SOME DETERMINANTS OF COMMUNICATION NETWORK CHARACTERISTICS AMONG CLOSE FRIENDS

> Thesis for the Degree of M. A. MICHIGAN STATE UNIVERSITY MALCOLM R. PARKS 1975





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#### ABSTRACT

### SOME DETERMINANTS OF COMMUNICATION NETWORK CHARACTERISTICS AMONG CLOSE FRIENDS

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The research sought to develop and test a model which would predict the size and integration of communication networks among close friends. The nature and significance of close friendship as a unique class of social relations are examined. An extensive review of literature led to the development of a causal model which attempted to predict network size and integration on the basis of a combination of individual, situational and environmental variables.

Network size was hypothesized to be a function of the desire, ability or skills and opportunities for participation in close friendship communication networks. Opportunity was conceptualized as the common factor among the following underlying variables: 1) residential mobility; 2) the number of memberships in voluntary associations; 3) the subject's socioeconomic status; 4) the amount of time spent with mass media sources; 5) the amount of time spent with non-friends; 6) the amount of time spent with non-close friends; and 7) the amount of time spent alone by the subject. The analysis of zero-order correlations of these variables with network size indicated that only the amount of time spent alone was significantly related to network size. This was a negative association. When desire, skills, and opportunity were entered into a multiple regression equation to predict size, only opportunity proved to •

Malcolm R. Parks

be related to size at a level of statistical significance. This was a positive relationship.

Network integration was hypothesized to be a function of four variables. These were: 1) the overall level of perceived similarity among members; 2) the overall level of effort necessary for members of the network to communicate with each other; 3) the level of the subject's residential mobility; and 4) the size of the communication network. An analysis of the zero-order correlations and multiple regression procedures indicated that the only statistically significant predictor of integration was perceived effort.

The entire model was tested within a path analytic format. Because of the lack of proper software, a substantial amount of the final aspect of the analysis was achieved by means of relatively crude improvised procedures. As a path analytic model, the causal model received little support. In general, the hypothesized relationships among the variables did not explain any significant portion of the variance. The major problems which such procedures and results are discussed in detail.

In addition to hypothesizing and testing a general model of network characteristics, a secondary goal of the research was to secure descriptive information regarding the nature of close friendship networks. It was found that such networks tend to be relatively small (Mean Size = 7.91 persons) and quite poorly integrated. The implications of this latter finding for the application of small group research and theory to friendship relations are discussed.

Finally, the research is criticized in terms of the use of a student sample (N = 58), measurement, and conceptualization. The implications for future research are explored.

### SOME DETERMINANTS OF COMMUNICATION NETWORK CHARACTERISTICS AMONG CLOSE FRIENDS

By

Malcolm R. Parks

## A THESIS

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### CHAPTER I

### THE RESEARCH PROBLEM: A REVIEW OF THE LITERATURE

From the social milieu, we select persons with whom we communicate. As a result of the fact that some persons are selected and others are not, networks of communication evolve. The present research deals with the characteristics and determinants of an important class of communication networks--those among close friends.

The chapter progresses in three parts: 1) a brief examination of the nature and significance of close friendship; 2) a description of communication networks and an identification of their relevant characteristics; 3) the identification and explication of those variables hypothesized to be determinants of close friendship communication networks.

### The Nature and Significance of Close Friendship

In almost all societies individuals form friendships (Cohen, 1961). The topic of friendship has been a perennial one in the literature of Western civilization (Cohen, 1961; Rake, 1970). Despite the ubiquity and significance of friendship, most observers (Albert & Brigante, 1962; Rangell, 1963; Fiebert & Fiebert, 1969; Sadler, 1970; Simon, Crotts & Mahan, 1970; Weinberg, 1970) agree that relatively little social scientific attention has been devoted to its study.

Close friendships serve important and highly valued functions. However, relatively little research has been directed toward the explication of these functions (Armstrong, 1970). Despite the lack of research, several observers have suggested functions for friendship. Among these are:

1) socialization (Weinberg, 1970); 2) personality stability (Weinberg, 1970); 3) therapeutic experiences (Maslow, 1954; Schofield, 1964); 4) self-definition (Albert & Brigante, 1962); and 5) economic assistance (Cohen, 1961). To the extent that these factors are important or necessary to individuals, their presence would lead one to believe that close friendship is a significant class of social relations. Further, much of the significance of close friendship rests on the perception of the relationship as important by the participants themselves.

Close friendship represents a distinct class of social relations. It can be distinguished from: 1) non-friendship; and 2) other levels of friendship.

Friendship can be distinguished from non-friendship in several areas. The following paragraphs suggest five areas of distinction between the two types of relationships.

First, positive affective orientations among participants are necessary for the existence of friendship, but not necessary to many other classes of social relations (Williams, 1959).

Second, friendship is a voluntary relationship. One voluntarily enters in friendship relations. Similarily one can, painful as it may be, leave or dissolve a friendship--without the intervention of a third party and without any formal change in status (Suttles, 1970). This factor serves to distinguish friendship from marital relations. The latter typically cannot be dissolved without the intervention of a third party. Further, the dissolution of a marriage involves a formal change in status.

Third, friendship represents an exclusive and private relationship (Suttles, 1970). It is not tied to social convention--participants are

free to negotiate a personal norm set within such relationships. It is a truly interpersonal relationship in the sense that individuals relate to each other in terms of knowledge or information about the other as a unique individual (Miller & Steinberg, 1975). It is exclusive in that participants are committed to maintaining their unique relations or norm set (Suttles, 1970). Within the possible exception of marriage, no other social relationship involves such intense personal negotiation.

Fourth, friendship engenders a high degree of equality between participants (Naegele, 1958; Cohen, 1961; Suttles, 1970). While distinct status differences may result from interaction in friendship over time, the participants initiate the relationship as equals. Not only are friends expected to treat each other as equals, but so too are the friends of friends. Friendship thus exerts a leveling influence not found in most other social relations. Marriage, for example, makes in-laws into kin, but not into equals (Suttles, 1970). Most other social relationships do not appear to depend upon or assume the degree of initial equality found in friendships.

Finally, friendship implies an equality of information control not found to as great an extent in other relations. That is, regardless of the particular level of disclosure involved, most persons are likely to engage in reciprocal information handling in friendship. Trust, intimacy, and self-disclosure (factors traditionally associated with friendship) are likely to be reciprocal in friendship to an extent not found in other social relationships (Simmel, 1950; Naegele, 1958; Williams, 1959; Suttles, 1970; Weinberg, 1970).

Most of these distinctions between friendship and non-friendship are distinctions of degree rather than of kind. Taken in concert, however, these factors delineate friendship as a unique class of social relations.

Friendship itself, however, does not represent a monolithic set of social relationships. Naegele (1958) interviewed high school students and reported that several levels of friendship were perceived by respondents. Students distinguished levels of friendship primarily on the basis of the amount and breadth of self-disclosure involved. In order of increasing disclosure were the following categories: 1) acquaintances; 2) friends; and 3) close friends including one's best friend. In Naegele's data, then, close friendship was distinguished from other levels of friendship on the basis of the amount and breadth of self-disclosing communication.

Kurth (1970) offers a more comprehensive explication of the distinction between close friendship and other forms of friendship. Kurth distinguishes between "friendship" and "friendly relations." The conceptualization of "friendship" is equivalent to what is classified as "close friendship" in the present work. Friendship is distinguished in the following paragraphs from friendly relations in six areas.

First, while both are voluntary in nature, friendly relations are more dependent on the convenience of maintaining the relationship than is friendship. Friendly relations are usually severed when it becomes difficult for participants to maintain the relationship with a minimum of effort. Crudely placed within an exchange theoretic format, the argument might be phrased as follows. There are limited rewards to be derived from friendly relations. Thus, when inconvenience creates increments in the cost of maintaining the relationship, it is likely to be dissolved. This is not so true of friendships. This probably reflects the higher value placed on friendships by the participants or the greater social sanctions associated with dissolving a relationship with someone who is perceived by others as a close friend.

Second, a friendly relation lacks the sense of uniqueness found in a close friendship. To a much greater extent than friendship relations, friendly relations are perceived by participants as interchangeable. Each friendship, however, is perceived as a unique relationship among the participants. This may reflect the fact that there are likely to be higher levels of self-disclosure in a close friendship than in friendly relations.

Third, while friendships are characterized by relatively high levels of reciprocal self-disclosure, important factors inhibit high levels of intimacy in friendly relations. Kurth suggests two such factors: 1) friendly relations frequently take place in situations which are not conducive to intimate revelations--such as one's place of work; and 2)

> . . . friendly relation networks tend to inhibit revelation of intimate information, for none of the relationships lends itself to intimacy more than any other and the revelation of information to one individual in the network might lead to its disclosure to a number of individuals (p. 140).

Presumably, this sort of diffusion of disclosure tends to reduce the value of the disclosure and is thus devalued. Further, this implies that disclosure in friendship can be expected to remain confidential--a claim one cannot apparently make in a friendly relationship. While Kurth's rationale as to why disclosure is limited in friendly relations is not as clear or as defensible as one might wish, the central point is that close friendship is likely to involve higher levels of disclosure than non-close friendship (friendly relations).

Fourth, obligations are generally more limited in friendly relations than in friendship. Kurth observes that: "the higher levels of obligation and stronger positive sentiments are causes as well as consequences of the considerable personal involvement in friendship" (p. 141).

Fifth, while strong positive sentiments are essential to close friendship, they are not so necessary to the maintenance of friendly relations. As Kurth asserts: ". . . we maintain friendly relations with those we do not have strong feeling for and perhaps even dislike somewhat" (p. 142).

Finally, while friendly relations do not assume future interaction, such an assumption on the part of the participants is essential to the nature of interaction in close friendship. Kurth explains this notion:

> In a friendship individuals can draw on past credits and also trade in futures without disrupting the sense of balanced exchange. Thus, in an enduring relationship such as friendship, past experiences, and possibilities for the future as well as the current situation affect the exchange in an encounter. On the other hand, friendly relations emphasize parity in encounters. When individuals establish a friendly relation, they are oriented to the present situation with the other, rather than to the past or future. Individuals in a friendly relation are generally not committed to extensive future relations. They try to avoid trading in futures because it commits them in the future to the development of a different type of relationship (e.g., a friendship) (p. 163).

Taken as a whole, these distinctions between friendship (close) and friendly relations (non-close friendship) are primarily distinctions in degree rather than in kind. However, Kurth does suggest that: 1) levels of self-disclosure; and 2) the participants' orientations toward exchanges will be markedly different in the two types of relationships.

While the logical consistency of the arguments is not always perfect, the distinctions discussed above do suggest that close friendship is a distinct and unique class of social relations. It differs in kind and in degree from non-friendship relations. It differs in degree and, to some extent, in kind from other classes of friendship (i.e., friendly relations). The distinctions between friendship and non-friendship and

between close friendship and non-close friendship have been summarized in Tables 1 and 2. Taking these considerations as a set, the following constitutive definition is offered for close friendship:

> Close friendship is that voluntary dyadic relationship characterized by: 1) high levels of mutual disclosure and trust; 2) strong positive affect; and 3) the unilateral ability of either member to terminate the relationship; and which is perceived by the participants as: a) unique; b) initially equal; c) extended over time; and d) involving extensive and generalized obligations.

The general thrust of this definition appears to be consistent with those factors identified by respondents in Naegele's (1958) study.

#### Communication Networks

From the mass of individuals in our social milieu, we select a set with which we maintain friendly relations and from that set we select a few with whom close friendship are formed (Chambliss, 1965). The formation and functioning of close friendship implies active channels of communication (Festinger, Schachter & Back, 1950). Among a set of close friends there will be many possible channels of communication linking individuals. The frequency with which these potential channels are utilized will determine the structure of a communication network among a set of close friends.

The structure of a communication network is expressed as the pattern of information flow among the individuals designated as members of that system (Danowski & Farace, 1974; Richards, 1974a). For example, assume that we have four individuals (A, B, C, D) comprising a communication network. By asking each person how frequently they communicate with the other three, we can discover the pattern of communication. By displaying the responses of all individuals, it is possible to portray the structure of the network itself. Consider the following hypothetical network:

	Non-Friendship		Friendship
1.	Positive Affective Orientation Not a Necessary Condition	1.	Positive Affective Orientation is a Necessary Condition
2.	Formation and Dissolution Need Not Be Voluntary in Nature	2.	Formation and Dissolution are Voluntary in Nature
3.	Need Not Involve Relationship or Individual Specific Mean- ings and Norms	3.	Characterized by the Development of Relationship and Individual Specific Meanings and Norms
4.	Need Not Involve Initial Equality Among Participants and Pe <b>ers</b>	4.	Characterized by Initial Equal- ity Among Participants and Peers
5.	Need Not Involve Equality or Reciprocity of Information Flow	5.	Characterized by Reciprocity of Information Exchange
Tab	ole 2. Summary of Differences Betw Friendship.	een C	lose Friendship and Non-Close
	Non-Close Friendship		Close Friendship
1.	More Dependent on Convenience for Maintenance	1.	Less Dependent on Convenience for Maintenance
2.	Not Perceived by Participants as a Unique Relationship	2.	Perceived by Participants as a Unique Relationship
3.	Less Intimate or Self-Dis- closing Communication	3.	More Intimate or Self-Disclosing Communication
4.	Limited or Bounded Obligations	4.	Extensive Mutual Obligations
5.	Less Dependent on Strong Posi- tive Affective Orientations	5.	More Dependent on Strong Posi- tive Affective Orientations
6.	Future Interaction Not Neces- sarily Assumed in Exchange Relations	6.	Future Interaction Implicitly Assumed in Exchange Relations

Table 1. Summary of Differences Between Friendship and Non-Friendship.



Person A is linked to persons B and D who, in turn, are linked to each other. Person C is linked by communication only to person D. This procedure allows us to view the structure of the communication network.

While there are a number of methods by which one can describe a communication network, two of the most basic characteristics of communication networks are their <u>size</u> and <u>integration</u>.\* These basic parameters are also the basis for more advanced measures of network characteristics (Richards, 1974c). The size and degree of integration of communication networks among close friends will constitute the dependent variables of primary concern in the present research. A closer examination of these two variables seems warranted.

<u>Network Size</u>. Network size is the number of nodes in the communication network. What constitutes a node may vary depending on one's particular research interest. In this case, a node will be defined as an individual who has been designated as a close friend by the respondent. The respondent is also counted as a node. The concern here will be with <u>egocentric communication networks</u>. That is, we are concerned with the structure of the flow of communication among the close friends of the respondent. We are not interested in relationships among persons not designated as close friends by the respondent. Such networks are generated by asking the respondent to generate a list of his or her close friends.

<sup>\*</sup>For a more complete discussion of network variables and their measurement, see Richards (1974a, 1974b, 1974c).

In the study of friendship communication networks, size is an important variable for three reasons. First, the larger the network, the more persons one would presumably have to draw upon for emotional, economic, and other assistance (Rangell, 1963; Schofield, 1964). Second, the larger the communication network, the more persons one would have available as sources of information. Third, as we shall see at a later juncture, network size can be hypothesized as a major determinant of network integration.

<u>Network Integration</u>. Network integration is a measure of the degree of linkage between individuals comprising a communication network. A link between persons may be conceptualized as an indicant of the existence of a relationship (Richards, 1974a). If persons A and B do not communicate, then no linkage exists. If persons B and D do communicate with each other, a linkage may be said to exist. The more frequently B and D communicate with each other, the stronger the linkage is. The strength of a link between any two individuals, then, is conceptualized and operationalized as the frequency with which they communicate. The more frequent the communication, the stronger the linkage (Richards, 1974a).

For a group of individuals, there will be many possible linkages. The total number of possible direct linkages for a given communication network may be derived from the following equation (Berlo, <u>et al.</u>, 1972; Richards, 1974c):

$$P = \frac{N(N-1)}{2}$$
(1)

Where: P = Total Possible Number of Direct Links of a Given
 Strength
 N = Number of Nodes (Size)

The right side of the equation is divided by two because a link from person A to B is assumed to be the same as one from B to A. That is, communication is assumed to be reciprocal.

In the case where no communication occurs between persons, the strength of the linkage may be said to be zero. On the other hand, when individuals communicate at some arbitrarily set upper frequency, the strength of the linkage may be designated as one. For any given linkage, then, the frequency of communication will determine a strength ranging from zero to one. In equation (1) above, P may be viewed as the total number of possible linkages among N persons where each linkage is assumed to have a value of one (maximal strength). This equation thus yields the total number of possible linkages at the highest possible strength for a network composed of N persons.

The integration of the network is derived by computing a ratio of the total possible maximal strength linkages to the sum of observed strength values for all possible linkages:

$$I = \frac{2L}{P N (N-1)}$$
(2)

Where:

I = Index of Integration
L = Sum of Observed Strength Values for All Linkages
P = Maximal Link Strength
N = Number of Nodes (Size)

The Index of Integration accounts for both the number of individuals in the communication network and the frequency with which they communicate. The index will range from a low extreme value of zero, when all possible linkages have a strength of zero, to a high extreme value of one, when every node (individual) communicates with every other node at some maximal frequency. This will be the case regardless of the number of nodes in the network since the value of the index (I) is expressed in terms of a ratio between parameters N and L.

The Index of Integration presented here represents an extension of previous work by Farace and Monge, as reported in Berlo, et al., (1972)

and Richards (1974c). These conceptualizations treated integration in an all or nothing sense--either a link was present or it was not. The conceptualization underlying equation (2) allows the investigator to account for the strength of linkages in deriving the index. Measurement of link strength is no longer limited to the nominal level.

The significance of connectivity as a research variable in the study of communication networks among close friends rests on an appreciation of the significance and dynamics of small informal social groups. Friendship networks have often been either explicitly (Klein, 1956; Hare, 1962; Cartwright & Zander, 1968b) or implicitly (Phillips, 1966; Applbaum, <u>et al.</u>, 1974) considered as small groups by small group theorists. The level of integration, however, will affect the extent to which such a view is valid. The reasoning behind this assertion can be derived by examining the nature of small groups in general and the nature of group cohesion in particular.

While a variety of conceptualization of small groups have been advanced, most of them are in agreement at a general level. Bales (1950) offers the following general definition:

> A small group is defined as any number of persons engaged in interaction with each other in a single face-to-face meeting or a series of meetings, in which each member receives some impression or perception of each other member distinct enough so that he can, either at the time or in later questioning, give some reaction to each of the others as an individual person . . . (p. 33).

