ABSTRACT
              This study investigated William Schutz's
three-dimensional theory of interpersonal behavior and compatibility
(FIRO) to determine its validity as a group measure of compatibility.
Data were collected from 248 students enrolled in a multi-section
course in small group communications at a large midwestern
university. Subjects self-selected themselves into 47 groups of no
less than five and no more than seven and participated in five hours
of introductory interaction. After this, they were asked to develop
and present two exercises on group communication topics. Several
instruments, including the FIRO-B instrument, were administered to
the subjects. Results revealed that the methodology of computing
group compatibility from equations that measure internal dyadic
compatibilities was inefficient and inappropriate. After a
reanalysis, findings suggest that even though a specific dyad in a
group is compatible, the behavior and interaction of other group
members may be an intervening factor causing a compatible dyad to be
ineffective in the group context. The complexity of group interaction
as well as the competition for attention among the group's many
members may keep specific dyadic compatibilities from surfacing.
Findings also suggest that defining group compatibility by measuring
dyadic compatibility runs contrary to the notion of group
synergy--that a group may be more than an additive function of its
parts. Continued investigations into methodological issues to
determine if compatibility is a useful discriminator in
distinguishing effective from ineffective groups appear to be called
for. (Eleven tables of data are included; 26 references are
attached.) (KEH)

EXPLORING INTERPERSONAL COMPATIBILITY IN GROUPS

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Schutz's FIRO theory of interpersonal relationships has long provided a standard explanation for need fulfillment in dyadic and group member relationships. The theory is behaviorally based on the three interpersonal needs of inclusion, control, and affection. The accompanying methodology provides formulas for measuring interpersonal compatibility. This project examines these equations in the group context and raises questions about FIRO methodology and the overall issue of the measurement of group compatibility.

EXPLORING INTERPERSONAL COMPATIBLITY IN GROUPS

Group research still has not conclusively shov.a how group interaction affects group process and outcomes (Hewes, 1986). Without such evidence, there is heavy reliance upon group inputs or group composition to explain differences in group decision making. Researchers and text writers have long looked to Schutz's (1958/1966) FIRO theory to explain and predict those differences. Unfortunately, FIRO is a dyadic methodology that has been extrapolated to the group context with little verification. The research project described here includes two methodological interpretations of the FIRO theory for explaining compatibility and predicting process and outcome differences among groups.

FIRO--Fundamental Interpersonal Relations Orientations

FIRO, a three dimensional theory of interpersonal behavior (Schutz, 1958/1966), explains interpersonal behavior in terms of an individual's orientation to others. Schutz applies his theory to the compatibility or cohesion of interpersonal relations, the sociometric patternings within a group, and the developmental stages of interpersonal relationships. Originally conceptualized as a dyadic theory, FIRO is used in the group context to explain group interrelationships. Most of this research has focused on dyadic relationships in groups, leader-member dyads, or two-person groups thus avoiding validation of FIRO as a group measure of compatibility. Although never explicitly stated, it is implied (Ryan, 1977; and Schutz, 1958/1966) that compatibility reflects a generally stable personality-like trait. Once a person's compatibility is measured and a compatibility profile computed, this index remains constant over time and situation.

According to Schutz, people have three interpersonal needs--inclusion, control, and affection. Each is evaluated on two planes, expressed and wanted. Together the combination of the six variables "constitute a sufficient set of areas of interpersonal behavior for the piediction and explanation of interpersonal phenomena" (Schutz, 1958/1966, p. 13). The accompanying FIRO-B instrument is a self-report measure of how an individual characteristically relates to other people. It measures both the behavior the individual expresses toward others (e) and the behavior the individual wants from others (w). "A matching of e's and w's for groups of

people seems likely to give information about compatible interaction" (Schutz, 1958/1966, p. 58).

Inclusion is defined as the need to establish and maintain satisfactory relationships with others through interaction and association. Control is defined as the need to establish and maintain satisfactory relationships with others through the exercise of power and authority and centers on the decision making process between people. Affection refers to the need for close personal and emotional feelings between individuals with its extremes represented by love and hate.

Each of these need areas can be exemplified in the group context. In groups, the need to be included is behaviorally manifested "by talking a great deal. Frequently these people are not interested in power or dominance but simply prominence" (Schutz, 1958, p. 21). Even negative attention paid to a joker can partially satisfy an individual's need to be included. The need for inclusion is met through interacting with others. It is unlike control in that the preoccupation is prominence not dominance and unlike affection because there is not strong emotional attachment.

Control behavior is often exhibited in a group setting by attempts to control the group task and generally centers around the decision making process between people. Control can also be manifested by constraining one's behavior toward others as in controlling expressions of emotions. The expression of control is displayed through the use of power and authority. Wanting control is displayed by expressing a need to be controlled and wanting responsibility removed.

Affection is displayed in group settings when a member makes strong overtures of friendship toward another. Being indiscriminately friendly toward all members is classified as inclusion, however. Affection between individuals is characterized by friendly, positive, close, and personal interaction. In groups, affection behavior is characterized by overtures of friendship while differentiating among group members.

Schutz (1958/1966) offers three equations for conceptualizing and measuring compatibility. The first, the reciprocal compatibility equation, reflects the degree to which members reciprocally satisfy each other's behaviors. "By comparing A's description of how he likes to be acted toward with B's description of how he likes to act toward people, and vice versa, a measure of mutual need satisfaction emerges" (Schutz, 1966 p. 107). Originator compatibility, the second equation, is based on

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individual preferences for giving or receiving a particular relationship behavior to or from a specifically identified interaction partner.

