LIAISON COMMUNICATION ROLES IN A FORMAL ORGANIZATION

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ABSTRACT

LIAISON COMMUNICATION ROLES IN A FORMAL ORGANIZATION

by Donald F. Schwartz

Most previous communication research in formal organizations has examined aspects of the formal structure with particular emphasis on superior-subordinate relations. The focus of this study was to map the extant functional communication structure of an organization (including both formal and informal aspects), then to differentiate this sociometric map into two structural types based on topological concepts from graph theory, and, finally, to describe differences on specified variables between the two structural types.

The primary structural type was the liaison communication role. Individuals who function in a liaison role have interlinking communication contacts with two or more sociometrically-defined clique groups in the organization. Essentially, when liaison role persons are removed from the sociogram of communication contacts, groups to which they are connected separate. Thus the liaison role, a conceptual analogue to the articulation point in graph theory, is a critical location in a communication network. All other individuals who were not liaison persons or isolates were termed non-liaison persons. Eleven hypotheses predicted differences between liaison and non-liaison persons in terms of certain communication behavior and personal

attributes perceived by their respective reciprocated non-liaison contacts.

The first step in topological analysis was to map the organization's communication structure based on sociometric reports from all members of their usual weekly or more often functional communication contacts. A communication linkage was assumed between two persons only if each reported the other as a contact. From a study population of 142 members composed of all the faculty and professional staff of a College within a large university, 225 reciprocated dyads emerged. This matrix of contacts was analyzed to yield identification of 22 liaison role persons, 18 isolates and 102 non-liaison persons who had sociometric membership in 29 separate groups of varying size.

Respondents completed questionnaires regarding their communication behavior with, and perceptions of, persons with whom they reported daily contact. Thirty questionnaires completed on 17 liaison persons by their reciprocated non-liaison contacts were the sources of data for the liaison sample. A random sample of 17 non-liaison persons yielded 21 questionnaires completed on them by their non-liaison contacts and these were the sources of data for the non-liaison sample. The individuals evaluated in each sample differed in the number of monthly committee meetings and span of reciprocated contacts, with liaisons having the higher average in both instances. The samples were comparatively similar on several other demographic variables

including age, sex, academic rank, time allotted to various duties, publication rate and tenure at the university.

Seven of the hypothesis-testing variables were operationalized as multi-item scales, with the remaining two direct estimates of message transaction initiation frequencies. Hypotheses were evaluated by the "t" test for independent sample means.

Contrasting liaison persons and non-liaison persons as perceived by their reciprocated non-liaison contacts, support was found for perceptual characterization of liaisons as having a larger number, more structurally diverse and more important contacts in the organization. Liaisons were perceived to be more influential within the organizational "power structure." In the organization's information relay network, liaisons were reported to more frequently serve as first sources of organization-related information for their contacts.

Support was not obtained for hypotheses concerning the frequency and directional ratio of deliberate message transaction initiation, qualification and safety dimensions of source credibility, general persuasiveness with secondary contacts and specific (dyadic) opinion leadership.

The study demonstrates a unique conceptual and methodological framework (communimetrics) for study of the extant communication structure of formalized social systems and provides some empirical evidence on perceived attributes and functions of liaison communication role incumbents.

LIAISON COMMUNICATION ROLES

IN A FORMAL ORGANIZATION

By

Donald F. Schwartz

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This work is dedicated to the memory of my parents, Frank W. and Mabel E. Schwartz, both of whom died during the author's tenure as a graduate student at Michigan State University. My father, who was forced to terminate his formal education at the fourth grade, and my mother, who held a bachelors degree in mathematics, provided the encouragement and considerable economic sacrifice for an academic career which, without their support, the author would have then enthusiastically abandoned at the eighth grade.

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CHAPTER I

INTRODUCTION

Examination of the literature on formal organizations reveals little explicit discussion or empirical research on the structure and process of communication. There is, however, general consensus that communication is an important process in organizations. Barnard (1938, p. 9) was one of the early theorists to posit communication as a central concern in organization theory:

> ...in any exhaustive theory of organization, communication would occupy a central place, because the structure, extensiveness, and scope of organization are almost entirely determined by communication techniques.

Many contemporary social scientists place similar emphasis upon organizational communication, but from differing viewpoints. Leavitt (1958, p. 300), for example, sees decision-making as a central theoretical concern but underlines the importance of communication:

> From management's perspective, we can think of ...(an organization) as an elaborate set of interconnected communication channels designed to collect and collate, analyze, and sort out information; also as a system for making decisions, acting them out, getting feedback information and correcting itself.

Viewing organizations from the standpoint of management theory, Dorsey (1957) explicitly identifies administration as a communication process.

More recently, Katz and Kahn (1966) have defined organizations from a systems viewpoint, characterizing an organization as both an energic and an informational system

with the function of the information system being management of the energic system. With this conceptual background, their emphasis on the importance of communication is expected:

> The closer one gets to the organizational center of control and decision-making, the more pronounced is the emphasis on information exchange.
>
> In this sense, communication -- the exchange of information and the transmission of meaning -- is the very essence of a social system or an organization. The input of physical energy is dependent upon information about it, and the input of human energy is made possible through communicative acts.
>
> ...Communication is thus a social process of the broadest relevance in the functioning of any group, organization or society. It is possible to subsume under it such forms of social interaction as the exertion of influence, cooperation, social contagion or imitation, and leadership. (p. 223, 224)

As a final example, Thayer (1967, p. 85) clearly elevates communication above other organization processes when he states, "...the essential and preeminent organismic, interpersonal, and organizational function is communication -- i.e., the programmatic inputting, processing, and outputting of 'information.'"

Given these and other commonalities on the theoretic assumption that communication is, at least, a central process in an organizational context, it is surprising that little empirical research has been accomplished within the specific context of formal organizations. Walton's (1962, p. 4) description of the state of knowledge about one aspect of organizational communication is still apt:

> Although the organization's communication system may be the most important factor accounting for its behavior, we have insufficient knowledge of the dynamics of the system writ large that clearly explains and

> accounts for the movement of messages within the organizational environment.

Thayer (1967, pp. 80-1) states the case even more strongly:

> Perhaps more has been 'communicated' about 'communications problems' in organizations than any other single topic in the field. Yet this plethora of commentary has not been conducive either to theory-building or to theory-validation. This bulk, most of which represents individual curiosities rather than scientific endeavor, defies cataloging on two points: first, the studies themselves have not been carried out in the context of any superordinate theory and hence offer little possibility for conceptual systemization; second, most have been based upon normative and not empirical assumptions. Consequently, their conceptual usefulness is severely diminished. ...no single integrated body of literature has been accumulated.

Since there is general consensus on the importance of communication as an organizational process but a poverty of empirical literature on organizational communication, the development of a conceptual and empirical approach necessarily rests on an analysis of why so little evidence appears to have been accumulated to date.

Critique of Previous Research

Perusal of the few investigations directed at the study of communication within the context of "real" organizations suggests several reasons why the field has not advanced substantially beyond a problem identification stage: (1) the bulk of the research has maintained a "machine theory" orientation which encourages a clinical, therapeutic result; (2) little attention has been paid to the development of methodology for analyzing the extant communication structure of an organization sans the formal, imposed

hierarchial structure; (3) too often the research which has been attempted was not conceptualized within the framework of a superordinate theory of either communication or organization. These major reasons are not mutually exclusive.

Theoretic Limitations

The concept of organization is predicated on the a priori prescription of a structured set of interrelationships between members and task-groups. Katz and Kahn (1966, pp. 36-7) describe organizations as contrived social systems and observe that "the essential difference between social organizations and less structured social systems is the greater reliance upon formal prescriptions of acceptable as against unacceptable behavior in the organization." In other words an organization is a "social machine" designed to organize relationships between "human parts" in order to efficiently accomplish collective goals. Within this context it is not surprising that the usual approach to organizational communication research has been an attempt to ascertain how communication operates within the formal "design" of the organization. Communication has typically been studied in terms of "vertical" or "horizontal" relationships between or among hierarchial levels or formally structured task units. Often the underlying goal of this approach has been to devise improvements for practicing organizational members; i.e., a therapeutic approach.

In the same vein Etzioni (1961, p. 137) observes that most organizational communication research has been carried

out primarily in a human relations tradition. Emphasis is usually upon superior-subordinate relations. Again, the focus of research is upon the formal structure of the organization with little attention paid to the impact of the informal communication structure[1] on formally prescribed relationships. Thayer (1967, p. 97) suggests:

> The traditional basic problems of 'downward' and 'upward' communication have been variously solved by traditional methods. The solutions are equivocal, however, suggesting that our traditional approaches and methods have not brought us far theoretically -- or practically....Perhaps we are getting the right answers to the wrong research questions.

A basic conceptual limitation prevents research conducted in the machine theory tradition from contributing substantially to inclusive theory-building: by encompassing only a few levels or units of the organization within the research problem, this approach is never able to conceptualize or adequately account for the total interactive dynamic of the organization's communication system. The result is only a partial analysis which has restricted theoretic utility. The conceptual limitation is based on "a much too limited, sometimes unworkable, sometimes confused, concept of what communication <u>is</u> in organizations" (Thayer, 1967, p. 83). When the conceptual formulation underlying research is restricted to a view of communication as a form of control or a tool with motivational implications between

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[1]With a machine theory orientation, the usual definition of the formal structure has been in terms of the imposed task-specialization, authority hierarchy. The informal structure has been negatively defined as a residual category.

superior and subordinate the fundamental role of communication as a functional information transmission process is obscurred in terms of overall organizational dynamics.

Significant examples of organizational communication research conducted within the machine theory tradition include Burns' (1954) study of communication patterns of departmental executives, Berkowitz and Bennis' (1961) and Simpson's (1959) descriptions of communication patterns between hierarchial levels, Wager's (1962) description of message diffusion in an organization, and Read's (1962) study of the relation between the accuracy of upward communication and a subordinate's upward mobility aspirations and trust of his superior. Other studies have attempted to describe the frequency, direction or effectiveness of formal channel usage; e.g., Goetzinger and Valentine (1962), Hinrichs (1964), Walton (1959) and Dahle (1954). Mischler and Tropp (1956) explored the relation between occupational status and frequency of formal and informal channel usage. Triandis (1959a, b) studied the relation between cognitive similarity and effectiveness of communication within superior-subordinate dyads.

A conceptual framework related to the machine theory tradition is the approach underlying the studies of communication networks in small groups; e.g., Bavelas (1950) and Leavitt (1951). The relevance of this research to the more complex level of formal organizations is still not clear (Thayer, 1967, p. 75). Although he justifies generalizing

small group findings to the organizational level, Guetzkow (1965, p. 535) admits a speculative basis:

> The richness of materials at the individual and group levels has induced extrapolation of findings perhaps inappropriate for rigorous analysis of communications in organizations. Yet, with the dearth of studies about organizations, either from the field or laboratory, one can but join with others in speculation.

These observations on the generalizability of small group research to the organization level underline an inability, at this point in time, to translate such research into the framework of a superordinate theory of organization.

Methodological Limitations

Concomitant with the limitations on communication-in-organization research imposed by the machine theory orientation is the lack of attention to methodology compatible with a more inclusive conceptual framework. The problem is a chicken-egg paradox. The lack of readily available methods may partially explain the lack of attention to a broader framework. On the other hand, it may be the lack of a broader framework in the first place which has hindered development of "new" methodology. In either event, there exist limitations in both data-collection and data-analysis methods.

Organizational communication research is by definition focused on the structure and/or process of message transactions. The heterogeneity of content or function and the temporal nature of these transactions pose unique problems in data collection when the researcher goes beyond the transactional structure imposed by formal prescription.

If the research problem involves content-functional delineations, there is necessity for a viable taxonomy to cope with the heterogeneity of transactions. No consensual taxonomy for this purpose exists.[1] This problem becomes manifest in attempts to operationalize, for example, sociometric questions.

The temporal nature of message transactions also creates data-collection problems. Such non-continuity poses the question of whether message transactions should be sampled or censused and over what time period. Message sampling, as well as selective observations of message transactions based on content, may result in only partial analysis. Likewise, a message census may raise serious questions of reliability if organizational members are asked to record all their message transactions during a given time period because involvement in record-keeping may bias communication processes.

Four general data-collection methods appear in the literature: (1) sociometric techniques (e.g., Jacobson and

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[1] Taxonomies have been attempted. Katz and Kahn (1966) propose five organizational subsystems: production, supportive, maintenance, adaptive, and managerial. It might be assumed that if such subsystems can be identified there must be an extractable communication network associated by content of message transaction with each, although with overlapping membership. Thayer (1967, pp. 94-6) proposes three basic information systems: operational, regulatory and maintenance-development. Guetzkow (1965, pp. 542-50) classifies research on communication networks into five categories based on content of transactions in the net: authority, information, task-expertise, friendship and status. The deductive efficacy of these taxonomies has not been demonstrated.

Seashore, 1951), (2) tracing of a given message after it diffuses through the organization (e.g., Davis, 1953a, b), (3) the communication log or audit wherein a census of messages is recorded by members over a given time period (e.g., Burns, 1954) and (4) timed random sampling of messages (e.g., Hinrichs, 1964). A fifth method, use of trained observers to record all or a sampling of message transactions (e.g., Bales, 1951) has not been attempted in field research. Problems in operationalization due to content heterogeneity and noncontinuity of transaction are inherent in each data-collection method.

Another methodological problem related to both data collection and data analysis is that imposed by the independent random sampling assumption necessary to most statistical models. In the machine theory tradition, individuals or dyads easily can be randomly selected from one or several organizations. But this approach does not permit relational analysis of a total social system which in essence requires a census of the members of the system (saturation sampling). Coleman (1964, p. 442) observes:

> The individual remained the unit of analysis. No matter how complex the analysis, how numerous the correlations, the studies focused on individuals as separate and independent units. The very techniques mirror this well: samples were random, never including (except by accident) two persons who were friends; interviews were with one individual, as an atomistic entity, and responses were coded on separate IBM cards, one for each person. As a result...(the problems were) never problems concerned with relations between people.

