C,D),GR(I),
0144       1GRSD(I),NU(I,A,B),NU(I,A,C),NU(I,A,D),NU(I,B,C),NU(I,B,D),NU(I,C,D
0145       11),GU(I),GUSD(I),I=2,3)
0146        IF(GR(2).LT.V(2)+Q(2).AND.GR(2).GT.V(2)-Q(2).AND.GR(3).LT.W(2)+R(2
0147       11).AND.GR(3).GT.W(2)-R(2).AND.GU(2).LT.X(2)+S(2).AND.GU(2).GT.X(2)-
0148       1S(2).AND.GU(3).LT.Y(2)+T(2).AND.GU(3).GT.Y(2)-T(2))
0149       1         WRITE(6,650) A,(IFIRO(A,I),I=1,6),B,(IFIRO(B,I),I=1,6)
0150       1,C,(IFIRO(C,I),I=1,6),D,(IFIRO(D,I),I=1,6),(NO(I,A,B),NO(I,A,C),
0151       1NO(I,A,D),NO(I,B,C),NO(I,B,D),NO(I,C,D),GO(I),
0152       1NI(I,A,B),NI(I,A,C),NI(I,A,D),NI(I,B,C),NI(I,B,D),NI(I,C,D),GI(I),
0153       1NS(I,A,B),NS(I,A,C),NS(I,A,D),NS(I,B,C),NS(I,B,D),NS(I,C,D),GS(I),
0154       1NT(I,A,B),NT(I,A,C),NT(I,A,D),NT(I,B,C),NT(I,B,D),NT(I,C,D),GT(I),
0155       1NR(I,A,B),NR(I,A,C),NR(I,A,D),NR(I,B,C),NR(I,B,D),NR(I,C,D),GR(I),
0156       1GRSD(I),NU(I,A,B),NU(I,A,C),NU(I,A,D),NU(I,B,C),NU(I,B,D),NU(I,C,D
0157       11),GU(I),GUSD(I),I=2,3)
0158        IF(GR(2).LT.V(3)+Q(3).AND.GR(2).GT.V(3)-Q(3).AND.GR(3).LT.W(3)+R(3
0159       11).AND.GR(3).GT.W(3)-R(3).AND.GU(2).LT.X(3)+S(3).AND.GU(2).GT.X(3)-
0160       1S(3).AND.GU(3).LT.Y(3)+T(3).AND.GU(3).GT.Y(3)-T(3))
0161       1         WRITE(6,700) A,(IFIRO(A,I),I=1,6),B,(IFIRO(B,I),I=1,6)
0162       1,C,(IFIRO(C,I),I=1,6),D,(IFIRO(D,I),I=1,6),(NO(I,A,B),NO(I,A,C),
0163       1NO(I,A,D),NO(I,B,C),NO(I,B,D),NO(I,C,D),GO(I),
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      1NI(I,A,B),NI(I,A,C),NI(I,A,D),NI(I,B,C),NI(I,B,D),NI(I,C,D),GI(I),
      1NS(I,A,B),NS(I,A,C),NS(I,A,D),NS(I,B,C),NS(I,B,D),NS(I,C,D),GS(I),
      1NT(I,A,B),NT(I,A,C),NT(I,A,D),NT(I,B,C),NT(I,B,D),NT(I,C,D),GT(I),
      1NR(I,A,B),NR(I,A,C),NR(I,A,D),NR(I,B,C),NR(I,B,D),NR(I,C,D),GR(I),
      1GRSD(I),NU(I,A,B),NU(I,A,C),NU(I,A,D),NU(I,B,C),NU(I,B,D),NU(I,C,D
      1),GU(I),GUSD(I),I=2,3)
       IF(GR(2).LT.V(4)+Q(4).AND.GR(2).GT.V(4)-Q(4).AND.GR(3).LT.W(4)+R(4
      1).AND.GR(3).GT.W(4)-R(4).AND.GU(2).LT.X(4)+S(4).AND.GU(2).GT.X(4)-
      1S(4).AND.GU(3).LT.Y(4)+T(4).AND.GU(3).GT.Y(4)-T(4))
      1        WRITE(6,750) A,(IFIRO(A,I),I=1,6),B,(IFIRO(B,I),I=1,6)
      1,C,(IFIRO(C,I),I=1,6),D,(IFIRO(D,I),I=1,6),(NO(I,A,B),NO(I,A,C),
      1NO(I,A,D),NO(I,B,C),NO(I,B,D),NO(I,C,D),GO(I),
      1NI(I,A,B),NI(I,A,C),NI(I,A,D),NI(I,B,C),NI(I,B,D),NI(I,C,D),GI(I),
      1NS(I,A,B),NS(I,A,C),NS(I,A,D),NS(I,B,C),NS(I,B,D),NS(I,C,D),GS(I),
      1NT(I,A,B),NT(I,A,C),NT(I,A,D),NT(I,B,C),NT(I,B,D),NT(I,C,D),GT(I),
      1NR(I,A,B),NR(I,A,C),NR(I,A,D),NR(I,B,C),NR(I,B,D),NR(I,C,D),GR(I),
      1GRSD(I),NU(I,A,B),NU(I,A,C),NU(I,A,D),NU(I,B,C),NU(I,B,D),NU(I,C,D
      1),GU(I),GUSD(I),I=2,3)
       IF(GR(2).LT.V(5)+Q(5).AND.GR(2).GT.V(5)-Q(5).AND.GR(3).LT.W(5)+R(5
      1).AND.GR(3).GT.W(5)-R(5).AND.GU(2).LT.X(5)+S(5).AND.GU(2).GT.X(5)-
      1S(5).AND.GU(3).LT.Y(5)+T(5).AND.GU(3).GT.Y(5)-T(5))
      1        WRITE(6,800) A,(IFIRO(A,I),I=1,6),B,(IFIRO(B,I),I=1,6)
      1,C,(IFIRO(C,I),I=1,6),D,(IFIRO(D,I),I=1,6),(NO(I,A,B),NO(I,A,C),
      1NO(I,A,D),NO(I,B,C),NO(I,B,D),NO(I,C,D),GO(I),
      1NI(I,A,B),NI(I,A,C),NI(I,A,D),NI(I,B,C),NI(I,B,D),NI(I,C,D),GI(I),
      1NS(I,A,B),NS(I,A,C),NS(I,A,D),NS(I,B,C),NS(I,B,D),NS(I,C,D),GS(I),
      1NT(I,A,B),NT(I,A,C),NT(I,A,D),NT(I,B,C),NT(I,B,D),NT(I,C,D),GT(I),
      1NR(I,A,B),NR(I,A,C),NR(I,A,D),NR(I,B,C),NR(I,B,D),NR(I,C,D),GR(I),
      1GRSD(I),NU(I,A,B),NU(I,A,C),NU(I,A,D),NU(I,B,C),NU(I,B,D),NU(I,C,D
      1),GU(I),GUSD(I),I=2,3)
       IF(GR(2).LT.V(6)+Q(6).AND.GR(2).GT.V(6)-Q(6).AND.GR(3).LT.W(6)+R(6
      1).AND.GR(3).GT.W(6)-R(6).AND.GU(2).LT.X(6)+S(6).AND.GU(2).GT.X(6)-
      1S(6).AND.GU(3).LT.Y(6)+T(6).AND.GU(3).GT.Y(6)-T(6))
      1        WRITE(6,850) A,(IFIRO(A,I),I=1,6),B,(IFIRO(B,I),I=1,6)
      1,C,(IFIRO(C,I),I=1,6),D,(IFIRO(D,I),I=1,6),(NO(I,A,B),NO(I,A,C),
      1NO(I,A,D),NO(I,B,C),NO(I,B,D),NO(I,C,D),GO(I),
      1NI(I,A,B),NI(I,A,C),NI(I,A,D),NI(I,B,C),NI(I,B,D),NI(I,C,D),GI(I),
      1NS(I,A,B),NS(I,A,C),NS(I,A,D),NS(I,B,C),NS(I,B,D),NS(I,C,D),GS(I),
      1NT(I,A,B),NT(I,A,C),NT(I,A,D),NT(I,B,C),NT(I,B,D),NT(I,C,D),GT(I),
      1NR(I,A,B),NR(I,A,C),NR(I,A,D),NR(I,B,C),NR(I,B,D),NR(I,C,D),GR(I),
      1GRSD(I),NU(I,A,B),NU(I,A,C),NU(I,A,D),NU(I,B,C),NU(I,B,D),NU(I,C,D
      1),GU(I),GUSD(I),I=2,3)
       IF(GR(2).LT.V(1)+Q(1).AND.GR(2).GT.V(1)-Q(1).AND.GR(3).LT.W(1)+R(1
      1).AND.GR(3).GT.W(1)-R(1).AND.GU(2).LT.X(1)+S(1).AND.GU(2).GT.X(1)-