The third, interchange compatibility, refers to the mutual exchange of a given need area and is more appropriate for group contexts since it does not rely on interaction with a specific person. As an example, high affection interchange occurs when all particip its exchange a great deal of affectionate behavior to express those feelings. The "preferred amount of interchange is a characteristic of both an individual and a group" (Schutz, 1966 p. 110). More specifically, in the three need areas, interchange compatibility means that people must agree on how involved they want to become, how much authority structure the group will operate with, and the amount of closeness that will be displayed among the group members.

For a group situation, the interchange compatibility measured on each dyadic pair gives an index of dispersion from which to assess group atmosphere.

Since an individual entering a larger group usually finds it difficult to relate directly to one person, he must interact with the group as a whole. The atmosphere of the group may be described in terms of the amount of interchange occurring in each need area; hence his satisfaction would be determined to a large extent by the atmosphere into which he enters. This fact suggests, incidentally, that the often used term 'group atmosphere' may be explicated by the concept of interchange. 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. (Schutz, 1958/1966, p. 112)

Certainly interpersonal compatibility makes intuitive sense and has a comforting appeal. People often talk about the compatibility they feel towards others by indicating how attracted they are to others. From the FIRO perspective, the theory and its accompanying methodology are being used to screen large groups of people for personnel selection in such diverse occupations as nuclear submarine crews, policemen, firemen, and teachers for team teaching programs (Ryan, 1977). This indicates that those in charge of personnel decisions believe compatibility is important to work groups and task teams. Ryan goes on to indicate that "FIRO can be

used to establish groups, to analyze group dynamics, or to measure the outcome of group methods" (1977, p. 5).

The general assumption of Schutz's theory is that compatible groups are more efficient and research generally supports this assumption although some investigators have failed to find expected relationships between interpersonal needs and behavior in groups (Shaw, 1981). Schutz (1958/1966) hypothesizes that the greater the compatibility of group members, the more cohesive the group will be. Shaw (1988) also endorses that compatible groups are more effective in achieving group goals and that these groups are better satisfied.

Group Effectiveness

Group effectiveness is often used as an outcome measure in group studies and is expected to result if the communication process of the group is of high quality. Theoretically, compatible groups should engage in high quality interaction which should lead to high quality outcomes. Typically, effective groups are characterized as being effective in terms of both task accomplishment and favorable interaction on the affective dimension.

Hackman and Walton (1986) define overall group effectiveness as the degree to which the group's output meets the quality, quantity, and timeliness standards of those who review it; the degree to which the process enhances the capability of members to work together in the future; and the degree to which the group experience contributes to the personal growth and well-being of team members. Without a single, unidimensional criterion of group effectiveness, this definition can be translated into the multiple criteria of: a) feelings of cohesiveness, b) feelings of satisfaction, and c) external review of group tasks.

Acceptable task output can be defined both in terms of the group having a favorable response to their own work and in terms of an outside evaluation of the group's work. The capability of the group to continue to work together can be directly affected by feelings of not doing well on the task whether that feeling is brought about by group members' self-judgments or by external evaluation. It is expected that individuals in a group who believe they have acted effectively and produced a satisfactory outcome will have enhanced feelings of cohesiveness and satisfaction.

The assumed relationship between the two concepts of cohesiveness and satisfaction strengthens the argument that the two could be identified as outcome effectiveness measures for a group task. Cohesiveness provides a

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measure of individual-to-group attitude while satisfaction provides a measure of individual expectation fulfillment.

Cohesion

The more attracted group members are to one another, the more cohesive the group members should feel towards one another. Many definitions of cohesiveness exist as there is little research and methodological consensus for the construct. One of the most referenced is McGrath's (1984) definition. He defines group cohesion as the sum of positive and negative forces of attraction of group members to each other. These forces are related to communication patterns, behavior, perceived homophily, perceived status, and perceived group task success. Unfortunately, a methodology for measuring this operationalization is not given. Three alternative conceptualizations of cohesion also provide a way to measure the construct.

First, Stokes (1983) conceptualizes and measures cohesion as a combination of three constructs--risk taking, attraction to individual members of the group, and the instrumental value of a group. High multiple correlations among the three constructs suggest that cohesion is related to group outcome, again indicating that group cohesion is a function of both task and interpersonal dimensions. The central focus of this self-report instrument is group attraction.

Second, the Group Attitude Scale (Evans & Jarvis, 1986) defines attraction to group "as an individual's desire to identify with and be an accepted member of the group" (p. 204). The attraction to group variable has been equated to group cohesiveness because attraction is "significant in the development of a group and to the outcomes members can expect from group participation. . ." (p. 204). Evans and Jarvis developed the self-report scale to measure feelings about the group rather than behavior in the group. Testing of the instrument indicates that the Group Attitude Scale has high internal consistency even when used in a variety of groups and at different points in group development. Self-report scores have been highly correlated to observers' evaluations of the level of attraction to group of group members. Additionally, third party observers have scored interaction in an effort to distinguish among individuals' attraction to the group. These observations have helped in identifying behaviors expected to be displayed by attracted group members. This instrument, then, should aid in measuring cohesion in a group.

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A third operationalization of group cohesiveness is Wheeless, Wheeless, and Dickson-Markman's (1982) Group Solidarity scale. These researchers use McGrath's (1978) definition of cohesion as the basis for their definition of solidarity: "solidarity relationships refer to those in which closeness derived from similarity finds expressions in sentiments, behavior, and symbols of that closeness" (Wheeless, Wheeless, & Dickson-Markman, 1982, p. 375). Testing of the instrument indicates that perceptions of group solidarity are significantly and positively related to group satisfaction with solidarity as the predominant predictor in defining the social-affective dimension of groups.