In defining the term, Sherif and Sherif (1953) stress the characteristics of interdependent role relationships and a "set of values or norms of its own" as central components of small group interaction. Obviously, both of these views of "group" presuppose the flow of communication among members. Festinger, Schachter and Back (1950) point out:

Small social groups occupy a strategic position as determiners of the behavior and attitudes of their members. . . . Face-to-face communication among members of a social group would be a method through which much of the development of these attitudes and behavior would occur (p. 3).

Unless persons are relatively interconnected through communication, however, it would appear doubtful that we would be warranted in calling them a group. The extent to which group norms or values, impression of other members, interdependent roles, and the extent to which members' attitudes and behavior are influenced would be significantly diminished in the case where persons were not connected through a communication network. Thus, the degree of integration in the network would emerge as an important determinant of the extent to which close friendship network could validly be considered as "groups."

This argument becomes stronger if we examine the nature of group cohesion. This variable has come to play an important role in theories of group functioning. In his review of the literature on group cohesion, Cartwright (1968) relates group cohesion to levels of: 1) member satisfaction; 2) maintenance of membership; 3) ability of the group to influence its members; 4) feelings of security in terms of anxiety reduction and an enhancement of self-esteem among group members; and 5) the degree of participation of members. However, unless members are high interconnected through a communication network, cohesion as the forces drawing and attracting persons to the group is likely to remain at very low levels. Under conditions of low integration, members would be less likely to: 1) perceive the aggregate of individuals as a unified whole, i.e., "a group"; 2) be exposed to other members directly; or 3) either receive or accept information from other persons. Under such conditions, it is extremely unlikely that any great amount of group cohesion will develop. In sum, the level of network integration will be an important determinant of both the extent to which close friendship communication networks can be considered as small groups and the extent to which an important small group variable (cohesion) will influence the attitudes and behaviors of participants. Study of network characteristics, then, is necessary to determine the extent to which the literature of small group research can be legitimately applied to close friendship networks.

The primary dependent variables of interest in the present research are, then, network size and network integration. Network size is defined as the number of persons designated as members of the communication network. Integration refers to the numbers and strength of linkages among persons composing the network. The present research is concerned with networks among those individuals designated as "close friends" by the subject. We now turn our attention to those variables which are hypothesized to be determinants of the size and integration of communication networks among close friends.

### Hypothesized Determinants of Network Characteristics

In the following discussion a set of theoretically based variables will be presented. Their hypothesized relationship to network characteristics (size and integration) will be presented on the basis of theoretical rationale and/or results of previous research. While the hypothesized determinants of network size and connectivity will be presented separately, the overall goal will be to develop a model descriptive of the entire set of relationships.

<u>Determinants of Network Size</u>. Network size was conceptualized as the number of individuals designated by the subject (including the subject himself or herself) as close friends. At a broad theoretic level we can

hypothesize that the size of such a network will be a function of: 1) one's desire to participate in such relationships; 2) one's ability to form and maintain such relationships; and, 3) one's opportunities to engage in such relationships. This typology is believed to be exhaustive. A closer examination of each factor is warranted.

As the earlier discussion of close friendship indicated, these relationships tend to be high risk and high cost in nature. Large amounts of time and energy are expended in their maintenance (Rake, 1970; Suttles, 1970; Kurth, 1970). The fact that such relationships are voluntary clearly implies that one intentionally enters into them. Assuming this is the case, it would appear that one would not form or maintain such relationships unless they held a positive attitude toward them. We shall treat this attitude as the level of desire the subject has for close friendship relations.

This attitude is not a generalized one. One associates with other persons besides close friends. In fact, Kurth (1970) persuasively argues that under many circumstances simple "friendly" relations would be preferable. Thus, a generalized "need for affiliation," level of "alienation" or degree of "sociability" would not appear to clearly explain the subject's attitude toward close friendships. One might, for example, have a very high "need for affiliation" but satisfy it through a network of acquaintances and casual friends. The desire to participate in close friendship relations would be a desire based on the unique qualities of that relationship which were advanced in the definition offered earlier. Among these would be the desire for a relationship or relationships involving: 1) a relatively intense positive affective orientation; 2) reciprocal disclosure and trust; 3) initial equality between participants; and 4) extensive and generalized obligations.

The second component of participation in close friendship relations is hypothesized to be one's abilities to form and maintain such relations. This ability will depend on the sorts of communication skills that one can bring to bear on the development and maintenance of close friendships. We would expect, then, that the more highly skilled the individual is in terms of interpersonal communication skills, the more easily and frequently he or she will be able to form close friendships. Thus, one's level of interpersonal communication skills is hypothesized as an antecedent condition to network size.

The final component or antecedent condition of network size is hypothesized to be the level of opportunity for participation. One may have the necessary desire and skills to participate in close friendship networks, but unless one also has the opportunity to do so, the participation would be expected to be minimal. The variables discussed below are all hypothesized as indicants of opportunity.

We would expect that persons of high socioeconomic status would have more opportunities to participate in close friendship relations. Higher SES persons have more resources than lower SES persons by definition. An inverse relationship exists between social class and percentage of income spent on food, shelter, and clothing (Warner & Lunt, 1941). Hence, lower SES individuals would be less able to afford: 1) facilities for receiving guests in the home; or 2) extensive entertaining outside the home (Shuval, 1956). Additionally, such individuals are more likely to be physically fatigued from their work (Shaval, 1956). As we descend the socioeconomic ladder, then, we would expect individuals to have less and less opportunity to participate in close friendship communication networks.

Socioeconomic status, as an indicant of opportunity would be expected to hold a positive relationship with the size of the communication network.

Previous research reports a consistently positive relationship between network size and SES (Lynd & Lynd, 1929; Shuval, 1956; Bell & Boat, 1957; Williams, 1958; Babchuk, 1965; Simon, Crotts & Mahan, 1970; Booth, 1972). In his review of this literature, Teele (1965) concluded that "there seems to be a direct relationship between having or seeing friends and social status."

Several other variables may be considered as factors underlying opportunity. Among these are: 1) membership in voluntary associations; and 2) the level of residential mobility. Both of these variables function to bring the individual into contact with greater numbers of persons. The greater the number of persons contacted, the more opportunities one might have for the selection of close friends. This, in turn, may lead to the actual selection of a greater number of close friends. Thus, we would hypothesize a positive relationship between levels of membership in voluntary associations and rates of residential mobility (as indicants of the opportunity variable) and the size of the communication network.

Membership in voluntary organizations has been found to vary positively with the number of close friends one has (Williams, 1958; Meadow, 1965) and the rates of interaction with those close friends (Axelrod, 1956).

The relationship between residential mobility and network size has been the subject of a great deal of speculation but relatively little empirical research. Toffler (1970) asserts that under conditions of high mobility individuals will become more adept at forming close friendships in shorter periods of time. Presumably, this would result in a greater network size, although Toffler goes on to suggest that these relationships will not be very durable over time. Packard (1972), on the other hand,

takes the position that high mobility rates function to cut the individual off from the community. Supposedly, this would result in a negative relationship between the level of residential mobility and network size. In one of the few quantitative studies in the area, Tomeh (1969) found that residential mobility was positively associated with participation in formal associations--which as we noted above has been positively related to network size in other research. The relationship between network size and residential mobility is not resolved, but morits further examination-especially in terms of the theoretical perspective advanced here.

Since one has only a finite amount of time for participation in a communication network among close friends, we would hypothesize that any activity which commits the individual to communication with persons other than close friends would be negatively associated with network size. The formation and maintenance of a series of close friendships requires time and effort. If this time and effort are directed elsewhere, we would expect that there would be fewer of these relationships. High allocations of time to activities such as: 1) spending time with non-friends; 2) spending time with non-close friends; 3) spending time with mass media sources; or 4) spending time alone, would be expected to reduce the opportunities one has for the formation and maintenance of close friendship relations. Thus, we would hypothesize a negative relationship between these time allocation variables and network size.

Under the general theoretic category of opportunity for participation, we have discussed seven variables: 1) SES; 2) levels of membership in voluntary associations; 3) rates of residential mobility; 4) the amount of time spent with non-friends; 5) the amount of time spent with nonclose friends; 6) the amount of time spent with mass media sources; and

7) the amount of time spent alone. All of these variables have been conceptualized as underlying the common factor of opportunity for participation. On this basis, we would expect that these variables would be highly interrelated. We have already noted Tomeh's (1969) finding of a positive relationship between residential mobility and membership in voluntary associations. Further, there is a strong, positive relationship between social status and membership in voluntary associations (Dodson, 1951; Axelrod, 1956; Williams, 1958; Teele, 1965). In their review of the literature on this relationship Hodge and Treiman (1968) conclude:

The positive association between membership in voluntary organizations and socioeconomic status is one of the best documented relationships in the sociological literature (p. 722).

These findings suggest that these variables are not independent. The position taken here is that they are all indicants of the underlying dimension of opportunity. Obviously, analysis of the data should address itself directly to this question.

At a broad level, we have conceptualized desire, ability, and opportunity as antecedent conditions of network size. We have examined the relevant literature with regard to each of these theoretic variables.

Determinants of Network Integration. Network integration refers to the degree of linkage between individuals in a communication network. The conceptualization and measurement of integration have been discussed in a previous section. At this juncture, hypothesized determinants of integration will be examined. These are: 1) network size; 2) perceived similarity; 3) propinquity or perceived effort; and 4) residential mobility.

It is hypothesized that network size will be negatively associated with the degree of network integration. We would expect that as network size increases, it would become more difficult for participants to maintain

active communication with each other. Thus, the larger the network, the less the degree of integration. Indirect support for this hypothesis can be found in the small group literature. Generally, it has been found that the larger the group, the less frequently any given individual participates in the communication activities of the group (Kelley & Thibaut, 1969). More direct support for this hypothesis comes from a study of communication network within a large financial institution. Danowski (1974) found that a strong negative relationship existed between network size and network integration.

One of the most consistent and best documented relationships in social science is that between liking or friendship choice and perceived similarity (Newcomb, 1961; Lott & Lott, 1965; Aronson, 1969; Byrne, 1969; Berscheid & Walster, 1969). We would hypothesize that: the more similar members of a communication network perceive themselves to be, the more integrated will be that network.

Research on liking (interpersonal attraction) and friendship choice in terms of similarity has generally focused on: 1) attitudinal vs. personality similarity; and 2) actual vs. perceived similarity. A brief review of this literature will serve to explicate the hypothesis advanced above.

The theoretic underpinning most often articulated for the relationship between similarity (both attitudinal and personality) and liking or friendship choice is that of exchange theory (Berscheid & Walster, 1969; Aronson, 1969). Similarity with another person is hypothesized to be rewarding in terms of an enhanced ability to predict his or her behavior (Kurth, 1970) and social validation for our views or qualities (Berscheid & Walster, 1969). The hypothesis can also be derived from theories of

cognitive consistency. Berscheid and Walster (1969) explicate the relationship in terms of Heider's balance theory:

> . . . Heider proposed that people strive to make their sentiment relationships harmonious with their perception of the unit relationships existent between objects. According to Heider, separate entities which are similar tend to be perceived as belonging together (have a unit relationship). According to Heider's theory, then, positive unit formation (e.g., perceived similarity) should induce a harmonious sentiment relationship (e.g., liking). This process, of course, should also operate in reverse: liking for another should lead to the perception that a harmonious unit relationship exists (e.g., that the liked other is similar to oneself) (p. 70).

Employing a variety of experimental and non-experimental designs, investigators have repeatedly found support for a positive relationship between actual attitudinal similarity and liking or friendship choice (Richardson, 1940; Precker, 1952; Byrne, 1961; Newcomb, 1961; Byrne & Nelson, 1965; Levinger & Breedlove, 1966; LaGaipa & Werner, 1971; Jackson & Mascaro, 1971). Byrne and Nelson (1965) found the relationship between the proportion of similar attitudes and attraction to be positive and linear.

Extensive evidence has also been gathered indicating that liking or friendship choice leads to perceived similarity (Newcomb, 1961; Byrne & Blaylock, 1963; Nowak, 1963; Levinger & Breedlove, 1966; Berscheid & Walster, 1969). The bulk of this research has examined either friendship or marital relations. Research has also indicated that perceived attitudinal similarity tends to be greater than actual attitudinal similarity (Byrne & Blaylock, 1963; Levinger & Breedlove, 1966).

The relationship between actual similarity in terms of personality traits and liking or friendship choice has also been the subject of extensive research. Typically, these studies compare friends' or spouses'

profiles on some objective personality inventory.\* Several studies have found a positive relationship between personality traits and profiles of persons exhibiting high attraction toward each other (Bonney, 1942; Reader & English, 1947; Izard, 1960; Banta & Hetherington, 1963; Izard, 1963; Poe & Mills, 1972). In her review of over 50 studies of personality and attitudinal similarity among friends and spouses, Richardson (1939) concludes that:

Throughout all the traits and the ranges of ages the correlations between the paired scores of friends or marriage partners have been positive with very few exceptions (pp. 116-117).\*\*

Other studies with similar designs and subject populations, however, have produced results which indicate no relationship between actual personality similarity and liking or friendship choice (Hoffman, 1958; Commins & Stefic, 1960; Day, 1961; Mehlman, 1962; Coats & Mazur, 1969). In general, positive correlations between these personality variables and attraction have not been found with the regularity with which positive correlations between attitudinal similarity and liking have been found. Further, personality similarity and liking tend to have lower correlations (when positive relations are found) than attitudinal similarity and liking. These results have prompted Berscheid and Walster (1969) to speculate that to the extent personality similarity is a factor in attraction, "it is perhaps a less important one than attitudinal similarity."

Perceived personality similarity, as opposed to actual similarity, has tended to receive more consistent confirmation as an antecedent to

<sup>\*</sup>The most frequently used profile has been the Edward's Personal Preference Schedule.

**<sup>\*\*</sup>The author does** not present any significance levels for these correlations, however.

attraction or friendship choice. A variety of studies have found a positive relationship between friendship choice or attraction and perceived personality similarity (Beier, Rossi & Garfield, 1961; Broxton, 1963; Secord & Backman, 1964; Miller, et al., 1966). Miller, et al. (1966) argue that this relationship represents an overgeneralization on the subject's part.

In sum, the literature gives strong support for a positive, linear relationship between actual or perceived attitudinal similarity and interpersonal attraction or friendship choice. Perceived personality similarity is also positively related to attraction or friendship choice, but actual personality similarity is not consistently related to liking. Relatively little research, however, has been directed toward isolating the direction of these relationships. That is, we are asking if the predominant path of influence is from similarity to attraction or from attraction to similarity. Evidence to support the relationship in both directions has been reported. Most investigators have treated the relationship as non-recursive (Lazarsfeld & Merton, 1954; Newcomb, 1961; Lott & Lott, 1965). Given that the degree of liking is positively related to the frequency of communication (Festinger, Schachter & Back, 1950; Bovard, 1951; Bovard, 1956; Chambliss, 1965), we would hypothesize a positive, linear, non-recursive relationship between overall perceived similarity among participants and the degree of integration in the communication network.

Substantial support has been found for the hypothesis that physical proximity and frequency of interaction are positively related (Caplow & Forman, 1950; Festinger, Schachter & Back, 1950; Gullahorn, 1952; Maisonneuve, Palmade & Fourment, 1952; Willerman & Swanson, 1952; Kipnis,
1957; Riemer & McNamara, 1957; Deutsch & Collins, 1958; Loether, 1960; Menne & Sinnett, 1971). In a broad sense, the explanatory variable underlying these findings can be conceptualized as "effort to communicate." The easier it is to communicate with someone, the more likely it is we will communicate with that person--all other things being equal. Since physical proximity implies that persons would require less effort to communicate, we would expect proximal individuals to communicate more frequently than distal individuals. In general, we would expect that perceived effort of communicating with a given individual will be negatively related to the frequency of actual communication with that individual. Since frequency of actual communication is the central component of network integration, we would hypothesize that: the greater the level of perceived effort to communicate with other members, the less well integrated the network will be.

In addition to offering an explanatory vehicle for the propinquity/ interaction findings, effort is a useful conceptualization from the operational standpoint. If we use residential propinquity, we are immediately faced with the lack of a stable referent. Individuals, for example, may live far apart, but share a common office. In this case, residential propinquity would be a less than adequate measure of functional or actual propinquity. On the other hand, if we use proximity in terms of place of work, we have the same problem if we find that some individuals who live close together, but who are widely separated in terms of their work setting. By using level of effort, we avoid these difficulties.

The final hypothesized antecedent of network integration to be discussed in the present research is residential mobility. Again, relatively little previous research can be brought to bear on this relationship.

However, if we assume that individuals do make close friends as they travel about, then it would seem logical to assume that the more spatially mobile one is, the less integrated would be his or her communication network. Residential mobility will have both a direct and indirect influence on network integration. First, it would be less likely that one's close friends either know or communicate frequently with each other under conditions of high mobility. In this case, the level of residential mobility would be hypothesized to have a direct, negative influence on the level of network integration. Second, as indicated above, as one's proximity to close friends decreases as a result of residential mobility, greater effort would be required to maintain communication at any given level. This increased effort should result in decreased frequencies of communication with one's close friends. Residential mobility and effort are assumed to be positively related in this case. Here, residential mobility would have an indirect and negative impact on integration through perceived effort. On this basis, it is hypothesized that: the higher the rate of residential mobility, the lower the degree of network integration.

In a broad sense, then, network integration is hypothesized to be a function of four variables. These are: 1) network size; 2) perceived similarity level; 3) perceived effort to communicate; and 4) the rate of residential mobility. Network size and perceived effort are hypothesized to be negatively related to integration. Perceived similarity and integration are hypothesized to be associated in a linear, positive, non-recursive fashion. Residential mobility is hypothesized to have a direct negative impact on integration and an indirect negative impact through perceived effort on integration.

<u>A Causal Model of Determinants of Network Characteristics</u>. The relationships hypothesized above may be viewed as comprising a system of

causal relationships. The path or causal model below (Figure 1) is an attempt to explicate and identify the nature of the logical and empirical relationships within that system. Our concern in the model is not so much with individual bivariate relationships as with all relationships taken in concert as a system.

Network size is hypothesized to be a function of one's desire, ability and opportunity to participate in close friendships. Opportunity is conceptualized as the underlying characteristic common to the following variables: 1) SES; 2) number of memberships in voluntary associations; 3) residential mobility; 4) time spent alone; 5) time spent with mass media; 6) time spent with non-close friends; and 7) time spent with nonfriends. Opportunity has the status of an unmeasured variable.

