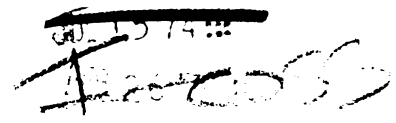
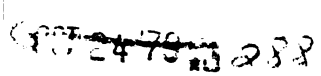
SIMILARITY AS A BASIS FOR INTERPERSONAL ATTRACTION AMONG GROUPS IN LONG-TERM ISOLATION

Thesis for the Degree of M. A.
MICHIGAN STATE UNIVERSITY
ROBIN RICHARD VALLACHER
1972





SEP 0 5 2007

ABSTRACT

SIMILARITY AS A BASIS FOR INTERPERSONAL ATTRACTION AMONG GROUPS IN LONG-TERM ISOLATION

By

Robin Richard Vallacher

The present study investigated the role of similarity in friendship formation. Research in the area of interpersonal attraction and friendship formation is marked by conflict in theory and inconsistency in empirical findings. Particularly confusing is the role of similarity in attracting individuals to one another. This confused state of affairs is in part due to the limited generalizability of the settings and subject samples employed in many of the studies dealing with this issue. The present study avoided such difficulties by examining natural groups in a field setting. Specifically, groups of men who lived and worked together for approximately one year in an isolated environment (Antarctica) were examined to see if any consistent relationships between

friends could be found. Correlational analyses were used to assess these relationships.

Contrary to prediction, friends in Antarctica were found to be similar on few personality dimensions, and only slightly similar in background characteristics. While in Antarctica, however, friends did tend to develop similar attitudes regarding their station group experience. On the other hand, as predicted, pairs of individuals who avoided each other as friends were significantly different on various dimensions and tended to develop conflicting attitudes while in Antarctica. It appears, therefore, that in a stressful task-oriented situation it is easier to predict incompatibility than compatibility on the basis of various traits and characteristics of the individuals involved.

It was also predicted that depending on how salient a given dimension is for an individual, he should be attracted to a larger or smaller range of people on that dimension. The results of the analyses of this hypothesis were generally nonsignificant, although the results for several personality measures were in the predicted direction. Thus, at least to some extent,

individuals who were "high" on a personality dimension tended, as a group, to have as friends individuals who were relatively homogeneous on that dimension, i.e., they were similar to each other.

Several aspects of the setting involved in this study were discussed as possible reasons why more significant results were not obtained. Some of these (task-orientation, prescribed membership, temporary suspension of common psychological needs) were held as more tenable than others (dissatisfaction with self, dissimilarity as stimulation in a monotonous environment).

Various theoretical and methodological problems with the published research in the area of friendship formation and interpersonal attraction were discussed. Some of these (single trait approach, unknown relationship between test responses and behavior, use of correlational analyses) were evident in this study, while others (control of temporal factors, examination of nonlinear relationships) were not.

SIMILARITY AS A BASIS FOR INTERPERSONAL ATTRACTION AMONG GROUPS IN LONG-TERM ISOLATION

By

Robin Richard Vallacher

A THESIS

Submitted to
Michigan State University
in partial fulfillment of the requirements
for the degree of

MASTER OF ARTS

Department of Psychology

1972

To the members of my karass, one and all!

ACKNOWLEDGEMENTS

This thesis would have been impossible without the invaluable assistance given me by members of the Navy Medical Neuropsychiatric Research Unit in San Diego, California. In addition to making the data for this thesis available to me, they assisted a great deal in the analyses and provided me with relevant Unit reports and publications. I especially wish to thank Dr. E. K. Eric Gunderson, Head of the Operational Psychiatry Division, who made the data and assistance available to me; Mary Paul, who wrote the necessary computer programs; and George E. Seymour, a good friend as well as a competent research associate, who provided much assistance and acted as the liaison between the Unit and myself at all stages in the development of this thesis.

I would also like to thank the members of my thesis committee, Dr. Lawrence A. Messé, Dr. Gary E. Stollak, and Dr. William D. Crano, for their assistance and patience during the writing of this thesis. I would

like to give special thanks to Dr. Messé, the committee chairman, who made helpful comments on the early drafts.

This research was supported by the Bureau of Medicine and Surgery, Navy Department, under Research Work Unit MF12.524.001-9003D. Opinions expressed are those of the author and are not to be construed as necessarily reflecting the official view or endorsement of the Department of the Navy.

TABLE OF CONTENTS

TABLE OF CONTENTS (Cont.)

LIST OF TABLES

The purpose of this thesis is twofold: 1) to review theoretical approaches and research findings regarding interpersonal attraction and friendship formation; and 2) to relate these to the problem of interpersonal attraction in groups in long-term isolation. More specifically, groups of men who "wintered-over" at United States Antarctic scientific stations were examined on a wide variety of measures to see if there are any consistent relationships between friend pairs. In addition to providing a test of several issues in interpersonal attraction (e.g., similarity vs. complementarity, the role of temporal factors, etc.), the present study was designed to identify factors which contribute to the prediction of compatibility under unique and often stressful circumstances. This latter aspect has increasing relevance as man more and more must adapt to new and continually changing conditions such as increasing loss of "personal space."

Perhaps the most parsimonious model relevant to the prediction of interpersonal attraction involves the notion of similarity along various dimensions between

individuals who are attracted to one another. No one, of course, maintains that similarity is the sole determinant of interpersonal attraction. Other important factors include such things as propinquity (e.g., Festinger, Schacter, and Back, 1950), the reinforcing properties of the situation (e.g., Lott and Lott, 1960), the temporal length of the relationship (e.g., Rosenfeld and Jackson, 1965), characteristics like boastfulness and self-depreciation (Pepitone, 1964), the respective status of each individual (e.g., Jones, 1964), and perceived liking for oneself on the part of the other person (e.g., Backman and Secord, 1959). However, these other factors are not as potentially useful in choosing the composition of groups as is the similarity principle. Those factors that are related to the situational context (e.g., reinforcing properties of the situation) give no clue as to the possible influence of personality variables, while those factors that do relate to personality either are not of a predictive nature (e.g., perceived liking for oneself) or are contingent on the situational context (e.g., the respective status of each individual).

Theoretical Support for Similarity-Attraction Hypothesis

Several theories are often advanced to support the idea that similarity is conducive to positive interpersonal attraction. Some of these appear to be more relevant to the problem at hand than others. Similarity between friends would seem to follow naturally from the various consistency theories. Heider's balance theory (1958), for example, holds that people strive to make their sentiment relationships harmonious with their perception of the unit relationship existent between objects. According to Heider, separate entities which are similar tend to be perceived as belonging together (having a unit relationship). Thus, positive unit formation (perceived similarity) should induce a harmonious sentiment relationship (liking). However, this line of reasoning is not particularly convincing since it is abstract and non-intuitive, that is, it doesn't consider attraction from the point of view of a person's needs, feelings, etc.

A much more intuitive notion is that similarity facilitates attraction because it allows for the prediction of another's future behavior. If a person appears

sociable and says he likes to be included in group activities, we may reasonably expect that he will engage in group activities at every opportunity. If we ourselves are also high in need for affiliation, we may like another who we know to be similarly high on that need--not for reasons of cognitive consistency but simply because we anticipate many rewarding interactions, engaging in affiliative behavior with someone who also enjoys engaging in affiliative behavior.

Another possible reason, related to the one described above, involves the notion of perceived liking for oneself on the part of the other person. It has been shown that people tend to like those who like them. It may be the case that when we learn that another is similar to us, we assume that he is likely to like us, and thus we in turn like him.

Perhaps the theoretical approach concerning similarity and attraction that is the most directly relevant to the conditions in the present study is Festinger's theory of social comparison (1954). The theory states that the individual has a drive to evaluate his opinions and abilities, and that the opinions and abilities of others will be used as a basis of comparison when no

objective criteria for evaluation exists. Persons who are similar to oneself provide more precise comparisons than do those who are dissimilar, and the similarity functions as reinforcement. Because of the greater amount of reinforcement provided, similar persons are more attractive than dissimilar ones. Although this theory is more concerned with the evaluation of one's opinions and abilities through comparison with others, it has been extended to the evaluation of one's personality (Griffitt, 1966). Given the unique circumstances in which the Antarctic volunteer finds himself, and hence the lack of objective criteria by which to judge his feelings, attitudes, behavior, etc., it seems plausible that something like social comparison would operate in friendship formation.

Theoretical Support for Complementarity-Attraction Hypothesis

In contradiction to the folk adage that "birds of a feather flock together" is the equally popular idea that "opposites attract." A leading proponent of this point of view is Winch (Winch et al., 1954), who developed a theory of "complementary needs." Although his theory and research

were primarily concerned with married and engaged couples, he felt that the basic idea could be extended to interpersonal attraction in general.

There are two general reasons why persons who differ in need structure should be attracted to each other. First of all, each member of the dyad finds interaction mutually or reciprocally rewarding because his needs are expressed in behavior that is rewarding to the other person. For example, a person with strong nurturance needs behaves in a protective, nurturant manner toward another person who has strong needs to be dependent. In this way, each individual satisfies the needs of the other person, and is in turn satisfied.

A second general reason is that persons are attracted to others who have characteristics to which they once aspired, but were prevented by circumstances from developing. Instead, they have modeled themselves after the image of a person with the opposite traits, but they find themselves attracted to individual who possess the once-coveted traits because of feelings of wistful admiration. This second idea concerning need complementarity and interpersonal attraction reflects the "need completion principle" advanced by Cattell and Nesselroade (1967).

Considering the context of the present investigation--groups of men isolated for a long period of time in a monotonous environment--it might reasonably be expected that individuals would be attracted to dissimilar rather than similar others, at least on certain dimensions. Dissimilar others can provide varied stimulation, such as different points of view and insights with life, new interests, unpredictability. Hence some degree of excitement may be generated by interacting with these persons. Conversely, it may be that individuals would prefer to interact with dissimilar others, except that they fear they would not be as well liked by dissimilar others as they are by similar others. Walster and Walster (1963) found that individuals who were confident that everyone they came in contact with would like them were likely to associate with dissimilar others. On the other hand, they found that when it was especially important to be liked, or when one was unsure of his likability, an individual was likely to "play it safe" and to associate with similar people.

Methodological Approaches to Similarity-Attraction Hypothesis

Just as there are several theoretical approaches relevant to the role of similarity in interpersonal attraction, different methods of investigation are employed by various investigators. One approach involves comparing an individual's test responses on some measure with the test responses of his friends. The scores of the pairs are then correlated and often compared with similar correlations for random pairs within the same population or with pairs of mutually antagonistic or mutually indifferent subjects. In another general approach, the measure or measures are obtained, and then previously unacquainted subjects are placed in a situation requiring some degree of interaction. Thus, similar and dissimilar pairs or groups are created, and their interpersonal responses are assessed following the interaction. Yet another method has been employed by Byrne and his colleagues (e.g., Byrne, Griffitt, and Stefaniak, 1967). This method involves first obtaining the test responses of a subject and then presenting him with the test responses of a "stranger" and asking the subject to evaluate the stranger on various dimensions. The test responses of the "stranger" are

actually created by the experimenter to be similar to the test responses of the subject on from 0 to 100% of the items.