      1S(1).AND.GU(3).LT.Y(1)+T(1).AND.GU(3).GT.Y(1)-T(1))
      1XK(1)=XK(1)+1
       IF(GR(2).LT.V(2)+Q(2).AND.GR(2).GT.V(2)-Q(2).AND.GR(3).LT.W(2)+R(2
      1).AND.GR(3).GT.W(2)-R(2).AND.GU(2).LT.X(2)+S(2).AND.GU(2).GT.X(2)-
      1S(2).AND.GU(3).LT.Y(2)+T(2).AND.GU(3).GT.Y(2)-T(2))
      1XK(2)=XK(2)+1
       IF(GR(2).LT.V(3)+Q(3).AND.GR(2).GT.V(3)-Q(3).AND.GR(3).LT.W(3)+R(3
      1).AND.GR(3).GT.W(3)-R(3).AND.GU(2).LT.X(3)+S(3).AND.GU(2).GT.X(3)-
      1S(3).AND.GU(3).LT.Y(3)+T(3).AND.GU(3).GT.Y(3)-T(3))
      1XK(3)=XK(3)+1
       IF(GR(2).LT.V(4)+Q(4).AND.GR(2).GT.V(4)-Q(4).AND.GR(3).LT.W(4)+R(4
```

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      0000000001111111111222222222233333333334444444444555555555566666666667777777778
      1234567890123456789012345678901234567890123456789012345678901234567890123456789
CARD
0219       1).AND.GR(3).GT.W(4)-R(4).AND.GU(2).LT.X(4)+S(4).AND.GU(2).GT.X(4)-
0220       1S(4).AND.GU(3).LT.Y(4)+T(4).AND.GU(3).GT.Y(4)-T(4))
0221       1XK(4)=XK(4)+1
0222        IF(GR(2).LT.V(5)+Q(5).AND.GR(2).GT.V(5)-Q(5).AND.GR(3).LT.W(5)+R(5
0223       1).AND.GR(3).GT.W(5)-R(5).AND.GU(2).LT.X(5)+S(5).AND.GU(2).GT.X(5)-
0224       1S(5).AND.GU(3).LT.Y(5)+T(5).AND.GU(3).GT.Y(5)-T(5))
0225       1XK(5)=XK(5)+1
0226        IF(GR(2).LT.V(6)+Q(6).AND.GR(2).GT.V(6)-Q(6).AND.GR(3).LT.W(6)+R(6
0227       1).AND.GR(3).GT.W(6)-R(6).AND.GU(2).LT.X(6)+S(6).AND.GU(2).GT.X(6)-
0228       1S(6).AND.GU(3).LT.Y(6)+T(6).AND.GU(3).GT.Y(6)-T(6))
0229       1XK(6)=XK(6)+1
0230      8 CONTINUE
0231        DO 30 I=1,8
0232     30 XK(I)=XK(I)/TOTAL
0233        WRITE(6,1000)
0234   1000 FORMAT('1')
0235        WRITE(6,1050) TOTAL,(XK(I),I=1,8)
0236   1050 FORMAT(1X,'OUT OF THE  ',F10.0,2X,'POSSIBLE GROUPS OF FOUR PERSONS
0237       1',/,1X,'EACH TYPE OF GROUP HAS THE FOLLOWING PROBABILITY:',//,
0238       1' CONTROL COMPLEMENTARITY COMPATIBILITY',2X,E11.4,/,
0239       1' CONTROL COMPLEMENTARITY NCOMPATIBILTY',2X,E11.4,/,
0240       1' AFFECN COMPLEMENTARITY COMPATIBILITY',2X,E11.4,/,
0241       1' AFFECN COMPLEMENTARITY NCOMPATIBILTY',2X,E11.4,/,
0242       1' CONTROL SIMILARITY NCOMPATIBILTY',2X,E11.4,/,
0243       1' CONTROL SIMILARITY COMPATIBILITY',2X,E11.4,/,
0244       1' AFFECN SIMILARITY COMPATIBILITY',2X,E11.4,/,
0245       1' AFFECN SIMILARITY NCOMPATIBILTY',2X,E11.4)
0246    500 FORMAT(1X,'PERSON NO. AND ASSOCIATED FIRO SCORES FOR A CONTROL COM
0247       1PLEMENTARITY-COMPATIBILITY GROUP',/,22X,I2,1X,6I1,3X,I2,1X,6I1,3X,
0248       1I2,1X,6I1,3X,I2,1X,6I1,//,8X,'CONTROL COMPATIBILITIES',/,13X,'DYAD
0249       1S',9X,'GROUP SCORE',/,5X,'1',3X,'2',3X,'3',3X,'4',3X,'5',3X,'6',3X
0250       1,'MEAN  SD',//,1X,'O',1X,6I4,2X,F4.1,/,1X,'I',1X,6I4,2X,F4.1,/,1X,
0251       1'S',1X,6I4,2X,F4.1,/,1X,
0252       1'T',1X,6I4,2X,F4.1,/,1X,'R',1X,6I4,2X,F4.1,1X,F4.1,/,1X,'U',1X,6I4
0253       1,2X,F4.1,1X,F4.1,////,7X,'AFFECTION COMPATIBILITIES',/,13X,'DYAD',
0254       19X,'GROUP SCORE',/,5X,'1',3X,'2',3X,'3',3X,'4',3X,'5',3X,'6',3X,'M
0255       1EAN  SD',//,1X,'O',1X,6I4,2X,F4.1,/,1X,'I',1X,6I4,2X,F4.1,/,1X,'S'
0256       1,1X,6I4,2X,F4.1,/,1X,'T',1X,6I4,2X,F4.1,/,1X,'R',1X,6I4,2X,F4.1,1X
0257       1,F4.1,/,1X,'U',1X,6I4,2X,F4.1,1X,F4.1,////////)
0258    650 FORMAT(1X,'PERSON NO. AND ASSOCIATED FIRO SCORES FOR A CONTROL COM
0259       1PLEMENTARITY-NCOMPATIBILTY GROUP',/,22X,I2,1X,6I1,3X,I2,1X,6I1,3X,
0260       1I2,1X,6I1,3X,I2,1X,6I1,//,8X,'CONTROL COMPATIBILITIES',/,13X,'DYAD
0261       1S',9X,'GROUP SCORE',/,5X,'1',3X,'2',3X,'3',3X,'4',3X,'5',3X,'6',3X
0262       1,'MEAN  SD',//,1X,'O',1X,6I4,2X,F4.1,/,1X,'I',1X,6I4,2X,F4.1,/,1X,
0263       1'S',1X,6I4,2X,F4.1,/,1X,
0264       1'T',1X,6I4,2X,F4.1,/,1X,'R',1X,6I4,2X,F4.1,1X,F4.1,/,1X,'U',1X,6I4
0265       1,2X,F4.1,1X,F4.1,////,7X,'AFFECTION COMPATIBILITIES',/,13X,'DYAD',
0266       19X,'GROUP SCORE',/,5X,'1',3X,'2',3X,'3',3X,'4',3X,'5',3X,'6',3X,'M
0267       1EAN  SD',//,1X,'O',1X,6I4,2X,F4.1,/,1X,'I',1X,6I4,2X,F4.1,/,1X,'S'
0268       1,1X,6I4,2X,F4.1,/,1X,'T',1X,6I4,2X,F4.1,/,1X,'R',1X,6I4,2X,F4.1,1X
0269       1,F4.1,/,1X,'U',1X,6I4,2X,F4.1,1X,F4.1,////////)
0270    700 FORMAT(1X,'PERSON NO. AND ASSOCIATED FIRO SCORES FOR AN AFFECN COM
0271       1PLEMENTARITY-COMPATIBILITY GROUP',/,23X,I2,1X,6I1,3X,I2,1X,6I1,3X,
0272       1I2,1X,6I1,3X,I2,1X,6I1,//,8X,'CONTROL COMPATIBILITIES',/,13X,'DYAD
0273       1S',9X,'GROUP SCORE',/,5X,'1',3X,'2',3X,'3',3X,'4',3X,'5',3X,'6',3X
```

