PIRO-B INTERCHANGE COMPATIBILITY, ACADEMIC
ACHIEVEMENT, AND GROUP COHESION

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CHAPTER I
Introduction

It is recognized that group teaching methods in the college classroom can be valuable (6, 7). But before group teaching methods are used, it would seem pertinent to acquire a knowledge of which of those methods might be the most useful. In studies of group interaction, college classroom or otherwise, it has been found that the behavior patterns of the individuals composing a group will affect that group's behavioral patterns (4, 6, 7). Slocum (6) did a study which dealt with cohesiveness and academic achievement in the college classroom. He found that high cohesiveness led to increased academic achievement only when the attitude on the part of the individual students was favorable toward the particular school in which they were majoring—in this case, the School of Business. However, Wyer (7), from a study on the behavioral correlates of academic achievement, has demonstrated that the motivation patterns of students differ according to their ability (aptitude on college boards).

It is clear that at this time there are no definite answers to the effect of these variables on academic achievement in the classroom.

In 1958 a methodology was introduced by Schutz as a result of his work on a new theory. Schutz' theory and
methodology were enunciated in his book, FIRO--A Three-Dimensional Theory to Interpersonal Behavior (4). Schutz postulated three interpersonal needs which influence "... virtually every choice made and opinion formed" (4, p. 106). These needs are inclusion, control, and affection. In terms of a group of two or more persons (a dyad or more), those persons who are similar in their needs in the areas of inclusion, control, and affection are said to be compatible. This compatibility can theoretically be measured by an instrument which Schutz has constructed called the FIRO-B Questionaire (5).

The term "compatibility" according to Schutz is not limited to liking. Webster (4, p. 106) defines compatibility as "... being capable of co-existing in harmony," and sociometry (3) defines it by the relation "works well with."

Schutz' definition is

Compatibility is a property of a relation between two or more persons, between an individual and a role, or between an individual and a task situation, that leads to mutual satisfaction of interpersonal needs and harmonious coexistence (4, p. 105).

Schutz postulated several theorems about the concept of compatibility, but this study will be concerned with the investigation of the following two:

Postulate of Compatibility (Postulate 3)

If the compatibility of one group, h, is greater then that of another group, m, then the goal achievement of h will exceed that of m (4, p. 105).

Theorem 3-3 (from the Postulate of Compatibility)
If the compatibility of one group, \( h \), is greater than the compatibility for another group, \( m \), then \( h \) will be more cohesive than \( m \) (4, p. 137).

The fundamental Interpersonal Relations Orientation technique is a relatively new approach to the study of interpersonal relations. The body of data is somewhat small as compared to that employing other psychological tests. To a large extent Schutz validated his studies dealing with the theoretical orientation of compatibility with sociometric techniques. In addition the FIRO-B manual lists other studies, both published and unpublished, which have used the FIRO-B in marriage counseling, the compatibility between therapist and client, and group effectiveness programs as a function of compatibility (5). However, a survey of the available literature revealed that neither Schutz nor anyone else has done a study which concerned itself only with the theory of Interchange Compatibility. According to Schutz, there are three kinds of compatibility: Originator Compatibility (oK), Reciprocal (rK), and Interchange (xK). However, the first two types of compatibility concern themselves primarily with dyad behavior (two people). Schutz states that Interchange Compatibility uses a concept that is more applicable to the behavior found in a group (4, p. 110). As a result, the need for a pilot study using Schutz's criterion of Interchange Compatibility was recognized, and this study is an effort to add to the body of evidence for or against the validity of the concept of Interchange
Compatibility as a factor in the goal achievement and cohesion of a group.

In the light of the above statements it would seem that there must be a relationship between Interchange Compatibility and the goal achievement of a group, and between Interchange Compatibility and the cohesion of a group. Goal achievement is operationally defined here as performance on an objective class examination, and cohesion is operationally defined as a function of the mean overall choice level in addition to the mean number of mutual choices on a standard sociometric test (1, 3).

Hypotheses

The hypotheses to be investigated by this study were therefore two in number:

1. There would be a significant relationship between the Interchange Compatibility of a group, measured by Schutz' FIRO-B Questionnaire, and the goal achievement of that group, measured by the performance on an examination.

2. There would be a significant relationship between the Interchange Compatibility of a group measured by Schutz' FIRO-B Questionnaire, and the cohesion of that group, measured by a standard sociometric test.

Definition of Terms

The following definitions are from FIRO, A Three-Dimensional Theory of Interpersonal Behavior:
1. **Interpersonal.**—This is a term that refers to relations that occur between people as opposed to relations in which at least one participant is inanimate (4).

2. **Need.**—This is a term that is defined in terms of a situation or condition of an individual the nonrealization of which leads to undesirable consequences (4).

3. **The interpersonal need for inclusion.**—This need is defined behaviorally as the need to establish and maintain a satisfactory relation with people with respect to interaction and association. There are two determinants, wanted inclusion and expressed inclusion. Expressed inclusion refers to the degree to which the individual initiates relations with people. Wanted inclusion refers to the degree to which the individual wants others to include and associate with him (4).

4. **The interpersonal need for control.**—This term is defined behaviorally as the need to establish and maintain a satisfactory relation with people with respect to control and power. It has two determinants, expressed control and wanted control. Expressed control refers to the degree to which the individual wants to control and dominate others. Wanted control refers to the degree to which the individual wants others to dominate and control him (4).