Network integration is hypothesized to be a function of: 1) network size; 2) perceived similarity; 3) perceived effort; and 4) residential mobility. Residential mobility is hypothesized to have a direct effect on integration as well as an indirect effect mediated by perceived effort. The relationship between network integration and perceived similarity is hypothesized as non-recursive. All other relationships in the model are hypothesized as recursive.





#### CHAPTER II

### METHODS AND PROCEDURES

Selection and Description of the Sample. A sample of college students was utilized to test the model posited in Chapter 1. This choice was based on a consideration of three factors. First, there appears to be a curvilinear relationship between age and the number of close friends one has (Williams, 1958). Since the causal model is concerned with linear relationships among variables, it seemed desirable to reduce this potential source of variance in the population. College students represent a relatively age-homogenous population. Second, the common mode of contacting adult subjects through voluntary associations was ruled out since this would confound the voluntary association membership variable. Further, the amount and complexity of the data to be collected effectively ruled out the use of telephone interviewing of subjects. As a result, there was no obvious way in which to obtain an adult sample. Third, data could be more easily obtained from a student sample given the limited resources of the project.

Obviously the use of a student sample presents disadvantages. In this case, a student sample is restricted in terms of the range of socioeconomic backgrounds and in terms of the mobility variable. Packard (1972) suggests that students are considerably more mobile as a group than are non-students of the same age. However, the advantages in terms of obtaining an age-homogenous sample, the ease of obtaining large amounts of data, and the reduction of possible confounding of important variables appeared to warrant the use of a student sample.

The final sample of 58 students was drawn on a volunteer basis from sophomore level courses in the Department of Communication at Michigan State University in the Fall of 1974. An effort was made to select classes containing no first quarter freshmen. This was done on the assumption that the friendship networks of these individuals might not be stable over the period of time required for data collection.

The final sample consisted of 23 males and 35 females. The mean age of the subjects was 20.3 years. The low standard deviation (SD = 1.63) and the restricted range (18 to 26 years) for this variable indicated that the sample was relatively homogenous with respect to age.

No first quarter freshmen were involved in the study. The mean number of years of college education completed was 2.9. The range was one year to five years. All subjects were undergraduates.

Nine-tenths (89.7%) of the sample had never married. Of the remaining 10.3%, 8.6% were presently married and 1.7% were separated or divorced.

The 58 persons who completed the fourth and final wave represent a 63.7% completion rate when compared to the original 91 persons who signed up to participate in the study. Eighty-three persons (91.2%) completed the first two waves and 72 persons (79.1%) completed three waves. Aside from a tendency for more males to drop out of the study than females, those who dropped out of the study did not appear to be different than those who completed it. All persons who were dropped from the study were dropped because of a failure to complete one or more questionnaires.

Because of the small size of the sample and its special nature, the results and conclusions of this study must be treated as exploratory and preliminary.

Data Collection Procedures. The overall design of the study was nonexperimental in nature. Each subject completed four questionnaires. The

questionnaires were distributed approximately one week apart. All data were gathered between the last week of October and the third week of November.

Data collection adhered to the following general pattern. Subjects were given questionnaires in class and told to return them at the next meeting of that class or to a drop-off point. Subjects who failed to either pick-up or return a given questionnaire were contacted by phone. If a subject failed to complete the questionnaire or could not be contacted prior to the date scheduled for the distribution of the next wave of questionnaires, he or she was dropped from the study. In no case was the subject allowed to have more than one questionnaire at a time, for many of the items from wave to wave were similar and the investigator wished to avoid the possibility of subjects merely copying responses from one questionnaire to the next.

The first wave, unlike other waves, was completed in the subject's class. At that time, each subject was asked to complete a sign-up sheet. Additionally, the general purpose of the study was explained and assurances of confidentiality were given. Because of the personal nature of the responses and the need for subjects to be identified by name, considerable time was allocated for this latter point.

After the first wave, each questionnaire for each subject was prepared individually. This was necessary since: 1) the subjects' networks were of differing sizes--thus requiring differing numbers of items regarding network behavior; and 2) it was believed that the demands on the subjects would be lessened if the names of network members were filled in for the subject on each questionnaire. As a result, each subject received a questionnaire with his or her name on it.

The information (name, addresses, and phone number) from the sign up sheets completed along with the first wave was transferred to cards. This provided a relatively easy means of tracking each subject's progress through the study.

Instrumentation. With the exception of opportunity for participation, each of the variables in the models was measured in a questionnaire format. City size was not dealt with in this study. Opportunity for participation was conceptualized as the common underlying variables of a series of measured variables. A discussion of the measurement of the remaining variables follows below. Sample copies of the four questionnaires are contained in Appendices I, II, III, and IV.

<u>Network Integration</u>. As indicated previously, network integration was conceptualized as a ratio between the number of possible links at some maximal strength and the observed strengths for each of those possible links. Strength was equated with frequency of communication. This was measured by asking subjects to estimate the number of times each member of the network communicated with each other member of the network during the preceding one week period.

The maximal strength of a link was determined by using the highest frequency of communication as a standard. The strengths of all other links were derived from a ratio between the maximal strength and the observed frequency of communication for a given link.

Integration was computed according to the following formula:

$$I = \frac{2L}{(N) (N-1) (P)}$$
(1)

Where:

- I = Index of Integration
- L = Sum of Observed Strength Values for All Links
- N = Number of Nodes (Size of Network)
- P = Maximal Possible Link Strength

For example, assume that the maximum frequency reported for a network of size three was 100. That is, the subject reports an estimate of 100 for frequency of communication for a link and this estimate is the highest one given. For a three person network, there are three possible links. Assume further that the subject reports the following frequencies of communication for these links: 100, 50, 25. With these pieces of information we can proceed to calculate an index of integration (I).

$$I = \frac{2(100 + 50 + 25)}{(3)(2)(100)} = .583$$
 (2)

As previously indicated, the index of integration takes on values between zero and positive one. Thus, our hypothetical network above is more than half as integrated as it could possibly be. A maximally integrated network would have an integration index of 1.0. A network in which no person communicated with any other person would have an integration index of zero.

Subjects were asked to estimate frequencies of communication for all links three times (Waves II, III, IV). In each case, the subject was presented with a pair of names of network members and asked: "In the last week (7 days), estimate how many times you think that these two persons have communicated with each other?" By repeating this question for each possible link over three waves, data for a three-week period was obtained for each subject. With the additional knowledge of network size, it was then possible to compute the index of integration for each subject.

Perceived Similarity. This variable was conceptualized as the overall level of perceived similarity among network members. For each possible link, the subject was asked the following: "On the scale below, estimate how similar (in general) you think these two persons are." Responses were given on a nine-point scale bounded at the end points with the phrases "very different" and "very similar." In order to obtain a test-retest reliability estimate, the similarity item for each link was given on Waves II and III. The data was treated in the following manner. First, a mean value for perceived similarity for each wave was computed by dividing the sum of estimates for each link by the number of links for a given network. Second, the final value of the variable was computed by taking the mean of the estimate on Wave II and the estimate on Wave III. This resulted in an estimate of overall network similarity.

<u>Perceived Effort</u>. This variable was conceptualized as the overall level of effort necessary for each person to communicate with each other person in the network. It was operationalized in the following manner. For each possible link, the subject was asked to: "Suppose the first person wanted to get in touch with the second person of the pair. On the scale below, estimate how much effort it would take the first person to get in touch with the second person." Responses were given on a nine-point scale bounded at the end points with the phrases "very little effort" and "very much effort."

Like the perceived similarity measure, these measures were repeated on Waves II and III. The estimate of overall effort was computed in the same manner as the estimate of overall network similarity.

Network Size. Network size was conceptualized as the number of persons in the network--including the subject. In order to operationalize this variable, it was first necessary to operationalize the conceptualization of close friendship given in the first chapter. This was done by providing the subject with the following definition:

A close friend is someone you like and trust very much. He or she is someone with whom you share a great deal of personal or confidential information. A close friend is someone you could count on for help if you needed it--and he or she could count on you. Although either of you could end the friendship at any time, you don't expect to because you see it as a special and lasting relationship.

This definition represents a simplication in wording of the constitutive definition offered in the first chapter. Subjects were instructed to carefully read the definition and then list all those persons who were their close friends according to the definition. Subjects were verbally instructed that they could use the first name of a friend if they wished as long as that name did not repeat itself in their list. Subjects were also instructed to indicate the sex of each person listed. Further, subjects were instructed to ". . . not count your spouse (if you are married) as a close friend-even though he or she may be one. This was done to differentiate the marital relationship from the close friendship relationship in the list provided by the subject.

The final size of the close friendship communication network, then, was computed by counting the number of names listed by the subject and adding an additional one--the subject himself or herself.

Information regarding network size was collected on the first wave. (See Appendix I for a complete copy of this measure).

Desire for Close Friendships. In the previous conceptual discussion it was argued that the desire for close friendship was not a generalized attitude, need, or motivation. Rather, this desire would be one based on the unique qualities of the close friendship relationship. The previously provided constitutive definition of close friendship indicated the following unique qualities: 1) reciprocal self-disclosure; 2) mutual trust; 3) the perception of the relationship as special or lasting; 4) the existence of extensive and generalized obligations; and 5) a high level of mutual positive affect.

Desire for close friendships was operationalized by asking subjects to indicate the importance of each of the five aspects above to them. Five items were constructed (one for each quality) in which the quality was assumed to be important. Subjects were instructed to indicate their level of agreement or disagreement with each item on a nine-point scale bounded at the end-points by the phrases "strongly disagree" and "strongly agree." (See Appendix II for these scales.)

Since close friendship was considered to be the combination of the indicated qualities, it was also reasonable to view the desire for participation in close friendship relations as a combination of the importance placed on each of the individual qualities. On this basis, the final value of this variable was computed as the sum the five items.

Level of Interpersonal Communication Skills. In the preceding conceptual discussion, it was argued that one's levels of interpersonal communication skills would represent one's ability to form and maintain close friendships. The operationalization of this variable was accomplished by using the Bienvenu Interpersonal Communication Inventory (Bienvenu, 1969, 1971, 1974). The 40 items comprising this instrument were drawn from previous research in the areas of marital communication, parent-child communication, group therapy and intragroup communication. (See Appendix II for these items.)

Scoring for these items was done in accordance with the instructions given by Bienvenu (1974). The possible range of scores on the inventory is zero to 120. It was this sum score that was used for the value of this variable.

Socioeconomic Status. This variable was conceptualized as one of the variables underlying the unmeasured variable of opportunity for participation in close friendship networks. It was operationalized as the subject's score on the 1960 U.S. Census Socioeconomic Scales (U.S. Bureau of the Census, 1963). To obtain a subject's score on these scales, the investigator matched information about the subject's background with the categories of the scale.

Information necessary to do this was derived from a series of items. Among these were items asking the subject to describe the occupation of the breadwinner in his or her family, family income, parents' educational attainment level, and the perceived level of income relative to other persons in his or her community. (See Appendix II for these items.)

The possible range on the Census Socioeconomic Scales is zero to 100. The final value for this variable for each subject was the score on that scale.

Number of Memberships in Voluntary Organizations. This variable was also conceptualized as one of the variables underlying opportunity for participation in close friendship networks. It was operationalized by asking the subject to list all clubs or organizations to which he or she belonged either on-campus or off-campus. In order to somewhat structure the respondents' lists, the following examples were given: "church clubs, activity clubs like chess clubs, sports clubs, service clubs like Circle K, Lions, sororities or fraternities, and professional organizations." The final value of this variable for each subject was the number of voluntary organizations listed. (See Appendix II for this item.)

Residential Mobility. The rate of mobility of subjects was assumed to underlie the opportunity variable as well as enter into

relationship with perceived effort and network integration. Spatial mobility may be of two distinct types: 1) moves from one city or town to another; and 2) moves from one residence to another within the same city or town. To operationalize residential mobility, the subject was asked to list the number of moves he or she made in both categories within the last five years. The time period was chosen rather arbitrarily, but is consistent with other research on residential mobility. (See Appendix III for these items.)

In order to obtain an estimate of test-retest reliability, the mobility items were repeated on Waves III and IV. The final value of the variable for a given subject was computed in the following manner. First, the mean intercity mobility estimate was computed by comparing Waves III and IV. Second, the mean intracity mobility estimate was computed by comparing the intracity item on Wave III to the intracity item on Wave IV. Finally, a grand mean was computed from the mean intracity mobility rate and the mean intercity mobility rate. This grand mean was used as the value of the variable for each subject.

<u>Time Allocation Variables</u>. This section will discuss four related variables: 1) time spent with mass media sources; 2) time spent with non-close friends; 3) time spent with non-friends; and 4) time spent alone. Each of these variables was conceptualized as underlying the unmeasured variable of opportunity for participation in close friendship communication networks.

These variables were operationalized in the same general way. For each variable, the subject was asked to estimate the number of hours spent in that activity on an "average week day" and an "average weekend day." These estimates were then summed in a fashion which yielded a value for an average week for each variable. (See Appendix III for these items.)

With the exception of "time spent with mass media sources" each of the variables was operationalized with a single item. For mass media sources, however, three items were employed. One item dealt with television and another dealt with the other electronic media (radio and stereo). The final item requested a time allocation for printed media (books, magazines, newspapers, etc.). These three items were summed before the procedure outlined above was employed.

For reliability assessment purposes, the items relating to time allocation were presented in Waves II and III. The final value of each variable was the mean of the values for each administration.

Variables Not in the Model. Several variables not hypothesized in the model were also measured. This was done in an effort to either more fully describe the sample or to extend the possibilities for secondary analysis or explanation. Variables in the former category were: 1) the subject's age; 2) year in school; 3) marital status; 4) sex; and 5) number of quarters at Michigan State University. Variables in the latter category were: 1) an estimate of the distance from the subject to each of his or her close friends; 2) an estimate of the number of hours spent by the subject in communication with each of his or her close friends. Finally, subjects were given space to write comments concerning the study or the information requested.

Reliability of Measurement. With the exception of three variables (Network size, number of memberships in voluntary associations, and SES) reliability estimates were obtained for each of the variables in the model. These were one of two types--internal consistency and test-retest reliability.

Desire for participation in close friendship communication networks and interpersonal communication skills were both measured by multiple items

scales. Cronbach alphas (Cronbach, 1951) were computed for each. The Cronbach alpha for the desire items was .92. For the interpersonal inventory, it was .78. Both of these coefficients are sufficiently high enough to consider the measures to be reliable.

Computation of zero-order correlations provided test-retest reliability estimates for seven of the variables in the model. These results are summarized in Table 3.

Table 3. Test-Retest Reliability Estimates.<sup>a</sup>

	Variable	<u>r</u>
1.	Perceived Similarity	.83**
2.	Perceived Effort	.91**
3.	Residential Mobility	
	Intercity	.95**
	Intracity	<b>.8</b> 8**
4.	Time Spent with Mass Media Sources	<b>.7</b> 6**
5.	Time Spent with Non-Close Friends	.78**
6.	Time Spent with Non-Friends	.53**
7.	Time Alone	<b>.</b> 32 <b>**</b>

 $a_{N} = 58.$ 

\*p < .01

\*\*p < .001

With the possible exception of time spent alone, all of these variables appear to be acceptably reliable. Estimates of time spent alone varied greatly from one administration to the next largely due to what appeared to be a confusion on the part of the subject as to whether to include hours of sleep. This occurred despite the fact that subjects were instructed to include hours of sleep in this estimate.

Since the communication frequency data used to compute the level of network integration was collected in terms of a specific time period, it was not possible to obtain a direct estimate of reliability. However, an indirect estimate can be obtained if one assumes that the reported rates of communication represent generalized estimates by the subject. This appears to be a reasonable assumption given that in most instances the subject was estimating links in which he or she was not directly involved. In such a case, the subject probably gives some generalized estimate of the frequency of communication. Given these assumptions, it becomes possible to compare the communication frequency data for each network across the three waves since the same type of data was gathered on Waves II, III and IV. The mean interwave correlation was .92 (p < .001).\* Subjects appeared to be quite stable in their estimates of communication frequency.

<sup>\*</sup>An <u>r</u> to <u>Z</u> transformation of the zero-order correlations was employed in order to compute this mean.

#### CHAPTER III

#### RESEARCH FINDINGS

Reporting and discussion of the results of the present study have been divided into four sections: 1) a consideration of the descriptive statistics for each variable; 2) an evaluation of the pattern of zero-order correlations among variables; 3) the presentation and evaluation of the several applications of multiple regression procedures to the data; and 4) a consideration of the attempts to cast the entire model into the format of path analysis.

## Descriptive Analysis

The presentation and discussion of the descriptive statistics for each variable is divided into two general areas: 1) those variables which were hypothesized to be determinants of network size; and 2) those variables which were hypothesized to be determinants of network integration. A summary of the descriptive statistics for each variable is presented in Table 4.

Determinants of Network Size. The size of the subjects' close friendship communication networks was hypothesized to be a function of the subjects' desire  $(X_5)$ , skills or ability  $(X_6)$ , and opportunity to participate in close friendship communication networks  $(Y_1)$ . While desire and skills were hypothesized as being directly exogenous to network size  $(X_4)$ , opportunity was hypothesized to be the common factor among seven variables. These were: 1) the number of voluntary associations to which the subject belonged  $(X_7)$ ; 2) the socioeconomic status of the subject  $(X_8)$ ; 3) the rate or level of residential mobility of the subject  $(X_{12})$ ; 4) the amount of time the subject

	Variable	Mean	S.D.	Std. Error	Range
×1	Network Integration	<b>.</b> 04	.06	.007	0.028
x <sub>2</sub>	Perceived Similarity	5.23	1.09	.142	2.77 - 7.42
x <sub>3</sub>	Perceived Effort	4.48	1.42	.187	1.0 - 9.0
X <sub>4</sub>	Network Size	7.91	3.32	.435	2.0 - 16.0
x <sub>5</sub>	Desire	39,66	7.36	.966	9.0 - 45.0
x <sub>6</sub>	Communication Skills	87.67	13.39	1.758	55.0 - 117.0
х <sub>7</sub>	Voluntary Associations	1.50	1.76	.231	0.0 - 9.0
х <sub>8</sub>	SES	82.28	14.26	1.889	42.0 - 98.0
х <sub>э</sub>	Time/Mass Media	45.04	19.58	2.571	11.5 - 107.0
x <sub>10</sub>	Time/Non-Close Friends	18.61	11.16	1.465	4.0 - 67.0
x <sub>ll</sub>	Time/Alone	65.80	12.73	1.671	23.5 - 99.3
	Time/Close Friends	35.81	32.99	4.33	0.0 - 157.0
x <sub>12</sub>	Residential Mobility	3.57	3.49	.458	0.0 - 17.0
× <sub>13</sub>	Time/Non-Friends	10.17	7.03	.924	0.0 - 29.5

Table 4. Descriptive Statistics for Variables.<sup>a</sup>

<sup>a</sup>N = 58 for each variable

spends alone  $(X_{11})$ ; 5) the amount of time the subject spends with mass media sources  $(X_9)$ ; 6) the amount of time the subject spends with non-friends  $(X_{13})$ ; and 7) the amount of time the subject spends with non-close friends  $(X_{10})$ .