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      0000000001111111111122222222223333333333444444444455555555556666666666777777777 8
      1234567890123456789012345678901234567890123456789012345678901234567890123456789 0
CARD
0274       1,'MEAN  SD',//,1X,'O',1X,6I4,2X,F4.1,/,1X,'I',1X,6I4,2X,F4.1,/,1X,
0275       1'S',1X,6I4,2X,F4.1,/,1X,
0276       1'T',1X,6I4,2X,F4.1,/,1X,'R',1X,6I4,2X,F4.1,1X,F4.1,/,1X,'U',1X,6I4
0277       1,2X,F4.1,1X,F4.1,////,7X,'AFFECTION COMPATIBILITIES',/,13X,'DYAD',
0278       19X,'GROUP SCORE',/,5X,'1',3X,'2',3X,'3',3X,'4',3X,'5',3X,'6',3X,'M
0279       1EAN  SD',//,1X,'O',1X,6I4,2X,F4.1,/,1X,'I',1X,6I4,2X,F4.1,/,1X,'S'
0280       1,1X,6I4,2X,F4.1,/,1X,'T',1X,6I4,2X,F4.1,/,1X,'R',1X,6I4,2X,F4.1,1X
0281       1,F4.1,/,1X,'U',1X,6I4,2X,F4.1,1X,F4.1,////////)
0282     750 FORMAT(1X,'PERSON NO. AND ASSOCIATED FIRO SCORES FOR AN AFFECN COM
0283       1PLEMENTARITY-NCOMPATIBILTY GROUP',/,23X,I2,1X,6I1,3X,I2,1X,6I1,3X,
0284       1I2,1X,6I1,3X,I2,1X,6I1,//,8X,'CONTROL COMPATIBILITIES',/,13X,'DYAD
0285       1S',9X,'GROUP SCORE',/,5X,'1',3X,'2',3X,'3',3X,'4',3X,'5',3X,'6',3X
0286       1,'MEAN  SD',//,1X,'O',1X,6I4,2X,F4.1,/,1X,'I',1X,6I4,2X,F4.1,/,1X,
0287       1'S',1X,6I4,2X,F4.1,/,1X,
0288       1'T',1X,6I4,2X,F4.1,/,1X,'R',1X,6I4,2X,F4.1,1X,F4.1,/,1X,'U',1X,6I4
0289       1,2X,F4.1,1X,F4.1,////,7X,'AFFECTION COMPATIBILITIES',/,13X,'DYAD',
0290       19X,'GROUP SCORE',/,5X,'1',3X,'2',3X,'3',3X,'4',3X,'5',3X,'6',3X,'M
0291       1EAN  SD',//,1X,'O',1X,6I4,2X,F4.1,/,1X,'I',1X,6I4,2X,F4.1,/,1X,'S'
0292       1,1X,6I4,2X,F4.1,/,1X,'T',1X,6I4,2X,F4.1,/,1X,'R',1X,6I4,2X,F4.1,1X
0293       1,F4.1,/,1X,'U',1X,6I4,2X,F4.1,1X,F4.1,////////)
0294     800 FORMAT(1X,'PERSON NO. AND ASSOCIATED FIRO SCORES FOR A CONTROL SIM
0295       1ILARITY-COMPATIBILITY GROUP',/,20X,I2,1X,6I1,3X,I2,1X,6I1,3X,
0296       1I2,1X,6I1,3X,I2,1X,6I1,//,8X,'CONTROL COMPATIBILITIES',/,13X,'DYAD
0297       1S',9X,'GROUP SCORE',/,5X,'1',3X,'2',3X,'3',3X,'4',3X,'5',3X,'6',3X
0298       1,'MEAN  SD',//,1X,'O',1X,6I4,2X,F4.1,/,1X,'I',1X,6I4,2X,F4.1,/,1X,
0299       1'S',1X,6I4,2X,F4.1,/,1X,
0300       1'T',1X,6I4,2X,F4.1,/,1X,'R',1X,6I4,2X,F4.1,1X,F4.1,/,1X,'U',1X,6I4
0301       1,2X,F4.1,1X,F4.1,////,7X,'AFFECTION COMPATIBILITIES',/,13X,'DYAD',
0302       19X,'GROUP SCORE',/,5X,'1',3X,'2',3X,'3',3X,'4',3X,'5',3X,'6',3X,'M
0303       1EAN  SD',//,1X,'O',1X,6I4,2X,F4.1,/,1X,'I',1X,6I4,2X,F4.1,/,1X,'S'
0304       1,1X,6I4,2X,F4.1,/,1X,'T',1X,6I4,2X,F4.1,/,1X,'R',1X,6I4,2X,F4.1,1X
0305       1,F4.1,/,1X,'U',1X,6I4,2X,F4.1,1X,F4.1,////////)
0306     850 FORMAT(1X,'PERSON NO. AND ASSOCIATED FIRO SCORES FOR A CONTROL SIM
0307       1ILARITY-NCOMPATIBILTY GROUP',/,20X,I2,1X,6I1,3X,I2,1X,6I1,3X,
0308       1I2,1X,6I1,3X,I2,1X,6I1,//,3X,'CONTROL COMPATIBILITIES',/,13X,'DYAD
0309       1S',9X,'GROUP SCORE',/,5X,'1',3X,'2',3X,'3',3X,'4',3X,'5',3X,'6',3X
0310       1,'MEAN  SD',//,1X,'O',1X,6I4,2X,F4.1,/,1X,'I',1X,6I4,2X,F4.1,/,1X,
0311       1'S',1X,6I4,2X,F4.1,/,1X,
0312       1'T',1X,6I4,2X,F4.1,/,1X,'R',1X,6I4,2X,F4.1,1X,F4.1,/,1X,'U',1X,6I4
0313       1,2X,F4.1,1X,F4.1,////,7X,'AFFECTION COMPATIBILITIES',/,13X,'DYAD',
0314       19X,'GROUP SCORE',/,5X,'1',3X,'2',3X,'3',3X,'4',3X,'5',3X,'6',3X,'M
0315       1EAN  SD',//,1X,'O',1X,6I4,2X,F4.1,/,1X,'I',1X,6I4,2X,F4.1,/,1X,'S'
0316       1,1X,6I4,2X,F4.1,/,1X,'T',1X,6I4,2X,F4.1,/,1X,'R',1X,6I4,2X,F4.1,1X
0317       1,F4.1,/,1X,'U',1X,6I4,2X,F4.1,1X,F4.1,////////)
0318        STOP
0319        END
0320  //GO.SYSIN DD *
0321    5.5  6.0  5.2  5.5
0322  //
0323  $ENDLIST
```

APPENDIX B

GROUP COMPATIBILITY PROFILES EXISTENT FOR VARIOUS COMPATIBILITY DEFINITIONS WITH PERSONALITY DESCRIPTIONS BASED ON MORE THAN TWO TRAITS

The steps necessary to obtain uniform similarity/complementarity compatibility profiles for groups have been demonstrated for FIRO-B determined compatibility, which is based on comparisons among two traits (i.e., e and w scores). But it is conceivable that in other circumstances, compatibility might be defined in terms of three or more traits. The question then arises as to whether the difficulties incurred in attaining uniform compatibilities for two traits would be the same for three traits. Specifically, if LL and LH conditions are obtainable but the HL and HH conditions are not, duplicating the pattern for two traits, then it appears justified to expect that this same result would be found for compatibility based on any number of traits. The inability to have HL and HH group compatibility patterns may be a universal phenomenon operating in all groups, and have relevance in all group processes. The first step toward answering this question is to determine the possible combinations of traits that might be existent in dyads. In terms of similarity, the definition would be basically unaltered for three traits, and could be expressed:

$$\text{trait } 1_i = \text{trait } 1_j$$
$$\text{trait } 2_i = \text{trait } 2_j$$
$$\text{trait } 3_i = \text{trait } 3_j$$

From a number of logically possible definitions for complementarity listed in Table XXVI, one may be chosen for means of a demonstration of similarity/complementarity combinations. Using the first of the definitions (i.e., trait 1_i = trait 2_i = trait 3_j), it is possible to assess the trait profiles existing for similarity/complementarity of three

TABLE XXVI

LOGICALLY POSSIBLE COMBINATIONS OF THREE TRAIT COMPLEMENTARITY COMPATIBILITY EXCLUDING DEFINITIONS WITH MIXED TRAIT PRESENCE AND ABSENCE

	i	j	i	j	i	j	i	j
Trait 1	+		+			+		+
Trait 2	+			+	+		+	
Trait 3		+	+		+			+

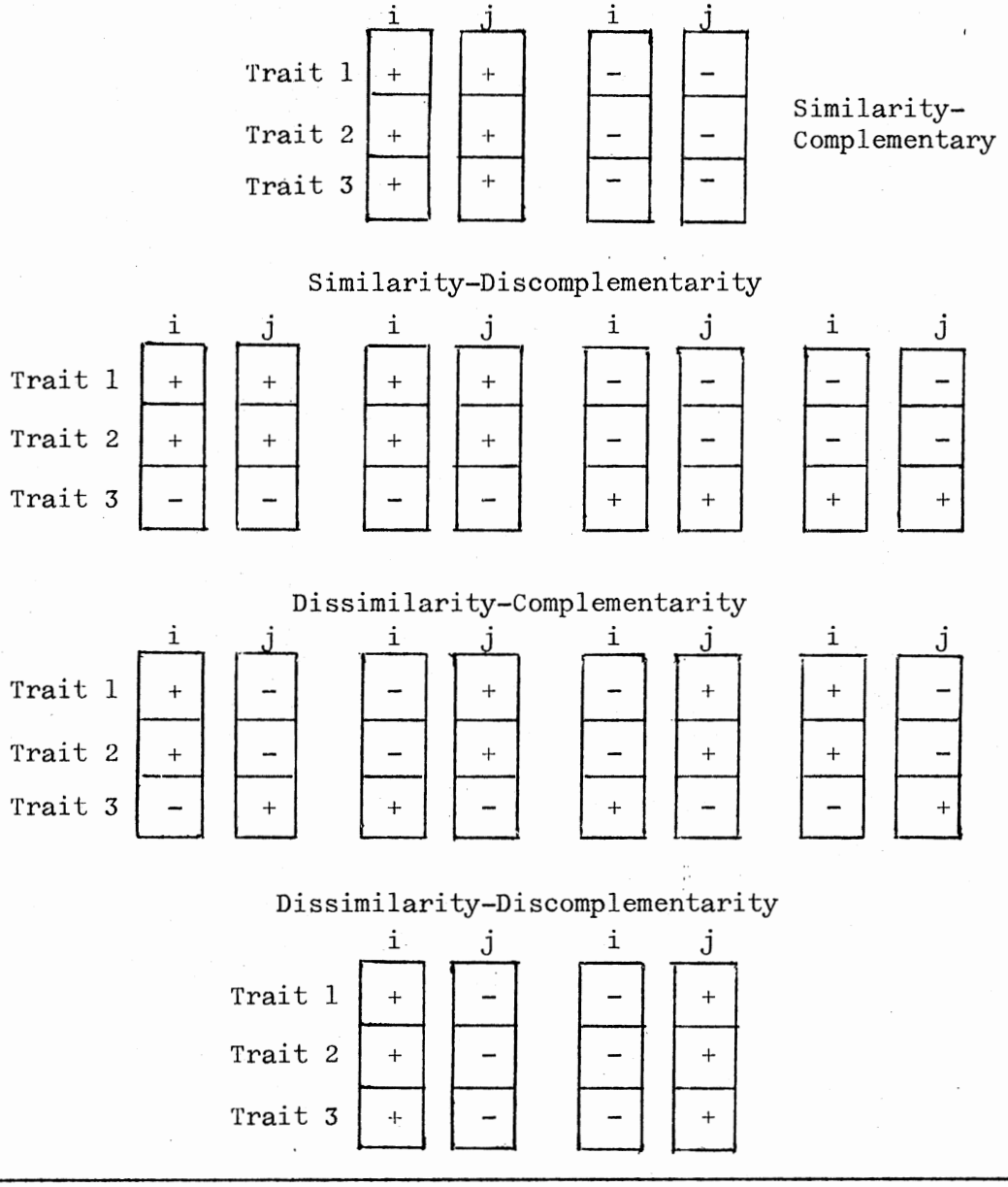
	i	j	i	j	i	j	i	j
Trait A	−		−			−		−
Trait B	−			−	−		−	
Trait C		−	−		−			−

i individual i
j individual j
\+ relative presence
− relative absence