Like cohesion, satisfaction is an outcome that results from group interaction. And often, the two variables are perceived to be related. If a group is cohesive, it is expected that group members will also be satisfied.

Satisfaction

Satisfaction is often expected to be an outcome resulting from effective group interaction. A line of research concerned with the measurement of individual group member satisfaction has been conducted by Wall and his colleagues (Wall & Galanes, 1986; Wall, Galanes, & Love, 1987; Wall & Nolan, 1986; and Wall & Nolan, 1987). Wall developed a Likert-type self-report measure for student task group satisfaction including both process and product related items. While the reliability has been substantially significant (generally in the upper .80's), the ability of of the instrument to capture respondent variation is low. It is difficult to assess whether the low variability is due to the instrument and the effects of what it is measuring, or if the low variability is more a result of the population under study. Up to this point, the instrument has only been used as a one-time representation of satisfaction.

The Wall measure of group member satisfaction is the only instrument that measures this construct in the group context. The Hecht (1978) Com-Sat Inventory measures interpersonal satisfaction in the dyadic context. Other measures of group satisfaction include variables from the larger organizational context.

Hypotheses

Shaw's (1988) hypotheses concerning group compatibility and cohesiveness and satisfaction have not been confirmed with Schutz's interchange compatibility as a group measure. Even though ideas--compatible groups are

more effective and members experience enhanced affective personal outcomes--have long been standard assumptions of group research, few have tried to measure compatibility as a group construct. It makes intuitive sense that the more effective individuals are in the input and formation stage (e.g., finding compatible others to join them in the task group), the greater the opportunity for group members to: a) feel more cohesive towards one another, b) feel satisfied with group process and task, and c) deal more effectively with the group task. The following hypotheses address these issues.

H1: Groups whose members are compatible will express more cohesiveness than groups less compatibly matched.

H2: Groups whose members are compatible will express more satisfaction than groups less compatibly matched.

H3: More compatible groups will produce more effective outcomes as measured by an external evaluator for the task problem.

Methodology

Subjects

Individuals who compose the groups for this study were students enrolled in a basic communication course at a large midwestern university. Students from many disciplines generally represented the traditional college ages (18-22) although a few nontraditional age students were interspersed throughout these classes. Females dominated the female to male balance by approximately a two to one ratio.

The course from which the subjects were drawn was a multi-section course in small group communication which was standardized across sections and combined theory lectures with experiential learning. The course syllabus clearly stated that group work was part of the class assignment and course grade. Two hundred and forty-eight students self-selected themselves into 47 groups for the course assignment. Subjects received extra credit toward their overall course grade for their involvement in the research project.

Group Formation and Assignment

Groups formed for the purpose of presenting two audience-participative workshops on group communication topics. As an aid to the task, ~roups were given 13 class periods to meet in groups. 3roups met seven times in

class before presenting the first workshop and an additional six times during the last half of the quarter to prepare for the second workshop.

Prior to self-selection, subjects participated in five class hours of introductory interaction. This allowed students to become acquainted and familiar with one another before choosing group members and to become accustomed to working in task oriented groups. Typical introductory and familiarization activities included small group and individual introduction exercises, group production tasks, group problem solving tasks, and exercises in which personal values, attitudes, and interests were expressed. For each activity, students were divided into small workgroups of five to seven members by some systematic means to enhance the opportunity for each student to interact with every other student.

Before and after activi'ies, instructors explained the importance of students' responsibility in selecting group members. During the socialization activities and group formation process, instructors were asked not to engage in any interaction or intervention that suggested any particular group of students be together. The subjects were told that after group member selection, the instructor would not impose other individuals (late-comers to the course) upon already formed groups. Late comers had the right to petition groups for membership. All groups were instructed that they also had the right to deny membership to anyone seeking it and that groups retained the right to reject a member upon reasonable and verifiable justification of member inactivity.

There was no attempt to control for age, sex, background, personality variables, or communication characteristics other than what the subjects imposed upon themselves as their own selection criteria. The groups were composed of no less than three and no more than seven members.

Of the 13 times the groups met as groups during class time, three sessions were selected for videotaping. The first session occurred at the second meeting (week 2-3) of the group. The second session videotaped was the meeting just prior to giving the first workshop (week 4-5). The third videotaped session was in the middle of the groups' preparation for the second workshop (week 7-8). Subjects were aware they were being videotaped during these three meetings.

Each group workshop was given a grade by the instructor along with constructive feedback for improvement. Students had knowledge of the grading criteria while they were developing the content and activities for

their workshop.   Each workshop grade counted as 10% of the students' course grade and the same grade was given to all group members.

Variable Definitions and Measures

Interpersonal Compatibility

Interpersonal compatibility is defined by Schutz's behavioral needs of inclusion, control, and affection.   The FIRO-B instrument was administered to subjects prior to group formation.   Behaviors expressed and behaviors wanted on each of the three dimensions are measured by nine items.   Each of the nine items vary around a single theme and can be answered with six responses ranging from "usually" to "never".   The subject must choose a single response category, but the specific choice may not be important to the score.   Acceptance-rejection cut-off points established from past research define a response on one side of the cut-off point as rejection of the item; a score on the other side is scored as acceptance.   The nine variations of a single theme and the acceptance-rejection cut-off serves to minimize subject invalidation of the instrument.   Examples of each of the six dimensions are shown here.