One of the more obvious problems of saturation sampling as a conceptual-methodological approach is that of generaliza-

bility of the findings to other similar, or dissimilar, organizations. The problem is not unique to organization research and is described by Katz (1960, p. 439) as "how to take account of interpersonal relations and still preserve the representativeness of a sample."

Implications for Future Research

Analysis of previous communication-in-organization research reveals several implications for future research, both in terms of conceptual and methodological orientation. What appears called for is a shift from the machine theory approach to a more inclusive theory of organizational communication as the structure and process of a network of interpersonal relations within which the formally prescribed network is but one aspect. This shift also requires a reorientation in methodology. Coleman (1964, p. 442) points out that such a shift is "quite a difficult one to make, both conceptually and technically."

A more inclusive theory of organizational communication would accept the communication network(s) of an organization as basic structural characteristics without initial regard for other structural characteristics such as authority, status, prescribed function, or spatial relation. Succeeding steps in this approach would superimpose these other structural characteristics upon the communication network(s) in an attempt to explain the variance found in their structural or operational functions. Within this context, before superimposing other organizational characteristics upon

communication networks, directionality of message transactions has no meaning in the usual machine theory sense; i.e., there can be no concepts of vertical or horizontal or "criss-cross" communication, but only communication between or among members and/or groups. Also within this context, the extraction of communication networks might be related to specific types of content or function yielding analyses based on specific types of networks, or the generic communication structure could be extracted on a content-free basis.[1] The latter approach would attempt to extract the most general extant communication network. For either approach, minimum criteria[2] for frequency of channel[3] usage within any network would have to be established to define exact limits for the existence of a channel (reflecting the temporal nature of message transactions between dyadic linkages) or dyadic linkages within a network could be assigned weights to reflect frequency of channel usage. Unfortunately, there is no existing empiric foundation upon which to base minimum criteria of

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[1]Utilizing, for example, a sociometric question like, "Who do you communicate with in this organization?" as opposed to a question worded "Who do you communicate with about (subject matter)?"

[2]For example, up to daily contact, up to once weekly contact, etc.

[3]The terms channel and dyadic linkage are used interchangeably. Either term means simply the occasion of a previous message relation of some frequency between members of the dyad.

channel usage by relating frequency of usage to maximum explanation of variance in operating characteristics and communication effects.

The generic communication structure[1] would represent a "pure type" within the framework suggested here. The pure type would provide a record of all message transactions between all members of the organization, regardless of content-type or historic frequency, in order to describe all the dyadic linkages making up the fabric of the organization's total communication structure. This over-all structure then might be redefined in terms of several content-frequency substructures with each being a separable network of its own, but most likely with overlapping membership across substructures. However, a complete "pure type" such as this may remain an ideal type as a result of practical limitations on data-collection procedures in real organizations. Nonetheless, procedures yielding a best-approximation of extant communication structures represent an improvement over previous research strictured by the machine theory conceptualization.

To correct for previous inadequacies, Thayer (1967, p. 97) opts for an operational-functional study of organizational communication and offers this suggestion:

> ...if the individual is viewed as a complex information-processing system, research on human behavior

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[1]The terms communication structure and communication network are used interchangeably.

> in organizations could be based upon a view of the individual as the focal point of a set of information vectors which define that individual's functional role in the organization.

Combining Thayer's suggestion with the generic communication structure concept points to a two-phase or topological-analytic procedure. The first step would involve mapping, as an abstracted isomorphic system, the extant communication structure (general or specific depending on the research question) of the organization. This topological map would permit locating any given member of the organization as the focal point of a unique set of information vectors; i.e., his set of previous message transaction linkages with other members of the organization. The second step in this procedure would be to determine the "meaning" of an individual's location within his unique set of vectors. For maximum utility, the topological-analytic procedure would necessarily rely on the development of descriptive structural concepts such as Jacobson and Seashore's (1951) "liaison role", Walton's (1962) "magnetic centers", or Davis' (1953a, b) "single strand", "gossip chain", "probability chain", and "cluster chain."

From a methodological viewpoint, the topological-analytic approach has special data-collection and data-analysis implications. Of the four data-collection methods used to date, sociometric and communication audit methods appear the most amenable procedures for mapping the extant communication structure. However, the requirement for having all members of the organization record all of their

daily message transactions may render the communication audit impractical in field research. Use of timed random sampling of message transactions may prove practicable after it can be established that a given time period for data collection yields a reliable approximation[1] of the extant communication structure. In a similar vein, Davis' (1953a, b) ECCO technique (tracing a given message after it diffuses through the organization) would require the tracing of some minimum number of messages for each content category[2] to yield a reliable approximation. At this point, content-free, non-directional[3] sociometric methods appear the most parsimonious and practical approach.

The methodological problem imposed by the independent random sampling assumption may be partially met in topological-analytic research because the many dyadic linkages

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[1]For example, given the heterogeneity of message content and the temporal nature of dyadic linkages, collection of a random sample of message transactions over a five-day period may be inadequate to description of the many dyadic linkages making up the extant communication structure.

[2]Davis' technique might be most useful in combination with another topological method where, first, the extant communication structure is mapped and then ECCO analysis is used to study, for example, sharpening, leveling and assimilation effects on given messages or to study uncertainty absorption (March and Simon, 1958, p. 165).

[3]A directional sociometric question on the order of "Who do you seek for information" yields a partial mapping of the communication structure; in this case, only the information seeking network. Informational message transactions can take place when neither member <u>deliberately</u> seeks the other, or when one member seeks another to <u>give</u> and not receive information.

within the communication structure or structures of large formal organizations may lend themselves to random sampling, depending upon the nature of the structural concepts utilized in a particular study. But the fact that most organizational communication research is usually done within one organization still poses a question of generalizability to other organizations. What appears necessary are comparative studies between several organizations or organization-types (Cf. Etzioni, 1961).

A major technical problem related to the first step in topological-analytic research is the need for descriptive structural concepts which have mathematic properties or which can be translated, for purposes of analysis, into more abstract mathematical models. As Weiss and Jacobson (1955, p. 661) observe:

> The use of sociometry to determine the overall structure of a complex organization probably owes its rarity to an absence of both structural concepts and of efficient methods for the manipulation of large masses of sociometric data.

Although contemporary concepts and procedures for analyses of communication structures are, in Coleman's words (1964, p. 442), "only halting steps toward a full-fledged methodology," some of the work in matrix algebra (e.g., Festinger, 1949) and graph theory (e.g., Harary and Norman, 1953) offer promise. For example, the liaison role concept is an analogue to the articulation point in graph theory (Weiss, 1956, p. 88; Ross and Harary, 1955, pp. 251-8). Unfortunately, little of the work accomplished in these

two related[1] fields has been programmed for computers in order to deal with the large sociometric matrices which typify organization research. But even though such a computer program would greatly increase methodological efficiency, its unavailability need not totally impede topological-analytic research. The focus of the present study, in fact, is directed at the examination of the liaison communication role concept.

The Research Context: Liaison Communication Roles

Of the organizational communication research which has been conducted, only the study of liaison communication roles (Jacobson and Seashore, 1951; Weiss and Jacobson, 1955; Weiss, 1956) bears conceptual relatedness to what has been described here as the generic communication structure. Not only is that study unique in its conceptual foundation, but it also presents a method for analyzing sociometric data to yield a differentiated topology of a communication structure based on analogues in graph theory. These analogues are generalized structural concepts which permit second-phase description and analysis of variables related to topological features.

The Theoretic Context

The present research is based upon the concept of the liaison communication role developed by Jacobson, Seashore

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[1]Connected graphs may be expressed in matrix form as sets of binary relations (1 or 0) representing communication linkages between components.

and Weiss. Undergirding the liaison role concept is a broader theoretical base which accepts the extant communication structure of the organization as the most general structural concept:

> 'Organization structure' can be conceptualized in terms of communication events which connect pairs of individuals, and thus establish patterns of contact among individuals and among groups (Jacobson and Seashore, 1951, p. 33).

Implicit in this definition of structure and in the preceding discussion in this paper is a distinction, and yet an inextricable relation, between the concepts of structure and process. Before examining the liaison role concept in more detail, clarification of the more basic relation between structural and processual concepts is necessary because that relation has both theoretic and methodological implications.

Structure and Process J. G. Miller (1965a, pp. 209-11) defines the structure of a system as "the arrangement of its subsystems and components in three-dimensional space at a given moment of time." Process is defined as "all change over time of matter-energy or information in a system." "Structure," he maintains, "is the static arrangement of a system's parts at a moment in three-dimensional space....Process includes the on-going function of a system, reversible actions succeeding each other from moment to moment." He further defines action as one form of process: "any change of state of matter-energy or its movement over space, from one point to another."

Miller's definition of structure appears to be a limiting conceptualization of a behavioral system. Katz and Kahn (1966, p. 31) suggest a reason why:

> There has been no more pervasive, persistent, and futile fallacy handicapping the social sciences than the use of the physical model for the understanding of social structures....This figurative type of thinking ignores the essential difference between the socially contrived nature of social systems and the physical structure of the machine or the human organism.

To counteract application of the "biological metaphor" to social systems, Katz and Kahn observe:

> Social systems...lack the fixed physical structure of biological and other physical systems. Social systems have structure, but it is a structure of events rather than physical parts, a structure therefore inseparable from the functioning of the system (p. 69).

Miller's definition of structure as an arrangement of components in three dimensional space at a given moment of time ignores the temporal nature of message transactions in the functioning of a social system. Miller further suggests, "A high-speed photograph...would reveal the three-dimensional spatial arrangement of the system's components as of that instant" (p. 209). However, a "high-speed photograph" of an organization would not reveal the interconnected linkages between members (i.e., the communication structure) as they endure over time, but would only capture a small sample of the message transactions in process at the moment of photograph. In fact a "time exposure" would be necessary to describe the communication structure of a social system because message transactions between individual

members of the system do not exist in continuous physical relation, but are temporal "parts" or processes of the system. Thus a "high-speed photograph" may be very misleading if one attempts to deduce the communication structure of the system from that single moment in time, or, for that matter, from the tracing of a single message over time, or from a random series of "photographs" at various moments in time; i.e., a timed random sampling of message transactions.

In terms of organizational communication research, Turner's distinction between structure and process may be most useful:

> The concept 'structure' predicates that a phenomenon consists of identifiable parts organized in functional relation....The concept 'process' predicates that a structure under the play of external forces and through its own energy undergoes action or acts so that change affects it....Structure, however enduring, exists in terms of process, and process, no matter how slowly or rapidly it operates, always moves through structure. (Quoted by Miller, 1965a, p. 210-11)

Turner's discussion implies that it is most useful to conceive of structure as the history of process; i.e., the communication structure is mapped as the message transaction linkages between system components (members) within a given duration of time. These linkages can be described as "channels" defined, in Miller's terms, as "a route in a spatial region by which markers bearing information can be sent[1] from a transmitter to a receiver" (1965b, p. 349).

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[1]This definition might read "has been sent" with "can be sent" reserved to describe <u>potential</u> channel in order to be consistent with the suggested definition of structure as the history of process.

In further refutation of Miller's definition, communication structure initially can be conceived as existing in two-dimensional space, rather than three-dimensional space. Thinking of the members of an organization as points on a two-dimensional plane, the communication structure can be represented by drawing lines between certain of those points based on information about the history of message transactions between them during a given time period. In a processual sense, one can visualize lines representing messages in transit moving out from one point to another, leaving a "trace" on the base plane to represent the history of the transaction; or, one of the points may physically move across this conceptual two-dimensional plane to connect with another point in a face-to-face message transaction, returning again to its original position and leaving a "trace" to record the process. The more lines existing between all points, the greater the saturation of communication contacts within the organization.

This basic conceptualization of the communication structure of an organization moves to a three-dimensional representation only when another characteristic, measured as the attributes of members, is introduced and as members are characterized as having more or less of the attribute(s) under consideration; e.g., authority, power, sociability, expertise. Therefore, for purposes of simple description, the communication structure based on message transactions as the unit of analysis is a two-dimensional, static

construct. For purposes of analysis, the superimposition of one or more other structural characteristics of the organization based on member attributes as the unit of analysis moves the abstracted system from static structure in two-dimensional space to static structure in three-dimensional space.

It is useful, then, to maintain a conceptual distinction between the communication structure as a descriptive two-dimensional concept and analytic structures as three-dimensional conepts and to conceive of the mapping of a behavioral structure as the history of process.

One caution is in order, however, for utilization of this conceptual framework. Miller notes that "it is notoriously hard to deduce process from structure, and the reverse is by no means easy" (1965a, p. 219). In utilizing the concept of structure there may be a tendency to reify the structural map. If the concept of structure is accepted as the history of process it must be remembered that the concept of process involves action and resultant change. Regardless of the historical regularity of the transactional process which forms the basis for a structural communication map, that structure is not a concrete system. As a result, prediction of future communication processes in a given system may not be totally accurate because the structure may have changed from time of abstraction to time of prediction.

The Liaison Role Concept The conceptual framework of

the Jacobson, Seashore and Weiss study contains the essential assumptions relating structure and process outlined above. Thayer (1967, p. 81) asserts:

> The Jacobson and Seashore study is significant by virtue of the authors' implicit emphasis on the interdependence of the structure and functions of communication events, and the manner in which they conceive of organization structures as dynamic patterns of communication events.