5. **The interpersonal need for affection.**—This term is defined behaviorally as the need to establish and maintain a satisfactory feeling of mutual affection and wanted
affection. Expressed affection refers to the degree to which the individual expresses affection toward others. Wanted affection refers to the degree to which the individual wants others to act personally toward him. (4).

6. Interchange Compatibility.—This theoretical concept refers to the mutual expression of the "commodity" of a given area. For example, high affection interchange refers to a situation in which all participants exchange a good deal of affectional behavior and feeling, such as in a close family situation. Low control interchange refers to a situation in which there is little controlling of the behavior of others by anyone, as in a laissez-faire schoolroom situation or a Quaker meeting. The atmosphere of the group may be described in terms of the amount of interchange occurring in each need area; hence an individual's satisfaction would be determined to a large extent by the atmosphere into which he enters.

Schutz says

That is, what may be usually meant by group atmosphere is the degree to which there is inclusion interchange (amount of contact and interaction), control interchange (giving and taking orders, advice, and the like), and affection interchange (expressions of closeness, intimacy, and emotional involvement with one another) present in the group (4, p. 113).

The concept may be expressed more clearly by the following Cartesian plot, offered by Schutz (4, p. 59). It can be seen in Figure 1 that two or more individuals' Interchange Compatibility will lie somewhere along the diagonal Low Interchange to High Interchange. Schutz gives an example
Interchange Incompatibility in the control area \((\times K^c)\) commonly arises over the reaction to structure in the group. It is a common phenomenon, especially in unstructured groups, for a division to form early in the group's history between those who like "structure," that is, an established hierarchy with each member's role clearly stated and delineated (autocrats), and those who want the group "unstructured," that is, without power differences or pecking orders but with freedom for members to work out each problem as it arises (abdicrats). This difference pervades all decision making, since it refers to the whole process by which people will relate to one another regarding decision making, and not just to specific disagreements \((4, p. 117)\).

Description of the Fundamental Interpersonal Relations Orientation-Behavior Scale (FIRO-B)

The FIRO-B \((5)\), is an instrument which is designed to measure both the individual's behavior toward others \((expressed)\), and the behavior he wants from others \((wanted)\). These two types of behavior are contained in the need areas of inclusion, control, and affection. Thus six scores are obtained: expressed and wanted inclusion, expressed and
wanted control, and expressed and wanted affection. Each of these six areas is measured by a nine-item Guttman scale (2). Scores vary from zero to nine on each dimension, with higher numbers meaning more of the dimension measured. From the six scores the three types of compatibility can be deduced. However, as stated above, this study will be concerned only with the measurement of Interchange Compatibility. Interchange Compatibility is the algebraic difference between the sum of one individual's scores on one need area, and the sum of the scores of another individual's scores on the same need area. For each need area two scores are obtained on the Guttman scale: for example, an expressed score and wanted score. The initials for expressed and wanted are e and w respectively. These two scores are added together for that individual. For another individual the same thing is done for the same need area. Thus individual A's and individual B's scores will look like this: (need area of inclusion), $e_A^I + w_A^I$ and, $e_B^I + w_B^I$. Then Interchange Compatibility is arrived at through the following formula:

$$xK = (e_A^I + w_A^I) - (e_B^I + w_B^I)$$

This formula is used for each need area of inclusion (I), control (C), and affection (A) (4, p. 112). The three individual scores are then added in order to obtain a Total Interchange Compatibility. The smaller the difference in the absolute value of the result, the greater the compatibility. A group can therefore be formed on the basis of the relatively
small differences in their Total Interchange Compatibility scores. Of course, very few of the comparisons would actually figure out to be zero; however, persons can be grouped when the differences are small--approximately two or three points.

Validity

Three areas of statistics were used to validate the FIRO-B: content validity, concurrent validity, and predictive and construct validity. The Guttman technique of scale analysis was used to ascertain content validity (2). In regard to the initial item, all items in the original scale were either equal to or exceeded the requirement that they be 90 percent reproducible.

This implies that any sample of items in this dimension would rank respondents in essentially the same way; therefore, the sampling of the inverse of items yields a satisfactory content validity (4, p. 138; 5).

Concurrent validity was ascertained by establishing to what degree FIRO-B scores correspond to people with known attitudes. Studies of concurrent validity are reported in the three areas of FIRO-B and political attitudes, FIRO-B and occupational choice, and FIRO-B and conformity behavior. As an example of the three above-mentioned attitudinal areas, four hypotheses were constructed in the area of political attitudes in an attempt to predict FIRO-B scores from groups with known attitudes. Three of the four predicted relations were significant at the 5 percent level or better. "The
probability of this occurrence, when three of the only four significant relations of sixteen possible relations are selected correctly, is less than 1 percent (4, p. 136)."

Reliability

Since Guttman scales were utilized in obtaining internal consistency, reproducibility was the basic criterion rather than the usual split-half method. All FIRO-B scales were 90 percent reproducible or better ($M = 94\%$) with the scale construction population (5).