In the following subsections the descriptive statistics for each of these variables will be discussed. When possible, these statistics will be compared with those from previous research.

<u>Network Size</u>. The mean size of the networks in the final sample (n = 58) was 7.91 ( $\underline{SD}$  = 3.32). The range for these networks was two to sixteen members. In the original sample of 91 persons who completed the first wave of the study, the range was two to twenty-two persons. Persons having larger networks were more likely to drop out of the study since their questionnaires tended to be quite long.

The size of networks studied here differed in two ways from the sizes reported in previous research. First, no one in the present study was unable to list a close friend. Previous research has indicated that between 10% (Lazarsfeld & Merton, 1954) and 40% (Dodson, 1951) of the sample was unable to list even one close friend. Dodson's figure only partially applies to the present study, however, since his sample was wholly composed of working class couples. Second, the mean network size (7.91) of the present study was somewhat larger than that reported in previous research. In Booth's (1972) data on close friendship networks of single, separated or divorced persons, the mean network size was 3.35 (SD = 3.25). In a study of marital dyads Babchuck and Bates (1963) report a mean network size of approximately five friendship "units." A unit was either another couple or a single individual. Thus, the mean network size for this study was probably between five and ten persons. Most other previous research

suggests that close friendship networks are quite small-although specific estimates are not given.

These discrepancies between previous research and the present study may well be due to the differing nature of the samples. This is the only study using a student sample. Williams (1958) found that persons between twenty and thirty years of age had larger networks than all other age categories except those for persons over forty years of age. Thus, the relatively youthful nature of the sample in the present study might explain the discrepancies.

<u>Desire for Participation</u>. Desire for participation was operationalized as the sum of five nine-point scales. The range of values possible for this sum was 5 to 45. The mean obtained was 39.66 (SD = 7.36). The distribution was heavily skewed toward the high end of the scale (Skew = -2.04). The reported range of scores was 9.0 to 45.0. Clearly, the descriptive statistics for this variable indicate that most subjects had a rather high desire for participation in close friendship networks--assuming the validity of the measures.

<u>Communication Skills</u>. The ability to participate in close friendship networks was conceptualized as the level of interpersonal communication skills possessed by the subjects. It was operationalized by means of the Bienvenu Interpersonal Communication Inventory (Bienvenu 1969, 1971, 1974). The possible range of scores on this measure is 0 to 120. The mean obtained in the present study was 87.67 ( $\underline{SD} = 13.39$ ). This is very similar to the results obtained in a sample of students by Bienvenu (1974). His results indicated a mean of 85.93 ( $\underline{SD} = 19.05$ ). The range of scores in the present study was 55 to 117.

Number of Memberships in Voluntary Associations. The participation in voluntary associations among students in this sample was quite low  $(\underline{M} = 1.5, \underline{SD} = 1.76)$ . The range for this variable was 0 to 9 memberships. These results are similar to those of Williams (1958) in a study of friendship relations among housewives. They tend to support Axelrod's (1956) observation that membership in voluntary associations is "neither markedly intensive or extensive."

Socioeconomic Status. The socioeconomic status of the subjects was scored on a 0 to 100 scale according to the 1960 Census Socioeconomic Scores. The mean obtained in the present study was 82.28 (SD = 14.26). This mean is relatively high--probably reflecting the fact that college students have a somewhat higher SES background than that found in the population as a whole. The scores in the present study ranged from a low of 42 to a high of 98.

Residential Mobility. Residential mobility was operationalized as the mean number of total moves (both intercity and intracity) in the last five years. That is, the sum of the means for intercity and intracity mobility was 3.59 (SD = 3.49). The distribution was heavily skewed toward the low end of the scale (Skew = 1.35). Reported rates of residential mobility appeared to be most greatly influenced by the rate of intercity mobility. The mean number of intercity moves per subject was 2.4 (SD = 2.6), while the mean number of intracity moves per subject was 1.2 (SD = 1.7).

In terms of the number of moves per year, the average subject in the present study moved 1.2 times. This figure includes both inter- and intracity moves. Citing governmental statistics, Packard (1972) asserts that the national yearly rate of mobility is 0.25. Thus, subjects in the present

study appear to be substantially more mobile than the average person. In view of the fact that college students as a group are probably more mobile than the average member of the adult population (Packard, 1972), these results do not appear to be unrealistic.

<u>Time Spent Alone</u>. The mean number of hours spent alone was 65.80 per week (<u>SD</u> = 12.73). The range obtained in the present study was 23.5 hours to 99.3 hours. In spite of clearly stated instructions to do so, several of the subjects indicated that they were confused as to whether to include hours of sleep. The fact that the low end of the distribution was as low as it was probably reflects this confusion. The low test-retest reliability (.32) obtained for this variable also would indicate that subjects did not always approach this variable in a uniform manner.

<u>Time Spent with Mass Media Sources</u>. The number of hours spent by the subject with mass media sources represented the sum for a sevenday period of estimates of hours spent with the various electronic media (television, radio, stereo, etc.) and printed media (books, magazines, newspapers, etc.). Considerable variability existed with reference to this variable (<u>SD</u> = 19.58, Range = 11.5 to 107.0 hours). The mean number of hours per week spent with mass media sources was 45.04 hours.

<u>Time Spent with Non-Friends</u>. Subjects indicated that they spent relatively few hours per week with persons not considered to be friends ( $\underline{M} = 10.17$  hours, <u>SD</u> = 7.03). The fewest number of hours reported was 0 and the greatest number of hours reported spent with non-friends was 29.5.

<u>Time Spent with Non-Close Friends</u>. Subjects also indicated that they spent relatively few hours per week with persons who were friends but who were not close friends ( $\underline{M}$  = 18.6 hours, <u>SD</u> = 11.16). The fewest number of hours reported was 4.0 and the greatest number of hours reported spent with non-close friends was 67.0.

The amount of time spent with non-friends and with non-close friends can be contrasted with the amount of time spent with close friends. Subjects reported spending more hours with close friends than with either nonfriends or non-close friends. The mean number of hours per week spent with close friends was 35.81 (SD = 32.98). The fewest number of hours reported was 0 and the greatest number of hours reported spent with close friends was 157.0.

Determinants of Network Integration. The level of network integration was hypothesized to be a function of: 1) the level of perceived similarity  $(X_2)$ ; 2) the level of perceived effort  $(X_3)$ ; 3) network size  $(X_4)$ ; and 4) the rate of residential mobility  $(X_{12})$ . Since the descriptive statistics pertaining to network size and residential mobility were discussed in the previous section, the following discussion will concern itself with the remaining variables of interest.

Network Integration. The level of network integration as operationalized in the present study is an index which had a possible range of 0.0 to 1.0. Most of the networks examined had a very low level of integration ( $\underline{M} = .04$ ,  $\underline{SD} = .06$ ). That is, most close friends apparently do not extensively interact with one another. This result is clearly reflected by the fact that the distribution for this variable was heavily skewed toward the low end of the scale (Skew = 2.59). The low level of integration found in the present study appears to be consistent with previous research. In their comparison of friendship networks in both high school and university student sample to randomly constructed networks, Fararo and Sunshine (1964) report that friendship networks were found to have a generally lower level of integration than randomly generated networks. In addition to the fact that close friendship networks are apparently not well integrated, the low levels of integration found in the present study can be partially explained as an artifact of measurement. In computing the integration index for each subject, the highest reported rate of communication for a single link across all subjects was used as a maximal value against which all other reported rates were compared. Since some of the subjects reported extremely high (and perhaps unrealistic) rates such as several hundred contacts per week, the overall mean of this variable was driven downwards.

<u>Perceived Similarity</u>. Perceived similarity levels for each subject's network were computed as the mean level of nine-point scales for each possible link. In describing the descriptive statistics for the overall data set, we are thus discussing the descriptive statistics for these means. The overall mean similarity was 5.23 (<u>SD</u> = 1.09). This represented an overall mean falling at approximately the mid-point of a nine-point scale where lower values indicated lesser levels of perceived similarity and greater values indicated greater levels of perceived similarity. The range in the sample was from a low value of 2.77 to a high of 7.42.

<u>Perceived Effort</u>. This variable, like perceived similarity, represents mean estimates for each subject's network. That is, the value of this variable for each subject is the mean of the estimates of the amount of effort necessary for communication to occur for all links in that subject's close friendship communication network. The overall mean across all subjects for this variable was 4.48 (<u>SD</u> = 1.42). Again, this value is in terms of a nine-point scale bounded at the low end by the phrase "very little effort" and bounded at the high end by the phrase

"very much effort." The range in the sample was from a low value of 1.0 to a high value of 9.0.

# Analysis of Zero-Order Correlations

The simple zero-order correlations among the variables can be discussed in terms of two general patterns. First, we shall examine the correlations between network size  $(X_{\downarrow})$  and the variables hypothesized as determinants of size. Second, we shall examine the correlations between network integration  $(X_{\downarrow})$  and its hypothesized determinants. At each point the obtained correlations will be examined in terms of their direction and significance. A complete correlation matrix is presented in Table 5. The entire model and its zero-order correlations are presented in Figure 2.

It should be noted that several of the variables were logarithmically transformed. The rationale and procedure the transformations are outlined in Appendix V.

Determinants of Network Size. The two exogenous variables of desire  $(X_5)$  and communication skills  $(X_6)$  did not correlate significantly with network size  $(X_4)$ . While the correlations for desire and communication skills with network size (+.09 and +.14, respectively) are both in the hypothesized direction, neither reach statistical significance. With regard to desire, one explanation for the result lie in the nature of the items used to tap desire. An examination of the items (See Appendix III) reveals that they tap a general desire for close friendship relations. Perhaps a subject's desire for close friendship relations can be as easily met by two or three close friends as by five or six or more. The items may not discriminate a general desire for close friendship relations from a specific desire for some particular number of such relationships. As

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		Mean	(s.D.)	х <sup>т</sup>	<b>x</b> <sub>2</sub>	×3	× <sup>rt</sup>	2 X	x <sub>6</sub>	x <sub>7</sub>	8 8	× <sup>6</sup>	x <sub>10</sub>	τι <sup>χ</sup>	x <sub>12</sub>	x <sub>13</sub>	>-
х <sup>1</sup>	Network Integration <sub>L</sub>	•0•	( 90. )	ч													1
X2	Perceived Similarity	5.23	(60.1)	07	ч												
Х3	Perceived Effort	4.48	(1.42)	<b></b> 38*.	28#	Ч											
Χμ	Network Size	7.91	(3.32)	- 003 -	<b>-</b> 00	<b>•</b> 00	ч										
X5	DesireL	39.66	( 7.36)	02 -	.21	.13	60.	_									
x <sub>6</sub>	Communication Skills	87.67	(13.39)	.17	- 05 -	.21	.14	.24#	ы								
X7	Voluntary Assoc. <sub>L</sub>	1.50	( .21)	.05	.13 -	.13	.12 -	11.	.12	н							
X <sub>8</sub>	SESL	82.28	(14.26)	- 08 -	.17	.15	.03 -	.01	.15	10.	Ч						
хg	Time/Mass Media <sub>r.</sub>	45.04	(19.58)	. 04.	.18 -	.05	- IJ -	.14	- 60.	- 60.	.29#	Ч					
x <sub>1</sub> c	, Time/Non-CloseL	18.61	(11.16)	<b>-</b> .09	.12 -	.05	.16 -	.05	.17	.03	.01	.16	Ч				
	Time/Alone	65.80	(12.73)	07	.16 -	.14 -	.22#-	- 03 -	.26#	.16	.05 -	- 10	.10	ч			
X12	2 Mobility <sub>L</sub>	3.57	( 3.49)	19	• 04	.06	.13 -	.03	.03	.06 -	.20 -	.17 -	.06	.14	г		
x	3 Time/Non-Friend <sub>L</sub>	10.17	( 7.03)	26#	.28#	.07	.05 -	- 11 -	- 00.	- TO.	.10	.12	•63 <b>*</b> -	.10	10.	ч	
i X	Opportunity	8.36	(1.18)	- 03 -	- 14 -	.02	. 34*	60.	.35*	• 38*-	•04	.41 <b>%</b>	.45*-	•60 <b>*</b>	<b>.</b> 38*	.18	Ч
a	= 58 fon each vaniahle	ineV	us selde	hscrit	ted w		1.1 tuoi		1 1 1	, m	trans	forma	tione	4 4 6	4	led'n	1

Intercorrelations Among and Descriptive Statistics for Variables<sup>a</sup> Table 5.

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TDIITST.IO variables. In all cases, descriptive statistics are for the original, untransformed, variables.

#<u>P</u> \_ .05

\*<u>P</u> \_ 01



Model Indicating the Pattern of Zero-Order Correlations Among Variables. Figure 2.

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a result, there may be no inherent reason for desire as such to be related to network size.

The relationship between communication skills and network size was also found to be problematic. It was hypothesized that greater quantities of interpersonal skills would yield greater numbers of close friendships. It may be the case, however, that a certain level of communication skills is necessary to maintain any close friendships and that once this level is reached, further increments in skills do not yield further increments in network size. Here, the relationship between skills and size would be non-linear. This alternative hypothesis, while intuitively plausible, could not be tested with the present data set given the fact that: 1) all subjects were able to identify one or more close friends; and 2) there were no extremely low scores on the communication skills inventory.

It should also be noted that desire and communication skills are significantly correlated with each other (r = .24, p < .05). This result suggests that in addition to direct effects of  $X_5$  (desire) and  $X_6$  (communication skills) on  $X_4$  (network size), there are two indirect paths operating. The first is from  $X_6$  through  $X_5$  to  $X_4$ . The second is from  $X_5$  through  $X_6$  to  $X_4$ . As a result the relationships among these three variables have not been clearly specified by the present research.

The number of memberships in voluntary associations  $(X_7)$  and the socioeconomic background of the subject  $(X_8)$  were hypothesized to be positively related to opportunity  $(Y_1)$  which in turn was hypothesized to be positively related to network size. One would speculate, then, that these two variables  $(X_7, X_8)$  would be positively related to network size. However, neither of the correlations was large enough to obtain statistical significance. The number of memberships in voluntary associations was somewhat more strongly related to network size (r = .12) than

was SES (r = .03), but neither of the associations was strong. With regard to the relationship between SES and network size, a partial explanation for the failure to support the hypothesis might rest in the nature of the sample. Most subjects had a relatively high SES (M = 82.28) and for the entire sample there was a relatively small amount of variance (SD = 14.26). This distribution may have precluded an adequate test of the hypothesized re-The nature of the sample can also be examined for an alterlationship. native hypothesis with regard to the hypothesized relationship between network size and memberships in voluntary associations. In the earlier discussion of this relationship it was suggested that memberships in voluntary associations functioned to bring the individual into contact with groups of persons from which some subset was selected for the close friendship relationship. However, on a university campus normal classroom meetings and living arrangements may serve the same function. Thus, it is plausible that other mechanisms which directly affect more persons are operating in the university community. In such a case, memberships in voluntary associations might not play as important a role as they might in other situations.

The time spent with mass media sources  $(X_9)$ , with non-close friends  $(X_{10})$  and with non-friends  $(X_{13})$  were hypothesized to be negatively associated with network size through opportunity. The data did not support these hypotheses. None of the correlations were in the hypothesized direction and none reached statistical significance. The rationale behind these hypotheses was that the more time individuals spent in other pursuits, the less time they would have to spend with close friends. As a result, individuals with less time would probably be able to support fewer close friendships. Obviously, an alternative hypothesis is that time can be simultaneously with close

friends, mass media, non-close friends, and non-friends. An additional rival hypothesis relates to the fact that since the various categories of time allocation used in the present study were not necessarily exhaustive, the individual might well have taken time from other, unmeasured activities to devote to the development and maintenance of close friendship relations. Thus, high allocations of time to the measured categories would not necessarily preclude high allocations of time to close friendships.

The final variable with regard to the allocation of time was the amount of time spent alone. The relationship of this variable to network size was significant and in the hypothesized direction (r = -.22, p < .05). It is worth noting that this result does not fully negate the first alternative hypothesis advanced with respect to the other time allocation variables. Time spent alone obviously is time that cannot be spent with close friends. The other categories of time allocation employed in this study do not preclude simultaneous activity with close friends. However, it should be noted that time spent alone could be time simultaneously spent with mass media.

Residential mobility  $(X_{12})$  was hypothesized to be positively related to opportunity  $(Y_1)$  which in turn was hypothesized to be positively related to network size  $(X_4)$ . Since opportunity was an unmeasured variable, it cannot be considered at this point in the discussion. However, we would expect the relationship between mobility and size to be positive. The obtained zero-order correlation was in the hypothesized direction (r =.13), but failed to reach statistical significance. Mobility was presumed to be related in a positive manner to network size by virtue of the belief that mobility would function to bring the individual into contact with greater numbers of others. A result of contact with greater numbers of others was believed to be greater numbers of close friendships. However,

another potential result of increasing levels of residential mobility might be a decreasing ability to maintain the close friendships left behind. If this is true, then the individual would be both gaining and loosing close friends as a result of moving. It does appear, however, that individuals are able to maintain close friendships over relatively great distances. When asked to estimate the distance between themselves and each of their close friends, subjects reported an overall mean distance of 462.28 miles.

<u>Determinants of Network Integration</u>. Network integration was hypothesized to be a function of four variables: 1) the level of perceived similarity in the network  $(X_2)$ ; 2) the level of perceived effort in the network  $(X_3)$ ; 3) the level of residential mobility  $(X_{12})$ ; and 4) the size of the network.