Expressed Inclusion: I try to be with people.
Wanted Inclusion: I like people to invite me to things.

Expressed Control: I take charge of things when I'm with people.
Wanted Control: I let other people strongly influence my actions.
Expressed Affection: I try to have close relationships with people.
Wanted Affection: I like people to act close toward me.

Obtaining the final scores on the FIRO-B instrument requires several data manipulation steps.   These are detailed in Schutz (1958/1966) and Ryan (1977).   A summary of individual FIRO scores is shown in Table 1.

insert Table 1 about here

According to Ryan (1977), interpretation of the mean scores of this population indicates that on the inclusion dimension subjects: a) are comfortable around people in social settings; b)   will tend to move toward people; and c) have a strong need to belong and to be accepted.   On the control dimension, this population scores moderately low indicating that these subjects are likely to: a) avoid making decisions; b) avoid taking responsibility; and c) abdicate responsibility while accepting control from others.   With respect to affection, these subjects fall in the moderate

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range indicating that they are neither: a) cautious about initiating relationships; or b) highly emotionally involved with others.

Several significant relationships were revealed when individual FIRO scores were subjected to Pearson product moment correlations. These are presented in Table 2.

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insert Table 2 about here

Within a group, permutations of all dyadic scores on each of the three dimensions were used in the interchange compatibility equation [the absolute value of (expressed need + wanted need of member one) - (expressed need + wanted need of member two)]. These scores reflect the degree of compatibility between each pair of group members. Within each group, the sum of the dyadic interchange differences represent an index of compatibility for each dimension. The larger the difference, the less compatible the group members. Table 3 summarizes the difference scores.

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Using the mean and standard deviation of the interchange sums for each dimension, high, medium and low compatibilities were determined for each dimension for each group. The groups that fell within one standard deviation of the mean were categorized as having medium compatibility on that dimension. The groups that fell above and below the medium category were classified as low and high compatibility, respectively. As a result, on each of the three dimensions, 16 groups were judged to have low compatibility, 16 were judged to have medium compatibility, and 15 were judged to have high compatibility.

From these results, each group still needed to be categorized as compatible or not compatible as an overall classification. Those groups that were similar on at least two of the three possible compatibility categorizations (e.g., high compatibility on inclusion and affection) were classified as being of that compatibility. If a group was dissimilar on each dimension (e.g., high inclusion compatibility, low affection compatibility, and medium control compatibility), then that group was labeled mixed compatibility. This second overall categorization resulted in 16 groups of low compatibility; 12 groups of medium compatibility, 10 groups of high compatibility, and 9 groups of mixed compatibility.

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Cohesion

Cohesiveness toward the group was measured with three instruments. Cohesion is defined as a group property with individual feelings of belongingness and attraction to the group. Specifically, group attraction was measured by a five item questionnaire developed by Stokes (1983). The 20 item Group Attitude Scale (Evans & Jarvis, 1986) was used to measure attitude toward the group. The 18 item Wheeless Solidarity Scale (Wheeless, Wheeless, & Dickson-Markman, 1982) measured the social-affective dimension of a group. All three instruments were administered immediately after each of the three videotaped group meetings. Reliabilities for each of these instruments and the other dependent variables are presented in Table 4; summary statistics for cohesiveness and the other dependent variables are presented in Table 5.

Satisfaction

Wall and Nolan's (1986) 10 item satisfaction instrument was used to gauge individual member satisfaction with both the interpersonal interaction in the group and the task. This instrument was administered with the cohesiveness instruments immediately after the videotaped group meetings. Internal reliabilities for this instrument at the three measurements are shown in Table 4; summary statistics are presented in Table 5.

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insert Table 4 about here

Group Grade

Each group was awarded a group grade for presenting their workshop. The course instructor's grade is the external evaluation of task group output. The grades were awarded on a 10-point scale ranging from excellent (10) to failure (0). Summary statistics for group grades are presented in Table 5.

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insert Table 5 about here

Results

Although each of the cohesiveness measures emphasized different factors of cohesiveness, the measures were expected to be correlated. A Pearson product moment correlation was produced for each pair of the cohesiveness measures and are shown in Table 6.

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insert Table 6 about here

Similarly, the cohesiveness measures were also expected to be correlated to the satisfaction measure. These correlations are presented in Table 7.

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Hypotheses one, two, and three were based on the compatibility classifications and were tested by subjecting the data of the 47 groups to one-way ANOVA procedures with the Tukey method for comparisons among the four classifications of compatible groups. The overall compatibility classification was used as the independent variable while group indices of each of the three measures of cohesiveness, satisfaction, and the group grade for each workshop presentation were used as separate dependent variables. The compatibility categorization process resulted in four categorizes of 16, 12, 10, and 9 groups. For a large effect size (.40) and a power of .80 at the .05 level of significance, 18 groups per category are required. For an effect size of .50 with the other criteria being constant, 12 groups per category are required (Cohen, 1977).

Of the one-way ANOVAs performed, four produced significant results. Group attraction (2) showed a significant difference among the four compatibility classifications ($F = 3.97$, df = 3,43 $p = .0140$) with group compatibility accounting for 21% of the variance. Group attitude (2) produced significant results ($F = 2.94$, df = 3,43 $p = .0439$) with compatibility accounting for 17% of the variance. Solidarity (2), also yielded significant results ($F = 5.04$, df = 3,43 $p = .0044$); compatibility accounted for 26% of the variance. Group attraction (3) yielded significant differences ($F = 3.64$, df = 3,43, $p = .020$) with compatibility accounting for 20% of the variance.