Review of Similarity-Attraction Literature

Despite the amount of research that has been conducted regarding the relative effects of similarity and complementarity on interpersonal attraction, the issue is far from settled. First of all, there are problems inherent in the methods described above which confuse the interpretation of the results found in many studies (some of these problems are discussed below). Also, whether similarity or complementarity is a better predictor of friendship is no doubt dependent in part on the situational context (e.g., task versus social-emotional orientation) as well as on the kinds of variables being considered.

Generally, similarity on such characteristics as age (Glick and Landau, 1950; Hollingshead, 1951), race (Golden, 1954; Morton, 1941), religious affiliation (Hollingshead, 1950; Thomas, 1951), ethnic origin (Bossard, 1939), economic status (Byrne, Clore, and Worchel, 1966),

education (Landis, 1945), and previous marital status (Bowerman, 1953) has been shown to have a positive effect on compatibility.

Attitudinal similarity has also been found to be positively associated with interpersonal attraction. Newcomb (1961), for example, in a study of friendship formation among male university students, found support for the general hypothesis that given adequate opportunity for individuals to become familiar with each other's attitudes, attraction is predictable from actual attitudinal agreement. Other studies, of a more experimental nature, have also supported the proposition that attitude similarity is a determinant of interpersonal attraction. Byrne and Nelson (1965), for example, showed that attraction is a positive linear function of the proportion of similar to dissimilar attitudes rather than the absolute number of similar attitudes.

With regard to personality variables, however, the results have been less consistent. Evidence has been found to provide support for the similarity hypothesis (Banta and Hetherington, 1963; Izard, 1960a, 1960b; Maisonneuve, 1954; Mehlman, 1962; Miller, Campbell, Twedt,

and O'Connell, 1966; Murstein, 1961), for the complementarity hypothesis (Cohen, 1956; Kerckhoff and Davis, 1962; Rychlak, 1965; Winch, Ktsanes, and Ktsanes, 1954), and for some combination of the two (Becker, 1964; Secord and Backman, 1964).

Other findings give only partial support to the similarity hypothesis in that similarity is positively associated with attraction only under limited conditions, or only in specific groups or with respect to only a few variables (Bonney, 1946; Bowerman and Day, 1956; Katz, Glucksberg, and Krauss, 1960; McLaughlin, 1971; Posovac, 1971; Rosenfeld and Jackson, 1965; Van Dyke, 1940). Izard (1963), for example, in a replication of an earlier study, found a relationship between similarity and sociometric choice among college freshmen, but not among college seniors.

Finally, a number of investigators have simply found no relationship between personality similarity and attraction (Corsini, 1956; Gordon, 1957; Hoffman, 1958; Hoffman and Maeir, 1966; Katz, Cohen, and Castiglione, 1963; Pintner, Forlano, and Freedman, 1937; Reilly, Cummins, and Stefic, 1960; Thorpe, 1955).

Since many of the studies in this area have used as subjects married or engaged couples, the applicability of such findings to interpersonal attraction in general is limited. Those studies that have dealt with interpersonal attraction more generally have, for the most part, involved short-term laboratory groups or presented subjects with personality profiles of alleged strangers. The generalizability of such studies is also limited since they probably do not make salient important characteristics which could be a potential source of conflict in many "real life" situations, particularly over an extended period of time. Several studies have shown, for instance, that temporal factors have an influence on the relationship between similarity and attraction (Newcomb, 1961; Rosenfeld and Jackson, 1965). In addition, subjects in laboratory studies generally represent a rather homogeneous population, i.e., college sophomores. Again, this limits the generalizability of such studies. The sample and setting involved in the present study, heterogeneous groups of men isolated for an extended period of time, did not encounter the particular limits on generalizability mentioned above.

A different type of problem encountered in studies of this nature involves the explanation for any observed

relationship between similarity and attraction. That is, since most of these studies involve correlational analyses, there are several possible explanations for any observed relationship between similarity and attraction. The popular explanation is that people select their friends on the basis of similar characteristics. Another possibility is that friends become similar due to their association. This possibility seems more likely with regard to attitudes than with regard to personality characteristics. Finally, it may be that individuals run into similar people for reasons that have nothing to do with personal preferences. The importance of propinquity as a determinant of interpersonal attraction is well established (e.g., Festinger et al., 1950), and it may be that people tend to be thrown together with those who possess similar characteristics. This might be particularly true in cases where a particular type of personality is drawn to a certain type of occupation.

For most of the variables used in the present study, any relationship between similarity and friendship would most likely be the result of individuals choosing their friends on the basis of similarity. This is so because scores for most variables were obtained from the

subjects before their deployment to Antarctica. Scores for a few variables (attitudes, emotional symptoms, and performance criteria), however, were obtained while subjects were living together at the duty station, so that for these variables there is the possibility that any observed relationship between similarity and friendship is due to friends becoming similar as a result of their association. The third possibility (similarity as an artifact of propinquity or occupational similarity) is possible for all of the variables, but not likely, since the groups are isolated for several months and thus there is much opportunity for group members to interact with and get to know one another intimately. Thus, for most of the variables examined in the present study, the interpretation of any observed relationship between similarity and friendship is not as ambiguous as it was in most studies in this area.

Setting

Since the International Geophysical Year of 1957-1958, the United States has maintained several year-round stations on the Antarctic continent to implement the Antarctic Research Program supported by the National Science

Foundation and the United States Navy. At the Antarctic stations, civilian scientists and technicians collect research data, while Navy personnel provide necessary logistical support. Groups varying in size from 15 to 40 men live and work together in close association for approximately one year. For a period of approximately eight months, all stations are completely isolated from each other and the outside world, except for intermittent radio communication. There is no possible way for members to leave the station nor for help to reach them during the isolation period.

In addition to the extreme isolation of the Antarctic stations, the physical setting is undoubtedly the most rugged environment inhabited by man. Temperatures below -100 degrees Fahrenheit have been recorded, and winds of more than 100 miles per hour may prevail. During the Antarctic summer months (when sunlight is nearly continuous), construction, repair, and storage tasks must be performed at every station in addition to the collection of scientific data. It is essential for these tasks to be accomplished if the group is to survive the savage onslaught of the Antarctic winter. Once the darkness of the winter sets in, station members must limit themselves

almost exclusively to indoor activities. For the remainder of the long winter, the men live and work together in virtual confinement with no possibility of evacuation or of additional supplies.

Men are initially selected for Antarctic assignments on the basis of competence in an occupational specialty. However, all applicants are subjected to thorough physical and psychiatric screening examinations. Volunteers tend to be youthful; participants range in age from 20 to 45, but most are under 35. The typical member of an Antarctic wintering group is likely to be totally inexperienced with respect to cold weather and isolation.

Since each station must be a completely self-sustaining community for many months, a variety of scientific, technical, and military occupations are represented. The Navy personnel work in occupational specialties involving support and maintenance, while scientific research is conducted by civilians in areas such as glaciology, ionospheric physics, and meterorology. Because of the wide variety of occupational specialties, Antarctic groups represent very heterogeneous populations. Occupational group differences (largely Navy-civilian differences) have been demonstrated in areas such as motivation and personal

values (Gunderson and Nelson, 1966), personality traits (Gunderson and Mahan, 1966), job satisfaction and performance (Doll and Gunderson, 1969), and in the predictive validity of screening measures (Doll, Gunderson, and Ryman, 1969).

While the frontier-like existence at the Antarctic station lends itself to a friendly and informal atmosphere, the close quarters and sameness of the physical and social environments tend to highlight personal and cultural idiosyncrasies during the long winter. Morale and work are affected to some degree by the interpersonal frictions that inevitably arise. Thus, psychosocial factors become important, and it is here that the greatest complexities exist, and knowledge is least adequate.

In 1961 a program of psychological studies involving groups wintering-over in Antarctica was instituted at the Navy Medical Neuropsychiatric Research Unit (NMNRU) in San Diego, California. This research is sponsored by the Bureau of Medicine and Surgery and is under the direction of Dr. E. K. Eric Gunderson. These studies have been primarily concerned with the validity of selection criteria, the measurement of job performance, and the determination of related correlates of adaptation in individual and

group behaviors which might influence task accomplishment. The NMNRU reports have been largely based upon data obtained *in absentia* from questionnaires, supervisor evaluations, and peer ratings administered by the station officer-in-charge two or three times during the winter. (Problems in the collection and limitations of this type of data were outlined by Gunderson and Nelson, 1965.) Gunderson (1966) has prepared a "Deep Freeze" bibliography with listings of NMNRU reports from 1962 to 1966. Wilkins (1967) reviewed Antarctic psychological studies in the context of group behavior in long-term isolation.

The basis of interpersonal attraction in Antarctica has not been previously examined *per se*, although Nelson (1964) has looked at the sociometric structures that develop during the winter. These small wintering-over Antarctic station groups seemed to provide a unique opportunity to examine the basis of interpersonal attraction. During the isolated winter months group members have little work to occupy their time, and, consequently, they have much time available to cultivate interpersonal relationships. A long period of time is involved, so the effects of temporal factors can be studied through repeated measures of many of the variables. A wide variety of data

is available on all of the individuals involved, including such things as personal history, personality measures, attitudes, measures of adaptation, satisfaction, and job performance while in Antarctica, and various sociometric measures. The sample is large (N = 204) and heterogeneous, and thus somewhat more representative of the general population than, say, college sophomores. Since a field or natural laboratory setting is involved, problems with demand characteristics, evaluation apprehension, etc., are negligible. Finally, as mentioned earlier, problems with the interpretation of any observed relationship between similarity and friendship are not involved.

Hypotheses

Personal history variables. Interpersonal attraction has been found fairly consistently to be facilitated by similarity on various background characteristics (see p. 9). Newcomb (1961), however, found that the importance of similarity on certain "quasi-demographic" characteristics in friendship formation diminished over time. Therefore, since friendship choices are ascertained after months in isolation, during which time no doubt other

traits assume prepotence, rather low level but positive correlations were expected between friends.

Personality variables. As pointed out earlier (p. 10), the empirical findings regarding personality similarity (or complementarity) and friendship are inconsistent and conflicting. No doubt this state of affairs is due in part to the relative neutrality of the settings used in such studies, i.e., certain psychological traits are not made salient. Given the setting of the present study, however, it is unlikely that an individual's psychological characteristics would not become highly manifest.

As Secord and Backman (1964) have pointed out, whether similarity or complementarity is a better predictor of attraction depends on the particular variable in question. Thus, with regard to certain needs examined in the present study (autonomy, achievement, and orderliness), similarity between friends seems a reasonable expectation. For instance, highly autonomous people should not be attracted to persons low on autonomy who need leadership and attention from others, but rather to individuals like themselves who are not demanding of others. On the other

hand, complementarity between friends seems a more reasonable prediction with regard to need for nurturance, which was also examined in the present study. That is, it was expected that a highly nurturant individual would not be attracted to another individual who similarly "needs" to give attention to others, but rather to an individual who has a "need" for receiving attention from others.