Coefficient of stability is a technique which refers to the correlations between test and retest with an intervening period of time. A coefficient of .70 was established for the retention of any scale on the FIRO-B. All scaled passed this requirement with a mean coefficient of .76 (5).
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CHAPTER II

SURVEY OF LITERATURE

The following survey of the literature includes those studies that are directly related to the present experiment as well as those that are somewhat more indirectly related. Included are those studies that deal with the central concepts of the psychological orientations which are the basis of the study. Therefore, this survey is divided into four parts: one, studies that deal with the FIRO-B and compatibility, and academic achievement; second, studies that deal with the psychological concept of cohesion and academic achievement; third, studies that are concerned with the validity of sociometry and its use in cohesion measurement; and fourth, studies that deal with the psychology of interpersonal attraction. Finally, a summary will be given which will attempt to mesh these four sections into the theoretical orientation that is espoused by Schutz and applied in this study.

Studies with the FIRO-B and Academic Achievement

The FIRO-B has been used to define the concept of compatibility, but only one study has been done which is directly related to the idea of using only Interchange Compatibility. Sapolsky (9) at Adelphi College while doing
his dissertation found that "A preliminary study had shown this scale (FIRO-B) to be effective in establishing compatible and incompatible groupings among individuals having only classroom contact with each other."

Sapolsky (9) did a follow-up study which investigated the effect of interpersonal relations upon verbal conditioning using the FIRO-B. Two experiments were conducted in the study: 1) Information was given beforehand to Ss in order to ascertain whether or not they could expect the experimenter to be attractive or non-attractive to them (in other words a set of expectations was formed previous to the actual experiment); 2) Compatible or incompatible scores on the FIRO-B Questionaire were used to match the experimenter and subjects for subsequent testing situations. In the second experiment, in which a control group was compared to an experimental group matched on FIRO-B compatibility scores, the results were significant at the .001 level. The experimenter and subject were matched on compatibility according to the interpersonal need of control as defined by Schutz (11). Sapolsky felt that the interpersonal need for control was most applicable for a testing situation. Sapolsky states that the experimenter and the subject were significantly more productive in subsequent testing situations relevant to the experiment than if they had not been matched on the basis of the FIRO-B scores.

In reference to the concept of compatibility, it would
be most pertinent to use Schutz' definition as it is to be applied to this study.

Schutz says

Compatibility refers to the successful operation of an interpersonal relation. The less compatible the relation, the more time just to be spent in finding ways of dealing with the difficulties. . . Again it is important to mention that compatibility does not necessarily imply liking. It has mainly to do with the ability to work together successfully (11, p. 106).

The concept of compatibility has been related to many different situations. One of these is the dyadic group of marriage. Levinger (6) has clarified the need of complementarity in marriage. He makes a mutually exclusive distinction between "complementarity" and "similarity." Complementarity is defined as referring to that which is able to supply the other's need—". . . mutually supplying the other's lack, or serving to fill out or complete." In addition Levinger (6) notes that Schutz confines himself to a type I need. A type I need is: "The need or needs in A which are being gratified are very different in intensity from the same needs in B which are being gratified (6, p. 158)." In other words, the type of need which Schutz concerns himself with is that which refers to opposites in individuals; for example, one individual may be high on expressed control but low on wanted control, and the other individual may be high on wanted control but low on expressed control. Therefore, these two individuals would be satisfying each other's needs. Levinger (6) states further that one difficulty in Schutz'
approach is that his test refers only to the respondent's general peer relations. Levinger concludes that the FIRO-B is not appropriate for use with married couples, and it is more difficult to translate adequately than, say, the Edwards Personal Preference Scale.

Sapolsky (10) has used the FIRO-B in the clinical setting. In this case outcome of treatment was correlated significantly with client and counselor compatibility.

Sapolsky states

Findings indicated that the degree of interpersonal compatibility existing between patient and doctor was a significant variable affecting the outcome . . . (10, p. 76).

In another study investigating client and counselor compatibility, Mendolsohn (7) did not achieve as significant a correlation as Sapolsky, but did find that an apparent relation exists between client and counselor when the FIRO-B is used. Mendolsohn was not prepared to say just what the relationship was, however.

Wyer (15) states that it is not correct to assume that students who are in a group learning situation will automatically learn. Schutz has stated that compatibility will facilitate this group process. Wyer and others have noted that differences in the motivation patterns of students were associated with levels of their ability (aptitude on college boards) and their sex. In terms of males and females, there were differences in team motivations as related to conformity.
These differences showed up with high-ability, high-performing males and females. High males conformed more to fictitious group norms than other males at different levels. But high females conformed less than other levels of females (15, p. 80). The determinants of these patterns of behavior were not clear.

Studies of Cohesion and its Relation to Academic Achievement

In testing the relation between compatibility and cohesion, Schutz (11, p. 138) used a cohesiveness test that was composed of nine items that had been used in other studies (11, p. 137). Schutz combined these nine items into one questionnaire, and administered it to eleven five-man groups composed of fifty-five Harvard freshmen. Schutz' results indicated that a relation between cohesiveness and compatibility was significant only when Total Compatibility was used. Total Compatibility is essentially a mathematical sum of all other compatibilities; that is, inclusion compatibility, control compatibility, and affection compatibility. Schutz arrived at a correlation of .81 between Total Compatibility and cohesiveness.