traits. Table XXVII lists these compatibility patterns. It can be seen that the similarity/complementarity (Low-Low), similarity/discomplementarity (Low-High), dissimilarity/complementarity (High-Low), and dissimilarity/discomplementarity (High-High) conditions can all be obtained in three trait dyads. This same demonstration is possible for any of the four complementary compatibility types listed in Table XXVI. Therefore, for any type of complementarity the Low-Low, Low-High, High-Low, and High-High conditions exist in dyads. It remains to be determined then whether they also exist for groups. As previously discussed, in the present study a group compatibility classification reflects perfect uniformity of the dyadic compatibility relationships. That is, in three member groups, each dyad (i.e., i-j, i-k, j-k) must possess the same compatibility profile. Table XXVIII illustrates the effect of adding individual k who is identical to individual i, to an existing dyad i-j for each dyadic compatibility profile: Low-Low, Low-High, High-Low, and High-High. It is apparent that it is possible to preserve the compatibility profile for every dyad in a three member group (i.e., i-j, i-k, k-l) in the Low-Low and Low-High conditions, but that the High-Low and High-High conditions cannot be maintained for groups. Since this is exactly the same result obtained for two trait compatibility, it follows logically that dissimilarity/complementarity and dissimilarity/discomplementarity compatibility profiles do not exist for groups regardless of the number of traits used to define compatibility. It appears a universal characteristic that only Low-Low and Low-High compatibility occurs in groups. A question arises, however, that there may be a possible limitation to this conclusion, in that complementarity compatibility is herein

TABLE XXVII

TRAIT PATTERNS FOR DYADIC SIMILARITY-COMPLEMENTARITY PROFILES



i individual i
j individual j
\+ relative presence
− relative absence

TABLE XXVIII

THIRD MEMBER EFFECTS ON DYADIC COMPATIBILITY

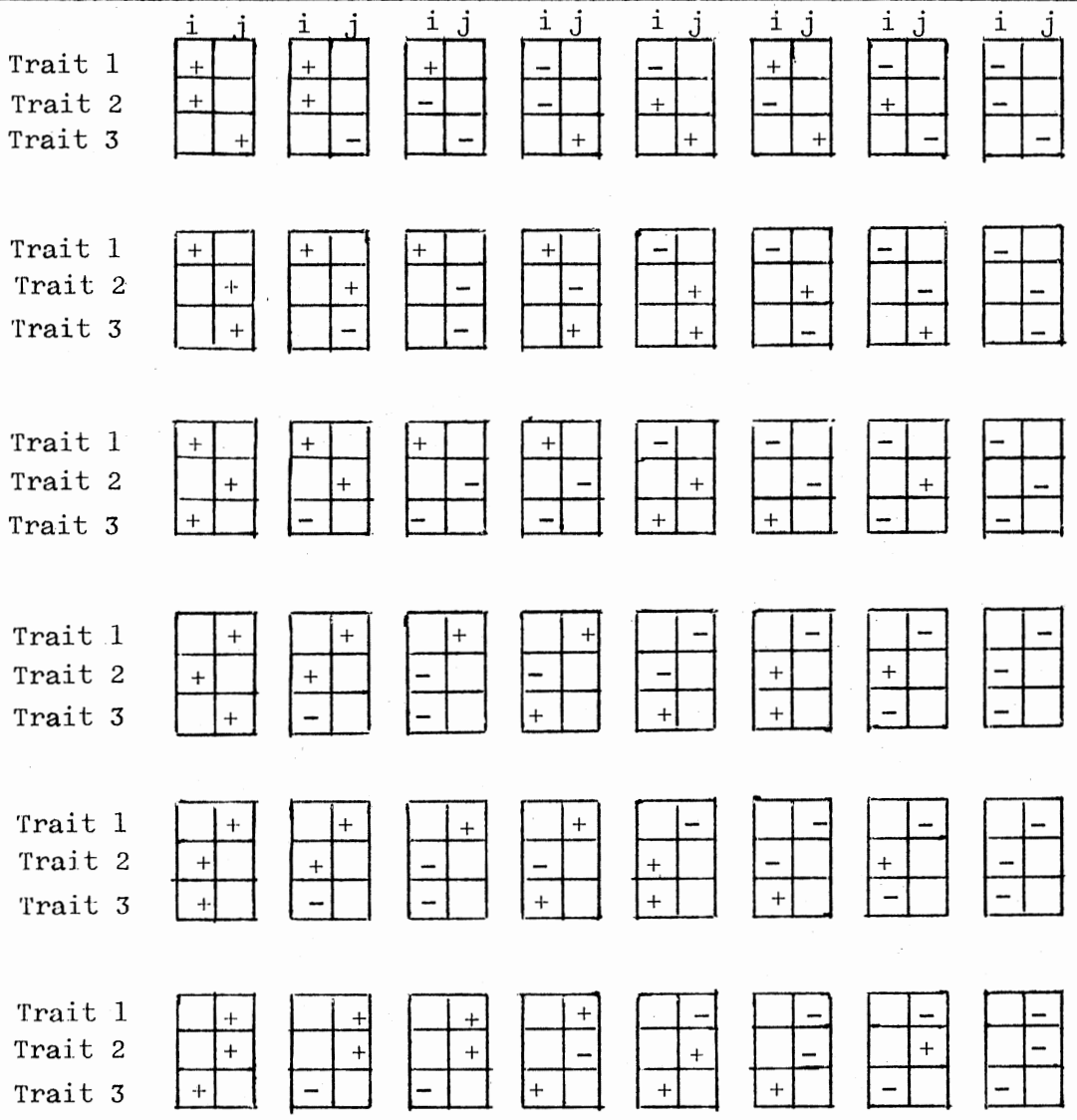
		i	j	k=i
Similarity-Complementarity	Trait 1	+	+	+
	Trait 2	+	+	+
	Trait 3	+	+	+
Similarity-Discomplementarity	Trait 1	+	+	+
	Trait 2	+	+	+
	Trait 3	-	-	-
Dissimilarity-Complementarity	Trait 1	+	-	+
	Trait 2	+	-	+
	Trait 3	-	+	-
Dissimilarity-Discomplementarity	Trait 1	+	-	+
	Trait 2	+	-	+
	Trait 3	+	-	+

i individual i
j individual j
k individual k
\+ relative presence
\- relative absence

defined as the simultaneous presence or the simultaneous absence of traits across individuals. It is conceivable that in some context compatibility would be defined as the presence of some traits in conjunction with the absence of other traits. This new latitude in definition results in additional combinations of traits which might be used to define complementarity. Table XXIX lists 36 possible definitions of complementarity which simultaneously include both the presence of traits and the absence of traits, in contradistinction to the previously discussed definitions. Although a formal proof will not be presented, it can be shown that for any of the 36 types of complementarity, only similarity/complementarity and similarity/discomplementarity compatibility profiles exist in groups. The only stipulation for the above conclusions is that complementarity in all cases refers to comparisons of exclusive traits across individuals. That is, complementarity could not be defined as trait 1_i = trait 1_j = trait 2_j, because this comparison across individuals i and j is not based on mutually exclusive traits (i.e., trait 1_i = trait 1_j). It appears that the demonstrated restrictions on compatibility profiles in groups (i.e., HL and HH) are an inherent characteristic within the confines of the current definitions of similarity and complementarity.

TABLE XXIX

THIRTY-SIX LOGICALLY POSSIBLE COMBINATIONS OF THREE TRAIT COMPLEMENTARITY COMPATIBILITY FOR DEFINITIONS WITH MIXED TRAIT PRESENCE AND ABSENCE



i individual i
j individual j
\+ relative presence
– relative absence

APPENDIX C

COMPUTER PROGRAM FOR THE GENERATION AND SCREENING OF EXPERIMENTAL GROUPS BY COMPATIBILITY PROFILE

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      00000000011111111112222222222333333333344444444445555555556666666666777777777 8
      12345678901234567890123456789012345678901234567890123456789012345678901234567890
CARD
0001  // EXEC FORTHCLG,REGION.GO=150K
0002  //FORT.SYSIN DD *
0003        INTEGER G,H,Q
0004        REAL MR(6,19),MO(6,19),MI(6,19),MS(6,19),MT(6,19),MU(6,19),MI2(6,
0005       119),MR2(6,19),MO2(6,19),MS2(6,19),MT2(6,19),MU2(6,19)
0006        DIMENSION NN(6,19),TNN(6,19),TI(6,19),TK(6,19),TJ(6,19),TL(6,19),
0007       1TL2(6,19),XMS(6,19),
0008       1XMT(6,19),XMU(6,19),SMS(6,19),SMT(6,19),SMU(6,19),TNNS(6,19,19),
0009       1TJ2(6,19),TK2(6,19),TL2(6,19),XMR(6,19),XMO(6,19),XMI(6,19),SMR(6,
0010       119),SMO(6,19),SMI(6,19),XI(6,19),XJ(6,19),XK(6,19),XL(6,19),SXI(6,
0011       119),SXJ(6,19),SXK(6,19),SXL(6,19),TNNW(6,19,19),TNNY(6,19,19),TNNZ
0012       1(6,19,19),SCORE(6,110),IF(1000,6),XXN(6,110),
0013       1TNNT(6,19,19),TNNU(6,19,19),TSI(6,19),TSJ(6,19),TSK(6,19),TSL(6,19
0014       1) ,SCOR2(6,10),XXL(6,10)
0015        READ(5,10) N,Q
0016     10 FORMAT(I3,I4)
0017        READ(5,20) (((IF(M,MM),MM=1,6),M=1,N)
0018     20 FORMAT(3X,6I1)
0019        DO 101 MM=1,6
0020        DO 101 M=1,110
0021    101 XXN(MM,M)=0.0
0022        DO 202 MM=1,6,2
0023        DO 202 M=1,N
0024        MMM=MM+1
0025        INDEX=10*(IF(M,MM)+1)+IF(M,MMM)+1
0026    202 XXN(MM,INDEX)=XXN(MM,INDEX)+1
0027        DO 303 MM=1,6,2
0028        DO 303 L=1,110
0029    303 SCORE(MM,L)=XXN(MM,L)/100.0
0030        DO 105 MM=1,6
0031        DO 105 M=1,10
0032    105 XXL(MM,M)=0.0
0033        DO 205 MM=1,6
0034        DO 205 M=1,N
0035        K=IF(M,MM)+1
0036    205 XXL(MM,K)=XXL(MM,K)+1
0037        DO 315 MM=1,6
0038        DO 315 L=1,10
0039    315 SCOR2(MM,L)=XXL(MM,L)/(N*1.0)
0040        WRITE(6,304)
0041    304 FORMAT('1',43X,'RAW SCORES IN SEQUENCE 1 THROUGH 6 WHERE:',//,57X,
0042       1'I   C   A',/,55X,'E 1   3   5',/,55X,'W 2   4   6',//,1X,'123456
0043       1123456 123456 123456 123456 123456 123456 123456 123456 123456 123
0044       1456 123456 123456 123456 123456 123456 123456 123456',/)
0045        WRITE(6,305) (((IF(M,MM),MM=1,6),M=1,N)
0046    305 FORMAT(1X,6I1,1X,6I1,1X,6I1,1X,6I1,1X,6I1,1X,5I1,1X,6I1,1X,6I1,1X,6I1,1X,
0047       16I1,1X,6I1,1X,6I1,1X,6I1,1X,6I1,1X,6I1,1X,6I1,1X,6I1,1X,6I1,1X,6I1,1X,
0048       16I1)
0049        DO 400 NCT=1,3
0050        IF(NCT.EQ.1) G=1
0051        IF(NCT.EQ.2) G=3
0052        IF(NCT.EQ.3) G=5
0053        H=G+1
```