Certain scales measuring self-perceptions were employed in the present study. Generally, research has shown that friends tend to perceive themselves in much the same way (e.g., Griffitt, 1966), although the findings are less than perfectly consistent (e.g., Miller et al., 1966). Thus, given the results of most past studies, similarity between friends was expected for the scales used in the present research.

Additional scales (FIRO-B; Schutz, 1958), which purportedly measure an individual's orientation to interpersonal relations, were examined in the present study. Similarity was expected between friends on those scales measuring the individual's affection and inclusion tendencies; that is, sociable and warm people should be drawn to each other. On the other hand, complementarity was predicted between friends on the scales assessing control

tendencies, since, for example, individuals who want to be controlled should not be attracted to someone who has similar motivations but rather to someone who will provide control.

Attitudes. The theoretical orientations and empirical findings are fairly consistent regarding attitude or opinion similarity and interpersonal attraction, as was pointed out earlier (p. 10). Therefore, with respect to the attitudes examined in this study (some of which were measured prior to Antarctic duty and some of which were measured while at the duty station), similarity was expected between friends.

Emotional symptoms. While at the Antarctic station, several stress symptoms were assessed at two time periods (early and late). Since research has shown that there is similarity between friends regarding their emotional states (Zimbardo and Formica, 1963), similarity was predicted for friends in their symptomatology. Furthermore, this similarity was expected to increase from the early to the late administration, as the volunteers' reactions to their environment become more manifest in stress symptoms.

Performance evaluations. It has been shown that performance evaluations of friends tend to be similar (Deutsch and Solomon, 1959). Furthermore, friends tend to have reputational similarity (Miller et al., 1966). Therefore, in the present study, friends were expected to be seen by both supervisors and peers as having similar standing on various task and social-emotional dimensions.

In addition to assessing the degree of similarity or complementarity between friends, tests were also performed to assess the influence of each of several personality dimensions on the tendency for subjects as a group to choose as friends persons who are similar or dissimilar to each other on the trait in question. It is an everyday observation that some people seem to relate effectively with a wide variety of people, while others seem to relate only to a very narrow range of personalities. It seems plausible that these differences are related to differences in certain personality traits. For instance, it may be that individuals who are highly nurturant relate only to highly succorant individuals, while individuals for whom nurturance is less salient can relate well to individuals with widely differing degrees of succorance. Thus, it was hypothesized that individuals who scored "high" on a given

personality dimension would, as a group, have as friends individuals whose scores on the same personality dimension would be relatively homogeneous, that is, the within group variance of scores would be small. On the other hand, individuals who scored "low" on a personality dimension were expected as a group to have friends whose scores on that dimension were relatively heterogeneous.

Additional variables. The sample employed in this study was split into two groups: Navy and civilian personnel. However, since the sample was split primarily for methodological reasons no hypotheses are presented to account for possible Navy-civilian differences in observed relationships. Also, as a basis of comparison for relationships observed between friends, the analyses were performed on a group of "mutual isolates," that is, pairs of individuals who did not choose each other as friends. Although no hypotheses are presented for this group, it should be noted that it is not a control group but rather a group composed of pairs of individuals who chose to avoid each other rather than to become friends. In many situations, ignoring or not choosing a person could merely mean a lack of sufficient contact for the development of a

crystallized attitude. Given the circumstances of the present study, however, it is unlikely that the individuals at a station had not formed definite attitudes about every other station member. Furthermore, Borgatta (1968), in a discussion of sociometric literature, concluded that persons who are unchosen when the positive choice form of the sociometric question is used tend to be the ones who are rejected in the negative form of the question. Thus, relationships opposite to those hypothesized to occur between friends were expected to occur between "mutual isolates."

METHOD

Subjects

The subjects for the present investigation were 204 male volunteers who were assigned to U.S. Antarctic stations for a period of one year during 1964-1969. Sixty-one percent of the subjects were Navy personnel; the remaining 39% were civilian scientists, technicians, and engineers. Only subjects from the two largest stations (Byrd and South Pole) were included in the analysis. The size of these stations ranged from 18 to 30 men.

The median age for both the Navy and civilian personnel was 27 years, with a range for the total sample of 18 to 43 years. Approximately half of the men were married. In terms of personal background, the Navy and civilian personnel represented different populations. The civilian personnel had higher levels of formal education (66% were college graduates) than did the Navy personnel (59% were high school graduates). The civilians more frequently came from urban communities and were raised in

smaller families of higher socio-economic status than were the Navy personnel.

In addition to background differences, the Navy and civilian personnel have been shown to differ along various other dimensions. As mentioned in the Introduction (p. 16), there are Navy-civilian differences in the areas of motivation and personal values, personality traits, job satisfaction and performance, and in the predictive validity of their scores on the screening measures.

Because of these cultural and psychological differences between the Navy and civilian personnel, the sample was split into these two sub-groups for purposes of analysis. That is, since they come from different backgrounds and have different values, etc., they may have different criteria for friend selection, which, when considering the two groups together, could mask or wash out strong relationships that might exist in each group separately.

Procedure and Variables

As mentioned earlier, all applicants undergo a rigorous screening program several months prior to their

deployment to Antarctica. In addition to a physical examination and separate interviews with a psychiatrist and a psychologist, each applicant is administered several questionnaires and inventories. Of these, the following were included in the present investigation.

(1) Personal History Questionnaire

This questionnaire obtained basic background data pertaining to the applicant's developmental history. The particular items included in the analysis were level of education, church attendance, number of siblings, boyhood town size, father's education, and mother's education.

(2) Opinion Survey

This survey was developed especially for the Antarctic screening program. Factor analysis was employed to identify highly inter-correlated clusters of items which appeared to represent meaningful psychological concepts. Four of the test scales measured common psychological needs (Need Scales): Achievement, Autonomy, Nurturance, and Orderliness. The content of these four scales are generally similar to those of the corresponding Edwards Personal Preference Schedule scales (1958), although the format of the items was entirely different. Statements

were presented as single items to be evaluated on a six-point scale ("strongly agree" to "strongly disagree") and response values were summed for items composing each scale.

Also derived through factor analysis were five scales which measured attitudes toward the Antarctic assignment (Attitude Scales): Motivation, Usefulness, Boredom, Confidence in organization, and Confidence in medical care. As with the Need scales, statements were presented as single items to be evaluated on a six-point scale of agree-disagree, and response values were summed for items composing each scale.

Finally, four scales represented personality self-descriptions based upon clusters of intercorrelated traits (Self Scales). The scales and the traits composing them are as follows: Decisive (Decisive, Obedient, Handy, Alert, Orderly, and Self-improving); Excitable (Excitable, Argumentative, Hostile, Suspicious, and Impulsive); Blunt (Blunt, Stubborn, Rough in manner, and Hard); and Absent-minded (Absentminded, Awkward, and Slow). Each of these traits was presented as an adjective to be evaluated by the volunteer as being descriptive of himself along a six-point scale. Response values were summed for all traits composing a scale.

(3) FIRO-B (Fundamental Interpersonal Relations Orientation-Behavior)

The only published test used consistently in Antarctic research has been the FIRO-B questionnaire (Schutz, 1958). According to Schutz's "Postulate of Interpersonal Needs": "(a) Every individual has three interpersonal needs: inclusion, control, and affection. (b) Inclusion, control, and affection constitute a sufficient set of areas of interpersonal behavior for the prediction and explanation of interpersonal phenomena [1958, p. 13]." He defined these three needs as follows:

Inclusion: ". . . the need to establish and maintain a satisfactory relation with people with respect to interaction and association." (1958, p. 18.)

Control: ". . . the need to establish and maintain a satisfactory relation with respect to control and power." (1958, p. 18.)

Affection: ". . . the need to establish and maintain a satisfactory relation with people with respect to love and affection." (1958, p. 20.)

The FIRO-B measures two complementary aspects (expressing and wanting) of these three needs. There are thus six scales, each of which consists of nine items, and the scales are cumulative (Guttman) in type:

Inclusion Expressed (IE): participating in group activities;

Inclusion Wanted (IW): wanting to be included in group activities;

Control Expressed (CE): controlling others, exercising dominance or leadership;

Control Wanted (CW): wanting direction or regulation from others;

Affection Expressed (AE): being affectionate with others;

Affection Wanted (AW): wanting affection from others.

Scores on each of the six scales can range from 0 (low need) to 9 (high need).

In addition to the above measures (prediction variables), which were obtained prior to Antarctic duty, various measures were obtained on each subject while he was at his duty station (station variables). Of these measures, the following were examined in the present study. All of the following measures except the Supervisor

evaluations (6) and Peer evaluations (7) had two administrations: one month after the beginning of the winter isolation period (March) and one month before the winter isolation period ended (September).

(4) Station Opinion Survey

This questionnaire tapped the station member's perceptions of his Antarctic experience and his impressions of how well the station functioned. Each station member rated 34 statements along a six-point scale of agree-disagree. Factor analysis was used to derive six scales (Station Scales): Egalitarian atmosphere, Compatibility, Motivation, Accomplishment, Usefulness, and Job dissatisfaction. Response values were summed for all items composing a scale.

(5) Common Complaints

Each of ten "stress" symptoms was rated by the station member along a four-point scale according to how much he was troubled by it while at the station. Four scales were derived by factor analysis (Symptom Scales): Depression, Insomnia, Hostility, and Anxiety. Response values were summed for all items composing a scale.

(6) Supervisor Evaluations

Both the military supervisor and the civilian supervisor at a station independently rated each station member on ten dimensions, using an eight-point scale for each dimension. The military and civilian evaluations on each dimension were then averaged for each subject. On the basis of content, four scales were derived and used in the present study (Supervisor Scales). The scales and the items of which they are composed are as follows: Task performance (Industriousness, Motivation, Proficiency); Emotional stability (Emotional control, Acceptance of authority); Social compatibility (Likability, Cheerfulness, Considerate of others); and Leadership (Leadership ability). Response values were summed for items composing a scale. Individuals at each station were ranked and assigned T-scores ($\overline{X}$ = 50, S.D. = 10) in terms of average supervisor ratings on each of the four behavior dimensions. T-scores were utilized in order to control for station size and differences in supervisor's rating distributions.

(7) Peer Evaluations

On each of ten items, each station member nominated from one to five men at the station whom he felt stood out

on the dimension tapped by the particular item. Four of these items correspond to the four Supervisor scales described above and were examined in the analysis. Thus, there were four scales (Peer Scales): Task performance, Emotional stability, Social compatibility, and Leadership. As with the Supervisor scales, the subjects at each station were ranked and assigned T-scores in terms of the number of peer nominations on each of the four behavior dimensions in order to control for station size. As mentioned earlier, peer nominations were obtained only once during the Antarctic assignment: one month before the end of the winter isolation period (September).