Equally significant in this study is the presentation of structural concepts which can be applied to a sociometric matrix in order to classify topological data of the matrix for analyses of functional processes. The formal constitutive definition of these concepts is presented by Weiss and Jacobson (1955):

> a. Work group was defined as a set of individuals whose relationships were with each other and not with members of other work groups (except for contacts with liaison persons or between groups).
>
> b. Liaison person was defined as an individual who worked with at least two individuals who were members of work groups other than his own.
>
> c. Contact between groups was defined as a single working relationship between members of sets of individuals who would otherwise be classified as separate work groups.

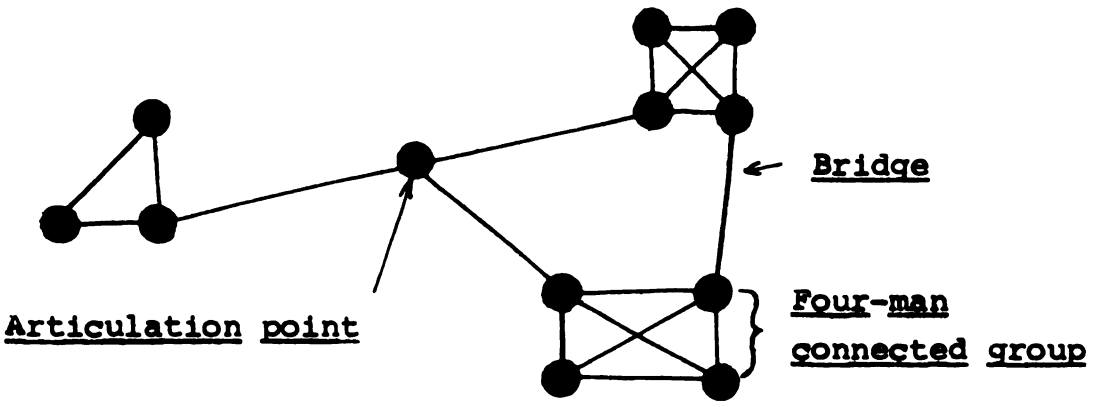
The definition of work groups was not based upon the organization's formal prescription of task units although some congruence was found between formal task units and sociometric work groups. Because the structural classification of the sociometric data was based on the extant patterning of communication contacts, the term work group has relevance only within that context. For example, it would be entirely possible for the extant communication structure of a formal

task unit to break into several work groups and it would also be possible for boundaries of work groups to exceed the boundaries of formal task units in instances where information or coordination across task unit lines was necessary. Another clarification of the work group definition is given by Jacobson and Seashore (1951, p. 37):

> ...some individuals have frequent, reciprocated and important contacts with a limited number of other individuals who in turn are closely interrelated, and have few, non-reciprocated and unimportant contacts outside of this group.

The separation of work groups into independent entities is basically accomplished by removing liaison persons and contacts between groups from the sociometric matrix. The liaison person is a communicative link between multiple work groups and they "characteristically have many, frequent, reciprocated and important contacts which cut across the contact group structure" (Jacobson and Seashore, 1951, p. 37). The special criterion for the liaison person is that he must have contacts with at least two persons in work groups other than his own. A single contact between two members of separate work groups is not defined as a liaison, but as a contact between groups. In graph theory the liaison person is an analogue to the articulation point and the contact between groups is an analogue to the bridge as illustrated in Figure 1.

A liaison person may or may not have membership in one of the separate work groups. In Figure 1, the liaison (articulation point) is characterized without group membership.



Adapted from Weiss, 1956, pp. 88-9

Figure 1. Graph theory representation of articulation point and bridge

In the Jacobson, Seashore and Weiss study, one-third of the identified liaison persons could not be characterized as members of any separate work group because they "had many contacts with each other and few with any single work group" (Weiss and Jacobson, 1955). This group of liaisons were termed members of a liaison set. The other liaisons who could be identified as having group membership were each termed a liaison group member, and the remaining were termed liaison individuals.

It appears possible that the individuals who emerge as liaisons in this topological description might be executives who by location in the formal hierarchy have contacts within their task units and contacts at their own executive level for coordination of work at that level. But Jacobson and Seashore report that "this was not the case. They...(liaisons) are found at all status levels in the structure" (p. 37).

The special functional significance of the liaison person's position in an organization's communication structure is underlined by Jacobson and Seashore (p. 37):

> These liaison persons appear to be of critical importance to the conceptualization of organization in communication terms as they are in a position to influence significantly or to control the communications to and from certain groups. Through them, it is expected, it will be possible to trace differential influences throughout the...(organization) as they are reflected in differences in attitudes among the several sub-groups.

In other words, the liaison person functions at least in a "gatekeeper role"[1] for the various sub-groups to which he is connected. He may selectively relay information to sub-groups or he may function as a structurally important "uncertainty absorber." This is not to say, however, that a given liaison person's control over information to any given sub-group may be absolute. Information may be transmitted to a sub-group through contacts sub-group members have with other liaisons or through bridge contacts. The complex web of the total extant communication structure of a formal organization is not as simple as the structure implied in Figure 1. Nonetheless, an analysis based upon this topological differentiation of communication structure clearly emphasizes the unique locational role of the liaison person in that structure. What remains to be learned is the phenomenological, behavioral and influential meaning of this

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[1] Katz and Lazarsfeld (1955, p. 119) define the gatekeeping function as "controlling a strategic portion of a channel ...so as to have the power of decision over whether whatever is flowing through the channel will enter the group or not."

unique locational communication role in organizations.

The Methodological Context

Because topological-analytic research methods are in a developmental state and have not been programmed for computers in order to cope with large sociometric matrices, this study will replicate the manual method of sociometric differentiation developed by Jacobson, Seashore and Weiss. This study will also closely replicate the sociometric data-collection method of that study.

Sociometric Data Collection The basic sociometric instrument in the previous research was termed a *Personal Contact Checklist*. Instructions were:

> Now go over the past two or three months and think of the people (in the organization) with whom you have worked most closely. We would like to get the names of the people with whom you work most closely. Write their names in here.

Following the instructions were 18 blanks in which respondents could list the names of their contacts. In addition, respondents were asked to check for each individual predetermined categories for frequency of contact, subject matter, reason for contact, and importance of contact. This Personal Contact Checklist provided the basic data for topological analysis.

Although the instructions in the checklist yield nondirectional sociometric contacts, they do not yield completely content-free contacts and in this sense the resulting structure is not the *generic communication structure* in entirety. Specifically, the structural description is

of the work-related, or functional, communication network. Functional contacts were selected as the sociometric criterion because the result would "presumably include all or nearly all of the important communication relationships between pairs of persons" (Jacobson and Seashore, 1951, p. 35). In other words it was assumed that the most frequent and most relevant information exchanges between individuals would take place in the course of contacts brought about by individual and group task requirements. Partial support for this assumption is reported by Blau and Scott (1962, p. 134): "Work pressures increased the frequency with which colleagues consulted each other about their professional problems." It was also assumed that functional relationships, because of the demands of task roles, would remain relatively stable over time (Weiss and Jacobson, 1955, p. 661).

Sociometric Analysis Preliminary to topological analysis of sociometric data in the Jacobson, Seashore and Weiss study was the need to establish a criterion for operationalizing the existence of a contact between two persons. Approximately 2400 work relationships were reported by 196 respondents in the study or an average of 12 contacts per respondent. Of this number 44 percent were reciprocated. Weiss and Jacobson report:

> The technique used in isolating work groups required that the matrix be symmetric across the main diagonal ....The original unreciprocated matrix could be made into a symmetric form either by adding entries in the proper cell when a report was not reciprocated, or by deleting unreciprocated entries. The second

> method was chosen because the close relationship between reciprocation and importance and frequency of contact suggested that the simplification would not be at the cost of essential information.[1]

The basic sociometric data, then, was graphically represented in a 196X196 matrix containing approximately 1000 non-zero entries designating reciprocated contacts between pairs of individuals. However, in the final stages of differentiating the matrix into sub-groups it was found necessary to use unreciprocated contacts of some liaison persons in order to determine whether they would be classed as liaison individuals or liaison group members.

After the basic sociometric data was arranged in a symmetric matrix,[2] the next step involved applying a criterion of group membership in order to differentiate separate work groups:

> The technique...consisted of applying, initially, a stringent criterion of group membership in order to locate the most clearly differentiated groups and to identify their core membership; this initial criterion was followed by the application of a series of less stringent criteria of group membership until all, or nearly all, of the members were identified as belonging to one or more of the groups. (Jacobson and Seashore, 1951, p. 36)

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[1] In the same article, Weiss and Jacobson report that 80 percent of the contacts listed as "several times daily" and of "utmost" or "great" importance were reciprocated while only 19 percent of the low frequency and low importance contacts were reciprocated.

[2] In order to accomplish the succeeding steps in matrix analysis, it is necessary that contacts be clustered as much as possible, around the diagonal. Listing members according to the formal organizational chart resulted in clusters around the diagonal since most work-related contacts were generally within formal task units.

Briefly, the first step in the procedure[1] was to arbitrarily break the original matrix into smaller segments of not more than 50 persons. Segments were divided so that members in the segment had a minimum number of contacts outside the segment. Each segment could contain several clusters of contacts around the diagonal. Separation of sub-groups within a segment was accomplished by removing tentatively identified liaison persons from the segment matrix, reordering the matrix to maintain clusters around the diagonal, removing tentative liaisons, reordering the matrix, etc. The end goal of this procedure was to identify separate work groups within each segment by inspection. Specified criteria were maintained throughout the procedure and a number of checks applied to guard against improper classification. Careful attention was paid to the final identification of separate groups to be sure that the original arbitrary boundary of a segment did not in fact divide one or more work groups into different segments. At the end of this procedure, the yield was a list of the membership of each separate group, a list of liaison persons, and a list of isolates. It was necessary at this point to utilize high-frequency unreciprocated contacts of liaison persons and isolates in order to ascertain

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[1]The procedure is described in detail by Weiss, 1956, pp. 88-108. Weiss and Jacobson (1955) report that, after the basic reciprocated matrix is prepared, one person can probably complete the procedure for a 200X200 matrix in approximately 40 hours.

whether or not they could be characterized as having membership in one of the separate groups. Weiss and Jacobson (1955) describe their end product:

> a. About 82 percent of the respondents could be classed as members of the 22 separate work groups that formed the basic framework of the organization.
>
> b. The 22 work groups were held together by a network of liaison persons who were the remaining 18 percent of the respondents.

The result of this sociometric analysis is the identification of sub-groups within an organization based entirely upon the extant communication structure and the identification of individuals within that structure who play an important locational communication role by linking sub-groups together. In the organization studied, the procedure allowed classification of the 196 members into two discrete groups: 35 liaison persons and 161 non-liaison persons (the members of the 22 sub-groups). Because the analysis is based on the extant communication structure, it is not possible to predict a priori the number of liaison persons who will emerge from a given organization. Jacobson and Seashore (1951, p. 36) suggest, "It can be expected that organizations will differ greatly as to their uniformity and clarity of sub-group differentiation." Concomitantly, it probably can be expected that organizations will differ greatly in the number of liaison persons in a given organization based on such factors as, for example, task coordination demands or the degree of rigidity in adhering to formal hierarchial lines.

Given differentiation of an organization's communication structure into the liaison and non-liaison categories, the second step in the topological-analytic approach is descriptive and/or functional analysis of these roles.

Hypotheses and Rationale

The focus of this study will be upon the comparison of two sets of individuals, liaison persons vs. non-liaison persons, as to certain aspects of the phenomenology of their communication role in the organization, their communication behavior and their interpersonal and organizational influence potential.

The only currently available evidence that liaison persons are different from non-liaison persons is the fact of the unique locational position of the liaison role in the organization. Justification for study of the liaison communication role can be based on two factors:

1. differentials between liaisons and non-liaisons in regard to actual communication behavior and influence; and/or
2. differentials between liaisons and non-liaisons in regard to perceived communication role and influence potential in the organization.[1]

Within this broad context, a large number of research

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[1] In a similar vein, Yadav and Rogers (1966, p. 4) opt for study of opinion leadership in terms of behavioral attributes, personality attributes and attributes perceived by group members.

questions might be posed. The questions selected for this study are directed primarily toward specifying certain differentials based on perceptions reported by non-liaison persons in direct contact with selected liaisons and non-liaisons. Thus the sampling unit will be liaisons and certain non-liaisons, but the source of data will be non-liaison persons directly linked to them in order to attempt definition of the phenomenological meaning of the liaison communication role. In Thayer's terms, the focal point of the information vectors will be defined in terms of perceptions by persons immediately adjacent to that point. These "immediate others" will be referred to as dyadic contacts. Selection of this analytical perspective is conditioned by the necessity for collecting sociometric and descriptive data at the same time and the fact it is not possible to identify the liaison persons until topological analysis of the sociometric data is completed.

The specific variables selected for this study are assumed directly related to communication functions. Whether differentials are antecedents to, or consequents of, the communication functions of liaison persons will not be detected. The differentials, if any, will only be descriptive of the discrete categories -- liaison and non-liaison.

General classification of the variables selected for study include (1) awareness of the existence of liaison roles, (2) interpersonal communication behavior of liaison role persons, (3) information relay functions of liaison

role persons, (4) perceived personal attributes of liaison role persons, and (5) diffuse (organizational level) and specific (interpersonal level) influence functions of liaison role persons. While in-depth study of a range of variables within each of these categories would be possible and desirable, this pilot study will focus on only certain variables within each in order to provide a beginning assessment of the efficacy of the liaison role concept in organizational communication research.

A major limitation in attempting to derive descriptive hypotheses regarding the liaison communication role is that there is no exact analogue in previous research to this structural concept.