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      0000000001111111111222222222233333333334444444444555555555566666666667777777778
      1234567890123456789012345678901234567890123456789012345678901234567890123456789
CARD
0054        WRITE(6,306)
0055    306 FORMAT('1',1X,'INTERPERSONAL AREA',17X,'PROBABILITY FOR EACH SCORE
0056       1',/,28X,'0',4X,'1',4X,'2',4X,'3',4X,'4',4X,'5',4X,'6',4X,'7',4X,
0057       1'8',4X,'9')
0058        DO 307 MM=G,H
0059    307 WRITE(6,308) MM,(SCOR2(MM,L),L=1,10)
0060    308 FORMAT(9X,I1,15X,10F5.2)
0061        WRITE(6,410)
0062    410 FORMAT('1')
0063        WRITE(6,420) G,H,(SCORE(G,_),L=11,110)
0064    420 FORMAT(///,35X,'PROBABILITY OF DYADS E-W FOR INTERPERSONAL AREAS',
0065       1I2,'-',I1,1X,'WHERE THEY',/,38X,'ARE PRINTED IN THE ORDER 0-0,'
0066       1' 0-1, 0-2 ... 9-9',/,(25F5.2,/))
0067        DO 2 M=1,6
0068        DO 2 N=1,19
0069        NN(M,N)=0
0070        TNN(M,N)=0.
0071        TSI(M,N)=0.
0072        TSJ(M,N)=0.
0073        TSK(M,N)=0.
0074        TSL(M,N)=0.
0075        MR(M,N)=0
0076        MJ(M,N)=0
0077        MI(M,N)=0
0078        MS(M,N)=0.
0079        MT(M,N)=0.
0080        MU(M,N)=0.
0081        MR2(M,N)=0.
0082        MJ2(M,N)=0.
0083        MI2(M,N)=0.
0084        MS2(M,N)=0.
0085        MT2(M,N)=0.
0086        MU2(M,N)=0.
0087        XMR(M,N)=0.
0088        XMJ(M,N)=0.
0089        XMI(M,N)=0.
0090        XMS(M,N)=0.
0091        XMT(M,N)=0.
0092        XMU(M,N)=0.
0093        SMR(M,N)=0.
0094        SMJ(M,N)=0.
0095        SMI(M,N)=0.
0096        SMS(M,N)=0.
0097        SMT(M,N)=0.
0098        SMU(M,N)=0.
0099        TI(M,N)=0.
0100        TJ(M,N)=0.
0101        TK(M,N)=0.
0102        TL(M,N)=0.
0103        TI2(M,N)=0.
0104        TJ2(M,N)=0.
0105        TK2(M,N)=0.
0106        TL2(M,N)=0.
0107        XI(M,N)=0.
0108        XJ(M,N)=0.
```

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      00000000011111111112222222222333333333344444444445555555555666666666677777777778
      12345673901234567890123456789012345678901234567890123456789012345678901234567890
CARD
0109          XK(M,N)=0.
0110          XL(M,N)=0.
0111          SXI(M,N)=0.
0112          SXJ(M,N)=0.
0113          SXK(M,N)=0.
0114          SXL(M,N)=0.
0115          DO 2 MN=1,19
0116          TNNW(M,N,MN)=0.
0117          TNNY(M,N,MN)=0.
0118          TNNS(M,N,MN)=0.
0119          TNNT(M,N,MN)=0.
0120          TNNU(M,N,MN)=0.
0121        2 TNNZ(M,N,MN)=0.
0122          DO 100 II=1,10
0123          DO 100 JJ=1,10
0124          DO 100 KK=1,10
0125          DO 100 LL=1,10
0126          I=II-1
0127          J=JJ-1
0128          K=KK-1
0129          L=LL-1
0130          A=I-L
0131          B=K-J
0132          C=I-J+K-L
0133          D=I+J-K-L
0134          E=I-J-K+L
0135          F=I-J
0136          P=K-L
0137          PP=I-K
0138          O=J-L
0139          NR=ABS(A)+ABS(B)
0140          NO=ABS(C)
0141          NI=ABS(D)
0142          NS=ABS(E)
0143          NT=ABS(F)+ABS(P)
0144          NU=ABS(PP)+ABS(O)
0145          DO 100 M=1,6
0146          IF(M.EQ.1) MM=NR+1
0147          IF(M.EQ.2) MM=NO+1
0148          IF(M.EQ.3) MM=NI+1
0149          IF(M.EQ.4) MM=NS+1
0150          IF(M.EQ.5) MM=NT+1
0151          IF(M.EQ.6) MM=NU+1
0152          MMW=NR+1
0153          MMY=NO+1
0154          MMZ=NI+1
0155          MMS=NS+1
0156          MMT=NT+1
0157          MMU=NU+1
0158          KU1=10*II+JJ
0159          KU2=10*KK+LL
0160          SUPER=SCORE(G,KU1)*SCORE(G,KU2)
0161          TNN(M,MM)=TNN(M,MM)+SUPER
0162          TSI(M,MM)=TSI(M,MM)+SCOR2(G,II)
0163          TSJ(M,MM)=TSJ(M,MM)+SCOR2(G,JJ)
```