Another validation study by Schutz (11, p. 139) was done using a real-life group in testing the relation between cohesion and compatibility. The group was a street corner gang that had been together for a period of three to six years. This gang was used in order to answer the charge that laboratory groups are not real groups. The FIRO
and an extended sociometric questionnaire was used to compare this gang with the Harvard freshman group. It was assumed, however, that the gang was cohesive due to the fact that most members had been together for at least six years. It was necessary, though, to establish whether or not the members were compatible in order to confirm Schutz' Theorem 3-3. The patterns of compatibility in the experimental groups were of two types—the overpersonal and the underpersonal.

Schutz said

The overpersonal type attempts to become extremely close to others. He definitely wants others to treat him in a very close, personal way... The underpersonal type tends to avoid close personal ties with others. He characteristically maintains his dyadic relations on a superficial, distant level and is most comfortable when others do the same to him (11, p. 30-31).

A personalness scale (Schutz' FIRO-2) was given to the gang and the Harvard students as well as an extended sociometric questionnaire. Schutz' Theorem 3-3 would predict that the gang would be either overpersonal or underpersonal, but not incompatible. On the personalness scale in terms of overpersonal behavior between the gang and the Harvard freshmen, \( X^2 = 3.84 \) and \( p < .05 \). Schutz considered the Harvard Freshman Study and the Street Corner Gang Study to confirm Theorem 3-3. Theorem 3-3 postulated a direct relationship between compatibility and cohesion in any group.

Cohesion in psychology is at best a controversial concept in terms of what it is and how it is measured. Van Bergen and Koekebakker (14) have attempted to enunciate
how group cohesion can be used in the laboratory setting. Rather than use cohesion, "attraction to group" was their term. However, it was not known what "attraction to group" really means in its empirical sense. Basically, the concept implies a condition of whether or not the individual wishes to remain or leave the group. To simplify the matter the initials ATG were used. ATG was defined and related to measurement in the laboratory situation by Van Bergen and Koekebakker. References were made to others who have done extensive work in the area of cohesion such as Festinger, Libo, Schachter, and Eisman. Essentially these works stated that ATG can be used, but the locomotion criterion (to remain or leave) must be manipulated according to the particular situation.

Van Bergen and Koekebakker say, cautioning the experimenter, to

... make certain that the activities which have to be performed during the experiment will not act as a component of ATG, if another component is manipulated as the experimental variable (14, p. 98).

Four other checks and balances were stated which caution the experimenter that in ATG, it is not known just what is being measured in terms of cohesiveness. However, these checks and balances appeared to lend themselves to a more rigorous measurement of the concept of cohesion.

As far as Schutz was concerned, cohesiveness or cohesion is a term that indicates or measures "... general satisfaction with the group activities and a member's place in
those activities. . ." (11, p. 136). Upon reflection, it is clear that satisfaction according to Schutz could be operationally defined in terms of a location criterion, such as ATG.

Slocum (12) did a study on cohesiveness as related to academic achievement. A class of BBA majors scheduled together for twelve hours were found to be more cohesive according to scores from a scale by Seashore and Stoffer, et al (12). Higher cohesiveness was associated with higher grades. However, high cohesiveness led to high academic achievement only if the groups' attitude toward the School of Business was favorable.

Studies in Sociometric Validity and Its Relationship to Cohesion

Criswell (3) did a study in the measurement of group integration (cohesion) using data from sociometric techniques. Formulas for extracting mutual choices and the probability of obtaining them are explicated as opposed to no mutual choices. In this case cohesion is defined in sociometric terms as a function of the extent of mutual choices, the extent of cross criterion choosing, and the total number of choices.

Davis and Warnath (4) conducted a study concerned with the reliability, validity, and stability of a sociometric rating scale. Several applications of Cunningham's Classroom Social Distance Scale were examined for reliability
over a relatively short period of time (two months), for agreement with another sociometric measure (a "guess who" test), and for stability over a three year period. Short reliability was best in terms of trait for the measure reflecting degree of acceptance. The index of correlation for the stability over the three year period was .56. This correlation was in terms of ratings for the degree of attraction as a friend by classmates.

Bonney (1) demonstrated the constancy of sociometric ranks among college students over a two year period. Five hypotheses were stated with three confirmed.

Bonney said

1. The average difference in ranks over two consecutive semesters would not vary more than three or four points.
2. Those high on the first testing would show greatest amount of stability.
3. Those most consistently high would have a higher grade-point average (1, p. 533).

It was shown that sociometric tests could be used with college students who had a period of acquaintance of no more than three weeks. Bonney stated that the resultant stability of sociometric questionnaires validates their reliability (1, p. 540).

Bonney (2) conducted a study investigating friendship choices in college in relation to church affiliation, in-church preferences, family size and length of enrollment in college. A central concept in sociometric theory was confirmed by the study.
Bonney said

Apparently when a person enters a group, he establishes his social status within a relatively short time, and this status remains approximately constant over a period of years unless unusual circumstances arise either in his favor or disfavor (2, p. 165).

Helen Jennings (5) clarified the psychological stability of sociometric choosing—particularly the first choice.

The chooser makes his greatest psychological investment in his first choice, reaching deep into the core of his personality in making his decision, and apparently this choice can be neither ourgrown nor replaced as readily or as quickly as his other choices, which are less essential and less necessary to him... the implications of crucial needs lie chiefly in first choices (5, p. 10).