Awareness of Liaison Roles

One factor which may affect the communicative function of the liaison person is the extent to which his dyadic contacts are aware of his strategic location in the organization's communication structure. Findings from small group communication network research indicate that group members who are not initially aware of the predetermined structure of the group are, with some experience within the group, able to detect elements of the actual structure (Bavelas, 1960, p. 676[1]). The actual pattern of interpersonal contacts of liaison persons is by definition more structurally diverse

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[1]Specifically, group members are able to identify the person occupying the central location in the network as the group leader.

than that of non-liaison persons.

H 1: Liaison persons are perceived to have more structurally diverse communication contacts in the organization than are non-liaison persons.

By inspecting the sociogram drawn from the Jacobson, Seashore and Weiss study (reproduced in Weiss, 1956, pp. 60-1) to identify liaison persons, a random sample of liaisons and non-liaisons revealed a broader span of reciprocated contacts for liaisons. The median span for liaisons was six with a range from four to twelve (N=9); for non-liaisons the median span was four with a range from two to six (N=9).

H 2: Liaison persons are perceived to have more communication contacts in the organization than are non-liaison persons.

Interpersonal Communication Behavior

The fact that the communication contacts of liaison persons are more structurally diverse, at least within the extant communication structure, suggests that there may be physical or psychological propinquity differentials between liaisons and their dyadic contacts versus non-liaisons and their dyadic contacts. To the extent such differentials exist, it might be assumed that initiation of message transactions requires more effort in liaison -- non-liaison dyads than in non-liaison -- non-liaison dyads; i.e., message transaction initiation within liaison -- non-liaison dyads may be more deliberate or purposive. Non-liaison -- non-liaison dyads, the members of which are tied together in a closely related work group, appear more likely to

happen to meet in the course of their regular work schedule.

H 3: Liaison -- non-liaison dyads more frequently participate in deliberately initiated message transactions than do non-liaison -- non-liaison dyads.

Any set of deliberately initiated message transactions between two persons may be further differentiated by the directionality of the initiation; i.e., the proportion of times A seeks B to the times B seeks A. One person may seek another either to get or give information or opinions.

There is no evidence to suggest why individuals assume liaison roles. Perhaps either (or both to a degree) of two conditions obtain: (1) the liaison may be a gregarious person who seeks others in diverse locations to get or give information or opinions[1], or (2) the liaison may be a "magnetic center" (Walton, 1962) who possesses unique attributes[2] which attract others to him for information or opinions. If either condition uniquely applies to the liaison role, the implication is that directionality of message transaction initiation will be proportionately different between liaison-non-liaison dyads and non-liaison -- non-liaison dyads; i.e., directionality of initiation will be more equal in the latter dyad than the former.

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[1]Katz and Lazarsfeld (1955, pp. 287-9), for example, found gregariousness an important variable in opinion leadership, especially in regard to public affairs content.

[2]Walton's research on magnetic centers was based on attributes related to authority, power, expertise and sociability. To this could be added: information related to task coordination, charismatic personality, awareness of the liaison's locational role and others.

H 4: The directionality of deliberate message transaction initiation is more disproportionate in liaison -- non-liaison dyads than in non-liaison -- non-liaison dyads.

Information Relay Function

In their discussion of the gatekeeping function, Katz and Lazarsfeld (1955, pp. 119, 113) distinguish between the information transmission role and the influential role of a gatekeeper. While this distinction may be difficult to maintain operationally unless limited to source-oriented analysis, it is possible to differentiate first sources of information from later, redundant sources without regard for source purpose or the effect of the information on the receiver. In addition, first sources may be studied regardless of whether the content of information relayed was evaluative or non-evaluative or the original source was the relayer or some other person.

Wager's (1962) study of rumor transmission in a formal organization suggests that individuals who have access to rumor information play an important communication role by serving as first sources of information for their contacts. The relay of information across formal organizational lines also appeared to serve a status enhancement function for the relayer. Davis (1953b, p. 46) reports a characteristic of the information relay behavior of "liaison persons" as:

> ...the sooner he knows of an event after it happened, the more likely he is to tell others. If he gets the information late, he does not want to advertise his

late receipt of it by telling it to others.[1]

The strategic location of the liaison person in the communication structure implies that he is in a position to have early access to information available in the organization and that, although his position is peripheral to a given sub-group (especially liaison individuals and members of the liaison set), he is central among at least two sub-groups. Studies of network centrality in problem-solving small groups (e.g., Leavitt, 1951) indicate that centrals assume a position of "information relay leadership" by virtue of their strategic location. If the liaison role can be assumed analogous to centrality in a small group and if Davis' interpretation is appropriate, it might be expected that liaison persons will be more consistent first sources of information for their dyadic contacts than will non-liaisons.

H 5: Liaison persons are more likely to serve as first sources of organization-related information than are non-liaison persons.

Perceived Personal Attributes

Berlo, Lemert and Mertz (undated) assert:

> Whether one's judgement is based on the classical admonitions of Aristotle, common-sense observations, introspection, or the empirical research evidence of the past forty years, it is safe to conclude that an individual's acceptance of information and ideas is based in part on 'who said it'.

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[1] Davis does not report using the Jacobson, Seashore and Weiss sociometric analysis for identifying liaison persons. His identification appears based on simple inspection of the data. Interpretation of his findings must be tempered by this apparent shortcoming in his analysis.

The construct used to label this phenomenon is termed source credibility. The generally consistent finding is a positive relation between degrees of source credibility and degrees of acceptance of information contained in messages from specified sources. The factor analytic study conducted by Berlo, Lemert and Mertz provides an instrument for operationally defining credibility as a perceived attribute of sources. The construct factored into three dimensions: qualification, safety and dynamism. The latter factor was found less stable than the former two and its function was suggested as an intensifier for the others (Berlo, Lemert and Mertz, p. 21).

A perceived personal attribute, then, which may be predictive of the acceptance of information relayed within an interpersonal communication network is the source credibility of the relayer. The maintenance of an individual in a liaison communication role suggests that his dyadic contacts may attribute greater source credibility to him than do the dyadic contacts of non-liaison persons. This assumption is based on the notion that leadership, or in this case information relay leadership, is a role conferred by followers rather than a role usurped by the leader (Katz and Kahn, 1966, p. 301). Furthermore, to the extent that the liaison role can be conceived as a type of leadership, there is evidence that perceived competence (partially analogous to the qualification factor) is positively related to attributed leadership (e.g., Katz, 1957, p. 73; Lippitt,

et al, 1958, p. 261).

H 6: Liaison persons are perceived to have higher source credibility (qualification and safety dimensions) than are non-liaison persons.

Influence Potential

Sociometric mapping of the extant communication structure of an organization permits separating influence functions according to specified pairs of individuals. Further, from the phenomenological viewpoint of any individual within that communication structure, influentiality can be differentiated on at least three levels: (1) my dyadic contact's influence over me (specific opinion leadership); (2) my dyadic contact's influence over his other contacts (diffuse opinion leadership); and (3) the "importance" of the other (secondary) contacts which my dyadic contact has[1]. As Katz (1957, pp. 74-5) observed, "An individual may be influential not only because people within his group look to him for advice but also because of whom he knows outside his group." In addition, influence over a dyadic contact may be related to how much influence is perceived to be exercised over those other secondary contacts.

Katz and Lazarsfeld (1955, p. 123) observe that "the gatekeeping role is often coupled with influentiality within the group -- although the two functions need not necessarily go together." Leavitt (1964, p. 238) asserts that "preferential access to information...is a major source of power in

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[1]Importance is defined here as accessibility to the organizational "power structure" and to individuals knowledgeable of activities in the organization.

any organization." The liaison person's more diverse contacts within the organization suggest he should have greater access to information than non-liaisons and thus may be attributed greater power. Lippitt, et al, (1958, p. 259) report that "the recipient of attributed power will make more frequent attempts to influence the behavior of others and will be more successful in these attempts." Again, to the extent that the liaison role can be conceived as a type of leadership, Beer, et al, (1959, pp. 49-56) report that elected leaders of social groups are perceived to be more forceful and persuasive than non-leaders. The implication of these statements for the liaison communication role is that this strategic social position may be related to influentiality both in terms of power over information relay and the concomitant opportunity to exercise opinion leadership over dyadic contacts.

H 7: Liaison persons are perceived to have more important secondary contacts in the organization than are non-liaison persons.

H 8: Liaison persons are perceived to have more influence over their other contacts in the organization than are non-liaison persons (diffuse opinion leadership).

H 9: Liaison persons are more likely to be perceived as personal opinion leaders for their dyadic contacts than are non-liaison persons (specific opinion leadership).

Tests of the hypotheses presented in this study are anticipated to provide a beginning assessment of the research efficacy of the sociometric description of the extant communication structure of an organization proposed by Jacobson, Seashore and Weiss. Evidence regarding these hypotheses

will serve as a basis for further exploration of the specific functions of unique locational roles within the communication structure of an organization. The analytic framework is more inclusive than the fragmentary study of communication within only the formally prescribed structure.

CHAPTER II

RESEARCH DESIGN

The study population from which the samples will be drawn consists of all the professional faculty and staff of one College who are officed in a single, multifloor building of a large Midwestern university. Professional faculty and staff are defined as those individuals holding academic rank of instructor or higher and/or administrative titles denoting professional functions in a separate task unit within the formal structure of the College. The College selected is not known to be unique in any significant manner from other subject matter Colleges at the same University, with the exception of size and subject matter orientation. Sociometric data will be collected only on functional communication relationships among individuals meeting the professional faculty or staff criterion and whose office is in the main building housing the College. One hundred and forty-two individuals meet these two criteria.

The sources of data from each respondent will be a Personal Contact Checklist, a questionnaire concerning primarily demographic data, and a Personal Contact questionnaire to be completed for each individual named in the "daily" or "several times daily" categories of the Personal Contact Checklist. All instruments will be self-completed. Instruments and data-collection procedures will be pretested

to determine ambiguities in procedures, instrument instructions, and item wording; to determine potential instrument-completion success, and to analyze the scales developed for this study.

The Sample

Although sociometric and questionnaire data will be collected from all members of the study population, only a portion of the members of this population will be included in the final sample. The first step in determining the sample will be to complete matrix analysis of the sociometric data in order to classify the population into liaison person and non-liaison person categories (if any isolates are found, they will not be included in either category). The primary sample of liaison persons will include all of the individuals identified in that category. A random selection of non-liaison persons equal to the number of liaison persons will constitute the primary non-liaison person sample.

From the remaining population, non-liaison persons will be identified who are dyadic contacts of individuals in the liaison and non-liaison primary samples on a "daily" or "several times daily" basis. These non-liaison dyadic contacts, the secondary samples, will be the source of data; i.e., data used to test the hypotheses will be taken from the Personal Contact questionnaires these individuals completed on their reciprocated contacts who are in either the

liaison sample or the non-liaison sample. In the event that one individual might be the source of data for one person in the liaison sample and another person in the non-liaison sample, a random procedure will be utilized to select one or the other in order to maintain independence of source data between the two sample categories. Additionally, in the event that two individuals in the non-liaison secondary sample are a reciprocated dyad, a random procedure will be utilized to select only one as a source of data. Both of these procedures should insure independence of source data between and within the two secondary samples.

The rationale for selecting a primary sample of non-liaison persons equal in number to the primary liaison person sample is to equalize a major source of variance between the two sample categories. When dyadic contacts are the source of data, for example, two sources of variance are: (1) within-dyadic set differences and (2) between-dyadic set differences. Differences among perceptions of a given person by his set of dyadic contacts (within-dyadic set differences) are likely to be somewhat similar because the same person is the perceived object. This within-dyadic set variance is expected to be less than between-dyadic set variance. Thus, selecting equal numbers into the liaison and non-liaison primary samples should tend to minimize the standard error of the difference between sample means[1] more than any other sampling procedure applicable

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[1]Cf. Edwards, 1967, pp. 214.

to sociometric cluster sampling such as utilized here.

If an organization much larger than the one in this study were investigated, it might be possible to order the dyadic contacts of all liaison persons as a sampling population, order the dyadic contacts of all non-liaison persons as a sampling population, and then randomly select individuals into two sample categories from these two populations. However, it is not expected in this study that a sufficiently large number of individuals will be available to permit random sampling from within two such sampling populations.

Operationalization of Variables

The key variables to be used in this study are:

1. Perceived structural diversity of contacts
2. Perceived number of contacts
3. Deliberately initiated message transactions
4. Directional ratio of deliberate message transaction initiation
5. First source of information
6. Perceived source credibility (qualification and safety dimensions)
7. Importance of secondary contacts
8. Diffuse opinion leadership
9. Specific opinion leadership

Six of the nine variables are operationalized as Likert-type scales (Oppenheim, 1966, pp. 133-42), two are

direct frequency estimates, and one utilizes Semantic Differential scales (Oppenheim, 1966, pp. 204-8; Kerlinger, 1964, pp. 564-80; Berlo, Lemert and Mertz, undated). Information from appropriate reported research was utilized in selection and construction of scale items.

The operationalization of variables is for the pretest instrument (Personal Contact questionnaire). It is anticipated that analysis of pretest data will result in deleting certain items from the final instrument in order to shorten, as much as possible, the completion time required for each Personal Contact questionnaire.

Each of the items in the following sections is completed by a respondent in terms of a specific individual he named as a dyadic contact on the Personal Contact Checklist.

Perceived Structural Diversity of Contacts

Cues for items[1] in this scale and the following Perceived Number of Contacts scale are derived from respondent's open-end descriptions of reasons for going to a certain individual (a "magnetic center") in an organization for information as summarized and reported by Walton (1962, pp. 79-109).

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[1]The number preceding each item in this and following scales refers to the item number in the pretest instrument. Items in the pretest questionnaire were ordered on a random basis.

4. Would you say that this person works with people in more or fewer different departments or administrative offices than most other members of the faculty in the College of (---)?