The zero-order correlation between perceived similarity and network integration was small (r = -.07). The interpretation of this result must begin with an appreciation of the nature of measurement. Both of these variables were estimated from the perspective of the subject. A more complete procedure would have been to obtain estimates from all members of the network. It might be the case that the subjects' perceptions of similarity were not as accurate as would have been the estimates of the network members directly involved in a given judgment. If so, there need be no necessary relationship between estimates of similarity and estimates of rates of communication. This may be an especially severe problem with a subjective judgment like similarity.

The zero-order correlation between perceived effort and network integration was significant and in the hypothesized direction (r = -.38, p < .01). To some extent the fact that this association reached statistical significance mitigates the assertion that the subjective nature of the judgments

being made might reduce the level of association. Surely, judgments of perceived effort are as subjective as those of perceived similarity.

The zero-order correlation between residential mobility and network integration was in the hypothesized direction but failed to reach statistical significance (r = -.19). The association nearly reaches an acceptable level of significance (p < .05) but falls short (p < .09). There appears to be a strong trend in the data.

Residential mobility was also hypothesized to be positively related to perceived effort. This correlation proved to be quite small (r = .06). This might have been due to the fact that physical distance separating people has become less of a barrier to communication as a result of continuing improvements in long-distance communication facilities (Packard, 1972). That is, the increasing separation which would seem to be implied by increasing levels of residential mobility need not necessary result in increasing difficulties in maintaining a given rate of communication. An additional alternative hypothesis is that residential mobility by itself need not result in great increments in the physical distance separating communicants and thus might not increase the amount of effort necessary to maintain a given rate of communication.

The final hypothesized determinant of network integration was network size. The correlation between these two variables proved to be extremely small (r = -.03). This result was counter to previous findings in other settings--notably those of Danowski (1974). One potential explanation rests with the fact that neither of the variables has a great amount of variance. Another potential explanation might be that the university brings persons into such close proximity that it is relatively easy to communicate with other members of the network regardless of how many

other members there are. Of course, the rather large mean distance (462.28 miles) between the participant and each of his or her close friends reduces the plausibility of such a hypothesis. In any case, since previous research which has found a significant negative association between these two variables employed non-student samples, a point of departure should be the careful examination of the distinctions between student and non-student samples.

#### Multiple Regression Analysis

The hypothesized model was divided into two sets of regression equations. One relates the exogenous variables of desire  $(X_5)$ , communication skills  $(X_6)$ , and opportunity  $(Y_1)$  to the dependent variable of network size  $(X_4)$ . The second relates perceived similarity  $(X_2)$ , perceived effort  $(X_3)$ , residential mobility  $(X_{12})$ , and network size  $(X_4)$  to the dependent variable of network integration. Figure 3 graphically portrays the relationships among these variables derived from multiple regression procedures.

Determinants of Network Size. Network size was hypothesized to be a function of three variables: 1) desire; 2) communication skills; and 3) opportunity. Since opportunity was an unmeasured variable in the present investigation, it was first necessary to obtain an estimate for it. The procedures employed to do this are outlined in Appendix VI.

Multiple regression procedures relating the three hypothesized determinants of network size indicated that the major impact on size was opportunity. This was the only partial regression coefficient (beta weight) which reached statistical significance (beta = .36, p < .01). The other regression coefficients were quite small and did not approach statistical significance. The multiple correlation was relatively large



Significance:	*p <pre>* 05</pre> ***p <pre>&lt; 01</pre> (n = 58)
X <mark>6</mark> = Communication Skills X <sup>6</sup> <sub>6</sub> = Residential Mobility	Note: For clarity, residual terms and their intercorrela- tions have been omitted.
Y <sub>1</sub> = Opportunity X <sub>7</sub> = Network Integration	X <sup>L</sup> = Perceived Similarity X <sup>2</sup> = Perceived Effort X <sup>3</sup> = Network Size X <sup>4</sup> = Desire
Where:	

Model Indicating the Pattern of Regression Coefficients Among Major Variables. Figure 3.

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but failed to reach statistical significance (R = .35, p < .06). It can be said that the major determinant of network size in the present study was the level of opportunity individuals had to participate in such networks. Neither the level of desire for participation or the level of communication skills of the subject seemed to be related to network size.

A problematic factor with the findings with respect to these variables is the existence of relatively high zero-order correlations (see Table 6) among the independent variables. These intercorrelations imply that the relationship between the exogenous variables and network size represents some indeterminant combination of direct and indirect effects.

		۲ <sub>1</sub>	x <sub>6</sub>	x <sub>5</sub>
Yl	Opportunity	1		
x <sub>6</sub>	Communication Skills	.35**	1	
x <sub>5</sub>	Desire	.09	.24*	l

Table 6. Intercorrelations Among Exogenous Variables.<sup>a</sup>

a N = 58 for each variable
\*p < .05
\*\*p < .01</pre>

Determinants of Network Integration. As Figure 2 indicates, the only variable which was significantly associated with network integration was perceived effort (beta = -.38, p <.01). Despite the insignificant contributions of the remaining three variables (perceived similarity, network size, and residential mobility), the overall multiple correlation proved to be significant (R = .41, p <.05). The general pattern of results obtained from multiple regression analysis of these variables, however, can
probably be more parsimoniously explained by the simple association between perceived effort and network integration. The other variables do not make important contributions to the amount of variance explained. Some tentative explanations for these results were advanced in the preceding discussion of zero-order relationships.

## A Path Analytic Evaluation of the Causal Model

A more comprehensive analytic technique than those applied up to the present point is path analysis. For a model involving recursive relations among variables, path analysis represents an extension of conventional regression analysis (Duncan, 1971). It functions to cast regression analysis into a pattern of interpretation. Path analysis may be viewed as a tool for making explicit the rationale for and the interpretation of a set of regression equations (Duncan, 1971). In the recursive case, path analysis of a model typically entails a series of interlocking regression procedures (Kerlinger and Pedhazur, 1973). More complete discussions of the nature of path analysis can be found in Kerlinger and Pedhazur (1973) and in Van de Geer (1971).

A comprehensive application of path analytic techniques to the present data set was not possible for several reasons. The primary reason was the unavailability of the necessary computer software. Standard regression analysis does not yield: 1) the correlations among the residual terms; 2) a solution for the non-recursive relationship hypothesized between network integration and perceived similarity; or 3) a unified set of procedures for dealing with unmeasured variables. As a result, the application of path analysis to be presented here is incomplete. Improvised procedures involving hand computation were applied in several instances, but the magnitude of the task precluded a complete solution of the model

by such procedures. The necessary procedures and computer software for the solution of the hypothesized model have been developed Joreskog and his associates (Joreskog, 1969, 1970a, 1970b, 1971; Werts, Joreskog and Linn, 1973). This software was not fully mounted on the Michigan State University computer system at the time of analysis. It must be stressed, then, that the path analytic procedures discussed below are incomplete and that conclusions based on that analysis are preliminary and tentative.

Before attempting to evaluate the model as a whole, it is necessary to discuss its derivation in two specific areas: 1) the estimation of path coefficients linking opportunity to its hypothesized underlying variables; and 2) the estimation of the path coefficients in the non-recursive relationship between perceived similarity and network integration.

Opportunity  $(Y_1)$  was estimated as the linear combination of those variables hypothesized to underlie it  $(X_7 - X_{13})$ . The procedures by which this estimation was made have been outlined in Appendix VII. Once opportunity had been estimated, it was necessary to obtain estimates of the path coefficients linking opportunity to the hypothesized underlying variables. These estimations involved hand computation and have been presented in Appendix VII. In brief, the estimation of these path coefficients involved multiplying the matrix of path coefficients (standardized partial regression coefficients) obtained when the underlying variables were regressed on network size by the zero-order correlation matrix for the hypothesized underlying variables. This procedure yielded estimates of the path coefficients which accounted for the unmeasured variable (opportunity).

Because of its non-recursive (reciprocal) nature, conventional regression techniques did not fully specify the relationship between perceived similarity  $(X_2)$  and network integration  $(X_1)$ . There were actually

two path coefficients to be estimated. The first was the path from perceived similarity to network integration. The second was the path from integration to perceived similarity. The procedures employed for these estimations have been outlined in Appendix VIII.

In both of the cases where hand computation and estimation procedures were applied, it became difficult to obtain precise estimations of the level of significance associated with each of the path coefficients, further restricting attempts to evaluate the model.

The hypothesized model cast into a path analytic format is presented in Figure 4. Before examining its specifics, several general characteristics of the solution should be noted. First, most of the path coefficients fail to reach statistical significance. Because of the difficulties in estimation discussed above significance estimates were not obtained for several of the paths. Nonetheless, the absence of statistically significant path coefficients suggests that the model as constituted and specified was not well supported by the data.

Second, the almost uniformly large value of the residuals (Range = .83 to .99) suggests that the hypothesized relationships do not account for a substantial amount of variance.

Third, the fact that the three exogenous variables are significantly interrelated suggests that: 1) the effects of these variables on network size were not fully clarified by this analysis; and 2) the estimations of other paths which involved mathematical manipulation of these variables were prone to error. Multiplication by exogenous variables was involved in the estimation of the non-recursive paths (See Appendix VIII).

Three specific path coefficients merit special discussion. First, the significant path (+.36, p <.05) in the hypothesized direction linking opportunity and network size is the only statistically significant



Figure 4. Hypothesized Model Cast into Path Analytic Format.

path in the model. Second, the path coefficient linking perceived effort and network integration was one of the paths for which a precise estimate of statistical significance was unavailable. In the regression analysis which did not account for the non-recursivity of the similarity/integration relationship, however, this path was significant (See Figure 2). There is little reason to believe that the even larger path coefficient obtained in the case when this non-recursivity was accounted for would not also be statistically significant. Third, the estimate of the path from network integration to perceived similarity is abnormally large (3.77). Since path coefficients represent standardized partial regression coefficients, we would not expect their value to exceed 1.0. The unrealistic nature of the coefficient obtained might reflect one or more of the following factors: 1) errors introduced by virtue of use of sample data; 2) errors introduced by the failure to specify the model completely; or 3) errors introduced by the incomplete nature of the improvised procedures employed to estimate the path coefficient.

In summary, the results of the path analytic procedures suggest that as a model the system of interrelationships is: 1) not properly or fully specified; 2) not statistically significant in any overall sense; and 3) prone to serious error as a result of the incomplete and improvised nature of many of the estimations.

#### CHAPTER IV

### SUMMARY AND DISCUSSION

In this chapter the major findings of the research will be summarized and discussed. In addition, suggestions and implications for future research will be presented and discussed. The chapter is divided into two general areas: 1) a summary of major findings; and 2) a discussion of suggestions and implications for future investigations.

## Summary of Findings

This section will be divided into sections summarizing and discussing the four types of analysis utilized: 1) descriptive; 2) zero-order correlation; 3) multiple regression; and 4) path analysis. While they will be discussed separately, the basic similarity between the latter two types of analysis must be recognized.

<u>Descriptive Analysis</u>. Six aspects of the descriptive analysis warrant further summary and discussion.

First, almost uniformly subjects viewed the close friendship relationship as an extremely important one. This conclusion is supported by the high mean ( $\underline{M} = 39.66$ ,  $\underline{SD} = 7.36$ ) reported for the desire ( $X_5$ ) items. The data suggests that the characteristics of the close friendship relationship are extremely important to individuals. These characteristics are: 1) reciprocal self-disclosure; 2) mutual trust; 3) the perception of the relationship as special or lasting; 4) the existence of extensive and generalized obligations; and 5) a high level of mutual positive affect. The high level of internal consistency for these items (.92) indicates

that they are highly interrelated and seem to be tapping the same general attitude. Thus, the data tends to support the belief that the characteristics of close friendship measured in the present research are uniformly perceived as important to subjects.

Second, in the first chapter the discussion of similarity pointed to extensive support in previous research that perceived similarity was positively related to friendship choice. However, subjects in this research did not perceive their friends to be particularly similar to one another. The mean on a nine-point scale was 5.23 (SD = 1.09). This suggests that friends were perceived as only slightly more similar than dissimilar. The discrepancy between this finding and the findings of previous research may be due in part to the highly general nature of the similarity judgment. Previous research has focused on similarity in terms of specific attitudes or personality traits. This study requested as general, gross judgment of similarity from subjects. It may be the case that despite actual or perceived similarities in attitudes or traits, subjects are aware of differences between themselves and their friends which would function to reduce a generalized perception of similarity. Future research should focus on the relationship between perceived similarity on specific attitudes and traits and perceived similarity as a generalized judgment. Further, the results obtained might also be due to the truncated range of relationships examined. That is, previous research has examined a broader range of types of relationships than did this study.

Third, the hypothesis that most persons do not extensively participate in voluntary organizations received further confirmation in this research. Previous research utilized adult (non-student) samples. The fact that support for the hypothesis was obtained with a student sample further extends the generalizability of this finding.

Fourth, the data tended to support the hypotheses advanced by Packard (1972) that students are more mobile than the average member of the population. Packard, citing government statistics, suggested that the mobility rate for the average person was 0.25 moves per year (both inter- and intra-city). The data gathered in this study suggest that in a student sample the annual rate was considerably higher (1.2 moves per year). Relatively high levels of mobility are apparently quite characteristic of students.

Fifth, the data tend to support the hypothesis that one generally limits his or her close friendships to a fairly small group of persons. The mean network size was 7.91 persons ( $\underline{SD} = 3.32$ ). While this is somewhat larger than the mean size reported in several other studies, it does suggest that persons do not typically include large numbers of individuals under the category of "close friend."

Finally, and perhaps most important, was the finding that close friendship communication networks are not well integrated. The possible range on the index of integration employed in this study was zero to 1.0. The mean level of network integration obtained was 0.04 (<u>SD</u> = 0.06). Most close friendship communication networks, then, are characterized by an extremely low level of integration. This finding tends to support the earlier findings of Fararo and Sunshine (1964).

The finding also tends to question the extent to which sets of close friends can be considered as "groups." In the first chapter, it was noted that small group theorists and researchers tend to categorize sets of close friends as small groups. It was suggested, however, that the extent to which such a categorization would be legitimate would depend on the extent to which sets of close friends represented a highly integrated communication network. The development of role interdependency, the ability

to respond to all other group members as individuals, the ability to take unified action, and the development of group cohesion (which are all characteristics of small groups) would seem to presuppose a communication network of relatively high integration. It is unlikely that poorly integrated networks would allow for the functioning of these characteristics in any important way or to any significant extent. The findings of this study in conjunction with those of Fararo and Sunshine (1964), then, question the extent to which findings and theories emerging from small group research can be legitimately applied to sets of close friends. Close friendship networks do not appear to have many of the important qualities that characterize the more common conceptualizations of small groups.

<u>Analysis of Zero-Order Correlations</u>. As Table 4 in the previous chapter indicates, the exogenous variables are highly interrelated. Further, almost all of the zero-order relationships hypothesized proved to be non-significant. Only two of the hypothesized associations reached statistical significance. These were: 1) the relationship between time spent alone  $(X_{11})$  and network size  $(X_4)$  (r = -.22, p < .05); 2) the relationship between perceived effort  $(X_3)$  and network integration  $(X_1)$ (r = -.38, p < .01). In sum, the pattern of zero-order correlations obtained does not lend support to the hypothesized model.

The fact that network size did not appear to be related to network integration in any systematic fashion deserves special comment. The issues raised in the previous chapter regarding this finding merit further explanation. Two potential explanations for this result were advanced. These were: 1) the fact that there was relatively little variance in either of the variables--especially network integration; and 2) the suggestion that the university as a community may serve to bring persons into such close

physical proximity that they have little difficulty communicating with other members of the network regardless of how many other members there are. Since subjects reported a relatively large mean distance between themselves and their close friends ( $\underline{M}$  = 462.28 miles), the plausibility of this latter explanation is somewhat in question. Nonetheless, there is a need to examine non-student populations. The findings of low network integration found in this research and in the report of Fararo and Sunshine (1964), both obtained with student samples, may not characterize non-student networks. In a non-student sample of close friendship communication networks, it is possible that a relationship might exist between network size and network integration. Future research on close friendship communication networks should address itself to this possibility. In any case, a more complete test of the hypothesis linking these two variables would certainly appear to require a sample with greater variance in the integration variable.

Finally, the finding that desire and communication skills and opportunity were interrelated suggests that the initial explanatory typology developed in the first chapter is inadequate. It was theorized that network size would be a function of one's desire, ability, and opportunity to participate in close friendship relations. Since these factors were highly intercorrelated, we are forced to conclude that the typology fails to meet one of the necessary requirements for an acceptable typology-that categories be independent. Future research will either need to: 1) clarify the typology offered; or 2) offer a different set of antecedent conditions within some different theoretic framework.

Multiple Regression Analysis. As indicated in the analysis chapter, the hypothesized causal model can be generally divided into two regression

equations: 1) one equation linking network size to its hypothesized determinants; and 2) one equation linking network integration to its hypothesized determinants.

Network size was hypothesized to be a function of desire, ability (level of interpersonal communication skills) and opportunity. When entered into a regression equation to predict network size, the only statistically significant regression coefficient was that from opportunity to size (beta = .36, p <.05). Neither of the other two variables made a significant contribution to the prediction of network size. As a result of the significant zero-order correlation between opportunity and communication skills (r = .35, p < .01) discussed earlier, the relationship between opportunity and network size must be viewed as a combination of direct and indirect effects. Opportunity and ability (if conceptualized in terms of communication skills) are not independent concepts. In fact to say that there is a combination of direct and indirect effects and to say that the concepts are not independent is to say the same thing from different perspectives--the former being statistical and the latter being theoretical. From either perspective, we are forced to conclude that the hypothesized model does not yield an adequate or clear set of predictors of network size--although opportunity as a linear combination of its hypothesized underlying variables clearly seems to be a factor. The overall regression equation failed to reach statistical significance.

Network integration was hypothesized to be a function of network size and the levels of perceived similarity, effort and residential mobility in the system. When entered into a regression equation to predict network integration, the only statistically significant predictor of integration was perceived effort (beta = -.38, p < .01). While neither of

the other three variables' contributions reached statistical significance (p <.05), the overall regression equation did (R = .41, p <.05). By itself, perceived effort explains 14.4% of the variance in network integration. The addition of the other three variables only increased variance explained by 2.4% ( $R^2 = .168$ ). This would appear to suggest that of the four variables, only perceived effort explains a significant portion of the variance and that the model could be more parsimoniously presented as the simple relationship between perceived effort and network integration. Thus, while the hypothesized relationships did result in a statistically significant predictive equation for network integration, only perceived effort makes a significant contribution to that equation's significance.