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      0000000001111111111222222222233333333334444444444555555555566666666667777777778
      1234567890123456789012345678901234567890123456789012345678901234567890123456789
CARD
0164        TSK(M,MM)=TSK(M,MM)+SCOR2(G,KK)
0165        TSL(M,MM)=TSL(M,MM)+SCOR2(H,LL)
0166        TNNW(M,MM,MMW)=TNNW(M,MM,MMW)+SUPER*Q
0167        TNNY(M,MM,MMY)=TNNY(M,MM,MMY)+SUPER*Q
0168        TNNZ(M,MM,MMZ)=TNNZ(M,MM,MMZ)+SUPER*Q
0169        TNNS(M,MM,MMS)=TNNS(M,MM,MMS)+SUPER*Q
0170        TNNT(M,MM,MMT)=TNNT(M,MM,MMT)+SUPER*Q
0171        TNNU(M,MM,MMU)=TNNU(M,MM,MMU)+SUPER*Q
0172        MR(M,MM)=NR*SUPER+MR(M,MM)
0173        MO(M,MM)=NO*SUPER+MO(M,MM)
0174        MI(M,MM)=NI*SUPER+MI(M,MM)
0175        MS(M,MM)=NS*SUPER+MS(M,MM)
0176        MT(M,MM)=NT*SUPER+MT(M,MM)
0177        MU(M,MM)=NU*SUPER+MU(M,MM)
0178        MR2(M,MM)=(NR**2)*SUPER+MR2(M,MM)
0179        MO2(M,MM)=(NO**2)*SUPER+MO2(M,MM)
0180        MI2(M,MM)=(NI**2)*SUPER+MI2(M,MM)
0181        MS2(M,MM)=(NS**2)*SUPER+MS2(M,MM)
0182        MT2(M,MM)=(NT**2)*SUPER+MT2(M,MM)
0183        MU2(M,MM)=(NU**2)*SUPER+MU2(M,MM)
0184        TI(M,MM)=TI(M,MM)+SCOR2(G,II)*I
0185        TJ(M,MM)=TJ(M,MM)+SCOR2(H,JJ)*J
0186        TK(M,MM)=TK(M,MM)+SCOR2(G,KK)*K
0187        TL(M,MM)=TL(M,MM)+SCOR2(H,LL)*L
0188        TI2(M,MM)=TI2(M,MM)+(I**2)*SCOR2(G,II)
0189        TJ2(M,MM)=TJ2(M,MM)+(J**2)*SCOR2(H,JJ)
0190        TK2(M,MM)=TK2(M,MM)+(K**2)*SCOR2(G,KK)
0191    100 TL2(M,MM)=TL2(M,MM)+(L**2)*SCOR2(H,LL)
0192        DO 200 MX=1,6
0193        DO 200 MMX=1,19
0194        XN=TNN(MX,MMX)
0195        IF(XN.EQ.0.) XN=1.
0196        AAA=XN*MR2(MX,MMX)-MR(MX,MMX)**2
0197        BBB=XN*MO2(MX,MMX)-MO(MX,MMX)**2
0198        CCC=XN*MI2(MX,MMX)-MI(MX,MMX)**2
0199        DDD=XN*MS2(MX,MMX)-MS(MX,MMX)**2
0200        EEE=XN*MT2(MX,MMX)-MT(MX,MMX)**2
0201        FFF=XN*MU2(MX,MMX)-MU(MX,MMX)**2
0202        IF(AAA.LT.0.) AAA=0.0
0203        IF(BBB.LT.0.) BBB=0.0
0204        IF(CCC.LT.0.) CCC=0.0
0205        IF(DDD.LT.0.) DDD=0.0
0206        IF(EEE.LT.0.) EEE=0.0
0207        IF(FFF.LT.0.) FFF=0.0
0208        XMR(MX,MMX)=MR(MX,MMX)/XN
0209        XMO(MX,MMX)=MO(MX,MMX)/XN
0210        XMI(MX,MMX)=MI(MX,MMX)/XN
0211        XMS(MX,MMX)=MS(MX,MMX)/XN
0212        XMT(MX,MMX)=MT(MX,MMX)/XN
0213        XMU(MX,MMX)=MU(MX,MMX)/XN
0214        SMR(MX,MMX)=(1./XN)*SQRT(AAA)
0215        SMO(MX,MMX)=(1./XN)*SQRT(BBB)
0216        SMI(MX,MMX)=(1./XN)*SQRT(CCC)
0217        SMS(MX,MMX)=(1./XN)*SQRT(DDD)
0218        SMT(MX,MMX)=(1./XN)*SQRT(EEE)
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      12345673901234567890123456789012345678901234567890123456789012345678901234567890
CARD
0219        SMU(MX,MMX)=(1./XN)*SQRT(FFF)
0220        IF(TSI(MX,MMX).EQ.0.0) TSI(MX,MMX)=1.0
0221        IF(TSJ(MX,MMX).EQ.0.0) TSJ(MX,MMX)=1.0
0222        IF(TSK(MX,MMX).EQ.0.0) TSK(MX,MMX)=1.0
0223        IF(TSL(MX,MMX).EQ.0.0) TSL(MX,MMX)=1.0
0224        XI(MX,MMX)=TI(MX,MMX)/TSI(MX,MMX)
0225        XJ(MX,MMX)=TJ(MX,MMX)/TSJ(MX,MMX)
0226        XK(MX,MMX)=TK(MX,MMX)/TSK(MX,MMX)
0227        XL(MX,MMX)=TL(MX,MMX)/TSL(MX,MMX)
0228        AAAA=TSI(MX,MMX)*TI2(MX,MMX)-TI(MX,MMX)**2
0229        BBBB=TSJ(MX,MMX)*TJ2(MX,MMX)-TJ(MX,MMX)**2
0230        CCCC=TSK(MX,MMX)*TK2(MX,MMX)-TK(MX,MMX)**2
0231        DDDD=TSL(MX,MMX)*TL2(MX,MMX)-TL(MX,MMX)**2
0232        IF(AAAA.LT.0.) AAAA=0.0
0233        IF(BBBB.LT.0.) BBBB=0.0
0234        IF(CCCC.LT.0.) CCCC=0.0
0235        IF(DDDD.LT.0.) DDDD=0.0
0236        SXI(MX,MMX)=(1./TSI(MX,MMX))*SQRT(AAAA)
0237        SXJ(MX,MMX)=(1./TSJ(MX,MMX))*SQRT(BBBB)
0238        SXK(MX,MMX)=(1./TSK(MX,MMX))*SQRT(CCCC)
0239   200  SXL(MX,MMX)=(1./TSL(MX,MMX))*SQRT(DDDD)
0240        WRITE(6,2000)
0241   2000 FORMAT(1H1,1X,'FREQ',5X,'COMP TYPE',16X,'COMPATIBILITY MEAN AND ST
0242       1D DEVIATION',30X,'INTERPERSONAL AREA')
0243        WRITE(6,3000)
0244   3000 FORMAT(22X,'R',4X,'RSD',3X,'O',4X,'OSD',3X,'I',4X,'ISD',3X,'S',4X,
0245       1'SSD',3X,'T',4X,'TSD',3X,'J',4X,'USD',6X,'#1E',9X,'#1W',9X,'#2E',
0246       19X,'#2W')
0247        WRITE(6,4000)
0248   4000 FORMAT(88X,'M',5X,'SD',4X,'M',5X,'SD',4X,'M',5X,'SD',4X,'M',5X,
0249       1'SD',/)
0250        DO 250 M=1,6
0251        DO 250 MM=1,19
0252    250 TNN(M,MM)=Q*TNN(M,MM)
0253        DO 300 M=1,6
0254        DO 300 MM=1,19
0255    300 WRITE(6,5000)TNN(M,MM),M,XMR(M,MM),SMR(M,MM),XMO(M,MM),SMO(M,MM),
0256       1XMI(M,MM),SMI(M,MM),XMS(M,MM),SMS(M,MM),XMT(M,MM),SMT(M,MM),XMU(M,
0257       1MM),SMU(M,MM),XI(M,MM),SXI(M,MM),XJ(M,MM),SXJ(M,MM),XK(M,MM),SXK(M
0258       1,MM),XL(M,MM),SXL(M,MM)
0259   5000 FORMAT(E11.4,2X,I2,6X,F4.1,1X,F4.1,2X,F4.1,1X,F4.1,2X,F4.1,1X,F4.1
0260       1,2X,F4.1,1X,F4.1,2X,F4.1,1X,F4.1,2X,F4.1,1X,F4.1,
0261       12X,F4.1,2X,F4.1,2X,F4.1,2X,F4.1,2X,F4.1,2X,F4.1,2X,F4.1,2X,F4.1)
0262        IF(NCT.EQ.2) WRITE(6,500)
0263        IF(NCT.EQ.3) WRITE(6,600)
0264    500 FORMAT('1',1X,'THE FOLLOWING MEA- COMPATIBILITY SCORES ARE FOR CON
0265       1TROL NEEDS',/)
0266    600 FORMAT('1',1X,'THE FOLLOWING MEAN COMPATIBILITY SCORES ARE FOR AFF
0267       1ECTION NEEDS',/)
0268        SUMTR=0.0
0269        SUMTU=0.0
0270        SUMXR=0.0
0271        SUMXU=0.0
0272        DO 11 I=1,19
0273        SUMTR=SUMTR+TNN(1,I)
```

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      00000000011111111112222222222333333333344444444455555555556666666666777777777 8
      12345678901234567890123456789012345678901234567890123456789012345678901234567890
CARD
0274          SUMTU=SUMTU+TNN(6,I)
0275          SUMXR=SUMXR+XMR(1,I)*TNN(1,I)
0276       11 SUMXU=SUMXU+XMU(6,I)*TNN(6,I)
0277          XMEANR=SUMXR/SUMTR
0278          XMEANU=SUMXU/SUMTU
0279          WRITE(6,800) XMEANR,XMEANU
0280      800 FORMAT(1X,'COMPLEMENTARITY-COMPATIBILITY MEAN',5X,F6.2,/,1X,'SIMIL
0281         1ARITY-COMPATIBILITY MEAN',5X,F6.2,/////)
0282          WRITE(6,6000)
0283     6000 FORMAT('1',6X,'TYPE EVAL',5X,'VALUE OF',6X,'VALUE OF OTHER',34X,
0284         1'FREQ OF COMP TYPES',/,20X,'EVAL TYPE',7X,'COMP TYPES',/,59X,
0285         1'R',12X,'O',12X,'I',12X,'S',12X,'T',12X,'U',/)
0286          DO 400 M=1,6
0287          DO 400 MM=1,19
0288          DO 400 MMM=1,19
0289          M1=MM-1
0290          M2=MMM-1
0291      400 WRITE(6,7000) M,M1,M2,TNNW(M,MM,MMM),TNNY(M,MM,MMM),TNNZ(M,MM,MMM)
0292         1,TNNS(M,MM,MMM),TNNT(M,MM,MMM),TNNU(M,MM,MMM)
0293     7000 FORMAT(9X,I2,11X,I3,14X,I3,12X,E10.3,3X,E10.3,3X,E10.3,3X,E10.3,3X
0294         1,E10.3,3X,E10.3)
0295          STOP
0296          END
0297  //GO.SYSIN DD *
0298  183100
0299  //
0300  $ENDLIST
```