   1. a great many more
   2. quite a few more
   3. just a few more
   4. about the same number
   5. just a few less
   6. quite a few less
   7. a great many less

16. All of this person's contacts are concentrated within one somewhat separate group of faculty in the College of (---).

   This statement is:
   1. definitely false
   2. probably false
   3. might be false
   4. neither true nor false
   5. might be true
   6. probably true
   7. definitely true

25. Because of his work this person really "gets around" among faculty from many different areas in the College of (---).

   1. agree strongly with this statement
   2. agree somewhat with this statement
   3. agree slightly with this statement
   4. neither agree nor disagree with this statement
   5. disagree slightly with this statement
   6. disagree somewhat with this statement
   7. disagree strongly with this statement

26. In any organization like this College, clique groups develop. Would you say that this person has contact with people in more or fewer clique groups in the College than do most other faculty members?

   1. a great many more clique groups
   2. quite a few more clique groups
   3. just a few more clique groups
   4. about the same number of clique groups
   5. just a few less clique groups
   6. quite a few less clique groups
   7. a great many less clique groups

35. This person works with people whose offices are located in several buildings in the College of (---).

    1. agree strongly with this statement
    2. agree somewhat with this statement
    3. agree slightly with this statement
    4. neither agree nor disagree with this statement
    5. disagree slightly with this statement
    6. disagree somewhat with this statement
    7. disagree strongly with this statement

These five items will be reflected and summed to a total scale score for each respondent. The larger the total score, the more structurally diverse are the dyadic contact's relationships.

Perceived Number of Contacts

Items in the pretest scale include:

7. Other than myself, very few faculty or administrators in the College communicate with this person.

    1. I agree strongly with this statement
    2. I agree somewhat with this statement
    3. I agree slightly with this statement
    4. I neither agree nor disagree with this statement
    5. I disagree slightly with this statement
    6. I disagree somewhat with this statement
    7. I disagree strongly with this statement

11. This person probably works with more other faculty in the College than do most other members of the faculty.

    1. I agree strongly with this statement
    2. I agree somewhat with this statement
    3. I agree slightly with this statement
    4. I neither agree nor disagree with this statement
    5. I disagree slightly with this statement
    6. I disagree somewhat with this statement
    7. I disagree strongly with this statement

20. About how many academic or administrative people in the College of (---) would you say this person has contact with in an "average" week compared to the number with whom most other members of the faculty have contact?

    1. a great many more
    2. quite a few more
    3. just a few more
    4. about the same
    5. just a few less
    6. quite a few less
    7. a great many less

29. This person has access to more members of the faculty of the College of (---) than do most others in the College.

    1. I agree strongly with this statement
    2. I agree somewhat with this statement
    3. I agree slightly with this statement
    4. I neither agree nor disagree with this statement
    5. I disagree slightly with this statement
    6. I disagree somewhat with this statement
    7. I disagree strongly with this statement

32. This person communicates with very few administrators and members of the faculty in the College of (---).

    1. I agree strongly with this statement
    2. I agree somewhat with this statement
    3. I agree slightly with this statement
    4. I neither agree nor disagree with this statement
    5. I disagree slightly with this statement
    6. I disagree somewhat with this statement
    7. I disagree strongly with this statement

Numeric values of response alternatives for items 11, 20 and 29 will be reflected and the five items summed to a total score. The higher the total score, the more contacts the dyadic contact is perceived to have.

Deliberately Initiated Message Transactions

This variable will be operationalized as a direct estimate of the frequency of deliberate message transaction initiation with dyadic contacts. The item takes the form:

34. Out of 100 times you might have contact with this person, about how many times would:

    a. you seek him or initiate the contact (you go to see him, place the phone call, write) . . . . . ___

    b. he seek you or initiate the contact (he comes to you, places the phone call, writes). . . . . ___

    c. none of the above, we just happen to meet (neither of us goes to the other) . . . . . ___

TOTAL = 100 contacts

The frequency of contact reported in response (c.) will be taken as the reflex of estimated deliberate initiation; i.e., 100 minus (c.) equals the estimated frequency of deliberate message transaction initiation based on 100 transactions.

Directional Ratio of Deliberate Initiation

This variable will also be a direct estimate of interaction frequency. Estimated frequency of respondent seeking behavior to contact's seeking behavior (response alternatives a. and b. in item 34 above) will be taken as a measure of the directional initiation ratio for deliberate message transactions within the dyad. The specific measure will be the fraction (a.) over (b.) or (b.) over (a.) with the larger number always in the denominator. The more this fraction deviates from one, the more disproportionate is message transaction initiation in the dyad.

First Source of Information

The reported research of Walton (1962, pp. 89, 91-2)

and Wager (1962) provide information for construction of items in this scale.

2. When you learn about some change or new idea being proposed or discussed in the College of (---) or any of its departments or institutes, how likely are you to hear about it <u>first</u> from this person?

   1. extremely likely
   2. very likely
   3. somewhat likely
   4. about 50-50
   5. somewhat unlikely
   6. very unlikely
   7. extremely unlikely

19. A great deal of the planning for the College and its sub-units is accomplished by faculty committees. How frequently do you learn about the activities and discussions of certain committees <u>first</u> from this person?

   1. extremely infrequently
   2. very infrequently
   3. somewhat infrequently
   4. about half the time
   5. somewhat frequently
   6. very frequently
   7. extremely frequently

28. As new developments occur in the College, I usually "get the word" from someone <u>other</u> <u>than</u> this person.

   1. I agree strongly with this statement
   2. I agree somewhat with this statement
   3. I agree slightly with this statement
   4. I neither agree nor disagree with this statement
   5. I disagree slightly with this statement
   6. I disagree somewhat with this statement
   7. I disagree strongly with this statement

36. Thinking back over the contacts you've had with this person in the past month, about how often have you learned something new from him about programs, activities, or people in the College?

   1. almost every time
   2. very often
   3. slightly more than half the time
   4. about half the time
   5. slightly less than half the time
   6. seldom
   7. almost never

Items 2 and 36 will be reflected and the four items summed to a total scale score. The higher the total score, the more likely the dyadic contact is to serve as a first source of information.

Perceived Source Credibility

The five most representative scales for each of the two major dimensions of source credibility, qualification and safety, identified in the factor analytic study by Berlo, Lemert and Mertz (undated, p. 18) will be used to assess the perceived credibility of dyadic contacts. Each dimension will be tested as a separate variable. References to both dimensions were manifest in respondent evaluations of "magnetic centers" as reported by Walton (1962; qualification: pp. 80, 84, 88, 96, 100-1; safety: pp. 81, 105).

The form of each scale will follow semantic differential procedures with word-anchors added.[1] The word-anchors used with response alternatives for each adjective pair will be: extremely, quite, somewhat, so-so, somewhat, quite, extremely. The recommended adjective pairs for the safety dimension are: safe-unsafe, just-unjust, kind-cruel, friendly-unfriendly, honest-dishonest; for the qualification dimension: trained-untrained, experienced-inexperienced, skilled-unskilled, qualified-unqualified, informed-uninformed.

---

[1]The addition of word-anchors to semantic differential scales was recommended by V. C. Troldahl, Department of Communication, Michigan State University, in a personal conversation.

Response alternatives will be scored from one to seven with seven representing the most positive evaluation for each adjective pair. The scales for each dimension will be summed to a total score with a range from 5 to 35.

Importance of Secondary Contacts

Secondary contacts are defined as other persons in the organization with whom the respondent perceives his dyadic contact to have a regular communication relationship. Pre-test scale items developed to measure perceptions of the importance of these secondary contacts were derived again from the reported research of Walton (1962, pp. 83, 89, 92, 98). Importance of the secondary contact is defined in terms of access to individuals in the "power structure" or knowledgeable of organizational activities.

5. If there is anything noteworthy going on in the College of (---), this person works with people who usually know about it.

    1. I agree strongly with this statement
    2. I agree somewhat with this statement
    3. I agree slightly with this statement
    4. I neither agree nor disagree with this statement
    5. I disagree slightly with this statement
    6. I disagree somewhat with this statement
    7. I disagree strongly with this statement

8. How important are the members of the College of (---) faculty with whom this person works most closely?

    1. very important
    2. moderately important
    3. somewhat important
    4. so, so
    5. somewhat unimportant
    6. moderately unimportant
    7. very unimportant

13. Very few College of (---) faculty members with whom this person works would be very "useful" contacts if one wanted support for an idea he was trying to get adopted in the College.

    1. I agree strongly with this statement
    2. I agree somewhat with this statement
    3. I agree slightly with this statement
    4. I neither agree nor disagree with this statement
    5. I disagree slightly with this statement
    6. I disagree somewhat with this statement
    7. I disagree strongly with this statement

23. Of the College faculty with whom this person works, hardly any of them are in a position to officially or unofficially influence important decisions made about activities of the College or the faculty.

    1. I agree strongly with this statement
    2. I agree somewhat with this statement
    3. I agree slightly with this statement
    4. I neither agree nor disagree with this statement
    5. I disagree slightly with this statement
    6. I disagree somewhat with this statement
    7. I disagree strongly with this statement

27. This person has access to individuals who are relatively high in the "power structure" of the College of (---).

    1. I agree strongly with this statement
    2. I agree somewhat with this statement
    3. I agree slightly with this statement
    4. I neither agree nor disagree with this statement
    5. I disagree slightly with this statement
    6. I disagree somewhat with this statement
    7. I disagree strongly with this statement

37. This person works with faculty in the College of (---) who are "in the know" about what's going on in the College.

    1. I agree strongly with this statement
    2. I agree somewhat with this statement
    3. I agree slightly with this statement
    4. I neither agree nor disagree with this statement
    5. I disagree slightly with this statement
    6. I disagree somewhat with this statement
    7. I disagree strongly with this statement

Items 5, 8, 27, and 37 will be reflected and six items summed to a total score. The higher the total score, the

more important secondary contacts are perceived to be.

Diffuse Opinion Leadership

Diffuse opinion leadership is defined as the extent to which a respondent's dyadic contact is perceived to influence the opinions of others in the organization (i.e., the latter's secondary contacts). Walton's (1962, pp. 83, 87, 91) respondents suggest this perceived influence over secondary contacts as one reason for initiating communication with a "magnetic center." These reports suggest items for a Diffuse Opinion Leadership scale:

9. Those relatively high in the "power structure" of the College of (---) have been very receptive to this person's suggestions and opinions.

    1. I agree strongly with this statement
    2. I agree somewhat with this statement
    3. I agree slightly with this statement
    4. I neither agree nor disagree with this statement
    5. I disagree slightly with this statement
    6. I disagree somewhat with this statement
    7. I disagree strongly with this statement

10. Many of the "official" and "unofficial" influential people in the College look to this person for opinions and advice.

    1. I agree strongly with this statement
    2. I agree somewhat with this statement
    3. I agree slightly with this statement
    4. I neither agree nor disagree with this statement
    5. I disagree slightly with this statement
    6. I disagree somewhat with this statement
    7. I disagree strongly with this statement

12. When this person communicates his views to others in the College, they usually listen and heed his suggestions.

    1. I agree strongly with this statement
    2. I agree somewhat with this statement
    3. I agree slightly with this statement
    4. I neither agree nor disagree with this statement
    5. I disagree slightly with this statement
    6. I disagree somewhat with this statement
    7. I disagree strongly with this statement

15. I see this person as a key figure who can support or block proposals made in the College of (---).

    1. I agree strongly with this statement
    2. I agree somewhat with this statement
    3. I agree slightly with this statement
    4. I neither agree nor disagree with this statement
    5. I disagree slightly with this statement
    6. I disagree somewhat with this statement
    7. I disagree strongly with this statement

17. Those individuals who have a lot to say about what goes on in the College respect the suggestions this person makes.

    1. I agree strongly with this statement
    2. I agree somewhat with this statement
    3. I agree slightly with this statement
    4. I neither agree nor disagree with this statement
    5. I disagree slightly with this statement
    6. I disagree somewhat with this statement
    7. I disagree strongly with this statement

21. This person doesn't have much influence with the other people he works with in the College of (---).

    1. I agree strongly with this statement
    2. I agree somewhat with this statement
    3. I agree slightly with this statement
    4. I neither agree nor disagree with this statement
    5. I disagree slightly with this statement
    6. I disagree somewhat with this statement
    7. I disagree strongly with this statement

24. When interacting with other faculty members in the College, this person isn't a very good convincer.

    1. I agree strongly with this statement
    2. I agree somewhat with this statement
    3. I agree slightly with this statement
    4. I neither agree nor disagree with this statement
    5. I disagree slightly with this statement
    6. I disagree somewhat with this statement
    7. I disagree strongly with this statement

30. This person has a way of getting what he wants from the other people in the College of (---) with whom he has contact.

    1. I agree strongly with this statement
    2. I agree somewhat with this statement
    3. I agree slightly with this statement
    4. I neither agree nor disagree with this statement
    5. I disagree slightly with this statement
    6. I disagree somewhat with this statement
    7. I disagree strongly with this statement

Items 9, 10, 12, 15, 17, and 30 will be reflected and the eight items summed to a total score. The higher the total score, the more diffuse opinion leadership the dyadic contact is perceived to exercise.

Specific Opinion Leadership

Specific opinion leadership is defined as the perceived influence a dyadic contact has over the respondent as reflected in information and opinion giving-seeking behavior and attempts to convince.

Items in this scale are adapted from self-designating opinion leadership scales developed by Rogers and Cartano (1962, pp. 435-41) and Troldahl and Van Dam (1965). Rogers (1962, p. 231) reports a split-half reliability of .703 for his six-item scale and a coefficient of reproducibility of 91.4 percent. Both previous scales require respondents to estimate their potential opinion leadership behavior across all their communication contacts. Adaptation of the scales for this study is based on asking respondents to estimate potential opinion leadership behavior with a specific individual. Opinion leadership is thus estimated by one member of a dyad on a zero-sum basis. Reported perceptions of opinion leadership in reference to a specific individual offer the potential of greater accuracy in estimating interpersonal behavior.