The Tukey test for simple comparisons among groups further supported the differences. Each of the cohesiveness measures were responsible for differences among groups (df = 43, alpha = .05). Group attraction (2) supported differences between the high and mixed compatibility groups. Group attitude (2) resulted in differences between the high and mixed compatibility groups. Solidarity (2) yielded differences between high and low groups, and high and mixed compatible groups. Group attraction (3)

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supported differences between the high and low compatibility groups. Table 8 displays the data.

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insert Table 8 about here

The ANOVA procedures did not produce significant differences for the hypotheses predicting compatible groups would report greater satisfaction or receive higher task outcomes in terms of group grade.

Thus, in this compatibility measurement procedure, the results are mixed. The first hypothesis received support as compatible/incompatible groups differentiated on the cohesiveness measures. Generally, highly compatible groups were more cohesive followed by the medium, low, and then mixed compatible groups. Hypothesis two predicted compatible groups would be more satisfied. This hypothesis was not supported. The third hypothesis regarding compatible groups and effective group outcome (group grade) was not supported.

These results also show that some individuals can select themselves into compatible groups with others consistent with the FIRO-B compatibility dimensions of inclusion, control, affection. It also appears some individuals are better at this than others since the groups were spread among the high, medium, low, and mixed compatibility classifications.

Discussion

This project used classroom groups whose members selected one another to complete two group tasks. The task had outcome consequences for the subjects in terms of a shared group grade, and, maybe more importantly, the task also had process consequence for the subjects. It is easy to degrade the importance of classroom task groups; however, these groups interacted for 10 weeks. The project evaluated 248 subjects in 47 groups on both group process and group task measures at several points during group history. Data were collected before group formation, and once each in the group's early, middle, and late history. Beyond the group task, each individual group member wrote two data based papers about their experiences in the groups. Subjects were clearly immersed in these groups. These groups are full-fledged groups in that group members must interact and be interdependent to produce a group outcome from which members share a common fate.

Using Schutz's FIRO-B methodology for determining compatible groups,

some individuals are better than others at selecting compatible group members. What is not known from this study is if those individuals who selected themselves into the FIRO-B defined compatible groups were aware that they were doing so. Was group member selection that resulted in compatible groups a result of a conscious and overt attempt on the part of the subjects to do so? This cannot be answered directly. But it does seem that some subjects intuitively applied use of those dimensions.

One reason that some groups may have been classified as having low or mixed compatibilities is that some people may not have been as aware of the selection process, or motivated to attend to the selection. Second, in a group of 30 people, it is possible that the mix of people did not allow for more than a few compatible groups. It may be that individuals who are adequately stimulated by the selection process actively seek out compatible others in the class. From the researcher's informal observations, it appeared that high achievers and assertive individuals are drawn to similar others. Those individuals who do not actively attend to the selection process were "left over" and fell into one group. Those individuals who were somewhat active in the selection process formed groups somewhere between these extremes. Third, the compatibility classifications may be affected by the variability of the reliability coefficients for the six FIRO-B factors which ranged from the .70's to the .90's.

The process of classifying compatible groups was similar to the process used by Downs and Pickett (1977) although they weighted the affection dimension before classifying high, medium and low compatibilities for 5-person groups. Shaw and Webb (1982) used matched assignments to groups; Reddy and Byrnes (1972) used random assignment; and Frandsen and Rosenfeld (1973) extensively explored each of the FIRO compatibility equations for dyads in groups. In each instance, the compatibility classification did help in understanding outcome differences among groups.

Downs and Pickett (1977) identified an interaction between compatibility and group leadership, discovered that incompatible groups did not suffer from incompatibility as much as Schutz predicts, and were intrigued by overpersonal (highly compatible) groups. Their last finding indicated that overpersonal groups showed the most, yet inconsistent reaction to different types of leadership. They suggest this may offer one possible explanation of why researchers do not always find consistent relationships between productivity and satisfaction.

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Shaw and Webb (1982) conducted two studies with FIRO classified groups. In the first, they found that members of 2-person groups who were compatible on the control dimension performed poorly. In a second study on 4-person groups, the same results were found in addition to the conclusion that inclusion compatibility and performance were not related. The Reddy and Byrnes (1972) study concluded that incompatible groups may be effective over the short term, but that their effectiveness dissipates over time.

Frandsen and Rosenfeld (1973) used each of the three compatibility indices (originator, reciprocal, and interchange) suggested by Schutz (1958/1966). Although their subjects were in dyadic pairs, these researchers concluded that while the FIRO-B questionnaire taps separate dimensions, the three different compatibility equations did not distinguish between compatible and incompatible groups.

Hypotheses one, two, and three predicted that those members in groups judged to be compatible would experience more cohesiveness and satisfaction and produce better task outcomes than members of groups who were less compatible. No differences were found for those measurements taken at the first videotaped meeting. Each of the cohesiveness measures (group attraction, group attitude, and solidarity) did differ among compatibility classifications at the second measurement. The high compatibility groups had the highest scores on each of the cohesiveness measures, followed by the medium, low, then mixed compatibility groups. While the same pattern of differences exist for all the cohesiveness measures, the only statistically significant differences were between the high and mixed or high and low compatibility groups. At the third measurement, only the group attraction measure yielded significant differences between the high and low compatible groups. No differences were found in satisfaction or outcome (grade) with respect to compatibility classification.