It is clear that Jennings, like Schutz, adhered to a theory of need in interpersonal behavior. Finally, according to Jennings, one's choices are found to be graduated: he selects others who are, at their particular stages of development, more skillful in meeting life's problems and situations (5, p. 11).

Smith (13) discussed the relationship between sociometric rankings and cohesion. Cohesion was defined according to the construct of ATG (attraction-to-group): "The only valid measure of cohesiveness is a measure of the resultant intention to leave or to stay in a group..." (13, p. 337). Smith tested four theories relating sociometric rankings to cohesion, and he concluded that Theodorson's theory, which uses the concept of ATG, tended to be the most applicable to the concept of cohesion.
Smith (13) in two other studies discussed in the above article showed that a subject's FIRO reward scores were significantly related to other group members' perceptions of his behavior. A FIRO reward score is composed of answers from selected items of the FIRO-B under control and affection behaviors. In Smith's studies, the difference was calculated between the frequency with which the subject expected to perform the behaviors himself and the frequency with which he preferred others to perform the behavior in his presence. It is relatively clear that Smith's concept as it was used in a reward score was very similar to Schutz' theoretical concept of FIRO in general.

It is possible to conjecture that the FIRO orientation is a function of the individual's need set as related to a learning concept of reward and punishment. However, in subsequent testing of reward scores in relation to sociometric rankings, Smith found no significant relationship. Smith was attempting to correlate sociometric rankings with FIRO reward scores.

Smith's failure to find a correlation between FIRO reward scores and the differentiation between sociometric rankings could be explained by looking at Interchange Compatibility. Apparently the FIRO reward score is not as general a measure as Interchange Compatibility in measuring a group's atmosphere or the group's set of expected behavior patterns from members. The study did indicate, however,
that persons in small groups who were in general agreement as to their reward scores would have a more active group situation, regardless of the reason for which it was formed. It was suggested that reward scores would indicate the type and kind of group members who adhere to either leadership behavior (influential), flexible behavior, passive behavior, or unflexible behavior (13, p. 348).

Studies of Interpersonal Attraction

Newcomb (8) wrote of the psychology behind interpersonal attraction. Interpersonal attraction appears to be directly related to the concept of reward and punishment (operationally defined as positive or negative reinforcement—nonreinforcement). Newcomb brought together several diverse ideas from the literature to form a basic prediction of interpersonal attraction.

Newcomb concluded,

The fact seems to be that one can predict to interpersonal attraction, under specified conditions, from frequency of interaction, from the perception of reciprocated attraction, from certain combinations of personality characteristics, and from attitudinal agreement. . . If we are inclined to take a favorable view of positive interpersonal attraction, perhaps we should also be grateful for similarities: Vive la similarité! (8, p. 586).

Schutz' theoretical orientation behind Interchange Compatibility is not at odds with Newcomb's conclusions. Interchange Compatibility relies on the mathematical agreement between what a person expects and what he wants in an interpersonal situation
in terms of inclusion, control, and affection. The greater the similarity between individuals, the greater the Interchange Compatibility.

Summary

A survey of the literature was done which related studies in four psychological areas in terms of their applicability to Schutz' theoretical concept of Interchange Compatibility. Interchange Compatibility was defined as the "atmosphere" of a group in terms of the behavior that is expected of one member by all other members. It was postulated that groups matched on the criterion of Interchange Compatibility will be higher in academic achievement and higher in cohesion as measured by sociometric data.

The first group of studies related Schutz' FIRO-B Questionaire with academic achievement. It was felt that these studies supported a relationship between Interchange Compatibility, as measured by the FIRO-B, and academic achievement.

The second group of studies related academic achievement and the psychological concept of cohesion. Several studies were reviewed which tended to support Schutz' concept of cohesion as related to FIRO-B data. Also a study was noted that dealt with the more basic psychology supporting the idea of cohesion in any group. There was general agreement that a measure reflecting "attraction to group" was not at odds
with Schutz¹ definition of cohesion, which has to do with the individual's satisfaction with the group setting.

The third group of studies demonstrated the measurement of cohesion by using sociometric data. One study dealt with the actual measurement of cohesion, while others noted the validity, reliability, and stability of sociometric data.

Finally a study was reviewed which summarized the literature on the psychology of interpersonal attraction. This study, along with others done by Schutz, tended to support the idea that interpersonal attraction is more successful in a group setting when the differences between the individuals in that group are small.
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CHAPTER III

METHOD, RESULTS, AND DISCUSSION

Two classes of second-semester freshman psychology students were used to obtain the subgroups utilized in this study. There were 40 students in each class. Each subgroup in each class was composed of ten students—making four subgroups in each class. The four subgroups in the first class were matched solely on the basis of their scores on the FIRO-B Questionnaire. The students in the second class were assigned according to a table of random numbers.

The compatibility index used to match the students in the first class was Total Interchange Compatibility (xK). A full definition of Total Interchange Compatibility was given in Chapter I. It was stated earlier that an Interchange Compatibility index of around two or three points between two or more individuals on each need area of Inclusion, Control, and Affection would be desirable. Due to the relatively small size of the class (40 students), such an index was not always possible to achieve.