Items in the pretest scale include both content-related and content-free communication behavior.

1. Which of the following has usually occurred during discussions you've had with this person in the past week or so about activities, programs, or people in the College of (---)? I asked him questions:

   1. much more often than he asked me
   2. somewhat more often than he asked me
   3. slightly more often than he asked me
   4. about as often as he asked me
   5. slightly less often than he asked me
   6. somewhat less often than he asked me
   7. much less often than he asked me

3. Whenever you communicate with this person which one of the following is usually the case?

   1. almost always he talks and I listen
   2. very often he talks and I listen
   3. often he talks and I listen
   4. we usually talk and listen about equally
   5. often I talk and he listens
   6. very often I talk and he listens
   7. almost always I talk and he listens

14. Considering the relationship you have with this person, who do you think depends on the other more for advice on matters related to teaching, research or consulting? I depend on him:

   1. much more than he depends on me
   2. somewhat more than he depends on me
   3. slightly more than he depends on me
   4. about as much as he depends on me
   5. slightly less than he depends on me
   6. somewhat less than he depends on me
   7. much less than he depends on me

18. When you and this person discuss activities of the College or any of its sub-units, which of the following happens more often across a number of these discussions? He tells me about:

   1. a great many more things than I tell him
   2. quite a few more things than I tell him
   3. just a few more things than I tell him
   4. the same number of things I tell him
   5. just a few less things than I tell him
   6. quite a few less things than I tell him
   7. a great many less things than I tell him

22. During the last discussion you had with this person, which one of you attempted to do the most convincing? He tried to convince me:

    1. much more than I tried to convince him
    2. somewhat more than I tried to convince him
    3. slightly more than I tried to convince him
    4. as much as I tried to convince him
    5. slightly less than I tried to convince him
    6. somewhat less than I tried to convince him
    7. much less than I tried to convince him

31. Generally speaking, does this person depend on you more than you depend on him for information about activities and personalities in the College of (---)?

    1. much more than I depend on him
    2. somewhat more than I depend on him
    3. slightly more than I depend on him
    4. about as much as I depend on him
    5. slightly less than I depend on him
    6. somewhat less than I depend on him
    7. much less than I depend on him

33. Across a number of contacts you may have with this person, which one of the following usually happens? I am:

    1. much more likely to ask his opinions than he is to ask mine
    2. somewhat more likely to ask his opinions than he is to ask mine
    3. slightly more likely to ask his opinions than he is to ask mine
    4. about as likely to ask his opinions as he is to ask mine
    5. slightly less likely to ask his opinions than he is to ask mine
    6. somewhat less likely to ask his opinions than he is to ask mine
    7. much less likely to ask his opinions than he is to ask mine

Items 1, 3, 14, 18, 22 and 33 will be reflected and the seven items summed to a total score. The higher the total score, the more specific opinion leadership the dyadic contact is perceived to exercise.

Data Collection

Adaptations suggested by the pretest will be incorporated into the main study data-collection procedures, plus additional steps assumed necessary to insure as close as possible to 100 percent return of the Personal Contact Checklist.

One day prior to the start of data collection, a letter from a high prestige faculty member in the College will be distributed to all members of the study population. The entry letter will briefly introduce the study and the investigator, and will ask the cooperation of each individual. After the letter is distributed, personal telephone calls will be made to each member of the population to enlist their cooperation and, if obtained, to make an appointment for delivery and pick-up of the questionnaire packet. Insofar as possible, appointments will be made for delivery and pick-up on the same day.

Each questionnaire packet will include: (1) an introductory letter from the investigator, (2) Part I - Personal Data questionnaire, (3) Part II - Personal Contact Checklist and (4) Part III - ten Personal Contact questionnaires. The instructions for Part III will ask respondents to complete a separate Personal Contact questionnaire for each person they indicate contact with in Part II on a "daily" or "several times daily" basis, writing in the name of the individual at the top of the questionnaire.

When delivering the questionnaire packet, the

investigator will talk briefly with each respondent to request that they not reveal the nature of the questionnaires to other members of the study population.

It is anticipated that the entire population of 142 persons, excepting those who might be temporarily out-of-town, can be contacted and questionnaires delivered in a three-day period. Follow-up telephone calls and personal visits will be made to respondents who miss the pick-up deadline in an attempt to keep the time from delivery to pick-up at a minimum. In the event that a respondent refuses to complete the questionnaire packet after receiving it, special effort will be made to get, at minimum, the Personal Contact Checklist because of the critical need for complete sociometric data on the entire study population.

Data Analysis

The first step will be sociometric analysis to determine membership of the liaison and non-liaison categories from which the primary samples will be drawn. Reciprocation of contact will be operationalized as mutual listing on the Personal Contact Checklist by each member of a dyad regardless of the frequency of contact, or discrepancy in the reported frequency between members of the dyad. When non-respondents in the study population are mentioned as a contact by a respondent, reciprocation will be assumed for those non-respondents named only in the daily or more often contact-frequency category. The close relation between

reciprocation and high-frequency contact reported by Weiss and Jacobson (1955) suggests this is a realistic assumption for operationalizing reciprocation with non-respondents.

Personal Contact questionnaires with less than 50 percent completed items will be discarded. The treatment of missing data within a partially completed questionnaire will be as follows: (1) For item 34 (estimate of deliberate and directional message transaction initiation frequency) if two of three response alternatives are completed, the third can be accurately predicted because one degree of freedom exists for the response alternatives; if only one or none of the response alternatives are completed, questionnaires completed by other members of the population for the person named will be identified and the missing data coded as the mean response alternative of the distribution of other responses directed toward the person named. This "profile mean" transformation is utilized instead of transforming to the mean of all responses to an item because of the expectation that within-dyadic set variance will be less than between-dyadic set variance. (2) For all other items in the questionnaire, if the respondent completed other items in a scale, the no-response item will be coded as the mean of the responses to other scale items; if no items in a scale are completed, each item will be coded to the "profile mean" by the method described above.

McQuitty cluster analysis will be applied to the inter-item correlation matrix of each main study scale to assess

the dimensionality of items in comparison to the pretest results.

The nature of the hypotheses and the characteristics of the data indicate that each of the nine hypotheses can be evaluated with the "t" test for independent sample means (McNemar, 1962, p. 103).

Pretest Procedures

The purposes of the pretest are: (1) To determine if data-collection procedures result in sufficiently high co-operation from respondents; (2) To evaluate ambiguities in questionnaire instructions and item wording; (3) To determine potential instrument completion success, especially the Personal Contact Checklist; (4) To determine whether 16 blank spaces on the Personal Contact Checklist are sufficient for all respondents; (5) To estimate the maximum number of persons named in the "daily" and "several times daily" categories on the Personal Contact Checklist in order to determine if ten Personal Contact questionnaires are sufficient for each questionnaire packet in the main study; and (6) To analyze the scales developed for the pretest in order to select items for scales used in the main study.

The pretest sample will consist of 30 randomly selected professional faculty and staff from another College within the University. Each pretest respondent will be asked to complete two Personal Contact questionnaires, one for each of two randomly selected persons named on the

Personal Contact Checklist. A potential total of 60 Personal Contact questionnaires will be available for pretest scale analysis.

The 30 randomly selected members of the pretest sample will be contacted by telephone to enlist their cooperation, and, if obtained, to make an appointment for delivery and pick-up of the questionnaire packet.

The contents of each questionnaire packet will include: (1) a letter briefly introducing the study, (2) Part I - Personal Data questionnaire, (3) Part II - Personal Contact Checklist adapted from the instrument reproduced in Jacobson and Seashore (1951, p. 34), (4) Part III - two Personal Contact questionnaires, and (5) Part IV - a questionnaire evaluation form.

For the pretest, respondents will not be required to return the Personal Contact Checklist since sociometric analysis is not necessary to purposes of the pretest. The Checklist is included because respondents must complete it in order to complete the two Personal Contact questionnaires. Instructions on each Personal Contact questionnaire will read: "Please complete this questionnaire in terms of person #(---) you named on the Personal Contact Checklist." A randomly selected number between one and ten will be inserted in each blank by the investigator. In instances where respondents named fewer than ten persons on the Personal Contact Checklist, it is possible that one or both of the Personal Contact questionnaires will not be completed.

However, if the number of persons named approximates the findings of the Jacobson, Seashore and Weiss study (i.e., an average of 12 named), these instances should be rare.

The first step in pretest scale analysis will be to determine the internal consistency of each scale based on inter-item Pearson product moment correlations. Items in a scale which correlate zero or negatively with two or more other items will be deleted from the scale. If there is a negative correlation between any two individual items, the item which has the lowest average correlation with all other items in the scale will be deleted.

The requirement that main study respondents complete a Personal Contact questionnaire for each person named in the "daily" or "several times daily" contact-frequency categories suggests that each questionnaire should be as short as possible to assure the highest number of completed questionnaires. It is conceivable that some respondents may be required to complete as many as ten Personal Contact questionnaires. One purpose of the pretest will be to reduce the 37 pretest scale items to an approximate maximum of 25. This will require that any given scale be limited to an approximate maximum of five or six items, with a minimum of two. The reduced scales will be determined by the following method. After deleting inconsistent items from the scale inter-item correlation matrix by the method described above, McQuitty cluster analysis (McQuitty, 1957, pp. 207-29) will be applied to the remaining items to evaluate

scale dimensionality. If more than one dimension emerges, item selection will be based on inspection to determine the dimension most suited to the concept. If more than one dimension seems consistent with the general conceptual definition of the variable, those dimensions will be retained but will be treated as sub-scales and tested as separate variables for the appropriate hypothesis. If, after completion of these procedures, further reduction in the number of items is necessary for a given scale or sub-scale, the average correlation[1] of each scale or sub-scale item will be calculated and those items with the lowest average correlation will be deleted.

---

[1] Since the magnitude of difference between correlations is not linear, the average correlation is calculated by the following formula: $\sqrt{\frac{\sum r^2}{N}}$ where r^2 equals the square of each correlation and N equals the number of correlations.

CHAPTER III

PRETEST RESULTS

Members of the pretest population were identified by department and academic rank or administrative title from the university telephone directory. The 69 individuals so identified were listed alphabetically by department and name and each was assigned a unique identification number ranging from 01 to 69. Thirty two-digit numbers were drawn from a table of random numbers to select population members into the pretest sample.

The day prior to distribution of the pretest questionnaire packet each member of the sample was contacted by telephone and asked if he would be willing to participate in the pretest. All 30 agreed to do so. Each agreed to having the pretest packet delivered to his office the next morning with completion time agreed upon for later that afternoon or early the next morning.

The 30 questionnaire packets were delivered by 10 a.m. the next morning. Thirteen packets were returned by late that afternoon, eight more by noon the second day, five more by 9 a.m. the third day, and two more by the end of the fourth day. Two members of the sample (6.67%) refused to complete the questionnaires after receiving them. Of the last two packets picked up, one was not completed and the reason given by the respondent was that the questionnaire was "too personal" (even though the Personal Contact

questionnaires were anonymous). One non-respondent, although he had agreed to complete the questionnaires in the telephone contact, gave as his reason that he "hates research." The total non-response rate was ten percent of the pretest sample, indicating that additional steps in securing respondent cooperation would be necessary in the main study.

Each of the 27 respondents were asked in the instructions to complete a maximum of two Personal Contact questionnaires. Two respondents did not complete either questionnaire because the random numbers inserted on both their questionnaires were larger than the total number of contacts they listed on the Personal Contact Checklist. Six respondents completed only one questionnaire because the second random number was too high, and one respondent refused or neglected to complete the second. Eighteen respondents completed the maximum of two questionnaires. Thus a total of 43 Personal Contact questionnaires were available for scale analysis.

Pretest Analysis

Part IV of the pretest questionnaire packet was a brief questionnaire asking respondents to indicate problems they may have encountered in instrument instructions or item wording, and the approximate length of time required to complete each of the three different types of questionnaires.

No major instruction or item wording ambiguities were

mentioned by respondents. Some minor changes were suggested and incorporated into the main study instruments; e.g., adding "and ad hoc" to the types of committee assignments listed in item (10) of Part I; adding "none" to the list of administrative titles in item (3) of Part I.

The reported completion times for the Part I questionnaire by 25 respondents ranged from two to ten minutes, with a mean of 4.72 minutes and a mode of 5; for Part II, the Personal Contact Checklist, the range was one to ten minutes, with a mean of 3.70 minutes and a mode of 3 (N=23); for Part III, the Personal Contact questionnaire, the range was five to fifteen minutes, with a mean of 10.10 minutes and a mode of 10 (N=22). These estimates of completion times reinforced the need to reduce the over-all length of the main study questionnaires, especially the Personal Contact questionnaire. An "average" respondent who would be asked to complete as many as seven Personal Contact questionnaires in the main study would have an approximate completion time of 40 minutes for the entire set. Since the questionnaires were unsupervised and self-completing, it was deemed desirable to keep total completion time within a range of 20 to 30 minutes. The Personal Contact questionnaire would have to be reduced to an approximate total of 20 items, plus the ten Semantic Differential scales.

In order to keep the pretest questionnaires anonymous, respondents were not asked to return the Personal Contact Checklist but were asked in the Part IV questionnaire to

report the number of names listed in each frequency of contact category and whether or not they would have listed the same, fewer, or no names if the Checklist would have had to be returned. Twenty-one of 24 respondents indicated they would have listed the same persons, and three respondents indicated they would have refused to list any names. Combining this information with the previously reported nonresponse rate to the entire questionnaire packet, indicates that 20 percent of the pretest population would not have completed the Personal Contact Checklist. Because of the critical need for data from the Checklist for the main study sociometric analysis, it was obvious that special effort would be needed to insure greater cooperation from main study respondents in completing the Personal Contact Checklist.