One of the items from Peer Evaluations was considered separately in the present analysis. On this item, each station member nominated those men at the station whom he had found to be his closest friends while at the station (Closest friend).

Analysis

For each of the variables described above, Product-Moment correlations were computed for each station between "closest friends" (as determined by the Closest friend

item). That is, for each variable there were two columns of figures: in one column were the scores on that variable of all individuals at a station; in the other column were the corresponding scores of the "closest friend" (first choice on the Closest friend item) of each individual in the first column. Correlations were then computed between these columns of scores separately for each station on each variable.

The Fischer Z transformation was then used to transform each of the station correlations on each variable. These z-scores were weighted by N_i (the number of pairs of "closest friends" at station i) and an average z-score was obtained across stations on each variable, which was then transformed back into a correlation and the mean correlations were tested against the null hypothesis that the population correlation was zero by means of t-tests.

As a basis of comparison, a similar analysis was performed for "mutual isolates," i.e., pairs of individuals at a station who did not choose one another on the Closest friend item. This comparison group was derived in the following way. First, all individuals at a station who were not chosen at all by individual A on the Closest

friend item were looked at to see if they in turn did not choose individual A on the Closest friend item. Since there were often several such pairings between individual A and his mutual non-choices, only one such pairing was chosen randomly for individual A. This procedure was carried out for every individual at a station, so that every individual was paired with a "mutual isolate." Correlations were then computed between these pairs of "mutual isolates" and tested against the null hypothesis that the population correlation was zero in the manner described above for "closest friends."

In addition to the correlations obtained for each variable individually, correlations were computed between the following pairs of FIRO-B scales for both the "closest friends" and "mutual isolates" groups: Inclusion Expressed (IE) vs. Inclusion Wanted (IW); Inclusion Wanted (IW) vs. Inclusion Expressed (IE); Control Expressed (CE) vs. Control Wanted (CW); Control Wanted (CW) vs. Control Expressed (CE); Affection Expressed (AE) vs. Affection Wanted (AW); Affection Wanted (AW) vs. Affection Expressed (AE). According to Schutz (1958), ideal reciprocal compatibility can be achieved by a dyad only if for each need area the expressed behavior of each member is equal to the

wanted behavior of the other. This reciprocal condition parallels that which Winch et al. (1954) refers to as "type II complementariness," where a positive correlation exists between the need of one member and the complementary need of the other. Thus, these correlations tested the notion of need complementarity between "closest friends" and "mutual isolates."

The correlational analysis described above for the total sample was also performed separately for the Navy sample. The rationale for splitting the sample was given earlier (see Subjects, pp. 26-27). Thus, both "closest friends" and "mutual isolates" groups were derived for the Navy personnel. In a few cases, Navy personnel chose civilian scientists as "closest friends"; such cases were included in the analysis. However, the "mutual isolates" group was composed entirely of Navy subjects. Originally it was planned to perform this same analysis on the civilian sample, but because of the low number of civilians at each station (average N = 5) it was felt that the resulting correlations from separate stations would be too unstable.

In addition to the correlational analyses, further analyses were employed for certain of the personality

variables (Need scales and FIRO-B scales). The assumption underlying these analyses (see pp. 23-24) was that if an individual is "high" on some characteristic (e.g., need for Nurturance), he should be highly sensitive to that characteristic in others and hence should choose friends on that basis. On the other hand, a person "low" on that characteristic should be less discriminate in his choice of friends along that dimension since it has less salience for him. Thus, F-tests were employed to test the general hypothesis that for a group of individuals "high" on some characteristic there should be greater homogeneity on that characteristic in their "closest friend" choices than there should be in the "closest friend" choices of a group of individuals "low" on that characteristic. These tests were performed in the following way. First, a frequency distribution of scores was obtained for each variable in question (e.g., need for Nurturance). Those persons whose Nurturance scores were in the upper one-third of the distribution were classified as "high." Similarly, those persons whose Nurturance scores were in the lower one-third of the distribution were classified as "lows." Next, the "closest friends" chosen by the "highs" were determined (high chosen), as were the "closest friends"

chosen by the "lows" (low chosen). The variance of Nurturance scores in the high chosen group was then compared to the variance of Nurturance scores in the low chosen group by means of an F-test that was the ratio of the respective mean squares of the two groups of scores. The F-tests were performed separately for the Navy "closest friends" group and the civilian "closest friends" group on each of the Need scales and the FIRO-B scales.

For both the correlational and the F-test analyses the .05 level (two-tailed) was used to define statistical significance.

RESULTS

Prediction Variables

Table 1 presents the results of the correlational analyses for the Personal History variables. It appears that "closest friends" in the total sample were significantly similar on church attendance, father's education, and mother's education. None of the variables were significant for "closest friends" in the Navy sample. "Mutual isolates" in the total sample differed significantly on church attendance and boyhood town size, while "mutual isolates" in the Navy sample differed significantly on church attendance.

Thus, "closest friends" tended to be similar on a few aspects of their personal history, while "mutual isolates" tended to be different on certain aspects of their personal history. An exception to this pattern, however, is the significant similarity between "mutual isolates" in the total sample on amount of formal education. There was no relationship between "closest friends" on this dimension. Apparently, individuals who are somewhat similar

TABLE 1

AVERAGE CORRELATIONS, STANDARD ERRORS, AND T-TESTS FOR PERSONAL HISTORY VARIABLES

Variable	TOTAL SAMPLE						NAVY SAMPLE					
	"closest friends"			"mutual isolates"			"closest friends"			"mutual isolates"		
	$\bar{r}$	s_r	t	$\bar{r}$	s_r	t	$\bar{r}$	s_r	t	$\bar{r}$	s_r	t
Education	.059	.109	.545	.243	.094	2.579*	-.204	.139	-1.466	-.073	.105	-.690
Church attendance	.165	.060	2.745*	-.199	.082	-2.437*	.082	.089	.916	-.272	.073	-3.730**
Number of siblings	.027	.097	.278	-.141	.087	-1.625	-.058	.127	-.456	-.265	.109	-2.462*
Boyhood town size	.157	.113	1.383	-.155	.063	-2.465*	.215	.141	1.529	-.160	.089	-1.800
Father's education	.312	.074	4.223***	-.029	.095	-.303	.142	.086	1.640	-.079	.086	-.927
Mother's education	.189	.072	2.612*	-.105	.082	-1.276	.171	.112	1.518	-.092	.082	-1.122

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

in educational background tend to avoid one another in this type of environment, at least to a certain extent.

In Table 2 are shown the results of the correlational analyses for the Need scales. Within the total sample there were no significant correlations, positive or negative, on any of these scales between either "closest friends" or "mutual isolates." Within the Navy sample, however, "closest friends" were significantly <u>different</u> (complementary) on need for Achievement. There were no significant correlations on any of the scales between "mutual isolates" in the Navy sample, although there was a marginally significant trend toward complementarity on need for Orderliness.

The results of the F-tests on the Need scales for the Navy and civilian "closest friends" group are shown in Table 3. Although only three statistically significant F-ratios were obtained, in all cases the variance (MS) of the <u>low chosen</u> group was greater than the variance (MS) of the high chosen group. Thus, the hypothesis was generally confirmed; that is, a group composed of individuals with high need tended to choose friends who were more homogeneous than were the choices of persons with low need on that dimension. The significant results were obtained on (a) need

TABLE 2

AVERAGE CORRELATIONS, STANDARD ERRORS, AND T-TESTS FOR NEED SCALES

Variable	TOTAL SAMPLE						NAVY SAMPLE					
	"closest friends"			"mutual isolates"			"closest friends"			"mutual isolates"		
	$\bar{r}$	s_r	t	$\bar{r}$	s_r	t	$\bar{r}$	s_r	t	$\bar{r}$	s_r	t
n-Achievement	-.056	.089	-.627	-.137	.089	-1.534	-.262	.109	-2.404*	-.108	.112	-.966
n-Autonomy	.008	.118	.070	.005	.111	.043	-.112	.148	-.758	-.117	.117	-.996
n-Nurturance	-.000	.079	-.001	-.117	.092	-1.280	-.092	.114	-.809	-.148	.108	-1.372
n-Orderliness	-.030	.124	-.245	.000	.078	.002	-.014	.166	-.085	-.155	.083	-1.869

*p < .05.

for Autonomy for civilians, (b) need for Orderliness for Navy personnel, and (c) need for Orderliness for civilian personnel.[1] Thus, of the four needs measured, Autonomy proved to be salient in friend selection for the civilians, while Orderliness was salient in friend selection for both Navy and civilian personnel.

TABLE 3

RESULTS OF F-TESTS FOR NEED SCALES

Variable	Sample	High Chosen		Low Chosen		F
		N	MS	N	MS	
n-Achievement	Navy	22	17.87	22	24.95	1.40
	Civilian	12	11.52	12	10.27	1.12
n-Autonomy	Navy	22	17.19	22	18.50	1.08
	Civilian	12	10.27	12	30.39	2.96*
n-Nurturance	Navy	22	12.46	22	18.81	1.52
	Civilian	12	11.27	12	16.15	1.43
n-Orderliness	Navy	22	8.86	22	19.47	2.20*
	Civilian	12	8.88	12	33.12	3.73**

*$p < .05$
**$p < .025$

[1]It is interesting to note that in none of these three cases did the means of the high chosen group appear to be significantly different from the corresponding means of the low chosen group: Autonomy (civilian)--high chosen $\bar{X} = 31.42$, low chosen $\bar{X} = 30.25$; Orderliness (Navy)--high chosen $\bar{X} = 17.00$, low chosen $\bar{X} = 15.05$; Orderliness

Table 4 shows the results of the correlational analyses for the Attitude scales. In both the total sample and the Navy sample there were no significant correlations between "closest friends." There were significant correlations, however, between "mutual isolates" in both the total and Navy samples. In the total sample, "mutual isolates" tended to be significantly different on Confidence in organization and Confidence in medical care. "Mutual isolates" in the Navy sample tended to be significantly different on Boredom, as well as on Confidence in organization. Thus, it appears as though it is easier to predict mutual avoidance than it is friendship formation on the basis of certain attitudes related to anticipated group experience.

The results of the correlational analyses for the Self scales are shown in Table 5. There were no significant correlations, either positive or negative, for any of the scales. Apparently, self-descriptions bear no relationship to either friendship formation or mutual avoidance in this type of environment.

(civilian)--high chosen $\bar{X}$ = 16.17, low chosen $\bar{X}$ = 16.67. However, since the F-tests were significant the assumption of homogeneity of variance was clearly violated, thereby making t-tests inappropriate. Thus, statistical comparisons between the means were not made.