In summary, then, the multiple regression analyses performed on the data failed to provide extensive support for the hypothesized model.

Path Analysis. It was noted in the previous chapter that the application of path analysis to the data was incomplete. However, this should not imply that the path analytic portions of the analysis are valuable only as methodological exercises. This is true for two reasons: 1) the application of path analysis is useful even in its incomplete form because it suggests the proper level of statistical analysis for future research employing models of this sort; and 2) because it represents as complete an analysis as possible. While the incomplete application of path analysis may have resulted in inaccurate estimate in some aspects of the model, it also yielded useful data in others. Without the path analytic estimations, for example, it would not have been possible to obtain estimates of the paths from opportunity to its hypothesized underlying variables.

A general summary of the findings placed in a path analytic format would highlight three points. First, most of the path coefficients fail

to reach statistical significance. Second, the residual or error terms are almost uniformly large. Both of these results suggest that the model as constructed fails to explain a substantial portion of the variance in its endogenous variables. Third, the fact that the exogenous variables are related calls into question the estimations which required mathematical manipulation of these variables in order to estimate other paths. In this area, the estimates must be viewed with great caution.

# Implications and Suggestions

On balance, the analyses did not yield any systematic confirmation of the hypothesized model. They did, however, serve to highlight several of the shortcomings of the research. This section discusses suggestions for future research both in terms of measurement and in terms of overall research focus.

Measurement of integration proved to be problematic. As discussed earlier, the fact that some subjects reported very high and perhaps unrealistic rates of communication for some links tended to force the distribution of the variable to the low end of the scale. One result was very low variance in the variable. Since the open-ended nature of the response resulted in this problem, future research might productively employ a more structured response set. Perhaps the use of ordinal or interval scales for the measurement of rates of communication would result in less distortion in the distribution. It is not suggested, however, that future investigators retreat to the nominal level of measurement employed in some previous studies.

Second, future measurements of desire must be more clearly able to discriminate between a generalized desire for close friendships and more specific desires for friendship networks of a given size. That is, if the theoretical relationship between desire for participation and network

size is to be tested, the type of desire that must be measured is the desire for large or small numbers of friends. There is no reason to expect a generalized level of desire to be necessarily related to network size.

Third, the measurements of time allocation were rather crude in this research. One difficulty was the fact that the categories of time allocation presented to the subject did not constitute an exhaustive set. Future research employing this sort of variable should seek a remedy to this difficulty. Further, there appeared to be some difficulty in the general measure of time allocation. Subjects seemed to have difficulty making reliable judgments of the amount of time they spent alone and with nonfriends. It may be the case that asking subjects to estimate the number of hours they spend in various activities is overly demanding. Such judgments may be simply too nebulous. It may be difficult to obtain acceptable levels of reliability in several categories. More structured items may be required to solve these difficulties.

Finally with respect to measurement, future research might seek to directly contact all members of a communication network. In this research, all data were generated from the perspective of one person. An alternative measurement strategy would be to: 1) have the subject designate his or her close friends; and then 2) contact those persons and measure them in terms of the research variables. Certainly this sort of strategy would result in a more complete perspective on the functioning of close friendship communication networks. It is, however, a more involved approach which would require greater resources from the investigator. Given those resources, though, it would probably be the preferred strategy of research.

The conceptualization and analysis of this research raised several implications or suggests of a general nature for future research. Seven of these are discussed below.

First, at several points in the analysis and discussion of this data the special characteristics of the sample were mentioned. Future research should explore non-student as well as student samples. This is necessary for several reasons. The curvilinear relationship between network size and age found by Williams (1958) warrants further investigation. Can it be replicated? If so, what sorts of conditions would explain or predict it? What are its consequences? Questions such as these can only be answered with samples utilizing a broad range of age groups. In addition, research on student and non-student samples would be able to answer the following question: were the results of the present research attributable to the age of the subjects or to the particular social setting in which they live (i.e., the university)? Thus, future research should attempt to use a variety of age ranges and a combination of student and non-student samples.

Second, the relationship between communication skills and network size requires further clarification. Is it the case that a certain minimum level of skills is necessary for the maintenance of any close friendships? Or, is the relationship viable as hypothesized but simply requiring a sample with greater variance for confirmation? Future research should attempt to clarify this relationship and deal directly with these questions.

Third, the entire relationship between distance and the maintenance of close friendship relations is an important one in a mobile society such as ours. Is distance from close friends a more or less important determinant of relationship maintenance than the amount of time one has been physically separated from those persons? Packard (1972) argues that distance has little effect on our relationships but that time does. In a

society characterized by relatively high rates of residential mobility, such concerns merit empirical investigation. Such research would also serve to clarify the notion of "effort to communicate." It might tell us what factors lead a subject to believe that one communication requires more effort than another. Given the confirmation of the relationship between perceived effort and network integration, further research attempting to specify the antecedent conditions of perceived effort would seem warranted.

Fourth, the nature of generalized judgments of perceived similarity ought to be further clarified. Given the fact that most previous research has dealt with specific attitudes or traits in assessing similarity (actual and perceived), future research might productive explore the factors that lead to general or overall judgments of similarity. General similarity as a perception might be more dependent on some attitudes or traits than others. Further, the perception of overall similarity might change over the history of the relationship. It might be that the longer two individuals know each other, the more acutely aware of their differences they become. The reverse is equally plausible. In any case, since the level of perceived similarity appears to be an important determinant of interpersonal attraction the further exploration of the antecedents of and changes in these judgments over time would seem to be an important avenue of future research.

Fifth, future research should address itself to the question of how applicable the findings and theories resulting from small group research are to close friendship networks. The position taken here is that if networks are poorly integrated there are serious restrictions as to the generalizability of small group research to close friendship networks. Certainly such an assertion requires future research.

Sixth, this research sought to isolate the antecedent conditions of network integration. In addition to finding a more complete set of antecedents than those utilized here, future research might explore the consequences of differing levels of network integration. Examples of interesting questions for future research might be: 1) what are the consequences of varying levels of integration for the level of alienation or participation of members?; 2) what are the consequences of varying levels of integration for the levels of environmental uncertainty experienced by members? and, 3) do attempts at influence or persuasion of network members depend on the nature of the relationships among those members? Research on these questions would broaden our understanding of the nature and functioning of close friendship relations.

Finally, it is suggested that future research be addressed to a more rigorous specification of relationships among fewer of the variables. The broad scope of this research was useful in exploring a relatively large number of relationships within a coherent conceptualization. However, future research will need to narrow its focus to smaller portions of the model and more systematically explore smaller sets of relations. Hopefully, this will result in a more thoroughly specified set of relations that can then be more systematically combined to produce a larger theory of close friendship relations.

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APPENDICES

APPENDIX I: WAVE #1

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# IC'IGAN STATE !! IVERSITY

College of Communication Arts Department of Communication East Lansing • Michigan 48824

Dear Participant:

You are being asked to participate in a study of communication among close friends. The general goal of the study is to develop an understanding of how close friends communicate with each other. By participating in the study, you will be able to better understand your communication with your close friends. You will also help us to expand our knowledge of a seldom studied type of communication behavior.

A special session will be scheduled to more fully explain the nature and results of the study. This session will be arranged for your benefit at the conclusion of the study.

Over the next four weeks you will be asked to complete four questionnaires--including this one. <u>All information that</u> you give us will be kept strictly confidential. No one except me will have access to the questionnaires. Once the data are processed, the questionnaires will be destroyed. These safeguards are to assure the confidentiality of the information you give us.

Once each week for the next three weeks you will be given a questionnaire in this class. Take it home. Complete it and return it either at the next class meeting or to me (Rm. 423 South Kedzie). Each questionnaire should take less than one hour to complete. What you learn from participating in this study will depend on how carefully and thoughtfully you complete each questionnaire. Also, the value of the special explanatory session will depend on the care and thought you give in completing the questionnaires.

Thank you,

Mar Parks

Mac Parks Principal Investigator

Do not write here:
Wave # ID. #

- 1. Your Name: (Please Print)
- 2. Age: \_\_\_\_\_years.
- 3. Are you: (Circle one)
  - 1. Freshman
  - 2. Sophomore
  - 3. Junior
  - 4. Senior
  - 5. Other
- 4. <u>Marital Status</u>: (Circle one)
  - 1. Single (Never married)
  - 2. Married
  - 3. Separated, Divorced, Spouse Deceased
- 5. Sex: (Circle one)
  - 1. Male
  - 2. Female

PLEASE CAREFULLY READ THE FOLLOWING DEFINITION OF CLOSE FRIENDSHIP:

A close friend is someone you like and trust very much. He or she is someone with whom you share a great deal of personal or confidential information. A close friend is someone you could count on for help if you needed it--and he or she could count on you. Although either of you could end the friendship at any time, you don't expect to because you see it as a special and lasting relationship.

PLEASE LIST THE NAMES OF ALL PERSONS WHO ARE YOUR <u>CLOSE</u> FRIENDS--<u>ACCORDING TO THE DEFINITION ABOVE</u>. ALSO, <u>CIRCLE THE SEX OF EACH</u> <u>PERSON YOU LIST</u>. If you are married, please do not count your spouse as a close friend--even though he or she may be one. Please be complete, but <u>do Not Feel As If You Must Fill In</u> Every Blank. PLEASE PRINT.

1.	Sex:	male	females
2.	 Sex:	male	female
3.	Sex:	male	female
4.	Sex:	male	female
5.	Sex:	male	female
6.	 Sex:	male	female
7.	Sex:	male	female
8.	 Sex:	male	female
9.	Sex:	male	female

If you need more space--it is provided on the next page. Be sure to list all persons who meet the definition. DO NOT LIST ANYONE WHO YOU DO NOT CONSIDER TO BE A CLOSE FRIEND ACCORDING TO THE DEFINITION ABOVE. an<sup>1</sup>

10	 Sex:	male	fema <b>le</b>
11	Sex:	male	female
12	Sex:	male	fema <b>le</b>
13	Sex:	male	female
14	Sex:	male	female
15.	Sex:	male	female

ja (

If you need more space--please continue on the back of this page. Be sure to print the name of each person clearly and indicate the sex of each person.

# HAVE YOU??

- 1. WRITTEN YOUR NAME IN THE SPACE AT THE TOP OF PAGE 2?
- 2. COMPLETED ALL ITEMS ON PAGE TWO?
- 3. LISTED ALL PERSONS WHO MEET THE DEFINITION, BUT NONE WHO DO NOT?
- 4. INDICATED THE SEX OF EACH PERSON LISTED?

Please hand in this questionnaire when you are finished.

THANK YOU FOR YOUR COOPERATION.

APPENDIX II: WAVE #2

4

APPENDIX	II:	WAVE	#2
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NAME\_\_\_\_\_

I.D. #\_\_\_\_\_

Wave # 2

MICHIGAN STATE UNIVERSITY

College of Communication Arts Department of Communication East Lansing, Michigan 48824

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Dear Participant:

This is the second of four questionnaires concerning your communication in close friendships. Although there are a fairly large number of items, it is important that you consider each question carefully and answer it sincerely.

If you have any questions about any of the items, please call me.

Office Phone: 355-1862 Home Phone: 355-0789

You should be able to contact me or leave a message for me at these numbers. Please do not call before 7:30 in the morning or after 10:30 at night.

Remember that all information you give me will be kept strictly confidential.

PLEASE RETURN THIS QUESTIONNAIRE AT THE NEXT MEETING OF THIS CLASS OR TO ME IN ROOM 423 SOUTH KEDZIE HALL.

> Thank you, Mac Park

Mac Parks Principal Investigator 1. HOW MANY CLUBS OR ORGANIZATIONS DO YOU BELONG TO? LIST THEM. List all clubs or organizations which you belong to either on-campus or off-campus. Examples would be: Church clubs, activity clubs like chess clubs, sports clubs, service clubs like Circle K, Lions, sororities or fraternities, and professional organizations. LIST ALL CLUBS OR ORGANIZATIONS YOU BELONG TO:

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1.	
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(If you need more space--please continue on the back of this page.)

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YOUR FATHER'S O KIND OF WORK HE as an assistant	CCUPATION: (OR WAS, IF DEAD OR RETIRED) DOES, NOT WHERE HE WORKS). For example manager of a department store."	(SPECIFY THE , "My father wo
IN COMPARISON 1	VITH THE INCOME OR WEALTH OF FAMILIES IN	YOUR COMMUNITY,
DO YOU THINK YO	OUR FAMILY IS: (Check one)	
1. Consi	derably Above Average	
2. Some	<b>hat Above Ave</b> rage	
3. Avera	ıge	
4. Some	mat Below Average	
5. Const	derably Below Average	
HON MANY YEARS	OF SCHOOLING DID YOUR FATHER AND MOTHER (Check one for each)	COMPLETE?
FATHER		MOTHER
	less than 8 grades	
	S grades	
	9 to 11 grades	
	12 grades	
	graduated from high school	
	some college	
	graduated from college	
	graduated from correge	
	an advanced degree (Masters, Ph.D., or professional such as law or medicine)	

90

J
5. ESTIMATE THE ANNUAL INCOME OF YOUR FAMILY--

\$\_\_\_\_\_

6.	MY FATH	ER IS ENGAGED IN THE TYPE OF OCCUPATION CHECKED BELOW:							
		Office Work (Cashier, clerk, secretary, bookkeeper, etc.)							
		Professional (Doctor, lawyer, minister, teacher, etc.)							
		Executive (Manages large business, industry, firm, etc.)							
	Factory Worker (Laborer, janitor, farm hand, etc.)								
		Salesman (Insurance, real estate, auto, store, etc.)							
		Owns, Rents, Manages Small Business (Store, station, cafe, etc.)							
	·····	Owns, Rents, Manages a Farm							
		Other Occupation (Be Specific)							

7. BELOW IS A LIST OF ACTIVITIES. YOUR JOB IS TO ESTIMATE HOW MUCH TIME (IN HOURS) YOU SPEND ON EACH ACTIVITY ON AN AVERAGE WEEKDAY AND ON AN AVERAGE WEEKEND DAY. Be sure that your list for each day does not exceed 24 hours.

	ACTIVITY .	AVERAGE WEEKDAY	AVERAGE WEEKEND DA <b>Y</b>
A.	Watching television	hrs.	hrs.
в.	Reading books, magazines, newspapers, etc	hrs.	hrs.
с.	Listening to the Radio, Stereo (List only the hours when you were doing nothing except listening)	hrs.	hrs.
D.	Talking with persons who are friends but who are not close friends	hrs.	hrs.
E.	Talking with persons who are neither close friends or other types of friends-	hrs.	hrs.
F.	Time spent alonethat is, time you were not actually with one or more other persons. Include hours of sleep.	hrs.	hrs.

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8.	BELOW IS	THE	LIST	OF YO	UR CL	OSE I	TRIE	NDS T	HAT YO	U PF	OVIDED	BEFORE	2.
	ESTIMATE	HOW	MANY	MILES	EACH	PERS	SON 1	LIVES	FROM	YOU.	IF A	CLOSE	FRIEND
	LIVES LES	SS TI	IAN A	MILE	FRO11	YOU,	USE	A FR	ACTION	TO	ESTIMAT	THE THE	DISTANCE.

1.	lives	miles from me.
2.	lives	miles from me.
3.	lives	miles from me.
4.	lives	miles from me.
5.	lives	miles from me.
6.	lives	miles from me.
7.	lives	miles from me.
8.	lives	miles from me.
9.	lives	miles from me.
10.	lives	miles from me.
11.	lives	miles from me.
12.	lives	miles from me.
13.	lives	miles from me.
14.	lives	miles from me.
15.	lives	miles from me.

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9. BELOW IS A LIST OF ITEMS ABOUT HOW YOU COMMUNICATE WITH OTHER PEOPLE. PLEASE ANSWER ACCORDING TO THE WAY YOU FEEL AT THE PRESENT TIME. PLEASE BE AS FRANK AS POSSIBLE SINCE YOUR ANSWERS ARE CONFIDENTIAL. IF YOU CAN NOT GIVE THE EXACT ANSWER TO A QUESTION, ANSWER THE BEST YOU CAN, BUT BE SURE TO ANSWER EACH ONE.

YOU CAN ANSWER EACH QUESTION IN ONE OF THREE WAYS.

- --- Answer "YES USUALLY" when the question can be answered as happening most of the time or usually.
- --- Answer "NO SELDOM" when the question can be answered as happening seldom or never.

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--- Answer "SOMETIMES" only when you definitely can not answer "yes" or "no".

BE SURE TO ANSWER ALL ITEMS. THERE ARE NO RIGHT OR WRONG ANSWERS. PUT A CHECK MARK ( ) IN ONE OF THE SPACES.

		YES USU <b>ALLY</b>	NO SELDOM	SOMETIMES
1.	Do <b>your words come out the w</b> ay you would like them to in con- versation?			
2.	Wh <b>en you are asked a question that is not clear, do you ask the person to <b>explain what</b> he means?</b>			
3.	When you are trying to explain something, do other persons have a tendency to put words in your mouth?			
4.	Do you merely assume the other person knows what you are trying to say without your explaining what you really mean?			
5.	When in a discussion, do you attempt to find out how you are coming across by asking for feedback?			
6.	Is it difficult for you to converse with other people?			

		Y ES USUALLY	NO SELDOM	SOMETIMES
7.	Do you find it very difficult to become interested in other people?			
8.	Do you find it difficult to ex- press your ideas when they differ from those of persons around you?			
9.	In conversation, do you try to put yourself in the other per- son's shoes?			
10.	In conversation, do you have a tendency to do more talking than the other person?			
11.	Are you aware of how your tone of voice may affect others?			
12.	Wh <b>en you are angry, d</b> o you ad- mit it when asked by someone else?			
13.	Is it very difficult for you to accept constructive cri- ticism from others?			
14.	Do you have a tendency to jump to conlcusions in your interactions with others?			
15.	Do you later apologize to some- one whose feelings you may have hurt?			
16.	Does it upset you a great deal when someone disagrees with you?			
17.	When someone has hurt your feel- ings do you discuss the matter with that person?			
18.	Do you avoid disagreeing with others because you are afraid they will get angry?			
19.	When a problem arises between you and another person, are you able to discuss it without losing control of your emotions?			