APPENDIX D

QUESTIONNAIRE CONSISTING OF DEMOGRAPHIC DATA AND THE EYSENCK PERSONALITY INVENTORY

IDENTIFYING INFORMATION

NAME: _____

Age: _____

Sex: _____

Race: _____

Religious preference: _____

Religious activity: little some much

Marital status: _____

Permanent (home) town: _____

Approximate population of home town: _____

Approximate family income: _____

Parental status (check all applicable):

natural parents _____
divorced parents _____
single parent _____
foster parent _____

Number of siblings:

	brothers	sisters
younger	_____	_____
older	_____	_____

Major in college: _____

Grade point average in college: _____

Class: _____

EYSENCK PERSONALITY INVENTORY

Name_____

Date_____

INSTRUCTIONS

Here are some questions regarding the way you behave, feel and act. After each question is a space for answering "Yes," or "No."

Try and decide whether "Yes," or "No" represents your usual way of acting or feeling. Then blacken in the space under the column headed "Yes" or "No."

Work quickly, and don't spend too much time over any question; we want your first reaction, not a long drawn-out thought process. The whole questionnaire shouldn't take more than a few minutes. Be sure not to omit any questions. Now turn the page over and go ahead. Work quickly, and remember to answer every question. There are no right or wrong answers, and this isn't a test of intelligence or ability, but simply a measure of the way you behave.