Several explanations exist. Predicting a difference among compatibility classifications for the first videotaped meeting may have been expecting too much. This meeting occurred during the second or third week of the groups' life cycles and all the groups may have been experiencing similar group processes. Expecting differences at the second administration (fourth or fifth week and right before the completion of the first group task) seems more realistic in that the groups were experiencing time pressure at this point and reacting in different ways. The effect of compatibility classifications weakened at the third measurement (seventh or

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eighth week). Possibly this is a result of groups growing tired of the task or expecting their efforts to make more of a difference when evaluating the time and effort spent for the first group workshop in relationship to the outcome (grade) they received.

The cohesiveness measures appear to be tapping similar constructs. All had high internal reliabilities and were moderately to highly correlated with one another. Item analysis indicates that all but one item of the solidarity scale differed significantly from the neutral response range at the first measurement. In the subsequent measures (time two and time three) item analysis indicate that about half of the items differed significantly from the previous measure.

Interesting to note is the variability of the construct over time. Two of the cohesiveness measures, group attraction and group attitude, were highest at the first group meeting and then gradually declined at the second and third group meetings. These data behaved as expected with cohesiveness declining as the pressures of the group task affected the social dimension of the group. Of these two, group attitude appears more sensitive to group developmental changes as mean measures differ significantly from time 1 to time 2 and from time 2 to time 3.

The third cohesiveness measure, solidarity decreased slightly at the second group meeting, and then peaked at the third group meeting. Ralston, Purcell, and Scudder (1987) indicate that their statistical analyses of the group solidarity instrument points to problems with considering group solidarity as a cohesiveness measure. They believe that the instrument relies too heavily on attraction-to-group and strongly worded items. They further indicate that the scale does not seem sensitive to developmental changes within the group. Although the mean measure of solidarity did not significantly differ at the three measurements, variance in group composites of solidarity did differ significantly from time 1 to time 2.

Even though satisfaction was correlated to the cohesiveness measures and had high internal reliabilities, the instrument yielded no differences with respect to compatibility. It is a logical expectation for compatible groups to be more satisfied with the task or process characteristics of the group. Post hoc ANOVAs on the separate task and process components of the satisfaction instrument did not yield any significant relationships. Item analysis of the satisfaction instrument indicates that at the first measure, each item differed significantly from the neutral position. At

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subsequent measures, item analyses indicates that at least half of the items differed significantly from the previous measure.

The satisfaction instrument asks questions directly about being satisfied with both the group process and the group task. Other questions on the instrument are framed in terms of being frustrated by what is happening in the group interaction. Lack of significance in this study points to the complexity of the satisfaction variable. It may not be enough to ask if one is satisfied or, conversely, if one is frustrated. What makes one satisfied or frustrated with the group process and task may be better questions to ask.

Limitations

Several limiting factors can be identified as explanations for the few significant results of this study. First, the population was students. However, this researcher believes that this limitation was overcome by a research design that captured data from the overall group process. The research project was embedded into the course structure and students did not report that the taping of their meetings bothered or hindered the group process.

A second limitation is the project's reliance on self-report measures. It was determined that subject self-report measures should be tested against other subject self-report measures and those relationships should not be clouded by an additional source of bias and variance. Roskos-Ewoldsen and Liska (1987) comment that depending upon the questions asked, using self-report measures are superior to external observers for "observers may have little access to information about the nature of the relationship among the interactants. In the case of on-going groups, for example, observing and describing past encounters is essential to understanding current interactions. . ." (p. 4).

Third, measurement of group outcome is always problematic in studying the link between group inputs and outputs. Hirokawa and Poole (1986) indicate that the majority of communication studies measure output on three levels: a) solution quality, b) group-level socioemotional results, such as commitment and cohesion, and c) individual results, such as satisfaction and motivation. This study used all three levels of outcome measurement at different points in the group process. The only significant measures of outcome were the three cohesiveness measures.

It is disappointing that using grades as task outcome did not fare

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better. This could suggest that outcome may be an internal process and one that cannot be effectively judged externally. A group may feel they have performed effectively even though their results are judged to be less than highly effective by others. Anytime grades are used as a source of task outcome, difficulties can be expected. Bias and variance introduced by the several instructors involved in this project is one source of problem in addition to the small variation in the grades. There is some indication that an instructor sees the difference between highly effective outcomes (grades of A and A-) and moderately effective grades (grades in the B range) as substantial while student subjects perceive the grade as only one part of their total course grade or, and this researcher believes more importantly, not as a direct reflection of the group process that produced the output.

Conclusions and Implications

The FIRO-B compatibility measure was a weak predictor of group effectiveness. Further investigation of the interchange equation indicates that the equation does not account for compatibility imbalances. For example, in the equation, person's A scores of 8 and 0 combined with person B's scores of 1 and 1 result in the absolute value of 6. Similarly, person C's scores of 4 and 4 combined with D's scores of 1 and 1 result in the same absolute value of 6. Clearly in the first computation, the two sets of scores reflect individual imbalance (A) and balance (B) in expressed and wanted behaviors. The second set of scores reflect individuals who are both balanced at different intensities. Should these two conditions be interpreted similarly and contribute in the same way to a group index of compatibility?

A Second Analysis

The data were re-analyzed using multiple regression techniques and additional compatibility formulations. The three components of compatibility--inclusion, control, and affection--were used as multiple independent variables and cohesiveness, satisfaction, and group outcome were used as individual dependent measures. Rather than fitting the FIRO interval data into compatibility classifications, the data were left in raw numerical form and tested in the interchange as well as the reciprocal compatibility equation (the absolute value of the expressed need of member one minus the wanted need of member two plus the absolute value of the

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expressed need of member two minus the wanted need of member one). The originator equation was dropped from the analyses; negative totals confirmed that the this formula was inappropriate for the group context.