•

		YES USUALLY	NO SELDOM	Somet imes
20.	Are you satisfied with the way you settle your differ- ences with others?			
21.	Do you pout and sulk for a long time when someone upsets you?			
22.	In meaningful conversation, are you aware of how you are feeling and reacting to what the other person is saying?			
23.	Do you have difficulty trust- ing other people?			
24.	In attempting to settle a mis- understanding, do you remind yourself that the other person could be right?			
25.	Do you deliberately try to con- ceal your faults from others?			
26.	Do you help others to under- stand you by saying how you think, feel, and believe?			
27.	Is it difficult for you to con- fide in people?			
28.	Do you have a tendency to change the subject when your feelings enter into a discussion?			
29.	In conversation, do you let the other person finish talking before reacting to what he or she says?			
30.	Do you find yourself not paying attention while in conversation with others?			
31.	Do you ever try to listen for meaning when someone is talking?			
32.	Do others seem to be listening when you are talking?			

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		YES USUALLY	NO SELDOM	SOMETIMES
33.	In a discussion is it difficult for you to see things from the other person's point of view?			
34.	Do you pretend you are listening to others when actually you are not really listening?			
35.	In conversation, can you tell the difference between what a person is saying (his words) and what he may be feeling?			
36.	While speaking, are you aware of how others may be reacting to what you are saying?			
37.	Do you feel that other people wished you were a different kind of person?			
38.	Do other people fail to understand your feelings?			
39.	Can you tell what kind of day another person may be having by observing him?			
40.	Do you <b>admit that you are</b> wrong when you know that you are wrong about something?			

C

# PLEASE CHECK TO MAKE SURE THAT YOU HAVE ANSWERED EACH ITEM.

10. BELOW IS A LIST OF YOUR CLOSE FRIENDS. EACH OF YOUR CLOSE FRIENDS HAS BEEN PAIRED WITH YOU. ALSO, EACH OF YOUR CLOSE FRIENDS HAS BEEN PAIRED WITH EACH OTHER CLOSE FRIEND.

FOR EACH PAIR, THERE ARE THREE QUESTIONS. PLEASE CONSIDER EACH ITEM CAREFULLY BEFORE ANSWERING. ANSWER ALL ITEMS.

- ٤\_\_\_\_\_
  - a. In the last week (7 days), estimate how many times you think that these two persons have communicated with each other.

Number of Times in Last Week

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b. On the scale below, estimate how similar (in general) you think these two persons are. Circle the one number that indicates how similar you think they are. The bigger the number you circle, the more similar you think they are. The smaller the number you circle, the more different you think they are.

 Very
 Very

 Different
 1
 2
 3
 4
 5
 6
 7
 8
 9
 Similar

c. Suppose the first person wanted to get in touch with the second person of the pair. On the scale below, estimate how much effort it would take the first person to get in touch with the second person. Circle the one number that indicates how much effort you think it would take. Again, the bigger the number you circle, the more effort you think it would take. The smaller the number you circle, the less effort you think it would take.

Very										Very
Little	1	2	3	4	5	6	7	8	9	Much
Effort										Effort

<ul> <li>a. In the last week (7 days), estimate how many times you think that these two persons have communicated with each other.</li> <li>Number of Time in Last Week</li> <li>b. On the scale below, estimate how similar (in general) you think these two persons are. Circle the one number that ind how similar you think they are.</li> <li>Very Very Very Different 1 2 3 4 5 6 7 8 9 Similar</li> <li>c. Suppose the first person wanted to get in touch with the second person. On the scale below, estimate how much effort it wou take the first person to get in touch with the second person Circle the one number that shows how much you think it would take.</li> <li>Very Little 1 2 3 4 5 6 7 8 9 Very Little 1 2 3 4 5 6 7 8 9 Iluch Effort</li> <li>a. In the last week (7 days), estimate how many times you think that these two persons have communicated with each other.</li> <li>Number of Times in Last Week</li> <li>b. On the scale below, estimate how similar (in general) you th these two persons are? Circle the one number that indicates how similar you think they are.</li> <li>Very Different 1 2 3 4 5 6 7 8 9 Similar</li> <li>c. Suppose the first person wanted to get in Last Week</li> <li>b. On the scale below, estimate how similar (in general) you th these two persons are? Circle the one number that indicates how similar you think they are.</li> <li>Very Different 1 2 3 4 5 6 7 8 9 Similar</li> <li>c. Suppose the first person wanted to get in touch with the second person. On the scale below, estimate how much effort it wou take the first person wanted to get in touch with the second person. Circle the one number that shows how much effort it wou take the first person to get in touch with the second person. Circle the one number that shows how much effort it wou take.</li> <li>Very Very</li> </ul>											
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<ul> <li>a. In the last week (7 days), estimate how many times you think that these two persons have communicated with each other.</li> <li>Number of Times in Last Week</li> <li>b. On the scale below, estimate how similar (in general) you th these two persons are: Circle the one number that indicates how similar you think they are.</li> <li>Very Very Different 1 2 3 4 5 6 7 8 9 Similar</li> <li>c. Suppose the first person wanted to get in touch with the second person. On the scale below, estimate how much effort it wou take the first person to get in touch with the second person Circle the one number that shows how much effort you think i would take.</li> </ul>	-	ــــــــــــــــــــــــــــــــــــــ									
<ul> <li>Number of Times in Last Week</li> <li>b. On the scale below, estimate how similar (in general) you th these two persons are: Circle the one number that indicates how similar you think they are.</li> <li>Very Very Very Different 1 2 3 4 5 6 7 8 9 Similar</li> <li>c. Suppose the first person wanted to get in touch with the secure person. On the scale below, estimate how much effort it wou take the first person to get in touch with the second person Circle the one number that shows how much effort you think i would take.</li> <li>Very Very Very</li> </ul>	a.	In the last week (7 days), estimate how many times you think that these two persons have communicated with each other.									
<ul> <li>b. On the scale below, estimate how similar (in general) you th these two persons are. Circle the one number that indicates how similar you think they are.</li> <li>Very Very Different 1 2 3 4 5 6 7 8 9 Similar</li> <li>c. Suppose the first person wanted to get in touch with the second person. On the scale below, estimate how much effort it wou take the first person to get in touch with the second person Circle the one number that shows how much effort you think i would take.</li> <li>Very Very Very</li> </ul>		Number of Times in Last Week									
Very Different       Very 1       Very Similar         c.       Suppose the first person wanted to get in touch with the second person. On the scale below, estimate how much effort it wound take the first person to get in touch with the second person Circle the one number that shows how much effort you think i would take.         Very       Very	Ъ.	On the scale below, estimate how similar (in general) you think these two persons are: Circle the one number that indicates how similar you think they are.									
c. Suppose the first person wanted to get in touch with the second person. On the scale below, estimate how much effort it wou take the first person to get in touch with the second person Circle the one number that shows how much effort you think i would take.           Very		Very Different 1 2 3 4 5 6 7 8 9 Similar									
would take. Very Very											
Very Very	c.	Suppose the first person wanted to get in touch with the second person. On the scale below, estimate how much effort it would take the first person to get in touch with the second person. Circle the one number that shows how much effort you think it									
· · · · · · · · · · · · · · · · · · ·	с.	Suppose the first person wanted to get in touch with the second person. On the scale below, estimate how much effort it would take the first person to get in touch with the second person. Circle the one number that shows how much effort you think it would take.									
Little 1 2 3 4 5 6 7 8 9 Much	с.	Suppose the first person wanted to get in touch with the second person. On the scale below, estimate how much effort it would take the first person to get in touch with the second person. Circle the one number that shows how much effort you think it would take.									

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PLBASE:

- 1. LOOK BACK THROUGH THE QUESTIONNAIRE TO MAKE SURE THAT YOU HAVE ANSWERED EVERY ITEM YOU WERE SUPPOSED TO.
- 2. RETURN THE COMPLETED QUESTIONNAIRE AT THE NEXT CLASS MEETING OR TO ROOM 423 SOUTH KEDZIE HALL.

THIS HAS BEEN A LONG QUESTIONNAIRE. THANK YOU VERY MUCH FOR COMPLETING IT. YOUR TIME AND EFFORT ARE DEEPLY APPRECIATED. FUTURE QUESTIONNAIRES WILL NOT BE AS LONG.

THANK YOU

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APPENDIX III: WAVE #3

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APPENDIX III: WAVE #3

NAME\_\_\_\_\_

I.D.#

Wave # 3

MICHIGAN STATE UNIVERSITY

College of Communication Arts Department of Communication East Lansing, Michigan 48824

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Dear Participant:

This is the third of four questionnaires concerning your communication in close friendships. Although this questionnaire should not take you as long to fill out as the previous one, it is important that you consider each question carefully and answer it sincerely.

Some of the items from previous questionnaires are repeated here. There is a reason for doing this that will be explained at the special explanatory session. It is important that you answer these items. Do not try to recall your previous answers. Just answer the repeated items according to how you presently feel.

If an item is not clear or if you have any questions about any of the items, please call me.

Office Phone: 355-1862 Home Phone: 355=0789

You should be able to contact me or leave a message for me at these numbers. Please do not call before 7:30 in the morning or after 10:30 at night.

Remember that all information you give me will be kept strictly confidential.

PLEASE RETURN THIS QUESTIONNAIRE AT THE NEXT MEETING OF THIS CLASS, OR TO ROOM 423 SOUTH KEDZIE HALL.

Thank you,

Mar Pentis.

Mac Parks Principal Investigator

- 1. BELOW IS A SERIES OF ITEMS. YOUR JOB IS TO INDICATE HOW MUCH YOU AGREE OR DISAGREE WITH EACH ITEM. CIRCLE THE ONE NUMBER WHICH INDICATES HOW MUCH YOU AGREE OR DISAGREE WITH EACH ITEM. THE LARGER THE NUMBER YOU CIRCLE, THE MORE YOU AGREE WITH THE ITEM. THE SMALLER THE NUMBER YOU CIRCLE, THE LESS YOU AGREE WITH THE ITEM. BE SURE TO CIRCLE ONLY ONE NUMBER FOR EACH ITEM, PLEASE RESPOND TO EACH ITEM INDIVIDUALLY.
  - a. It is extremely important to me to have a relationship with another person in which we can share personal information about ourselves.

Strongly

1

Strongly

	Disagree	1	2	3	4	5	· 6	7	8	9	Agree	
Ъ.	It is extr person in	emely which	impo ther	rtant e is	to m a gre	e to at do	have al of	a rel f mutu	ation al tr	ship ust.	with anothe	r
	Strongly Disagree	1	2	3	4	5	6	7	8	9	Strongly Agree	
c.	Having a s extremely	pecia impor	l and tant	last to me	ing r	elati	lonshi	p wit	h <b>anc</b>	ther	person is	
	•••••										•. •	

Strongly										Strongly
Disagree	1	2	3	4	5	6	7	8	9	Agree

d. It is extremely important to me to have a relationship with another person in which both of us could count on each other for help when needed.

StronglyStronglyDisagree123456789Agree

e. It is extremely important to me to have a relationship with another person in which there is a great deal of mutual liking.

Strongly										Strongly
Disagree	1	2	3	4	5	6	7	8	9	Agree

2. BELOW IS A LIST OF ACTIVITIES. YOUR JOB IS TO ESTIMATE HOW MUCH TIME (IN HOURS) YOU SPEND ON EACH ACTIVITY ON AN AVERAGE WEEKDAY AND ON AN AVERAGE WEEKEND DAY IN EACH ACTIVITY. Be sure that your list for each day does not exceed 24 hours.

	ACTIVITY:	AVERAGE Week day	AVERAGE Weekend day
۸.	Watching television	hrs.	hrs.
<b>B</b> .	Reading books, magazines, newspapers, etc	hrs.	hrs.
c.	Listening to the Radio and Stereo (List only the hours when you did nothing else except listen)	hrs.	hrs.
D.	Talking with persons who are friends, but who are not close friends	hrs.	hrs.
Е.	Talking with persons who are <u>neither</u> close friends or other types of friends	hrs.	hrs.
F.	Time Spent Alone that is, time you were not actually with one or more other persons. Include hours spent sleeping in this category	hrs.	hrs.

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Now, think about the number of times you have moved from one town to another.

## 3. IN THE LAST FIVE YEARS, HOW MANY TIMES HAVE YOU MOVED FROM ONE TOWN TO ANOTHER TOWN OR CITY? LIST EACH MOVE. LIST ONLY THOSE TIMES WHEN YOU MOVED FROM ONE TOWN TO ANOTHER. DO NOT LIST MOVES WITHIN THE SAME TOWN OR CITY.

1.	Moved	from	_to
2.	Hoved	from	to
з.	Moved	from	_to
4.	Moved	from	to
5.	Moved	from	to
6.	Moved	from	to
7.	Moved	from	to
8.	Moved	from	to
9.	Moved	from	_to
10.	Moved	from	to
11.	Moved	from	to•
12.	Moved	from	to
13.	Moved	from	to
14.	Moved	from	to
15.	Moved	from	to

HAVE YOU ?

Listed only moves from one town to another? Listed only those moves in the last five years?

IF YOU NEED MORE SPACE, CONTINUE ON THE BACK OF THIS PAGE.

## 4. IN THE LAST FIVE YEARS, HOW MANY TIMES HAVE YOU MOVED FROM ONE PLACE TO ANOTHER WITHIN THE SAME TOWN? LIST EACH CHANGE OF ADDRESS. DO NOT LIST MOVES FROM ONE TOWN TO ANOTHER.

IF YOU CHANGED ADDRESSES MORE THAN ONCE WHILE LIVING IN THE SAME TOWN OR CITY, USE ONE LINE OF THE LIST BELOW FOR EACH MOVE. IF YOU NEED MORE SPACE, CONTINUE ON THE BACK OF THIS PAGE.

1.	changed addresses when I lived in							
2.	changed addresses when I lived in							
з.	changed addresses when I lived in							
4.	changed addresses when I lived in							
5.	changed addresses when I lived in							
6.	changed addresses when I lived in							
7.	changed addresses when I lived in							
8.	changed addresses when I lived in							
9.	changed addresses when I lived in							
10.	changed addresses when I lived in							
11.	changed addresses when I lived in							
10	changed addresses when I lived in							
14.	Changed addresses when I IIVed In							
13.	changed addresses when I lived in							
14.	changed addresses when I lived in							
15.	changed addresses when I lived in							
HAV	HAVE YOU ? Listed only moves within the same town?							
	LISTED ONLY MOVES WITHIN THE LAST FIVE YEARS?							

Listed only one change of address per line?

5. BELOW IS A LIST OF YOUR CLOSE FRIENDS. EACH OF YOUR CLOSE FRIENDS HAS BEEN PAIRED WITH YOU. ALSO, EACH OF YOUR CLOSE FRIENDS HAS BEEN PAIRED WITH EACH OTHER CLOSE FRIEND.

FOR EACH PAIR, THERE ARE THREE QUESTIONS. PLEASE CONSIDER EACH ITEM CARE-FULLY BEFORE ANSWERING. ANSWER ALL ITEMS.

- - a. In the last week (7 days), estimate how many times you think that these two persons have communicated with each other.

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Number of Times in Last Week.

b. On the scale below, estimate how similar (in general) you think these two persons are. Circle the one number that indicates how similar you think they are. The bigger the number you circle, the more similar you think they are. The smaller the number you circle, the more different you think they are.

**Very Different 1** 2 3 4 5 6 7 8 9 Similar

c. Suppose the first person wanted to get in touch with the second person of the pair. On the scale below, estimate how much effort it would take the first person to get in touch with the second person. Circle the one number that indicates how much effort it would take. Again, the bigger the number you circle, the more effort you think it would take. The smaller the number you circle, the less effort you think it would take.

Very										Very
Little Effort	1	2	3	4	5	6	7	8	9	Much Effort

)	ε
a.	In the last week (7 days), estimate how many times you think that these two persons have communicated with each other.
	Number of Times in Last Week.
b.	On the scale below, estimate how similar (in general) you think these two persons are. Circle the one number that indicates how similar you think they are.
	Very Different 1 2 3 4 5 6 7 8 9 Similar
с.	Suppose the first person wanted to get in touch with the second person. On the scale below, estimate how much effort it would take the first person to get in touch with the second person. Circle the one number that shows how much you think it would take.
	Very Little 1 2 3 4 5 6 7 8 9 Much Effort Effort
)	٤٤
a.	In the last week (7 days), estimate how many times you think that these two persons have communicated with each other.
	Number of Times in Last Week.
b.	On the scale below, estimate how similar (in general) you think these two persons are. Circle the one number that indicates how similar you think they are.
	Very Different 1 2 3 4 5 6 7 8 9 Similar
c.	Suppose the first person wanted to get in touch with the second person. On the scale below, estimate how much effort it would take the first person to get in touch with the second person. Circle the one number that shows how much effort you think it would take.
	VeryVeryLittle123456789MuchEffortEffort

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PLEASE :

- 1. LOOK BACK THROUGH THE QUESTIONNAIRE TO MAKE SURE THAT YOU HAVE ANSWERED EVERY ITEM YOU WERE SUPPOSED TO.
- 2. RETURN THE COMPLETED QUESTIONNAIRE AT THE NEXT CLASS MEETING OR TO ROOM 423 SOUTH KEDZIE HALL.

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THERE WILL ONLY BE ONE MORE QUESTIONNAIRE AFTER THIS ONE. IT WILL BE SHORTER THAN THE PREVIOUS TWO. YOUR TIME AND EFFORT ARE VERY GREATLY APPRECIATED.

THANK YOU.

APPENDIX IV: WAVE #4

11.50

Name :

Wave # 4

I.D. #\_\_\_\_\_

MICHIGAN STATE UNIVERSITY

College of Communication Arts Department of Communication

East Lansing, Michigan 48824

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Dear Participant:

This is the final questionnaire concerning your communication in close friendships. It should take you somewhat less time to complete than did the previous two questionnaires. I realize that you have already given us a great deal of your time and attention. I deeply appreciate this. Like previous questionnaires, it is important that you consider each item carefully and answer it sincerely.

Some of the items from previous questionnaires are repeated here. There is a reason for doing this that will be explained at the special explanatory session. It is important that you answer these items. Do not try to recall your previous answers. Just answer the repeated items according to how you presently feel.

If an item is not clear or if you have any questions about any of the items, please call me.

Office Phone: 355-1862 Home Phone: 355-0789

You should be able to contact me or leave a message for me at these numbers. Please do not call before 7:30 in the morning or after 10:30 at night.