Since both classes were given the FIRO-B, it was possible to make some comparisons between their scores in terms of Total Interchange Compatibility. In the first class the scores ranged from 2 all the way to 22. Total Interchange Compatibility scores were computed between each person
and all other members of his class. Even though a rather intense attempt was made to achieve the smallest Total Interchange Compatibility scores for each of the four subgroups, it was not possible to arrive at a mean smaller than 8.21 for any one subgroup, with the highest being 10.73.

Looking at the first class as a whole, the number of scores between 2 and 5 on the low end of the range was 38 out of a possible 180. That was about 21%. As stated in Chapter I, the index used was Total Interchange Compatibility. This means that an Interchange Compatibility was figured for each need area (inclusion, Control, and Affection), and then these compatibilities were simply added together to obtain Total Interchange Compatibility. Thus it can be seen that if a score of 3 or less was postulated to be indicative of a high compatibility on each need area, then a total score of 9 would meet this criterion. Therefore, a mean score of 8.21 or 10.73 for any one subgroup would be indicative of a relatively high compatibility.

The second class's lowest mean was 11.86 with the highest being 15.20. The number of scores between 2 and 5 in the class was 13 out of a possible 180. This was about 7%. Only 1 was a score of 2, and 2 were a score of 3. This is contrasted with the first class which had 5 scores of 2 and 10 scores of 3. However, the range was somewhat greater going from 2 to 31. Since Schutz actually makes no clear distinction in terms of the exact compatibility scores
one should use either in the FIRO manual or in his book, it was therefore postulated that for the purposes of this pilot study, a sufficient degree of compatibility was achieved to justify continuing the experiment.

The age range in each class was the same, 18 to 24. Both classes contained approximately the same number of students who had completed one year of college or more. In Table I can be seen the characteristics of the first and second classes on age, sex, and classification.

**TABLE I**

**CHARACTERISTICS OF THE TWO CLASSES IN AGE, SEX, AND CLASSIFICATION**

<table>
<thead>
<tr>
<th>Class</th>
<th>Age in Mean Years</th>
<th>Sex</th>
<th>Classification</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>M=26</td>
<td>F=14</td>
</tr>
<tr>
<td>First Class</td>
<td>19</td>
<td>14</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td></td>
<td>15</td>
<td>6</td>
</tr>
<tr>
<td>Second Class</td>
<td>18.2</td>
<td>M=25</td>
<td>F=15</td>
</tr>
<tr>
<td></td>
<td></td>
<td>17</td>
<td>5</td>
</tr>
<tr>
<td></td>
<td></td>
<td>9</td>
<td>7</td>
</tr>
</tbody>
</table>

The forty students in each class were administered the FIRO-B Questionnaire during the regular class period. After the four subgroups were obtained in each class, a regular class period was used to let the subgroup members become more acquainted with one another, and to give the teacher
a chance to explain how the subgroups were to be used as a part of regular class work. The subgroups were told that they were going to do some group work, lasting about a month, which was directly related to the work done in learning theory by Skinner.

The material used for the group work consisted of selected exercises from the *Attitudes of Science* workbook by Whaley (4). These exercises consisted of a method of teaching students basic scientific methodology and scientific principles by using what is called a "fading technique". An article is read, and then the group discusses the article according to a set of instructions at the end of each article. As the group progresses through the book, the set of instructions gradually fades out—forcing the group to rely more and more upon its own knowledge gained from previous articles and discussions. As a result of this fading technique, the group must rely more and more upon its members to create the atmosphere necessary for learning. It was hypothesized that if a group formed as a result of FIRO-B scores was more compatible, then it should be able to move ahead in its learning performance at a faster pace than if it was not compatible. This hypothesis was based on the Interchange Compatibility variable postulated by Schutz (3).

The subgroups in each class met every Friday during the regular class period in order to minimize the element of
coercion which would have been present had they been required to volunteer for an extra learning session. At each of the subsequent four meetings, the subgroups read and discussed a new exercise out of the workbook. After the fourth meeting of the subgroups, a standard sociometric test was given at the next class period. The test provided the data relating to the cohesion of the subgroups in each class.

Before the actual experiment was initiated, the first class exam was given both classes. This was a regular exam which had nothing to do with the experimental material, but the results helped to establish whether there were any differences between the two classes in scholastic aptitude. An examination of Table II shows that the similarity of scores by the two classes on the first exam would seem to indicate that little or no difference existed between the groups in scholastic aptitude.

One week after the sociometric test was given, the second class exam was given to both classes. This exam was an objective multiple-choice instrument over the material presented during the experiment in addition to more general material related to work done by Skinner. The scores in Table II are reported in percent of a possible one hundred. This test was helpful to the teacher, since the experiment aided him in evaluating his unit of teaching material. The results on this second exam were used to investigate whether the compatibility of these subgroups had any effect
on the achievement of the subgroups.

The standard sociometric test had three questions which can be seen by examining the Appendix on page 44. The first question asks the individual to choose those persons whom he believes would make good leaders. The second question asks the individual to select those he believes would be the type of persons that would be fun to do things with on a personal or intimate basis. The third question asks the individual to choose those he believes would be the type of persons that he would want to have as a partner in getting a task done--some sort of work project, for example.