The total number of contacts listed on the Personal Contact Checklist by 25 respondents was 213. Of this total, 13 percent were in the "several times daily" category, 22 percent in the "once daily" category, 34 percent in the "2-3 times per week" category, and 31 percent in the "once weekly" category. Combining the first two categories into a "once or more daily" category yields 35 percent of the total in this category. The raw data are presented in Table 1.

Only two of the 25 pretest respondents used all 16 blanks on the Personal Contact Checklist (i.e., listed 16 persons as contacts), but indicated they would not have

Table 1. Frequency of contact and number of contacts reported by twenty-five pretest respondents

Frequency of contact	Number of contacts listed by each respondent															Total contacts reported
	0	1	2	3	4	5	6	7	8	9	10	12	15	16		
A. Several times daily	8	10	4	2	1	(N=25)										28
B. Once daily	3	9	7	2	3		1	(N=25)								47
C. (Once or more daily)		6	7	5	1	2	2	2	(N=25)							(75)
D. 2-3 times per week	3	4	7	4	3		1	1	1		1	(N=25)				73
E. Once weekly		8	6	5	1	4	1	(N=25)								65
F. (Once or more weekly)				1	4	2	2	3	1	3	3	2	2	2	(N=25)	(213)

listed more persons if additional blanks had been provided. The highest number of contacts listed in the combined "daily or more" category was seven. Based on this information it was decided that nine Personal Contact questionnaires would be included in each main study questionnaire packet.[1] Instructions for Part III in the main study packets were written to indicate that more questionnaires

[1]A total of 1278 Personal Contact questionnaires were needed to make up 142 questionnaire packets.

would be available from the investigator if needed.

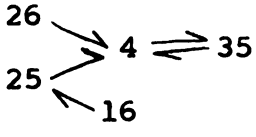
Pretest Scale Analysis

The first step in scale analysis was to determine the internal consistency of items in each scale by inspecting the inter-item correlation matrix for negatively correlated items. None of the items in any of the scales correlated zero or negatively with any other item in its respective scale.

The second step was to assess scale dimensionality by applying McQuitty cluster analysis to the inter-item correlation matrix of each scale. By applying cluster analysis and the method of average correlations, each scale was reduced to a minimum of two and a maximum of five items, yielding a total of 21 questionnaire items in the main study Personal Contact questionnaire.

Perceived Structural Diversity of Contacts The inter-item correlation matrix and the average correlation of each scale item in this scale is presented in Table 2.

Cluster analysis of the inter-item matrix yielded the following single typal structure:[1]



Items (4) and (35) emerged as the core of the matrix with items (25) and (26) most closely associated with item (4).

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[1]McQuitty (1957, p. 3) defines a typal structure as "one in which every member of a type is more like some other member of that type (with respect to the data analyzed) than it is like any member of any other type."

Table 2. Inter-item correlation matrix and average correlations for the perceived structural diversity of contacts pretest scale

Item number*	4	16	25	26	35	Average correlation
4	x	.443	.693	.754	.786	.745
16		x	.596	.404	.427	.473
25			x	.562	.608	.623
26				x	.659	.663
35					x	.688

* Item numbers in this and following tables may be compared to the item numbers in Chapter II under Operationalization of Variables to identify the item.

Based on the average correlation, item (26) was selected over item (25) to comprise the three-item scale used in the main study.

Perceived Number of Contacts The inter-item correlation matrix is presented in Table 3.

Cluster analysis of the inter-item matrix yielded two typal structures:

Type I: $32 \rightleftharpoons 29$

Type II: $11 \rightleftharpoons 20 \leftarrow 7$

Items (32) and (29), the highest single type in the matrix, were selected for the two-item scale used in the main study.

First Source of Information Table 4 presents the inter-item correlation matrix and average correlations for items in this scale.

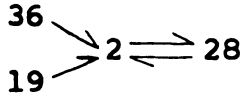
Table 3. Inter-item correlation matrix for the perceived number of contacts pretest scale

Item number	7	11	20	29	32
7	x	.358	.537	.346	.532
11		x	.773	.694	.625
20			x	.677	.676
29				x	.808
32					x

Table 4. Inter-item correlation matrix and average correlations for the first source of information pretest scale

Item number	2	19	28	36	Average correlation
2	x	.607	.740	.634	.663
19		x	.537	.545	.564
28			x	.567	.621
36				x	.583

Cluster analysis of the matrix yielded the following typal structure:



Items (2) and (28) formed the core of the single type which emerged and were selected to comprise the two-item main study scale.

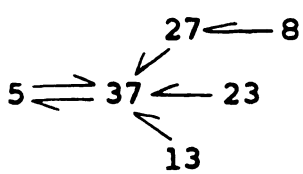
Importance of Secondary Contacts See Table 5 for the

Table 5. Inter-item correlation matrix and average correlations for the importance of secondary contacts pretest scale

Item number	5	8	13	23	27	37	Average correlation
5	x	.582	.428	.526	.598	.731	.582
8		x	.437	.527	.603	.570	.547
13			x	.478	.462	.493	.460
23				x	.414	.644	.523
27					x	.717	.569
37						x	.637

inter-item correlation matrix and average correlations for this scale.

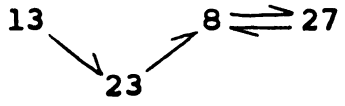
The following single typal structure emerged:



Based on the emergent typal structure, the average correlations, and a three-item limitation on the scale, procedure would dictate selecting items (5), (37) and (27). However, in order to retain item (8) for comparative purposes with the Jacobson, Seashore and Weiss study[1] and still remain within the three-item limitation, item (5), which is highly correlated with item (37), was deleted and

[1]Degree of "importance of contact" was one of the response categories in the original Personal Contact Checklist.

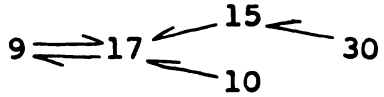
the three items retained for the main study questionnaire were (37), (27) and (8). Support for retaining item (8) is found in its relative centrality within the sub-matrix when items (5) and (37) are removed. The following typal structure then results:



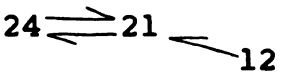
In addition, item (8) emerges with the highest average correlation from among these four items:

Item	Average correlation
8	.527
27	.499
23	.475
13	.459

Diffuse Opinion Leadership The inter-item correlations and average correlations within types for the Diffuse Opinion Leadership scale are reported in Table 6. Two typal structures emerged from the matrix with the following configurations:

Type I: 

Persuasiveness within organizational "power structure"

Type II: 

General persuasiveness with contacts

Inspection of the items in each emergent type indicates that Type I might be labeled "persuasiveness within the organizational power structure" and Type II might be called "general persuasiveness with contacts." With the exception of item (30), which is weakly associated within its cluster, the items in Type I refer to the receptivity members of the

Table 6. Inter-item correlation matrix and average correlations (within type) for the diffuse opinion leadership pretest scale

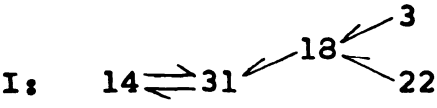
Item number	9	10	12	15	17	21	24	30	Average correlation within type	
9	x	.667	.657	.645	.784	.555	.546	.360	.633	
10		x	.491	.567	.691	.504	.528	.449	.601	
12			x	.617	.649	.658	.562	.575		.612
15				x	.734	.638	.603	.682	.660	
17					x	.669	.600	.566	.698	
21						x	.728	.590		.694
24							x	.575		.650
30								x	.528	

"power structure" have to suggestions, opinions and advice from the individual. Items in Type II refer to the individual's general ability to influence or convince others.

Items in Type II are most appropriate to the conceptual definition of diffuse opinion leadership, while items in Type I are more specific in defining a particular group with which the individual wields influence. Further, items in Type II are worded to indicate <u>direct</u> contact between the individual and others in the organization (e.g., item 24 states, "When interacting with other faculty members in the College, this person isn't a very good convincer."), while items in Type I may be interpreted to mean either indirect or direct relationships (e.g., item 17: "Those

who have a lot to say about what goes on in the College respect the suggestions this person makes."). However, because both types relate to general conceptual dimensions of opinion leadership, the most representative items from each type were retained for the main study but as separate variables. Based on the configuration and average correlations, items (9), (17) and (15) were selected from Type I and items (21) and (24) from Type II.

Specific Opinion Leadership The inter-item and average correlations for the Specific Opinion Leadership scale are presented in Table 7. Again, two typal structures emerged with the following configurations:



Inspection of the items in the Type I configuration suggest this set might be labeled "information-advice dependency" and the items in Type II can be called "asking behavior." Conceptually, the second type might be assumed a sub-set of the Type I items, since both are consistent with the general conceptual definition of opinion leadership. The Type II items are more specific to the direction of message transaction initiation, but still reflect an information-advice dependency.

Based on the emergent typal structures and the average correlations, items (3) and (22) were deleted from the

Table 7. Inter-item correlation matrix and average correlations (within Type I items) for the specific opinion leadership pretest scale

Item number	1	3	14	18	22	31	33	Average correlation within Type I
1	x	.269	.600	.321	.102	.562	.689	xxxx
3		x	.367	.601	.287	.593	.182	.482
14			x	.504	.095	.826	.670	.520
18				x	.423	.736	.187	.578
22					x	.283	.083	.296
31						x	.530	.643
33							x	xxxx

scale, with all other items retained. Type I and Type II item sets will be treated as separate variables in addition to treating all five items as a summary measure of specific opinion leadership.

Main Study Instrument Design

The word anchors used for response alternatives of certain items in the main study Personal Contact questionnaire were altered slightly from those used in the pretest instrument. Two pretest respondents pointed out that in the word-anchor set -- "agree strongly", "agree somewhat", and "agree slightly" -- the last two response alternatives are near scale equivalents. While this problem may have contributed some measurement error in pretest data, it was assumed that the ordering of response alternatives and the

number-anchors preceding each response alternative partially corrected this potential source of error. Based on a combined synthesis of the word-scale interval equivalence research reported by Dodd and Gerbrick (1960) and Jones and Thurstone (1955), the following word-anchors were selected for use with appropriate items in the main study instrument.

	Word-anchor	Interval weight
Degree of feeling:	very strongly	- 0.80 (by interpolation)
	quite a bit	- 1.20
	moderately	- 1.12
	neither-nor	-
Amount:	a lot more	- 1.00
	a good deal more	- 1.00
	a little more	- 1.00
	about as ( )	-
Number:	very many more	- 1.00
	many more	- 1.00
	a few more	- 1.00
	the same number of	-
Degrees in general:	extremely	- 1.25
	very	- 1.40
	fairly	- 1.51
	so-so (50-50)	-

Items in the main study Personal Contact questionnaire were first grouped for similarity of response alternative wording, and then randomly ordered within these groupings.

CHAPTER IV

FINDINGS

Three weeks were required to complete pretest data collection, scale analysis and preparation of the 142 main study questionnaire packets. Data collection began during the second week of the last full month of the academic year. The present chapter contains a summary of the data-collection procedures and response rates, the main study scale analysis, findings of the sociometric analysis, a description of the respondents and tests of the hypotheses.

Data Collection

The data-collection procedures described in Chapter II were followed with minor exceptions and consisted of (1) distribution of an entry letter[1] from a faculty member in the College, (2) telephone contact with each person to enlist cooperation and make appointments for delivery and pickup of the questionnaire packet, (3) personal delivery of the packet to each member and (4) pickup of the packet at the agreed upon time.

Only one of the 142 individuals refused to participate in the study when contacted by telephone and only 12 additional individuals refused, or were unavailable, to complete

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[1]See Entry Letter, Appendix A.

any part of the questionnaire packet after receiving it. Unfortunately, three other studies had been conducted with faculty respondents in the College during the month preceding this study.

It was originally hoped that the entire study population could be contacted and questionnaires delivered within a three-day period. By the end of the third day, 88 percent of the population had been contacted by telephone, with 96 percent contacted by the end of the fourth day. The remaining respondents, all of whom were out-of-town during the initial days of data collection, were contacted by the end of the sixth working day.

The daily cumulative total of packets delivered and returned is reported in Table 8.

Every effort was made to obtain 100 percent completion of, at least, the Personal Contact Checklist and to keep respondents' lag time from delivery to pickup at a minimum. Whenever possible personal visits were made to respondents who missed the agreed upon pickup date to set a second pickup time. Of the tardy respondents who were not in fact refusals, most were extremely busy or out-of-town shortly after delivery of the questionnaire packet. Several of these individuals turned out to be liaisons whose Personal Contact questionnaires were not used as a source of data in the study. Most of the 12 refusals came at the end of the tenth and fifteenth days of the data-collection period. Additionally, the investigator, who was officed

Table 8. Daily cumulative total of questionnaire packets delivered and returned

Working days	Number delivered	Percent delivered	Number returned*	Percent of number delivered
1	55	38.7	21	38.1
2	92	64.7	50	54.3
3	112	78.8	70	62.5
4	124	87.3	86	69.3
5	137	96.4	105	76.6
6	139	97.8	109	78.4
10	140	98.5	120	85.7
15	141**	99.2	137	97.1
17			139***	98.5

* Including refusals

** One individual refused to accept a packet.

*** Two individuals had not completed packets at the close of data collection.

in the building, and two other informants heard little comment on the study among faculty during the data-collection period. The combination of these factors led the investigator to believe that although the data-collection period was extended several days beyond the time originally anticipated, it did not appear that questionnaires from tardy respondents would be invalid.

From a total study population of 142, 129 individuals (90.8 percent) completed a Part I Personal Data questionnaire.