		Yes	No
1.	Do you often long for excitement?	___	___
2.	Do you often need understanding friends to cheer you up?	___	___
3.	Are you usually carefree?	___	___
4.	Do you find it very hard to take no for an answer?	___	___
5.	Do you stop and think things over before doing anything?	___	___
6.	If you say you will do something do you always keep your promise, no matter how inconvenient it might be to do so?	___	___
7.	Does your mood often go up and down?	___	___
8.	Do you generally do and say things quickly without stopping to think?	___	___
9.	Do you ever feel "just miserable" for no good reason?	___	___
10.	Would you do almost anything for a dare?	___	___
11.	Do you suddenly feel shy when you want to talk to an attractive stranger?	___	___
12.	Once in a while do you lose your temper and get angry?	___	___
13.	Do you often do things on the spur of the moment?	___	___
14.	Do you often worry about things you should not have done or said?	___	___
15.	Generally do you prefer reading to meeting people?	___	___
16.	Are your feelings rather easily hurt?	___	___
17.	Do you like going out a lot?	___	___
18.	Do you occasionally have thoughts and ideas that you would not like other people to know about?	___	___
19.	Are you sometimes bubbling over with energy and sometimes very sluggish?	___	___
20.	Do you prefer to have few but special friends?	___	___
21.	Do you daydream a lot?	___	___
22.	When people shout at you, do you shout back?	___	___
23.	Are you often troubled about feelings of guilt?	___	___

		Yes	No
24.	Are all your habits good and desirable ones?	___	___
25.	Can you usually let yourself go and enjoy yourself a lot at a gay party?	___	___
26.	Would you call yourself tense or "high-strung"?	___	___
27.	Do other people think of you as being very lively?	___	___
28.	After you have done something important, do you often come away feeling you could have done better?	___	___
29.	Are you mostly quiet when you are with other people?	___	___
30.	Do you sometimes gossip?	___	___
31.	Do ideas run through your head so that you cannot sleep?	___	___
32.	If there is something you want to know about, would you rather look it up in a book than talk to someone about it?	___	___
33.	Do you get palpitations or thumping in your heart?	___	___
34.	Do you like the kind of work that you need to pay close attention to?	___	___
35.	Do you get attacks of shaking or trembling?	___	___
36.	Would you always declare everything at the customs, even if you knew that you could never be found out?	___	___
37.	Do you hate being with a crowd who plays jokes on one another?	___	___
38.	Are you an irritable person?	___	___
39.	Do you like doing things in which you have to act quickly?	___	___
40.	Do you worry about awful things that might happen?	___	___
41.	Are you slow and unjurried in the way you move?	___	___
42.	Have you ever been late for an appointment or work?	___	___
43.	Do you have many nightmares?	___	___
44.	Do you like talking to people so much that you would never miss a chance of talking to a stranger?	___	___

		Yes	No
45.	Are you troubled by aches and pains?	___	___
46.	Would you be very unhappy if you could not see lots of people most of the time?	___	___
47.	Would you call yourself a nervous person?	___	___
48.	Of all the people you know are there some whom you definitely do not like?	___	___
49.	Would you say you were fairly self-confident?	___	___
50.	Are you easily hurt when people find fault with you or your work?	___	___
51.	Do you find it hard to really enjoy yourself at a lively party?	___	___
52.	Are you troubled with feelings of inferiority?	___	___
53.	Can you easily get some life into a rather dull party?	___	___
54.	Do you sometimes talk about things you know nothing about?	___	___
55.	Do you worry about your health?	___	___
56.	Do you like playing pranks on others?	___	___
57.	Do you suffer from sleeplessness?	___	___

APPENDIX E

BASIC INSTRUCTION CARDS

BASIC INSTRUCTION CARDS

CATEGORY 1. Any verbal expression of your current feelings resulting from interaction with the group.

CATEGORY 2. Seeking information from another group member regarding his feelings.

CATEGORY 3. Seeking information regarding your own behavior.

CATEGORY 4. Statements to another group member regarding your perception of his behavior.

CATEGORY 5. Any attempt to clarify the expressed feelings of another person.

HERE & NOW

APPENDIX F

INSTRUCTIONAL WARM-UP PROCEDURE

INSTRUCTIONAL WARM-UP PROCEDURE

This experiment is designed to help you get to know each other on a personal basis. One way you can do this is by noting your feelings in the present situation, and then sharing these feelings with the other group members. If your feelings are about another person's actions, tell him. If your feelings are good, chances are he will continue his behavior. If your feelings are bad, he may be willing to change. On the other hand, if others are not told of the effects of their behavior, they are not likely to change. The better you are able to specify what you like or dislike about the other person's actions, the more easily understood you will be. It is also a good idea to keep your expressions of feelings relevant to the current situation--the "here and now." In no way will either of you be able to change the past. Finally, you may attempt to give the other person empathy and understanding. This is perhaps the most valuable thing one person can give another. When you genuinely understand how the other person feels, he will naturally feel closer to you.

Some ways of expressing ourselves impair communication since they are open to debate. For example, do not make value judgments like, "What you just did is good or bad" or speculate about motives, such as, "You just say that because you're angry."

One way to avoid involvement is to spend time gathering information about another person; for example, "What are you studying here at school?," "Where are you from?," or "How are you classified?" This is

socially programmed use of time that we all have learned but it can hinder getting to know each other on a personal basis.

These five categories (at this time the experimenter points to cards in front of each subject on which the basic categories are outlined) are along the lines of what we've been talking about. They include ways of interacting that have been shown to be effective in establishing and maintaining close personal relationships.

CATEGORY 1. Any verbal expression of your current feelings resulting from interaction with the group. This corresponds to statements such as: "I feel angry, happy, nervous, sad, or frustrated." These are emotions. Undesirable statements are those which are opinions or value judgments, such as: "I feel that war is unnecessary, exams are unnecessary, or that Nixon is a dingbat."

CATEGORY 2. Seeking information from another group member regarding his feelings. An example of this would be, "How do you feel when she ignored your question?" You are inquiring about someone's emotional state; you are asking if they feel angry, happy, nervous, sad, or frustrated. Again, opinions are not relevant to this category. Undesirable questions would be similar to these: "How do you feel about the war, exams, or Nixon?"

CATEGORY 3. Seeking information regarding your own behavior. Questions such as, "Do my actions make you feel angry, sad, happy, nervous, or frustrated?," or "What is your appraisal of me?" would be appropriate.

CATEGORY 4. Statements to another member regarding your perception of his behavior. Statements like "Your behavior makes me feel angry, sad, happy, nervous, or frustrated," or "You are acting strangely, or as if you are angry" fit in this category.

CATEGORY 5. Any attempt to clarify the expressed feelings of another person. These are statements to another group member which communicate that you care to know what his subjective emotional state is. Very simply, this type of statement is summed up well by, "I care to know how you feel."

As I stated before, this experiment is designed to help you get to know each other personally. It is not a means of knowing that person by what he does at school or away from school, his views on dating, exams or politics. You will not know about the person in terms of actions outside this group. You will get to know about a person by the way he reacts to you and the others in the group, while you are participating in this experiment. Utilizing these categorized statements will help you to really know other group members, and make the group experience more rewarding.

Using these statements will be easier if a clear distinction is made between feelings, which are desirable, and opinions, which are not desirable. Opinions are from the head; they are ideas. Feelings are more from the body; they are sensations. If you've ever been chased by a big dog when you were a child, at that time you felt afraid. You experienced a feeling. Another example would be the anxiety which you experience just before a big exam. It is feelings that we want to examine in this group. These feelings are a result of the group interactions; they would not be existent except for this group experience. Many times we tend to ignore or avoid our feelings, which is what we want to overcome in this group. Letting others know our perceptions of them, and asking for their perceptions of us is another aspect of interaction that is often absent or lacking in our behavior with

others. It would be beneficial if we were able to increase this type of behavior, too.

Before we get started, I'd like for you to watch a short videotape which demonstrates the use of these verbal categories. See if you can recognize the correct and incorrect usage of the categories. (The experimenter shows the videotape and then fields questions from group members regarding the usage of the verbal categories.) Do you have any questions about the statements used in the videotape? (After discussing any questions the experimenter requests that group members, in a random order, produce a statement fitting one of the categories.) What about that statement corresponds to a category? (After evaluating the statements produced by members, the experimenter proceeds.)

I am asking you to interact with each other for a period of 50 minutes, using these categories. I will monitor this group discussion by way of the microphone and one-way mirror. Your conversation will be tape recorded and kept confidential. It will be used only in the analysis of the experiment and then erased. I'm going behind the mirror now, and I will come back in 50 minutes.

Whenever someone makes a statement that fits one of the categories, I will activate the counter which is in front of that person. The counter makes a loud click and this will give you the information that you are interacting according to the categories. The counter keeps a record of your total and if anyone falls too far behind, the red light on his counter will be turned on. This will indicate that either he is falling behind and may need assistance, or that someone may be

dominating the conversation. If no click is heard for a period of three minutes, all lights will flash on. This will be a signal that the group as a whole is not using the categories.

VITA

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