The first question is called simply a leadership question, but the second and third are called a psychetele question and sociotele question, respectively. Leadership is comprised of a kind of combination of psychetele and sociotele plus additional characteristics which the chooser values in others (1). Psychetele has to do with an attraction for persons with whom the individual would want to have an interpersonal relationship of a more intimate nature (1). Sociotele has to do with an attraction for persons whom the individual would want to have as partners in accomplishing some task--persons that could contribute in achieving some goal (1).

The sociometric test was given with instructions allowing the student to choose anyone in his particular class. From each of the three criteria, a Bonney-Fessenden Sociogram (2)
was constructed. Each sociogram yielded the two scores used in subsequent statistical computations on each sociometric question or variable; that is, level of over-all choice and level of mutual choice. This meant that a total of six sociograms were employed--three in each class.

Results

Two t-tests of significance were performed for the differences between means on the exam data. The t-test for the first exam was to determine, as mentioned above, differences that existed between the two classes in scholastic aptitude. The t-test for the second exam was performed in order to see if the first hypothesis had been confirmed.

The t for the first exam was not significant indicating that there were no significant differences in scholastic aptitude. The t on the second exam was significant at the .05 level indicating some confirmation of the first hypothesis.

A t-test of significance was performed for the differences between means on the three variables of the sociometric test described above. This was done to determine whether one type of sociometric variable would be more effective than another in determining differences in group cohesion. It is evident that in terms of group work in the classroom setting, however, it would be expected that the sociotele variable would be more relevant. This expectation would seem to be true especially in the case of an adult population. Adults
are more discriminating in whom they choose for work as opposed to whom they choose for play. The results of the statistical computations can be seen in Table II.

**TABLE II**

*t*-TEST FOR DIFFERENCE BETWEEN MEANS ON THE SOCIOMETRIC VARIABLES AND ON THE CLASS EXAMS

<table>
<thead>
<tr>
<th>Sociometric and Exam Data</th>
<th>Variables</th>
<th>Mean Scores</th>
<th>t</th>
<th>df</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Class I</td>
<td>Class II</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Leadership</td>
<td>Choice Level</td>
<td>1.90</td>
<td>1.90</td>
<td>0.00</td>
<td>78</td>
</tr>
<tr>
<td></td>
<td>Mutual Choice</td>
<td>0.55</td>
<td>0.50</td>
<td>0.35</td>
<td>78</td>
</tr>
<tr>
<td>Psychetele</td>
<td>Choice Level</td>
<td>2.10</td>
<td>2.47</td>
<td>1.73</td>
<td>78</td>
</tr>
<tr>
<td></td>
<td>Mutual Choice</td>
<td>0.63</td>
<td>0.77</td>
<td>0.87</td>
<td>78</td>
</tr>
<tr>
<td>Sociotele</td>
<td>Choice Level</td>
<td>2.20</td>
<td>3.25</td>
<td>4.67</td>
<td>78</td>
</tr>
<tr>
<td></td>
<td>Mutual Choice</td>
<td>0.70</td>
<td>1.32</td>
<td>3.01</td>
<td>78</td>
</tr>
<tr>
<td>Class Exams</td>
<td>Exam I</td>
<td>69.82%</td>
<td>68.28%</td>
<td>0.49</td>
<td>78</td>
</tr>
<tr>
<td></td>
<td>Exam II</td>
<td>69.55%</td>
<td>63.64%</td>
<td>2.15</td>
<td>78</td>
</tr>
</tbody>
</table>

*Significant in the opposite direction desired.

The data concerning the results on the sociometric test were divided into two measures for each of the sociometric questions. The first measure was the over-all level of choice, and the second measure was the level of mutual choice. The total number of *t*-tests was therefore six for the sociometric data.
None of the $t$'s for the sociometric data reached the .05 level. The second hypothesis was therefore not supported. One of the $t$'s in the opposite direction was significant. This was true for the sociotele variable.

Discussion

Perhaps the data would have supported the first hypothesis even more strongly if there had not been so many absences. The students at this institution are not required to attend class. Perhaps if the attendance had been better, students would have had a chance to interact more, and subsequently to score higher on the second exam. Upon examination of Table II, it can be seen that the first class was a little higher on its scores on the first exam. However, this difference was not significant. As stated in the method section, the first exam helped to establish some indication that the first and second class were somewhat equal on scholastic aptitude.

Due to the fact that the rest of the hypotheses were not supported, it would seem pertinent to suggest that a replication of the exam data or perhaps data from some other measure would be helpful in determining the validity of the effects of the type of grouping employed here. This would seem particularly desirable since the reason for such a difference could not have been due to an increase in group cohesiveness as measured here.

Neither the mean number of mutual choices nor the mean
number of choices received differed for the two groups. The fact that the second hypothesis was not supported by the data could have been due to several factors. In terms of the leadership and psychotele questions, it could have been that the kind of groups and the purpose for which they were formed had no connection with these types of variables. It was mentioned in the results section that these groups would be expected to interact more on the basis of a sociotele variable due to the task orientation employed by the experimental setting. The fact that a statistical significance was obtained on the sociotele question in the wrong direction is very difficult to explain.