TABLE 4

AVERAGE CORRELATIONS, STANDARD ERRORS, AND T-TESTS FOR ATTITUDE SCALES

Variable	TOTAL SAMPLE						NAVY SAMPLE					
	"closest friends"			"mutual isolates"			"closest friends"			"mutual isolates"		
	$\bar{r}$	s_r	t	$\bar{r}$	s_r	t	$\bar{r}$	s_r	t	$\bar{r}$	s_r	t
Usefulness	.120	.092	1.306	.100	.081	1.235	-.046	.150	-.307	-.064	.092	-.695
Boredom	.015	.115	.127	-.046	.075	-.619	-.006	.130	-.043	-.187	.078	-2.408*
Conf. in Organization	.125	.085	1.463	-.196	.072	-2.714*	.195	.144	1.360	-.167	.076	-2.207*
Conf. in Medical Care	-.014	.108	-.134	-.135	.047	-2.861*	.139	.161	.861	-.122	.076	-1.605
Motivation	.043	.097	.442	-.005	.101	-.049	-.032	.131	-.243	-.045	.126	-.357

*$p < .05$.

TABLE 5

AVERAGE CORRELATIONS, STANDARD ERRORS, AND T-TESTS FOR SELF SCALES

Variable	TOTAL SAMPLE						NAVY SAMPLE					
	"closest friends"			"mutual isolates"			"closest friends"			"mutual isolates"		
	$\bar{r}$	s_r	t	$\bar{r}$	s_r	t	$\bar{r}$	s_r	t	$\bar{r}$	s_r	t
Decisive	-.008	.123	-.062	-.066	.084	-.784	-.216	.160	-1.348	-.059	.081	-.735
Excitable	-.028	.080	-.345	-.063	.086	-.732	-.139	.104	-1.330	-.114	.083	-1.378
Blunt	.025	.114	.222	-.021	.044	-.479	-.059	.142	-.417	-.039	.056	-.704
Absent-minded	-.014	.105	-.136	.079	.070	1.127	-.018	.119	-.153	.035	.102	.344

The results of the correlational analyses on and between the FIRO-B scales are similarly disappointing (see Table 6). In both the total and Navy samples there were no significant correlations between "closest friends" on any of the scales or between complementary scales. There were, however, significant negative correlations between "mutual isolates" on Inclusion Expressed (IE) in both the total sample and in the Navy sample. Thus it appears that people who avoided each other in this situation differed in their affiliation tendencies.

Like the correlational analyses, the F-tests for the FIRO-B scales yielded statistically nonsignificant results. As can be seen in Table 7, which summarizes these comparisons, the only significant F-ratio was on Inclusion Wanted (IW) for the Navy sample. This F-ratio, contrary to the general hypothesis, indicates that as a group Navy personnel who scored high on IW tended to choose as "closest friends" a group of individuals who were less homogeneous on that dimension than

TABLE 6

AVERAGE CORRELATIONS, STANDARD ERRORS, AND T-TESTS FOR FIRO-B SCALES

Variable	TOTAL SAMPLE						NAVY SAMPLE					
	"closest friends"			"mutual isolates"			"closest friends"			"mutual isolates"		
	$\bar{r}$	s_r	t	$\bar{r}$	s_r	t	$\bar{r}$	s_r	t	$\bar{r}$	s_r	t
Inclusion Expressed (IE)	.053	.092	.571	-.177	.055	-3.237**	.111	.121	.918	-.188	.069	-2.731*
Inclusion Wanted (IW)	-.000	.098	-.001	.087	.107	.805	.007	.116	.059	.078	.102	.770
Control Expressed (CE)	-.027	.064	-.421	-.081	.070	-1.152	-.046	.103	-.446	-.145	.078	-1.859
Control Wanted (CW)	-.060	.096	-.621	-.058	.097	-.598	-.056	.110	-.513	-.105	.110	-.953
Affection Expressed (AE)	-.004	.109	-.035	.050	.077	.652	.009	.129	-.070	.021	.059	.360
Affection Wanted (AW)	.043	.132	.329	-.055	.062	-.893	.013	.145	.090	-.142	.092	-1.540
IE vs. IW	-.009	.092	-.099	-.031	.058	-.541	.002	.104	.015	.040	.063	.633
IW vs. IE	.094	.079	1.191	-.024	.088	-.275	.183	.111	1.650	-.067	.076	-.884
CE vs. CW	-.091	.085	-1.081	.110	.062	1.771	-.098	.112	-.874	.013	.087	.148
CW vs. CE	.033	.073	.458	-.067	.078	-.854	-.182	.120	-1.522	-.074	.081	-.920
AE vs. AW	-.056	.118	-.471	-.034	.073	-.466	.024	.161	.146	-.098	.091	-1.080
AW vs. AE	.030	.119	.250	.075	.042	1.800	-.103	.162	-.083	.018	.079	.230

*p < .05.
**p < .01.

TABLE 7

RESULTS OF F-TESTS FOR FIRO-B SCALES

Variable	Sample	High Chosen		Low Chosen		F
		N	MS	N	MS	
Inclusion Expressed (IE)	Navy	24	4.26	24	3.99	1.07
	Civilian	12	4.63	12	4.45	1.04
Inclusion Wanted (IW)	Navy	20	14.75	20	.79	18.74*
	Civilian	12	15.30	12	8.99	1.70
Control Expressed (CE)	Navy	23	3.80	23	3.42	1.11
	Civilian	12	10.39	12	4.81	2.16
Control Wanted (CW)	Navy	24	4.39	24	4.51	1.03
	Civilian	12	3.66	12	6.45	1.76
Affection Expressed (AE)	Navy	24	2.34	24	3.39	1.45
	Civilian	12	2.45	12	2.64	1.08
Affection Wanted (AW)	Navy	24	5.52	24	5.56	1.01
	Civilian	12	5.30	12	3.79	1.40

*$p < .005$.

did persons who scored low on IW.[2] The most obvious interpretation of this finding is that individuals who have a high need for affiliation (i.e., high on IW) want to be accepted by everyone, even by those for whom affiliation or inclusion is less important. However, it is not immediately clear why this should be so for only the Navy personnel, and not for the civilians as well. Perhaps the greater autonomy for civilians in their work roles made inclusion a less salient dimension than it was for the Navy personnel, whose work roles required much interpersonal contact.

Station Variables

In Table 8 are shown the results of the correlational analyses for the Station scales. For "closest friends" in the total sample, significant similarity was demonstrated on early Motivation, late Accomplishment,

---

[2] It is interesting to note that the mean of the high chosen group (3.7) appeared to be significantly greater than the mean of the low chosen group (.55), although significance tests were not performed (see footnote 1). Apparently a similarity effect was operating in friend choice for individuals low on IW; the very large variance in the scores of friends chosen by "high" individuals masked this effect, however, so that a nonsignificant correlation was obtained on this variable (see Table 6).

TABLE 8

AVERAGE CORRELATIONS, STANDARD ERRORS, AND T-TESTS FOR EARLY AND LATE STATION SCALES

Variable	TOTAL SAMPLE						NAVY SAMPLE					
	"closest friends"			"mutual isolates"			"closest friends"			"mutual isolates"		
	r	s_r	t	r	s_r	t	r	s_r	t	r	s_r	t
(Early)												
Egalitarian atmosphere	-.047	.095	-.490	.180	.067	2.674*	.037	.089	.412	.091	.077	1.190
Compatibility	.110	.096	1.140	-.145	.061	-2.364*	.157	.165	.956	-.148	.102	-1.452
Motivation	.308	.081	3.818**	.119	.107	1.108	-.143	.098	-1.457	-.149	.068	-2.201*
Accomplishment	.145	.110	1.315	.120	.121	.994	.015	.111	.132	-.043	.132	-.327
Usefulness	-.039	.066	-.591	.008	.067	.124	.026	.081	.321	.068	.082	.837
Job dissatisfaction	.163	.098	1.668	.108	.118	.915	.005	.095	.056	-.064	.132	-.483
(Late)												
Egalitarian atmosphere	.146	.110	1.324	-.037	.067	-.551	-.111	.141	-.790	-.167	.058	-2.879*
Compatibility	.186	.102	1.823	-.028	.088	-.313	.155	.108	1.436	-.086	.066	-1.302
Motivation	.119	.109	1.092	.180	.102	1.760	-.201	.126	-1.594	-.024	.092	-.258
Accomplishment	.350	.082	4.250***	.001	.074	.007	.286	.126	2.266*	-.186	.082	-2.285*
Usefulness	.147	.101	1.458	-.060	.069	-.882	.201	.132	1.527	-.023	.094	-.243
Job dissatisfaction	.346	.068	5.114***	.033	.067	.497	.231	.125	1.851	-.108	.090	-1.193

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

and late Job dissatisfaction. For the Navy sample the only significant similarity demonstrated between "closest friends" was on late Accomplishment. The "mutual isolates" in the total sample were significantly different on early Compatibility, but significantly similar on early Egalitarian atmosphere. "Mutual isolates" in the Navy sample were significantly different on early Motivation, late Egalitarian atmosphere, and late Accomplishment.

Thus, similarity was demonstrated between "closest friends" on certain attitudes, while with one exception (early Egalitarian atmosphere for "mutual isolates" in the total sample) differences were demonstrated between "mutual isolates" on certain attitudes. It is interesting to note that for none of the groups did the same scales demonstrate significance both early and late. Apparently different attitudes were salient in these two time periods. Generally, the late correlations were higher than the early correlations for "closest friends" in both samples, while no early-late differences are apparent for the "mutual isolates" groups. It appears, therefore, that "closest friends" became somewhat more similar in their attitudes as the winter isolation progressed.

The results of the correlational analyses for the Symptom scales are presented in Table 9. There were no significant correlations, positive or negative, between "closest friends" in the total sample. In the Navy sample there was a significant difference between "closest friends" on late Depression. There were no significant correlations, positive or negative, between "mutual isolates" in either the total sample or in the Navy sample. Apparently, friends in this type of environment do not necessarily develop similar symptoms, nor do people avoid those with similar symptoms.

Table 10 presents the results of the correlational analyses for the Supervisor and Peer scales. Between "closest friends" in the total sample there was significant similarity on Peer Emotional stability, while "closest friends" in the Navy sample were significantly different on Supervisor Leadership. Thus, for the sample as a whole, "closest friends" were seen to some extent by their peers as being similar in their emotional stability. Within the Navy sample, "closest friends" tended to be seen by supervisors as differing in their leadership. Perhaps leadership among Navy personnel (to some extent) reflects need

TABLE 9

AVERAGE CORRELATIONS, STANDARD ERRORS, AND T-TESTS FOR EARLY AND LATE SYMPTOM SCALES

Variable	TOTAL SAMPLE						NAVY SAMPLE					
	"closest friends"			"mutual isolates"			"closest friends"			"mutual isolates"		
	$\bar{r}$	s_r	t	$\bar{r}$	s_r	t	$\bar{r}$	s_r	t	$\bar{r}$	s_r	t
(Early)												
Depression	.004	.092	.046	-.030	.108	-.273	-.177	.148	-1.190	-.065	.101	-.644
Insomnia	.060	.087	.696	-.097	.067	-1.448	-.153	.100	-1.535	-.131	.082	-1.603
Hostility	-.030	.107	-.279	.015	.077	.197	-.109	.151	-.721	-.047	.104	-.449
Anxiety	.027	.099	.275	-.143	.096	-1.496	.178	.161	1.105	-.138	.102	-1.357
(Late)												
Depression	-.054	.073	-.737	.109	.087	1.248	-.285	.103	-2.759*	.106	.093	1.143
Insomnia	.065	.091	.713	.102	.082	1.248	-.061	.131	-.465	.030	.059	.502
Hostility	-.016	.095	-.168	.051	.094	.540	-.156	.126	-1.240	-.006	.100	-.056
Anxiety	-.208	.097	-2.149	-.069	.077	-.895	-.156	.130	-1.205	-.101	.087	-1.164

*$p < .05$.