Still taking each dyadic expression, ιe interchange and reciprocal equations were calculated as for the initial analyses except here totals were divided by the number of dyadic permutations in the group to allow for better cross-group comparisons of compatibility. The descriptive compatibility statistics are shown in Table 9.

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insert Table 9 about here

One way to evaluate the similarity of the interchange and reciprocal equations is to test for correlations among each equation's components as well as correlations between components of the two equations. Results of interest are shown in Table 10.

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insert Table 10 about here

In the first run of regressions, the number of subjects in the groups was used as a weighting factor to account for the different amounts of variance caused by unequal numbers in group membership. This weighting procedure generates a least squares model to produce more reliable estimates in the dependent variables of cohesiveness, satisfaction, and group grade. In a second run of regressions, individual regressions were run for each level of group membership; thus the weighting factor was dropped. In both of these runs all three indices of cohesiveness were combined into one composite measure of cohesiveness as the instruments were moderately to highly correlated, yet theoretically were developed to capture separate components of cohesiveness. No significant results were obtained at the .05 level of significance on any of these regressions. The descriptive statistics for the composite cohesiveness measure are shown in Table 11.

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insert Table 11 about here

The regressions were run a third and fourth time on each of the individual cohesiveness measures using both the mean and median of the dependent variables. Regressions were also ran on the median of the

satisfaction measure. Again, none of the regressions resulted in significant differences due to compatibility. Plots of residuals and predicted values were constructed for all regressions in the second analysis. Visual inspection of the plots did not indicate that unusual variability could account for the lack of significant results.

These results provide interesting conclusions. First, there appears to be little differentiation between the reciprocal and interchange formulas when used in the group context. The group totals from the reciprocal and interchange equations were moderately to highly correlated within dimensions (.654 to .891). Not finding any variation of either compatibility equation to significantly distinguish among cohesiveness, satisfaction, or task outcomes brings this conceptualization of compatibility into question.

Second, further study should be done using both compatibility equations to determine which equation, if any, is appropriate for measuring group compatibility. Unless more variance can be accounted for, however, determining the more appropriate equation might be a moot point. Typically, regression analyses that retain the full power of the raw data are a superior test to ANOVA procedures. Since the initial ANOVAs did result in some significance it is expected that the categorization of groups into high, medium, low and mixed compatibility were artificial representations of group compatibility as measured by the interchange equation. The categorization of groups resembled a process used by Downs and Pickett (1977); this process, however, may be susceptible to faulty aggregation.

Third, the definitional focus of effectiveness as a dependent variable may be the issue here. A critical viewpoint raised by Schwartzman (1986) is that researchers have

> imposed their own criteria of work group effectiveness onto the groups that they have studied (criteria such as task performance, task completion, goal attainment, productivity, and decision quality) without considering the fact that the members of a work group may have their own very different view of what constitutes "work" as well as "effectiveness". (p. 261)

In future group compatibility and effectiveness research may be enhanced by asking group members to define group and personal effectiveness. Perhaps we have been too long in assuming that external observation and measurement

can determine what makes a fulfilling group experience.

Summary

The topic of group member compatibility deserves more attention. Theoretically, Trenholm (1986) reports that "Schutz's theory may be used to explain why people either join or refuse to join groups" (p. 177). She acknowledges, however, that initial compatibility may not sustain through group development. Schutz's method of measuring compatibility implies that compatibility is a static concept and that compatibility does not respond to the interaction of the group. Trenholm continues, "Compatibility between group members is largely a matter of their ability to intermesh and satisfy each other's interpersonal needs" (p. 177). However, an initial measure of compatibility does not guarantee that those relationships will develop or be sustained.

Methodologically, these data suggest that it may be inefficient and inappropriate to compute group compatibility from equations that measure internal dyadic compatibilities. Even though a specific dyad in a group is compatible, the behavior and interaction of other group members may be an intervening factor causing a compatible dyad to be ineffective in the group context. The complexity of group interaction as well as the competition for attention among the group's many members may keep specific dyadic compatibilities from surfacing.

Further, defining group compatibility by measuring dyadic compatibility runs contrary to the notion of group synergy--that a group may be more than an additive function of its parts. The compatibility literature has largely relied on the assumption that the three variables that compose Schutz's FIRO--inclusion, control, and affection--are the responsible variables. Little investigation has validated this assumption. We should question if compatibility is: a) a composite measure; b) more prominent on one of Schutz's dimensions; or c) some combination of other dimensions. Perhaps there is an issue of task compatibility that underlies the complexity of group interaction and group performance. As an example, a social group may be very compatible in planning activities for their own entertainment. When an externally created and evaluated task is introduced into this group, however, compatibility may suffer and fail to carry the group to an acceptable task outcome.

Beyond the methodological issues raised in the re-analysis of the data, several practical issues need to be investigated with respect to

compatibility: a) what distinguishes those who can select compatible group members from those who cannot; b) should we rely on a pen and paper measure of compatibility or an authority figure to make group assignments; and c) given the opportunity to select group members is task compatibility, interpersonal compatibility, or a combination of the two the issue? Answers to these questions and further investigation of the methodological problems will help to determine if compatibility is a useful discriminator in distinguishing effective from ineffective groups.