It is entirely possible that using only Schutz's Interchange Compatibility criterion for matching groups in the classroom setting is not a broad enough measure. Or more specifically, perhaps Schutz's FIRO-B Questionaire does not actually measure what this study purported to measure in a college classroom setting. A basic purpose of this study was to shed light on the desirability of using Schutz's FIRO-B at the beginning of the semester for general classroom group work. If the FIRO-B proved itself to be valid in the classroom setting in terms of the Interchange Compatibility variable, then a teacher would not have to wait for the two or three weeks necessary in order to obtain sociometric data. Perhaps the FIRO-B would prove itself more significant if it were used in conjunction with sociometric data. Also it
is not known what effect the particular material used in the group work had on the compatibility of the groups. However, following the basic thesis of this study as stated above, the type and kind of material should not matter.

Another possible relevant variable might have been the personality of the teacher who taught these classes. Teaching technique was controlled since the same teacher was used in both classes. However, it might have been more instructive to have used several different teachers all using the same technique in order to determine the effects of teacher-personality.

In addition, the degree of absences on the part of the students may have had a differential adverse effect. The students in the second class may have attended more than the first class giving them a chance to interact more. This interaction might have contributed to the significant findings in the wrong direction on the sociotele variable. Unfortunately no roll was kept by the teacher making it impossible to assess this effect either in the first or second hypothesis.

It seems clear that the results at best of this study are somewhat nebulous. It is suggested that future studies could be more extensive in the use of FIRO-B compatibility variables; that future studies could control for teacher personality; and that finally, future studies could be more rigorous in requiring attendance on the part of the students.
It would also be desirable to have some measure of academic aptitude available as a control variable, particularly if the subjects cannot be assigned at random to the treatment groups.

The negative t-test of significance on the sociotele variable in Table II might reflect a differential effect of matching individuals according to FIRO-B scores. Perhaps Schutz' FIRO-B as used in a classroom setting for goal-directed group work puts individuals together who are too compatible. As a result, more time would perhaps be spent on socializing behavior than on a group's goal-directed behavior. It is therefore suggested, in addition to the suggestions offered above, that future studies could be considerably more extensive in assuring that the FIRO-B does not yield a compatibility index that has a differential effect on a group's goal-directed behavior.
CHAPTER BIBLIOGRAPHY


CHAPTER IV

Summary

Schutz's FIRO-B Questionnaire was used in a study to test the possibility of using the resultant measure of Total Interchange Compatibility scores to form groups in a college classroom setting. The first hypothesis that there would be a significant relationship between the Total Interchange Compatibility of a group, and goal achievement of that group measured by class exams was supported by a t-test of significance.

The second hypothesis that there would be a significant relationship between the Total Interchange Compatibility of a group and the cohesion of that group measured by a standard sociometric test was not confirmed by a t-test of significance.

The basic thesis of this study was that armed with the knowledge that a method was available to facilitate classroom group work, teachers would be able to form groups in their classes at the beginning of the semester. Groups formed on the basis of their compatibility scores would learn faster and would be more cohesive in keeping with Schutz's theory behind the FIRO-B Questionnaire. As a result of this cohesion, the atmosphere of learning in the class as a whole would be more positive.
To test the two hypotheses, an experiment was designed in which two classes of freshman psychology students were administered the F.I.R.O.-B Questionnaire. Each class contained 40 students. Four groups in the first class were formed on the basis of Total Interchange Compatibility scores; the four groups in the second class were formed on the basis of a table of random numbers. The classes met in groups for five sessions. The first session was to enable the members to become acquainted; the next four sessions were spent in specific group work which was relevant to the course of study being taught by the teacher. Before the groups began their first session, a class exam was given which helped to determine that there appeared to be no differences between the classes in terms of scholastic aptitude.

After the groups met the last time a standard sociometric test was given in order to check the groups' cohesion as defined by sociometric theory. Each individual was allowed to choose anyone in his class. Finally, a second class exam was given to assess the effects of compatibility on the variable of learning in those groups matched on the basis of their F.I.R.O.-B scores.

The first hypothesis was confirmed by a $t$-test of significance on the data from the second exam. The second hypothesis was not confirmed by a $t$-test of significance.

As a result of the somewhat inconsistent findings, it was suggested that future studies should be more extensive
in the use of FIRO-B data in terms of various compatibility variables. It was also suggested that future studies should control more extensively for teacher personality. Finally, it was suggested that in future studies it would be helpful if rigorous attendance was required since the degree of absence could have a direct bearing on the findings of this study.
APPENDIX

HOW WE SEE OTHERS

Your Name_________________________ Boy______ Girl______

Directions: Please give the names asked for in the three questions below so your instructor can better understand this class and help everyone in it to profit from being in your group.

You may put the same names under more than one of the questions if you wish, but you will probably want to name some new ones under each of the three questions. Be sure to put the last names of students who have the same first names.

1. Which students in this class do you believe are the best leaders—the ones who can get things done and who can influence others. You may list as many as you wish, but probably you will not want to list more than 4 or 5.

2. Which other students in this class would you choose to be with you for a recreation group—one in which you play games and have fun or entertainment. List as many as you wish, but you will probably not want to name more than 4 or 5.

3. Which other students in this class would you choose to work with you on a committee or work project—one which requires that you obtain information and prepare a report to be given to your instructor, and possibly before your class. You may list as many as you wish, but you probably will not want to name more than 4 or 5.
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