TABLE 10

AVERAGE CORRELATIONS, STANDARD ERRORS, AND T-TESTS FOR SUPERVISOR AND PEER SCALES

Variable	TOTAL SAMPLE						NAVY SAMPLE					
	"closest friends"			"mutual isolates"			"closest friends"			"mutual isolates"		
	r	s_r	t	r	s_r	t	r	s_r	t	r	s_r	t
(Supervisor scales)												
Task performance	-.063	.118	-.528	-.064	.095	-.674	-.062	.137	-.450	-.243	.112	-2.178
Emotional stability	.059	.101	.589	-.025	.095	-.260	-.062	.142	-.436	-.063	.123	-.512
Social compatibility	-.026	.130	-.198	-.169	.089	-1.898	-.104	.173	-.603	-.288	.109	-2.644*
Leadership	-.124	.096	-1.292	.098	.112	.882	-.297	.109	-2.733*	-.007	.124	-.058
(Peer scales)												
Task performance	.123	.089	1.376	-.066	.068	-.973	-.192	.097	-1.985	-.223	.061	-3.691**
Emotional stability	.283	.102	2.780*	-.027	.067	-.396	.015	.128	.116	-.242	.077	-3.128**
Social compatibility	.145	.095	1.530	-.011	.078	-.141	-.155	.116	-1.338	-.117	.110	-1.064
Leadership	-.043	.112	-.381	-.028	.077	-.366	-.167	.111	-1.509	-.062	.081	-.776

*p < .05.
**p < .01.

for Dominance and "closest friends" are complementary on that dimension.

For the "mutual isolates" in the total sample, there were no significant correlations on any of the Supervisor or Peer scales. Within the Navy sample, however, "mutual isolates" were significantly <u>different</u> on Supervisor Social compatibility, Peer Task performance, and Peer Emotional stability. Within the Navy sample, therefore, people who avoided each other as friends had a stronger relation on these dimensions (negative) than did people who chose one another as friends. Apparently, then, in this type of environment individuals tend to avoid those who are different on task and socio-emotional dimensions, but do not necessarily form friendships with those who are similar.

On balance, the results of the correlational analyses are disappointing in that few significant correlations were found between "closest friends," particularly on the prediction variables. In fact, the greater number of correlations (mostly negative) on the prediction variables for "mutual isolates" suggests that perhaps avoidance is easier to predict in this type of environment than is

positive attraction. On the other hand, the results of the F-tests indicate that personality measures (Need and FIRO-B scales) do have some predictive power for friendship formation but not in the usual linear sense.

DISCUSSION

Generally speaking, the results of the present study were disappointing. While similarity was demonstrated between "closest friends" on certain attitudes, personality similarity (and complementarity) proved to be a poor predictor of friendship choice. Within the total sample, similarity was demonstrated between "closest friends" on church attendance, father's education, mother's education, and in their early feelings of motivation and late feelings of accomplishment and job dissatisfaction while in Antarctica. In addition, "closest friends" were perceived by their peers in Antarctica as being similar in their emotional stability. The pattern of results for "closest friends" in the Navy sample generally resembled that of the total sample, although fewer results reached statistical significance. In fact, the only significant similarity demonstrated between "closest friends" in the Navy sample was in their late feelings of accomplishment while in Antarctica. Moreover, unlike the results for the

total sample, complementarity was demonstrated between "closest friends" on three variables for the Navy sample: need for Achievement, feelings of depression while in Antarctica, and supervisor perceptions of leadership ability.

Since no complementary relationships were obtained for "closest friends" in the total sample, the complementary relationships demonstrated between "closest friends" in the Navy sample suggest certain Navy-civilian differences in the criteria used in the selection of friends. It seems plausible that these differences are in large part related to differences between these two samples in their prescribed roles while in Antarctica. The civilians at these stations are there primarily for purposes of individual research, so a high degree of autonomy is possible and, if desired, these persons can avoid interpersonal contact. The Navy personnel, on the other hand, are responsible for station maintenance, which requires much coordinated effort on their part, and hence a great deal of interpersonal contact. In addition, the Navy personnel perform jobs that are more demanding and less intrinsically rewarding than the relatively "soft" duties performed by the civilians. Thus, different factors are likely to

become manifest and assume importance in friend selection for these two groups. In addition, established Navy-civilian differences in background and personality characteristics (see p. 16) may also contribute to differences between the two groups with respect to the criteria used in friend selection. Unfortunately, Navy-civilian differences in the criteria for friend selection can only be inferred since, as pointed out earlier (p. 37), the small number of civilians at each station made separate correlational analysis for the civilian sample impractical. Thus, differences between the total and Navy samples are seen as merely suggestive of possible differences between the Navy and civilian samples.

It is interesting to note the relatively large number of significant relationships that were obtained between "mutual isolates." As expected, these relationships were generally opposite to those observed between "closest friends," that is, relationships tended to reflect complementarity rather than similarity. Within the total sample, "mutual isolates" were found to be complementary with regard to church attendance, boyhood town size, their confidence in the organization and medical care prior to their Antarctic deployment, their reported

participation in group activities (Inclusion Expressed--FIRO-B), and in their early perceptions of group compatibility while in Antarctica. On the other hand, similarity was obtained for level of education, and in their early perceptions of egalitarian atmosphere in Antarctica. It is not clear why similarity should be obtained on these two variables, although the relatively low level of significance ($p < .05$) suggests that these results may have been due to chance.

As with the results for "closest friends," the pattern of results were generally similar for both the total and Navy samples of "mutual isolates." Complementarity was demonstrated between "mutual isolates" in the Navy sample with regard to frequency of church attendance, number of siblings, their anticipated boredom and confidence in the organization prior to Antarctic deployment, their reported participation in group activities (Inclusion Expressed--FIRO-B), and their early motivation and late perceptions of egalitarian atmosphere and accomplishment in Antarctica. In addition, in Antarctica they were seen by their supervisors as different in their social compatibility, and by their peers as different in their tas performance and emotional stability. Unlike "mutual

isolates" in the total sample, they did not demonstrate significant similarity on any of the variables.

Thus, the hypothesis of complementarity between mutually indifferent or antagonistic individuals in this setting was in general supported. In fact, more significant relationships were obtained for "mutual isolates" (19) than for "closest friends" (11). It appears, therefore, that mutual indifference or antagonism bears an equal or somewhat stronger relationship to the variables in this study than does friendship. Furthermore, only four of the prediction variables yielded a significant relationship between "closest friends," while for the "mutual isolates" eight of the prediction variables yielded significant relationships. This suggests that, at least in the setting of this study, mutual antagonism or indifference is easier to predict than attraction. Perhaps even stronger relationships on many of the other variables would have been obtained if the analysis had been done on pairs of individuals who were more clearly antagonistic. Unfortunately, an unambiguous measure of antagonism (e.g., "who don't you like?") was not obtained from the station members.

In addition to the hypothesized relationships between similarity or complementarity and friendship, it was expected that the salience of certain personality traits would relate to the homogeneity or heterogeneity of chosen friends on the trait in question. However, the F-tests which were employed to test this hypothesis yielded only four significant relationships of this nature. Although the F-ratios were generally nonsignificant, it was noted earlier (p. 42) that for the Need scales, the differences in variances were all in the predicted direction. Thus, with regard to need for Autonomy and need for Orderliness, and to some extent with regard to the other needs (Achievement and Nurturance), "high" individuals as a group tended to choose as friends individuals who were relatively homogeneous on the same need. In addition to theoretical interest, a finding of this nature has obvious practical application to the selection of individuals for group composition, particularly in the type of setting investigated in this study. That is, in a situation such as Antarctica where individuals must live and work together in virtual isolation from the remainder of society, it is important that individuals are chosen who can

establish a compatible relationship with most, if not all, of the group members.

Perhaps the main conclusion that can be drawn on the basis of the results of the present investigation is that similarity (or complementarity) is not as strong a predictor of friendship formation in a situation of this type as originally thought. Certain questions, however, remain unanswered. Why were generally "nonsignificant" results obtained? Would a different analysis have been more appropriate? Can these results be generalized to interpersonal attraction in general? Considering the published research in this area, can any firm conclusions be made about the determinants of friendship? What methodological changes are needed in future research in this area?

First of all, certain aspects of the situation may have accounted for the relative unimportance of similarity and complementarity. Life at the Antarctic station is very task-oriented; physical survival is dependent upon the performance of various jobs. Thus, group members may have been drawn to those who were most competent at performing their work role, and it has been shown that similarity affects interpersonal judgments along

social-emotional dimensions, but not along task-oriented dimensions (McLaughlin, 1971). Similarly, Hoffman and Maeir (1966) found that task-oriented groups composed of individuals with either similar or dissimilar personality profiles did not differ in their attractiveness for their members. Most of the positive correlations between similarity and attraction have been found in groups which were principally social in nature, such as rooming-house residents (Newcomb, 1961), or work associates who socialized together outside of the work setting, but who were not necessarily members of the same work group (Rosenfeld and Jackson, 1959). In these situations the principal demand placed on the relationship is merely one of getting along with one another and, hopefully, enjoying the relationship. Under such circumstances, similarity of personality could provide the basis for enjoying the same kinds of activities, sharing similar feelings about various events, and offering sympathy when things go wrong. The extreme salience of task performance in the present study, however, may have overwhelmed the importance of personality similarity in friendship.

Another possible factor specific to the Antarctic setting that may have influenced the obtained findings

involves the motivation of the typical Antarctic volunteer. Law (1960) concluded that "escape" is a motivating factor for these individuals. Certainly this type of situation is a haven for the technically competent individual who is deficient in social skills. Thus, to the extent that these individuals volunteer for Antarctic duty in order to "escape" their personalities, they should not be attracted to other station members who are similar to them in personality. This interpretation would be more plausible if similarity had been demonstrated between "mutual isolates." However, the results suggest that similar individuals did not necessarily avoid each other, so the above interpretation is not well supported.