Remember that all information you give me will be kept strictly confidential.

You will be notified as to the time, place, and date of the special explanatory session.

PLEASE RETURN THIS QUESTIONNAIRE AT THE NEXT MEETING OF THIS CLASS, OR TO ROOM 423 SOUTH KEDZIE HALL.

Thank you,

Max Parks.

Mac Parks Principal Investigator

1.	Moved	from	_to
2.	Moved	from	_to
з.	Moved	from	to
4.	Moved	from	to
5.	Moved	from	_to
6.	Moved	from	to
7.	Moved	from	to
8.	Moved	from	to
9.	Moved	from	_to
10.	Moved	from	to
11.	Moved	from	_to
12.	Moved	from	_to
13.	Moved	from	_to
14.	Moved	from	to
15.	Moved	from	to

## HAVE YOU ?

Listed only moves from one town to another? Listed only those moves in the last five years?

IF YOU NEED MORE SPACE, CONTINUE ON THE BACK OF THIS PAGE.

# 2. IN THE LAST FIVE YEARS, HOW MANY TIMES HAVE YOU MOVED FROM ONE PLACE TO ANOTHER WITHIN THE SAME TOWN? LIST EACH CHANGE OF ADDRESS. DO NOT LIST MOVES FROM ONE TOWN TO ANOTHER.

IF YOU CHANGED ADDRESSES MORE THAN ONCE WHILE LIVING IN THE SAME TOWN OR CITY, USE ONE LINE OF THE LIST BELOW FOR EACH MOVE. IF YOU NEED MORE SPACE, CONTINUE ON THE BACK OF THIS PAGE.

1.	I	changed	addresses	when	I	lived	in	
2.	I	changed	addresses	when	I	lived	in	
з.	I	changed	addresses	when	I	lived	in	
4.	I	changed	addresses	when	I	lived	in	
5.	I	changed	addresses	when	I	lived	in	
6.	I	changed	addresses	when	I	lived	in	
7.	I	changed	addresses	when	I	lived	in	
8.	I	changed	addresses	when	I	lived	in	
9.	I	changed	addresses	when	I	lived	in	
10.	I	changed	addresses	when	I	lived	in	
11.	I	changed	addresses	when	I	lived	in	
12.	I	changed	addresses	when	I	lived	in	
13.	I	changed	addresses	when	I	lived	in	
14.	I	changed	addresses	when	I	lived	in	
15.	I	changed	addresses	when	I	lived	in	

#### HAVE YOU ?

Listed only moves within the same town? Listed only moves within the last five years?

Listed only one change of address per line?

3. ESTIMATE THE ANNUAL INCOME OF YOUR FAMILY.

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- 4. BELOW IS A LIST OF YOUR CLOSE FRIENDS. EACH OF YOUR CLSOE FRIENDS HAS BEEN PAIRED WITH YOU. ALSO, EACH OF YOUR CLOSE FRIENDS HAS BEEN PAIRED WITH EACH OTHER CLOSE FRIEND. FOR EACH PAIR OF PERSONS THERE IS ONE QUESTION. PLEASE CONSIDER IT CAREFULLY BEFORE ANSWERING. ANSWER ALL ITEMS.
  - ٤\_\_\_\_\_ 1. In the last week (7 days), estimate how many times you think that these two persons have communicated with each other. Number of Times in Last Week 2. In the last week (7 days), estimate how many times you think that these two persons have communicated with each other. Number of Times in Last Week ٤ . . . 3. I In the last week (7 days), estimate how many times you think that these two persons have communicated with each other. Number of Times in Last Week 3 4. In the last week (7 days), estimate how many times you think that these two persons have communicated with each other. Number of Times in Last Week 5. ٤ . In the last week (7 days), estimate how many times you think that

In the last week (7 days), estimate how many times you think that these two persons have communicated with each other.

Number of Times in Last Week

6 ) In the last week (7 days), estimate how many times you think that these two persons have communicated with each other. Number of Times in Last Week ) 3 In the last week (7 days), estimate how many times you think that these two persons have communicated with each other. Number of Times in Last Week 6 ) In the last week (7 days), estimate how many times you think that these two persons have communicated with each other. Number of Times in Last Week 3 ) In the last week (7 days), estimate how many times you think that these two persons have communicated with each other. Number of Times in Last Week ) 3 \_\_\_\_\_ In the last week (7 days), estimate how many times you think that these two persons have communicated with each other.

Number of Times in Last Week

112

LAST	WEEK. PLEASE TRY TO BE AS ACCURATE AS	POSSIBLE.	
1.		HOURS	MINUTES
2.		HOURS	MINUTES
3.		HOURS	MINUTES
4.		HOURS	MINUTES
5.		HOURS	MINUTES
6.		HOURS	MINUTES
7.		HOURS	MINUTES
8.		HOURS	MINUTES
9.		HOURS	MINUTES
10.		HOURS	MINUTES
11.		HOURS	MINUTES
12.		HOURS	MINUTES
13.		HOURS	MINUTES
14.		HOURS	_ MINUTES
15.		HOURS	MINUTES
16.		HOURS	MINUTES
17.		HOURS	MINUTES
18.		HOURS	MINUTES
19.		HOURS	MINUTES
20.		HOURS	MINUTES
21.		HOURS	_ MINUTES
22.		HOURS	MINUTES

5. BELOW IS THE LIST OF YOUR CLOSE FRIENDS THAT YOU PROVIDED BEFORE. ESTIMATE HOW MANY HOURS AND MINUTES YOU SPENT TALKING WITH EACH CLOSE FRIEND IN THE LAST WEEK. PLEASE TRY TO BE AS ACCURATE AS POSSIBLE.

# 6. HOW MANY QUARTERS HAVE YOU BEEN GOING TO MICHIGAN STATE? COUNT UP ONLY THOSE QUARTERS IN COLLEGE THAT YOU SPENT AT THIS SCHOOL.

Number of Quarters at M.S.U.

- 7. BELOW ARE A SERIES OF QUESTIONS CONCERNING HOW YOU FEEL ABOUT THINGS IN GEN-ERAL. BENEATH EACH ITEM IS A SCALE. CIRCLE THE ONE NUMBER THAT INDICATES HOW YOU FEEL ABOUT THE ITEM. THE BIGGER THE NUMBER THE CIRCLE, THE MORE YOU AGREE WITH THE ITEM. THE SMALLER THE NUMBER YOU CIRCLE, THE MORE YOU DISAGREE WITH THE ITEM. Circle only one number for each item. Please answer each item.
  - a. MOST PUBLIC OFFICIALS (PEOPLE IN PUBLIC OFFICES) ARE NOT REALLY INTERESTED IN THE PROBLEMS OF THE AVERAGE PERSON.

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Strongly Strongly Disagree 7 2 3 5 6 8 9 1 4 Agree b. NOWADAYS A PERSON HAS TO LIVE PRETTY MUCH FOR TODAY AND LET TOMORROW TAKE CARE OF ITSELF. Strongly Strongly Disagree 5 6 1 2 3 4 7 8 9 Agree C. THE AVERAGE PERSON IS PROBABLY BETTER OFF TODAY THAN HE OR SHE EVER WAS. Strongly Strongly Agree 2 3 4 5 6 7 Disagree 1 8 9 d. IT'S HARDLY FAIR TO BRING CHILDREN INTO THE WORLD WITH THE WAY THINGS LOOK FOR THE FUTURE.

Strongly Disagree	1	2	3	4	5	6	7	8	9	Strongly Agree
DISARIGE	-	2	5	-	5	0	'	0	3	

e. THESE DAYS A PERSON DOESN'T REALLY KNOW WHOM HE CAN COUNT ON. Strongly Strongly Disagree 1 2 3 4 5 6 7 8 9 Agree ARE THERE ANY COMMENTS THAT YOU WOULD LIKE TO MAKE CONCERNING THE STUDY ITSELF OR CONCERNING THE INFORMATION YOU WERE ASKED?

THIS WAS THE FINAL QUESTIONNAIRE FOR THE STUDY. I SINCERELY APRPECIATE THE TIME, THOUGHT, AND EFFORT YOU HAVE GIVEN. YOU HAVE BEEN VERY HELPFUL TO ME. A SPECIAL EXPLANATORY SESSION WILL BE SCHEDULED AND ANNOUNCED IN YOUR CLASS.

THANK YOU.

RETURN THE COMPLETED QUESTIONNAIRE AT THE NEXT CLASS MEETING OR TO ROOM 423 SOUTH KEDZIE HALL.

# APPENDIX V: DATA TRANSFORMATIONS

#### APPENDIX V: DATA TRANSFORMATIONS

Descriptive statistics for the variables revealed that many of the variables were severely skewed either positively or negatively. In order to correct for this difficulty, each variable was subjected to a logarithmic transformation. In cases where the variable was positively skewed, the transformation was performed directly on the variable. In cases where the variable was negatively skewed, the distribution of the variable was first reversed (making it positively skewed) and then the logarithm of the variable was computed.

The choice as to whether to use the variable or its logarithm for later analysis was made by comparing the skewness of the variable to the skewness of its logarithm. In each case, the form possessing the least absolute skewness was used for later analysis. Table 7 presents the skew for each variable and its logarithmic transformation in the model.

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Variable	Skew of Variable	Skew of Logarithm
Network Size	+.496*	556
Memberships in Voluntary Associations	+1.861	+ .375*
Socioeconomic Status	-1.019	273*
Time/Mass Media	+ .824	760*
Time/Non-Close Friends	+1.667	139*
Time/Non-Friends	+ .989	950*
Time/Alone	309*	-3.880
Communication Skills	+ .007*	400
Desire for Participation	-2.044	+ .235*
Integration	+2.588	143*
Similarity (Perceived)	+ .039*	466
Effort (Perceived)	+ .040%	-1.322
Mobility	+1.352	180*

Table 7. Skewness of Variables and Their Logarithms.

\*This form of the variable was used for analysis.

APPENDIX VI: PROCEDURES FOR THE ESTIMATION OF OPPORTUNITY

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APPENDIX VI: PROCEDURES FOR THE ESTIMATION OF OPPORTUNITY

The unmeasured variable of opportunity  $(Y_1)$  was estimated as the linear combination of the measured variables hypothesized to underlie it. This was done according to the following two steps. First, the exogenous variables of desire  $(X_5)$  and communication skills  $(X_6)$  and the variables hypothesized to underlie opportunity  $(X_7 \text{ to } X_{13})$  were used as independent variables in a multiple regression procedure on the dependent variable of network size  $(X_4)$ . Second, the standardized regression coefficients (beta weights) for the hypothesized underlying variables were used in combination with the underlying variables themselves to form a linear equation which predicted opportunity  $(Y_1)$ .

The latter step can be more fully outlined by presenting both the general linear equation and then the specific values for the regression coefficients. In its general form, the equation to predict opportunity is:

 $Y_1 = p_{17}X_7 + p_{18}X_8 + p_{19}X_9 + p_{1,10}X_{10} + p_{1,11}X_{11} + p_{1,12}X_{12} + p_{1,13}X_{13}$ Where:

> Y = Opportunity X<sup>1</sup> = Number of Memberships in Voluntary Associations X<sup>8</sup> = Socioeconomic Status X<sup>9</sup> = Time Spent with Mass Media Sources X<sup>10</sup> = Time Spent with Non-Close Friends X<sup>10</sup> = Time Spent Alone X<sup>11</sup> = Level of Residential Mobility X<sup>12</sup> = Time Spent with Non-Friends p<sup>1</sup> = Standardized Regression Coefficients (Path Coefficients)

The first step outlined above yielded specific values for the standardized regression coefficients. When these specific values are substituted into the general predictor equation above, an estimate of opportunity is derived. The specific standardized and unstandardized regression coefficients for the variables hypothesized to underlie opportunity are given in the table below:

Table 8. Regression Coefficients for Variables Underlying Opportunity

Variable	Standardized Regression Coefficient	Unstandardized Regression Coefficient
Vol. Assoc.	.16870	2.08013
SES	10126	84205
Time/Mass Media	.18658	2.95303
Time/Non-Close	.11235	1.46621
Time/Alone	17874	04656
Mobility	.15848	1.49168
Time/Non-Friends	03867	39252

APPENDIX VII: PROCEDURES FOR THE ESTIMATION OF PATHS FROM OPPORTUNITY TO UNDERLYING VARIABLES

#### APPENDIX VII: PROCEDURES FOR THE ESTIMATION OF PATHS FROM OPPORTUNITY TO UNDERLYING VARIABLES

Opportunity  $(Y_1)$  was hypothesized to be the common factor of several underlying variables  $(X_7 \text{ to } X_8)$ . Thus, the estimation of the paths from opportunity to these variables was much like factor analysis. In fact, these path coefficients are very much like factor loadings.

To estimate the paths from opportunity to the hypothesized underlying variables, the following procedure was utilized. First, the standardized regression co-efficients of the underlying variables ( $X_7$  to  $X_{13}$ ) were obtained by applying a multiple regression procedure where the underlying variables were independent and the dependent variable was network size ( $X_4$ ). These values are listed in Table 8 in the previous Appendix (VI). Second, these beta weights were arrayed in a 1x7 matrix which was premultiplied by the zero-order correlation matrix of the seven hypothesized variables. The result of this matrix operation yielded estimates for each of the paths from opportunity to the underlying variables.

A more complete description of this procedure and a more detailed theoretic rationale behind it are presented in Van de Geer (1971).

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APPENDIX VIII: PROCEDURES FOR THE ESTIMATION OF THE RELATIONSHIP BETWEEN PERCEIVED SIMILARITY AND INTEGRATION
## APPENDIX VIII: PROCEDURES FOR THE ESTIMATION OF THE RELATIONSHIP BETWEEN PERCEIVED SIMILARITY AND INTEGRATION

The relationship between perceived similarity and network integration was hypothesized to be non-recursive. That is, the relationship was believed to be reciprocal. As a result, the typical regression techniques employed to estimate other paths in the model were insufficient. Because of the lack of the necessary software to deal with non-recursive paths, several improvised procedures were employed. These are described below.

## Estimating Paths to Integration

Integration was hypothesized to be a function of the following four variables: 1) network size; 2) residential mobility; 3) perceived effort; and 4) perceived similarity. Put in equation form, we can write the hypothesis in the following manner:

$$X_{1} = p_{14}X_{4} + p_{1,12}X_{12} + p_{12}X_{2} + p_{13}X_{3} + p_{1u}U$$
(1)

Where:

X1 = Network Integration
X1 = Perceived Similarity
X3 = Perceived Effort
X4 = Network Size
X4 = Residential Mobility
U1 = Residual Term (Error)

By multiplying this structural equation by the exogenous variables, estimating equations can be obtained. In addition to the exogenous variables of desire  $(X_5)$ , communication skills  $(X_6)$  and opportunity  $(Y_1)$ , age (which we will designate as  $X_0$ ) of the subject was employed to derive the estimating equations. This latter variable was used simply to get an additional estimating equation. The structural equation when multiplied by the four exogenous variables yields the following four estimating equations:

(By 
$$X_0$$
):  $r_{10} = p_{14}r_{04} + p_{1,12}r_{0,12} + p_{12}r_{02} + p_{13}r_{03}$  (2)

(By 
$$X_5$$
):  $r_{15} = p_{14}r_{54} + p_{1,12}r_{5,12} + p_{12}r_{52} + p_{13}r_{53}$  (3)

(By 
$$X_6$$
):  $r_{16} = p_{14}r_{64} + p_{1,12}r_{6,12} + p_{12}r_{62} + p_{13}r_{63}$  (4)

(By 
$$Y_1$$
):  $r_{1y} = p_{14}r_{y4} + p_{1,12}r_{y,12} + p_{12}r_{y2} + p_{13}r_{y3}$  (5)

It should be noted that the residual and its path in the structural equation drop out when multiplied by the exogenous variables since the correlation between a residual and an exogenous variable is assumed to be zero.

If the four estimating equations (2-5) above are segmented into matrices, the following identity is obtained:

All of the correlations (the "r's" are known. This leaves only the path coefficients (the "p's" are unknowns.) By rearranging the matrices we can solve for these unknowns. If we label the three matrices above as "A", "B" and "C" from left to right, we have the following identities:

$$A = BC$$
(7)

And

$$C = B^{-1} \times A \tag{8}$$

That is, C (the matrix of unknown path coefficients) equals the product of the inverse of matrix B and matrix A. When these operations are performed with the actual values of the correlations, the following results were obtained:

$$c = {\begin{array}{*{20}c} P_{14} & .4293 \\ P_{1,12} & -.3434 \\ P_{12} & -.0227 \\ P_{13} & -.5670 \end{array}}$$
(9)

These procedures have allowed us to estimate the path coefficients for all paths leading to network integration. Our particular interest here is with  $p_{12}$ , the path from similarity (X<sub>2</sub>) to network integration (X<sub>1</sub>). As equation 9 indicates, this estimate was -.0227.

## Estimating the Path to Similarity

Our interest now turns to the estimation of the other half of the nonrecursive relationship--the path from integration to similarity. In the hypothesized model, similarity is wholly a function of integration. Thus, the structural equation for perceived similarity is:

$$x_{2} = p_{21}X_{1} + p_{2y}V$$
 (10)

Where:

X = Network Integration X<sup>1</sup> = Perceived Similarity V<sup>2</sup> = Residual Term (Error) p = Path coefficient

Again, by multiplying this structural equation by the exogenous variables, four estimating equations are obtained:

$$(By X_0): r_{02} = P_{21}r_{01}$$
(11)

(By 
$$X_5$$
):  $r_{52} = p_{21}r_{51}$  (12)

$$(By X_6): r_{62} = p_{21}r_{61}$$
(13)

(By 
$$Y_1$$
):  $r_{y2} = p_{21}r_{y1}$  (14)

Where:

X = Age of Subject X<sup>0</sup> = Desire X<sup>5</sup> = Communication Skills Y<sup>6</sup> = Opportunity

Since all the correlations (the "r's") in these equations (11-14) are known, we have p<sub>21</sub>, the path from integration to perceived similarity, as the only unknown. Further, we have four estimates of this path:

Table 9. Estimates of p<sub>21</sub>.

Estimate of p <sub>21</sub>
.21
10.5
29
4.67

The best available estimate of p<sub>21</sub> is the mean of the four estimates listed in Table 9. This mean is 3.77. Thus, this is the value of the path coefficient for the path from integration to perceived similarity.