TABLE 1
Individual FIRO-B Data

Variable	Mean	S.D.	Internal Alpha
Expressed Inclusion	5.645	1.826	.701
Want Inclusion	6.535	2.292	.911
Expressed Control	3.566	2.307	.842
Want Control	4.081	2.138	.794
Expressed Affection	4.756	2.584	.843
Want Affection	5.387	2.580	.830

n = 248

TABLE 2
Significant FIRO-B Dimension Correlations

	Want Affection	Want Control	Expressed Inclusion	Expressed Affection	Expressed Control
Want Inclusion	.461 (<.01)	.119 (.030)	.613 (<.01)	.434 (<.01)	.210 (<.01)
Want Affection			.390 (<.01)	.684 (<.01)	
Want Control			.116 (.034)		
Expressed Inclusion				.553 (<.01)	
Expressed Control			.224 (<.01)		

n = 248

TABLE 3
FIRO-B Compatibility Difference Indices

Compatibility Dimension	Mean	S.D.	Minimum	Maximum
Inclusion	61.723	34.278	10	144
Affection	63.532	30.753	15	174
Control	56.170	27.438	8	128

n = 47 groups

TABLE 4
Reliabilities for Cohesiveness and Satisfaction Measures

Instrument	Time 1	Time 2	Time 3
Group Attraction (n =)	.738 (227)	.776 (214)	.722 (206)
Group Attitude (n =)	.888 (225)	.908 (214)	.917 (203)
Solidarity (n =)	.906 (225)	.942 (213)	.957 (201)
Satisfaction (n =)	.911 (213)	.939 (211)	.916 (204)

TABLE 5
Summary of Group Variables

Variable (Meeting)	Mean	S.D.	Minimum	Maximum
Group Attraction (1)	18.893	1.788	14.250	21.750
Group Attraction (2)	18.243	2.378	13.000	22.400
Group Attraction (3)	17.893	2.241	10.400	22.000
Group Attitude (1)	114.419	8.378	84.000	128.500
Group Attitude (2)	111.541	10.206	88.600	131.250
Group Attitude (3)	108.982	10.495	82.800	136.750
Solidarity (1)	63.718	5.878	47.333	73.600
Solidarity (2)	63.104	8.491	42.167	76.200
Solidarity (3)	64.200	8.590	37.000	81.500
Satisfaction (1)	53.820	4.894	40.333	62.200
Satisfaction (2)	51.274	6.413	36.000	63.750
Satisfaction (3)	49.816	6.987	27.200	66.250
Satisfaction (4)	50.467	7.114	32.333	66.500
Workshop Grade (1)	6.532	1.600	2.000	10.000
Workshop Grade (2)	7.064	2.026	2.000	10.000

n = 47 groups

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TABLE 6

Relationships Between Group Cohesiveness Measures

	Group Attitude	Solidarity
	Time 1	
Group Attraction	.699	.761
Group Attitude		.860
	Time 2	
Group Attraction	.872	.935
Group Attitude		.902
	Time 3	
Group Attraction	.771	.810
Group Attitude		.863

n = 47 groups; probability = .0001

TABLE 7

Correlation Between Satisfaction and Cohesiveness Measures

Satisfaction to	r	probability
Time 1		
Group Attraction	.621	.0001
Group Attitude	.772	.0001
Solidarity	.742	.0001
Time 2		
Group Attraction	.788	.0001
Group Attitude	.845	.0001
Solidarity	.816	.0001
Time 3		
Group Attraction	.596	.0001
Group Attitude	.750	.0001
Solidarity	.751	.0001

n = 47 groups

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TABLE 8

Differences Between Groups on Cohesiveness Measures

Cohesiveness Measure	Compatibility		Mean	N of Groups
Group Attraction (2)	(a)	mixed	16.831	9
		low	17.666	16
		medium	18.587	12
	(a)	high	20.023	10
Group Attitude (2)	(a)	mixed	106.128	9
		low	109.345	16
		medium	112.942	12
	(a)	high	118.248	10
Solidarity (2)	(a)	mixed	57.144	9
	(b)	low	60.741	16
		medium	65.586	12
	(a,b)	high	69.270	10
Group Attraction (3)		mixed	17.473	9
	(b)	low	16.857	16
		medium	18.225	12
	(b)	high	19.528	10

(a) = significant differences between mixed/high groups
(b) = significant differences between low/high groups

TABLE 9

Descriptive Statistics of Second Analyses

Variable	Mean	S.D.	Minimum	Maximum
Reciprocal Equation				
Inclusion	8.425	2.462	3.200	13.200
Control	9.027	2.512	2.400	14.000
Affection	8.792	2.137	3.600	12.952
Interchange Equation				
Inclusion	6.143	2.562	1.000	11.400
Control	5.188	2.162	1.200	12.381
Affection	6.984	2.313	2.800	12.381

n = 47 groups

TABLE 10
Correlations of the Interchange and Reciprocal Equations

	Recip Affection	Recip Control	Inter Inclusion	Inter Affection	Inter Control
Recip Inclusion	.232 (.116)	.099 (.509)	.778 (<.001)		
Recip Affection		-.161 (.278)		.891 (<.001)	
Recip Control					.654 (<.001)
Inter Inclusion				.113 (.450)	.051 (.733)
Inter Affection					-.089 (.553)

(probability)
n = 47 groups

TABLE 11
Composite Cohesiveness Measure

Measure	Mean	S.D.	Minimum	Maximum
Composite 1	197.77	16.03	140.75	221.00
Composite 2	192.89	20.45	145.17	227.50
Composite 3	191.07	20.30	130.20	239.75

n = 47 groups

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