Perhaps the most important factor involving the setting of the present study was the prescribed membership of the station groups. Although there is considerable opportunity for interaction between all individuals at the Antarctic stations, interaction between Navy and civilian personnel is relatively infrequent, presumably because they have vastly different roles to perform (although personality and cultural differences may also be a factor). Thus, "functional propinquity" (Festinger et al., 1950) may have put restrictions on friendship to a

considerable degree. In most studies finding a positive association between similarity and attraction, the groups were more able to regulate the extent of their relations with others or to associate more with certain members than others (e.g., Rosenfeld and Jackson, 1959). In unstructured social situations, people with similar personalities may become attracted to each other as they find their attitudes, interests, and reactions to shared experiences to be compatible. Friendship formation in a group whose membership is prescribed by the organization, may, on the other hand, be a function of factors more directly related to the goals of the group.

In addition to the specific factors related to the Antarctic setting, there are factors related to conditions of isolation in general that may in part account for the lack of a consistent relationship between similarity and attraction. As pointed out in the Introduction to this study (p. 7), it could be argued that individuals restricted to a monotonous unchanging environment should be attracted to others who are dissimilar rather than similar, since they would provide a source of varied stimulation. However, the results indicate that while "closest friends" were not similar on many dimensions,

neither were they significantly dissimilar on many dimensions. This interpretation, therefore, does not appear to be well supported.

Another, more plausible, interpretation is that this type of environmental deprivation amounts to the temporary suspension of basic human needs such as affection, security, and significance. Thus, to the extent that the various personality measures tapped such needs, similarity (or dissimilarity) on these dimensions would not necessarily be related to friendship. The results support this interpretation. In fact, the only personality measure that had a relationship (negative) with friendship choice was need for Achievement among the Navy sample. This particular relationship on need for Achievement probably reflects the increased salience of job performance in Antarctica, although it is not intuitively clear why friends should be dissimilar on this dimension. Perhaps need for Achievement also reflects need for Dominance, at least within the Navy sample, in which case complementarity would be expected.

Besides the factors related to isolation that may in part account for the obtained results, there are more general reasons why a consistent relationship between

similarity and friendship was not demonstrated. For one thing, there probably are large and consistent individual differences in the extent to which similarity or complementarity affects attraction. For example, a person with high self-esteem may be attracted to similar others, while a person with low self-esteem may shun similar others and be attracted instead to those who have traits which he lacks and/or to which he aspires. Support for this idea is given by Posavac (1971), who found that similarity was a prime factor in interpersonal attraction for certain personality types, while complementarity or some other factor was a major determinant of attraction for other personality types.

Furthermore, temporal factors have been shown to influence attraction. Newcomb (1961), for example, found that the effect of attitudinal similarity on attraction increased over time. At the same time, he also found that similarity in certain "quasi-demographic" variables related to interpersonal attraction early in acquaintance, but not later. He reasoned that early expectations about interpersonal agreement may have been formed on the basis of similarity of initially observable properties of the persons, but that these expectations subsequently were

disconfirmed when previously covert attitudes became expressed. This interpretation is consistent with the proposal that the behaviors exhibited by persons in the initial stages of interaction tend to be facades (Goffman, 1959) or at least nonrepresentative samples of the behaviors they display under more familiar circumstances (Thibaut and Kelley, 1959).

In addition to the possibility that overt behavior changes over time, changes in social motivation may also occur. It is likely that increased acceptance by one's peer group leads to a reduction in insecurity, thereby changing the criteria by which social choices are made. Research on early acquaintance has demonstrated that expectations and fears of rejection are positively related to the choice of similar persons (Rosenfled, 1964). Furthermore, even though highly similar persons are chosen because of expected reciprocation, less similar persons tend to be viewed as more attractive (Walster and Walster, 1963). Thus, social choices in later acquaintance may be based more upon the potential for pleasurable interaction than upon anxiety reduction.

Thus, it may be that early in acquaintance station members were attracted to one another, in part, on the

basis of similarity in personality or social behavior. But as individuals got to know one another better, facades were dropped and social motivation changed, so that friendships were formed on other bases, such as task performance or attitudinal agreement on topics of mutual concern. Unfortunately, there are no data regarding friendship choice early in the winter with which to test this interpretation. However, the results suggest that there was greater attitudinal agreement between "closest friends" late in the winter than early in the winter.

In addition to the situational and theoretical reasons outlined above, there are methodological reasons why more "significant" findings were not obtained. These problems are not limited to the analysis employed in the present study, but prevail throughout the literature in this area.

First of all, there is the general inadequacy of the single trait approach. In studies of this type an unknown number of unidentified variables are potentially operative, but are not consistently controlled. Further, personality similarity itself is defined in terms of one or at best a small subgroup of personality variables so that similarity along all other dimensions is also not

controlled. The situation, therefore, is one in which the effect of a very limited number of independent variables on attraction is determined in a context where a large number of uncontrolled independent variables are operating.

Furthermore, even when studies examine a large number of independent variables (as in this study), they are usually examined in isolation, that is, separate correlations are computed for each variable with the criterion. This implies the rather naive assumption that traits are additive. A much more reasonable position is that traits are interactive. Only if the variable under investigation were of sufficient strength to override all other independent variables, or if a sufficient number of the other independent variables happened to convary with it, or if the other variables were accidentally controlled through randomization, would the hypothesized relationship be observed. Since the obtained findings in this area lack consistency, these special circumstances do not appear to occur regularly. For example, a person high in need for affiliation and low in anxiety is likely to be attracted to entirely different people than is a person high on both affiliation need and anxiety. Or, as another example, a person high in need for dominance and low in need for

affiliation may interact with very few people and for limited selfish purposes. On the other hand, a person similarly high in dominance but also high in affiliation may be attracted to many different people and act as a popular leader rather than a ruthless manipulator. The above examples show how complex the situation can be considering only two variables at two defined levels; in the real world literally hundreds of variables may be interacting in a much more complex fashion.

Therefore, rather than looking at traits individually, the patterning of traits should be the independent variables in research of this nature. Many existing tests (e.g., MMPI, Edwards Personal Preference Schedule) yield personality profiles which could be employed in such research. Hoffman and Maeir (1966), for instance, used personality profiles based on responses to the Guilford-Zimmerman Temperament Survey to form homogeneous and heterogeneous groups.

Another methodological problem involves the relationship between scores on a personality measure and behavior in an interpersonal situation. Personality dimensions influence attraction only to the extent that such dimensions have an effect on behavior in a given situation;

it is the behavioral stimuli to which subjects respond and not to the hypothesized personality dimension. But the relationship between personality test scores and behavior in various everyday life encounters or even behavior in a controlled laboratory situation is for the most part unknown. However, it seems reasonable that a one-to-one relationship does not hold. It may be that test responses, because of social desirability, idealized self-image, etc., either do not correspond to behavior at all, or correspond to the behaviors exhibited early in an interaction, or between individuals who are less well-acquainted than are friends. If that is the case, it is not surprising that friends do not have "similar" personalities as measured by test responses. Friends may indeed be very similar in their behavior, motivations, and perspective toward life, but analyses that are based on tests that tap superficial behavior or no behavior at all will not demonstrate this.

One way to overcome this problem is to have actual behavioral measures of the subjects' personalities. For instance, separate judges could rate an individual on various dimensions as he is observed in interaction with others. However, in addition to being highly impractical--

even for a small number of subjects--this method is less than satisfactory, since the behavior exhibited by a subject in that situation may not reflect his behavior in different settings or with other interactants. Another possibility is to employ projective type tests to assess the subject's personality. Such tests supposedly reveal unconscious determinants of personality and hence are unlikely to be distorted by the subject's desire to appear "normal."

Another methodological weakness of studies in this area is the pervasive use of correlational analyses. It seems rather naive to assume that the relationship between similarity and attraction should be a linear one. There is no reason to suppose, for example, that a person slightly below average in need for dominance should choose as friends those slightly below (or above) average in need for dominance. He has other needs that are more salient and which should determine friendship choice. The F-tests employed in this study were an attempt to examine possible relationships that were free of the assumption of linearity in correlational analyses. It is an everyday observation that certain individuals can effectively (or superficially) relate only to a narrow range of people, while

others seem capable and/or willing to build relationships with practically everyone. This aspect of friendship formation seems just as important as asking in what ways are all friends similar, but has never been examined empirically.

Another possible alternative to correlational analyses would be to compute eta coefficients for friend pairs. Eta does not yield insight into the specific nature of a relationship, however, and therefore has less predictive value than the product-moment correlation. Yet another possibility is to compute correlations separately for different points on the distribution of subject scores on the variable in question. Thus, it may be that individuals low on some dimension choose similar people as friends, while individuals high on the same dimension choose dissimilar (complementary) people as friends. The total correlation, meanwhile, would show no relationship. The above possibilities are not by any means exhaustive. Certainly other analyses are also possible; the point is that results obtained from traditional correlational analyses can be misleading since only linear relationships are examined.

Still another problem with studies in this area is the confusion between "interpersonal attraction" and "friendship." It is one thing to view another person as attractive and quite another thing to build a friendship with that person. While many people may be seen by an individual as attractive, most people have a relatively small number of close friends. The qualities we admire in a person may not be the qualities we would desire in a person with whom we confide, confess our weaknesses, etc. As pointed out earlier (pp. 70-71), at different steps in the acquaintance process we may exhibit different behaviors or have different social motivations. Supposedly, friends are at a fairly advanced point in the acquaintance process, so that facades to some extent are dropped and persons at this stage interact for different reasons than do those who are less well acquainted. Laboratory studies of interpersonal attraction, however, look at individuals with no prior acquaintance (e.g., Walster and Walster, 1963), or ask subjects to evaluate supposed "strangers" whom they never will meet (e.g., Byrne et al., 1967). Thus, conclusions regarding similarity and attraction from such studies may not be generalizable to

real-life interaction past the first encounter, let alone to something as unique as friendship.

This particular weakness was not evident in this study since the subjects were isolated together for several months. However, it may be that really close relationships were not formed and that "closest friends" were individuals who were merely more compatible with each other than with anyone else at the station. This seems plausible since there were relatively few mutual or reciprocated friend choices; only 40 percent of the individuals chosen first on the Closest friend item reciprocated in their first choice (although almost all individuals chosen first reciprocated on later choices). Thus, the results of the present study may reflect interpersonal attraction in this type of situation rather than friendship *per se*.

SUMMARY

Contrary to prediction, "closest friends" in Antarctica were found to be similar on few personality dimensions, and only slightly similar in background characteristics. While in Antarctica, however, "closest friends" did tend to develop similar attitudes regarding their experience at the station. On the other hand, as predicted, "mutual isolates" (pairs of individuals who were not attracted to one another) were significantly different on various dimensions and tended to develop conflicting attitudes while in Antarctica. It appears, therefore, that in a stressful task-oriented situation it is easier to predict incompatibility than compatibility on the basis of various traits and characteristics of the individuals involved.

It was also predicted that depending on how salient a given dimension is for an individual, he should be attracted to a larger or smaller range of people on that dimension. The results of the analyses of this hypothesis

were generally nonsignificant, although the obtained F-ratios for several personality measures (Need scales) were in the predicted direction.

Several aspects of the setting involved in this study were discussed as possible reasons why more significant results were not obtained. Some of these (task-orientation, prescribed membership, temporary suspension of common psychological needs) were held as more tenable than others (dissatisfaction with self, dissimilarity as stimulation in a monotonous environment).

Various theoretical and methodological problems with the published research in the area of friendship formation and interpersonal attraction were discussed. Some of these (single trait approach, unknown relationship between test responses and behavior, use of correlational analyses) were evident in this study, while others (control of temporal factors, examination of nonlinear relationships) were not.

REFERENCES

REFERENCES

Backman, C. W., and Secord, P. F. The effect of perceived liking on interpersonal attraction. Human Relations, 1959, 12, 379-384.

Banta, T. J., and Hetherington, M. Relations between needs of friends and fiances. Journal of Abnormal and Social Psychology, 1963, 66, 401-404.

Becker, G. The complementary-needs hypothesis, authoritarianism, dominance, and other Edwards Personal Preference Schedule scores. Journal of Personality, 1964, 32, 45-46.

Bonney, M. E. A sociometric study of the relationship of some factors to mutual friendships on the elementary, secondary, and college levels. Sociometry, 1946, 9, 21-47.

Borgatta, E. F. Sociometry. In Sills, D. (Ed.), International Encyclopedia of the Social Sciences, Vol. 15. The MacMillan Company and The Free Press: 1968, 53-57.

Bossard, J. H. S. Nationality and nativity as factors in marriage. American Sociological Review, 1939, 4, 792-798.

Bowerman, C. E. Assortive mating by previous marital status: Seattle, 1939-1946. American Sociological Review, 1953, 18, 170-177.

Bowerman, C. E., and Day, B. R. A test of the theory of complementary needs as applied to couples during courtship. American Sociological Review, 1956, 21, 602-605.

Byrne, D., Clore, G. L., Jr., and Worchel, P. Effect of economic similarity-dissimilarity on interpersonal attraction. Journal of Personality and Social Psychology, 1966, 4, 220-224.

Byrne, D., Griffitt, W., and Stefaniak, D. Attraction and similarity of personality characteristics. Journal of Personality and Social Psychology, 1967, 5, 82-90.

Byrne, D., and Nelson, D. Attraction as a linear function of proportion of positive reinforcements. Journal of Personality and Social Psychology, 1965, 1, 659-663.

Cattell, R. B., and Nesselroade, J. R. Likeness and completeness theories examined by 16 personality factor measures on stably and unstably married couples. Journal of Personality and Social Psychology, 1967, 7, 351-361.

Coates, T., and Mazur, S. Personality characteristics and interpersonal attraction. Psychology, 1969, 6, 2-9.

Cohen, A. R. Experimental effects of ego-defense preference on interpersonal relations. Journal of Abnormal and Social Psychology, 1956, 52, 19-27.

Corsini, R. J. Understanding and similarity in marriage. Journal of Abnormal and Social Psychology, 1956, 52, 327-332.

Deutsch, M., and Solomon, L. Reactions to evaluations by others as influenced by self-evaluations. Sociometry, 1959, 22, 93-112.

Doll, R. E., and Gunderson, E. K. E. Occupational group as a moderator of the job satisfaction-job performance relationship. Journal of Applied Psychology, 1969, 53, 359-361.

Doll, R. E., Gunderson, E. K. E., and Ryman, D. H. Relative predictability of occupational groups and performance criteria in an extreme environment. Journal of Clinical Psychology, 1969, 25, 399-402.

Edwards, A. L. Manual for the Edwards Personal Preference Schedule (revised edition). New York: Psychological Corp., 1959.

Festinger, L. A theory of social comparison processes. Human Relations, 1954, 7, 117-140.

Festinger, L., Schachter, S., and Back, K. Social pressures in informal groups: A study of human factors in housing. New York: Harper, 1950.

Glick, P. C., and Landau, E. Age as a factor in marriage. American Sociological Review, 1950, 15, 517-529.

Goffman, E. The presentation of self in everyday life. Garden City, N.Y.: Doubleday, 1959.

Golden, J. Patterns of Negro-white intermarriage. American Sociological Review, 1954, 19, 144-147.

Gordon, J. E. Interpersonal predictions of repressors and sensitizers. Journal of Personality, 1957, 25, 686-698.

Griffitt, W. B. Interpersonal attraction as a function of self-concept and personality similarity-dissimilarity. Journal of Personality and Social Psychology, 1966, 4, 581-584.

Gunderson, E. K. E. Adaptation to extreme environments: Prediction of performance. U.S. Navy Medical Neuropsychiatric Research Unit Report No. 66-17, April, 1966.

Gunderson, E. K. E., and Mahan, J. L. Cultural and psychological differences among occupational groups. Journal of Psychology, 1966, 62, 287-304.

Gunderson, E. K. E., and Nelson, P. D. Personality differences among Navy occupational groups. Personnel and Guidance Journal, 1966, 44, 956-961.

Gunderson, E. K. E., and Nelson, P. D. Individual performance measures for extremely isolated groups. U.S. Navy Medical Neuropsychiatric Research Unit Report No. 65-6, February, 1965.

Heider, F. The psychology of interpersonal relations. Wiley, 1958.

Hoffman, L. R. Similarity of personality: A basis for interpersonal attraction? Sociometry, 1958, 21, 300-308.

Hoffman, L. R., and Maeir, N. R. F. An experimental reexamination of the similarity-attraction hypothesis. Journal of Personality and Social Psychology, 1966, 3, 145-152.

Hollingshead, A. B. Cultural factors in the selection of marriage mates. American Sociological Review, 1950, 15, 619-627.

Hollingshead, A. B. Age relationships and marriage. American Sociological Review, 1951, 16, 492-499.

Izard, C. E. Personality similarity and friendship. Journal of Abnormal and Social Psychology, 1960, 61, 47-51 (a).

Izard, C. E. Personality similarity, positive affect, and interpersonal attraction. Journal of Abnormal and Social Psychology, 1960, 61, 484-485 (b).

Izard, C. E. Personality similarity and friendship: A follow-up study. Journal of Abnormal and Social Psychology, 1963, 66, 598-600.

Jones, E. E. Ingratiation: A social psychological analysis. New York: Appleton-Century-Crofts, 1964.

Katz, I., Cohen, M., and Castiglione, L. Effect of one type of need complementarity on marriage partners' conformity to one another's judgments. Journal of Abnormal and Social Psychology, 1963, 67, 8-14.

Katz, I., Glucksberg, S., and Krauss, R. Need-satisfaction and Edwards PPS scores in married couples. Journal of Consulting Psychology, 1960, 24, 203-208.

Kerckhoff, A. C., and Davis, K. E. Value consensus and need complementarity in mate selection. American Sociological Review, 1962, 27, 295-303.

Landis, P. H., and Day, K. H. Education as a factor in mate selection. American Sociological Review, 1945, 10, 558-560.

Law, P. Personality problems in Antarctica. Medical Journal of Australia, 1960, 47, 273-282.

Lott, B. E., and Lott, A. J. The formation of positive attitudes toward group members. Journal of Abnormal and Social Psychology, 1960, 61, 297-300.

Maisonneuve, J. A contribution to the sociometry of mutual choices. Sociometry, 1954, 17, 33-46.

McLaughlin, B. Effects of similarity and likableness on attraction and recall. Journal of Personality and Social Psychology, 1971, 20, 65-69.

Mehlman, B. Similarity in friendships. Journal of Social Psychology, 1962, 57, 195-202.

Merton, R. K. Intermarriage and the social structure. Psychiatry, 1941, 4, 371-374.

Miller, N., Campbell, D. T., Twedt, H., and O'Connell, E. J. Similarity, contrast, and complementarity in friendship choice. Journal of Personality and Social Psychology, 1966, 3, 3-12.

Murstein, B. I. The complementary need hypothesis in newlyweds and middle-aged couples. Journal of Abnormal and Social Psychology, 1961, 63, 94-197.

Nelson, P. D. Structural change in small isolated groups. U.S. Navy Medical Neuropsychiatric Research Unit Report No. 64-24, 1964.

Newcomb, T. M. The acquaintance process. New York: Holt, Rinehart, and Winston, 1961.

Pepitone, A. Attraction and hostility. New York: Atherton, 1964.

Pintner, R., Forlano, G., and Freedman, H. Personality and attitudinal similarity among classroom friends. Journal of Applied Psychology, 1937, 21, 48-65.

Posavac, E. J. Dimensions of trait preferences and personality type. Journal of Personality and Social Psychology, 1971, 19, 274-281.

Reilly, M. S. A., Commins, W. D., and Stefic, E. C. The complementarity of personality needs in friendship choice. Journal of Abnormal and Social Psychology, 1960, 61, 292-294.

Rosenfeld, H. M. Social choice conceived as a level of aspiration. Journal of Abnormal and Social Psychology, 1964, 68, 491-499.

Rosenfeld, H. M., and Jackson, J. Effect of similarity of personality on interpersonal attraction. American Psychologist, 1959, 14, 366-367.

Rosenfeld, H. M., and Jackson, J. Temporal mediation of the similarity-attraction hypothesis. Journal of Personality, 1964, 33, 649-656.

Rychlak, J. F. The similarity, compatibility, or incompatibility of needs in interpersonal selection. Journal of Personality and Social Psychology, 1965, 2, 334-340.

Secord, P. F., and Backman, C. W. Interpersonal congruency, perceived similarity, and friendship. Sociometry, 1964, 27, 115-127.

Schutz, W. C. FIRO-B: A three-dimensional theory of interpersonal behavior. New York: Rinehart and Co., 1958.

Thibaut, J. W., and Kelley, H. H. The social psychology of groups. New York: Wiley, 1959.

Thomas, J. L. The factor of religion in the selection of marriage mates. American Sociological Review, 1951, 16, 487-491.

Thorpe, J. G. A study of some factors in friendship formation. Sociometry, 1955, 18, 207-214.

Van Dyke, V. E. Personality traits and friendship formation in adolescent girls. Journal of Social Psychology, 1940, 12, 291-303.

Walster, E., and Walster, G. W. Effect of expecting to be liked on choice of associates. Journal of Abnormal and Social Psychology, 1963, 67, 402-404.

Wilkins, W. L. Group behavior in long-term isolation. In M. H. Appley and R. Trumbull (Eds.), Psychological Stress. New York: Appleton-Century-Crofts, 1967.

Winch, R. F., Ktsanes, J., and Ktsanes, V. The theory of complementary needs in mate selection: An analytic and descriptive study. American Sociological Review, 1954, 19, 241-249.

Zimbardo, P., and Formica, R. Emotional comparison and self-esteem as determinants of affiliation. Journal of Personality, 1963, 31, 141-162.

MICHIGAN STATE UNIV. LIBRARIES
31293100287121