Part II Personal Contact Checklists were completed by 127 individuals (89.4 percent). Of the 15 non-respondents who refused or were unavailable to complete a Personal Contact Checklist, six were determined to be isolates in the sociometric analysis, seven refused because they were "too busy", or the questionnaires were "too personal", "unethical"[1], or "impossible to complete", and two individuals simply did not complete their packets by the close of the data-collection period.

Of the 127 respondents who completed Personal Contact Checklists, 96 (75.6 percent) listed at least one daily or more frequent contact. Respondents were asked to complete a Personal Contact questionnaire (PCQ) for each individual they named in this frequency of contact category. From among these 96 respondents who could have completed one or more PCQs, 86 (89.5 percent) completed at least one questionnaire and ten did not complete any questionnaires on their daily contacts. Of the 86 respondents who completed at least one questionnaire, 78 (90.6 percent) completed questionnaires for all their daily or more frequent contacts. A potential of 33 PCQs were lost from the ten individuals who did not complete any questionnaires on their daily contacts and an additional 13 PCQs were lost from the eight individuals who completed fewer questionnaires than

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[1]Scales for the safety dimension of source credibility were especially singled out in this category by respondents.

the number of daily contacts they listed.

The 96 respondents who each listed at least one daily contact reported a total of 270 contacts. A total of 224 Personal Contact questionnaires were completed, or a response rate of 82.9 percent.

Scale Analysis

Only 32 of the 224 completed Personal Contact questionnaires lacked one or more responses to questions within the instrument. The longest set of no responses occurred on one questionnaire in which the respondent skipped the ten source credibility scales plus nine other questions. Three questionnaires were not complete for the item estimating deliberate and directional message transaction initiation frequency; all three were transformed to the "profile mean" of the person evaluated as described in Chapter II. Of the remaining 29 questionnaires, 14 required missing data transformations for only one question each, with most of the remainder requiring only two to five question transformations. The procedures specified in Chapter II were followed in all cases.

The raw data were coded and punched into IBM cards forming a raw data deck. Next, negatively worded or coded items were reflected and repunched into a transformed data deck to facilitate scale construction procedures and so that all inter-item correlations would printout in the "true" direction.

Following the scale analysis procedures used with the pretest instrument, scale inter-item Pearson product moment zero-order correlation coefficients were inspected for zero or negatively correlated items and McQuitty Cluster Analysis applied to the three five-item scales to assess scale dimensionality. All of the obtained correlations within each scale were significantly different from zero at the 0.001 level, two-alternative test, N=224 (critical value of r = 0.227).

The obtained inter-item correlations for the three-item Perceived Structural Diversity of Contacts scale were as follows: items 14, 19[1], r = 0.557; items 14, 21, r = 0.703; items 19, 21, r = 0.709. The correlation between the two items of the Perceived Number of Contacts scale (items 12, 17) was 0.699. The two-item First Source of Information scale (items 8, 20) correlated 0.683. Inter-item correlations among the three items of the Importance of Secondary Contacts scale were: items 10, 15, r = 0.762; items 10, 22, r = 0.729; and items 15, 22, r = 0.748.

The inter-item correlation matrix for the Diffuse Opinion Leadership scale is presented in Table 9. Application of McQuitty Cluster Analysis to the matrix of correlations yields the following single type:

$$9 \longrightarrow 13 \longrightarrow 11 \rightleftharpoons 18 \longleftarrow 16$$

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[1]Item numbers may be compared to item numbers in the Personal Contact questionnaire, Appendix B, to identify the item.

Table 9. Inter-item correlation matrix for the diffuse opinion leadership main study scale

Item number	9	11	13	16	18
9	x	.636	.683	.460	.618
11		x	.736	.663	.780
13			x	.560	.673
16				x	.663
18					x

This typal structure differs from the pretest results wherein two types emerged with items 11, 16 and 18 forming Type I (persuasiveness within the "power structure") and items 9 and 13 forming Type II (general persuasiveness with contacts). The questionnaires upon which these correlations are based were completed on respondent's contacts in two frequency of contact categories: "once per day" and "several times daily." Partitioning the data on these two frequency categories, on the assumption that so doing might provide an indication of the stability of the scale, yields the same single type from the "once per day" frequency category (N=136). But the inter-item correlations from the "several times daily" category (N=88) yields the following two types each of which contain the same items as those found in the pretest:

Type I: $11 \rightleftharpoons 18 \leftarrow 16$ Persuasiveness within the "power structure"

Type II: $9 \rightleftharpoons 13$ General persuasiveness with contacts

The correlation matrix is presented in Table 10.

Based on the results of this analysis and those of the pretest, the Diffuse Opinion Leadership scale items were treated as two variables in accord with the two emergent types from the data of Table 10.

The inter-item correlation matrix for the Specific Opinion Leadership scale is presented in Table 11. Cluster analysis of the matrix yields the following single type:

$$4 \longrightarrow 2 \rightleftharpoons 5 \longleftarrow 3 \longleftarrow 6$$

Although two types emerged from this scale in the pretest it was argued in Chapter III that the face validity of the items suggested one type to be a subset of the other, indicating a single general type. This contention is supported by the findings from the main study data. Even when the data are partitioned into the two frequency of contact categories, a single type emerges from each separate matrix although with a slightly different configuration for the "several times daily" category. Based on these results, the five items were treated as a single variable, but, for purposes of cross-checking, the two types which emerged from the pretest analysis were tested separately.

The inter-item correlation matrix for the ten scales of the safety and qualification dimensions of the source credibility concept are reported in Table 12. Cluster analysis produces two typal structures, each of which contains exactly those scales originally input for each dimension:

Table 10. Inter-item correlation matrix for the diffuse opinion leadership scale based on "several times daily" frequency of contact questionnaires

Item number	9	11	13	16	18
9	x	.597	.648	.453	.617
11		x	.644	.623	.714
13			x	.481	.562
16				x	.642
18					x

Table 11. Inter-item correlation matrix for the specific opinion leadership main study scale

Item number	2	3	4	5	6
2	x	.660	.647	.727	.533
3		x	.588	.676	.556
4			x	.557	.530
5				x	.548
6					x

Table 12. Inter-item correlation matrix for the source credibility scales

Item number	7A	7B	7C	7D	7E	7F	7G	7H	7I	7J
7A	x	.322	.560	.261	.465	.364	.495	.262	.194	.409
7B		x	.409	.624	.377	.671	.142	.711	.622	.348
7C			x	.444	.656	.419	.611	.452	.438	.598
7D				x	.434	.641	.244	.581	.596	.402
7E					x	.410	.532	.371	.401	.658
7F						x	.194	.657	.658	.384
7G							x	.217	.217	.412
7H								x	.764	.473
7I									x	.546
7J										x

Type I: $7I \rightleftharpoons 7H \leftarrow 7B \leftarrow 7F \leftarrow 7D$ Qualification dimension

Type II: $7J \rightleftharpoons 7E \leftarrow 7C \leftarrow 7A$ (with $7C \leftarrow 7G$) Safety dimension

Each type was treated as a separate variable as originally anticipated.

Sociometric Analysis

The source of data for sociometric mapping of the communication structure of the organization was the Personal Contact Checklist (PCC), Part II of the questionnaire packet. A total of 895 contacts were listed by 127 members of the study population, or an approximate average of seven contacts per person ($\bar{X}$ = 7.047, s.d. = 3.441, range 0 - 16, median[1] = 6.625). The total number of contacts reported within each frequency of contact category was: "several times daily" - 102; "about once per day" - 168; "2-3 times per week" - 271; and "about once per week" - 354. The frequency distributions of reported contacts by frequency category are summarized in Table 13.

In the study reported by Weiss and Jacobson (1955, p. 663) the average span of reported contacts per respondent was approximately 12, while the average in this study is approximately seven. The findings are not comparable, however, because the Personal Contact Checklist utilized in

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[1]Medians for contacts are calculated without midpoints since communication choices are discrete.

Table 13. Distributions of reported contacts by frequency of contact category

Frequency of contact	Number of contacts listed by each respondent																	Total contacts	Mean
	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16		
Several daily	70	32	14	6	2	2	1	0	0	0	0	0	0	0	0	0	0	102	0.831
Once daily	46	38	22	13	1	3	2	1	0	1	0	0	0	0	0	0	0	168	1.323
Once or more daily	31	26	27	17	15	3	3	2	0	1	0	1	1	0	0	0	0	(270)	2.126
2-3 times per week	27	32	23	22	10	3	4	4	1	0	0	0	1	0	0	0	0	271	2.134
Once weekly	20	21	25	17	16	12	9	5	1	0	0	0	0	0	0	0	0	354	2.787
Once or more per week	2	2	9	13	11	14	20	9	8	7	4	4	8	5	3	3	5	(895)	7.047

N = 127

in the previous study included a more extended range of contact-frequency categories; their categories extended from "2-3 times per week" to "several times monthly" and "several times yearly", whereas the upper limit in the present study was "about once per week."

The 895 contacts reported by 127 respondents were distributed among the 142 members of the study population. The approximate average number of choices received was six ($\bar{X}$ = 6.30[1], s.d. = 5.561, range 0 - 29, N = 142, median = 5.56). The grouped frequency distribution is:

Number of choices received:	0-4	5-9	10-14	15-19	20-24	25-29
Number of members (N = 142):	62	56	16	1	2	5

Completion of the sociometric analysis to identify the necessary topological properties of the communication structure required determining reciprocation of contact from the contacts reported in the Checklist. Since this topological analysis was accomplished in matrix form, the most efficient method of determining reciprocation was to begin with construction of the 142x142 matrix. During the period of data collection a preliminary matrix had been constructed in which respondents were originally listed sequentially according to the department or administrative unit in which they were officed. Groupings of individuals in the final matrix was accomplished by inspecting the locations of

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[1]The mean number of choices received is definitionally less than the mean number of choices given because there were 15 non-respondents to the Checklist. If 100 percent of the study population had completed a checklist the two means would be equal.

tentatively identified reciprocated choices in the preliminary matrix and relisting individuals within the second matrix in order to bring each into adjacency with a majority of the other individuals with whom he had contact. The purpose of the reordering was to create clusters of reciprocated contacts around the diagonal as required for matrix analysis.

The final matrix was plotted on a 34-inch square section of ¼-inch-square graph paper. Respondents' identification numbers were listed down the left hand edge of the sheet (for rows) and across the top of the sheet (for columns) in identical sequence beginning in the upper left hand corner.

The data contained in the Personal Contact Checklists were then transferred to the matrix by placing a number representing a code for the frequency of contact in the matrix intersect cell of the respondent and his reported contact. This first transfer was made using the identification numbers along the side of the matrix (rows) for the respondent (the person making choices), and the identification numbers along the top of the matrix (columns) for the contacts listed (the persons chosen). At the completion of this step the matrix contained entries in 895 cells, representing the total contacts listed on the Personal Contact Checklists.

Next, to make entries in the matrix symmetric and to determine reciprocation in such a way as to have a record

of the frequency of contact listed by both members of a reciprocated dyad, the matrix was rotated counterclockwise one-quarter turn and the data from the Checklists again transferred to the matrix. Now, however, the identification numbers for the contacts listed (persons chosen) were along the bottom of the matrix; i.e., rows in Step 1 became columns in Step 2.

At the completion of these two steps, those cells of the matrix which contained two entries represented reciprocated contacts. At this point there were a total of 400 cells with double entries indicating 400 reciprocated one-way communication linkages, or 200 two-way pairs of individuals.

The last step in construction of the matrix of reciprocated contacts was to assume reciprocation of contact for non-respondents based on their selection in the "several times daily" or "about once per day" contact-frequency categories.[1] The 15 non-respondents were indicated as daily contacts by 25 respondents (12 on a "several times daily" basis and 13 on a "once daily" basis). These 25 choices were assumed to be reciprocated, adding 50 reciprocated one-way contacts to the total, or 25 two-way pairs. The

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[1] As reported earlier, Weiss and Jacobson (1955) found a close relation between reciprocation of contact and reported importance of the listed contact. They indicate that 80 percent of the contacts listed as "several times daily" and of "utmost" or "great" importance were reciprocated while only 19 percent of the low frequency and low importance contacts were reciprocated. In this study only 59 of the 270 daily or more often contacts (22%) were not reciprocated.

final total of reciprocated contacts used for topological analysis was 450 or 225 reciprocated dyads. The "best measure"[1] of the percentage of reciprocation was 50.63 percent.

The approximate average number of reciprocated contacts per person was three ($\bar{X}$ = 3.169, s.d. = 2.571, range 0 - 13, N = 142, median = 3.241, mode = 3). The grouped frequency distribution is:

Number of reciprocated contacts:	0-2	3-5	6-8	9-11	12-13
Number of members (N = 142) :	64	56	16	4	2

A reproduction of the final working matrix[2] is presented in Figure 2. The shaded cells represent reciprocated contacts, the small numbers are unreciprocated contacts (1 = several times daily, 4 = once weekly).

Using only the reciprocated contacts in the final matrix, the topological analysis was accomplished following the procedures specified by Weiss (1956, pp. 88-108). The first step was to partition the large matrix into smaller segments by inspection. The segments were selected so members within the segment had a minimum of contacts outside the segment. By this procedure the large matrix was divided

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[1] The "best measure" is based on subtracting the 105 times non-respondents were chosen (all frequency categories) from the total number of choices made (895 - 105 = 790) and dividing this number into the total number of reciprocated contacts not including those assumed for non-respondents; i.e., 400/790 = 50.63 percent.

[2] The final working matrix reproduced in Figure II is actually a 136x136 matrix, rather than 142x142. Six persons who were positively identified as isolates before construction of the matrix were deleted because isolates are deleted from the working matrix in the first steps of segment analysis.

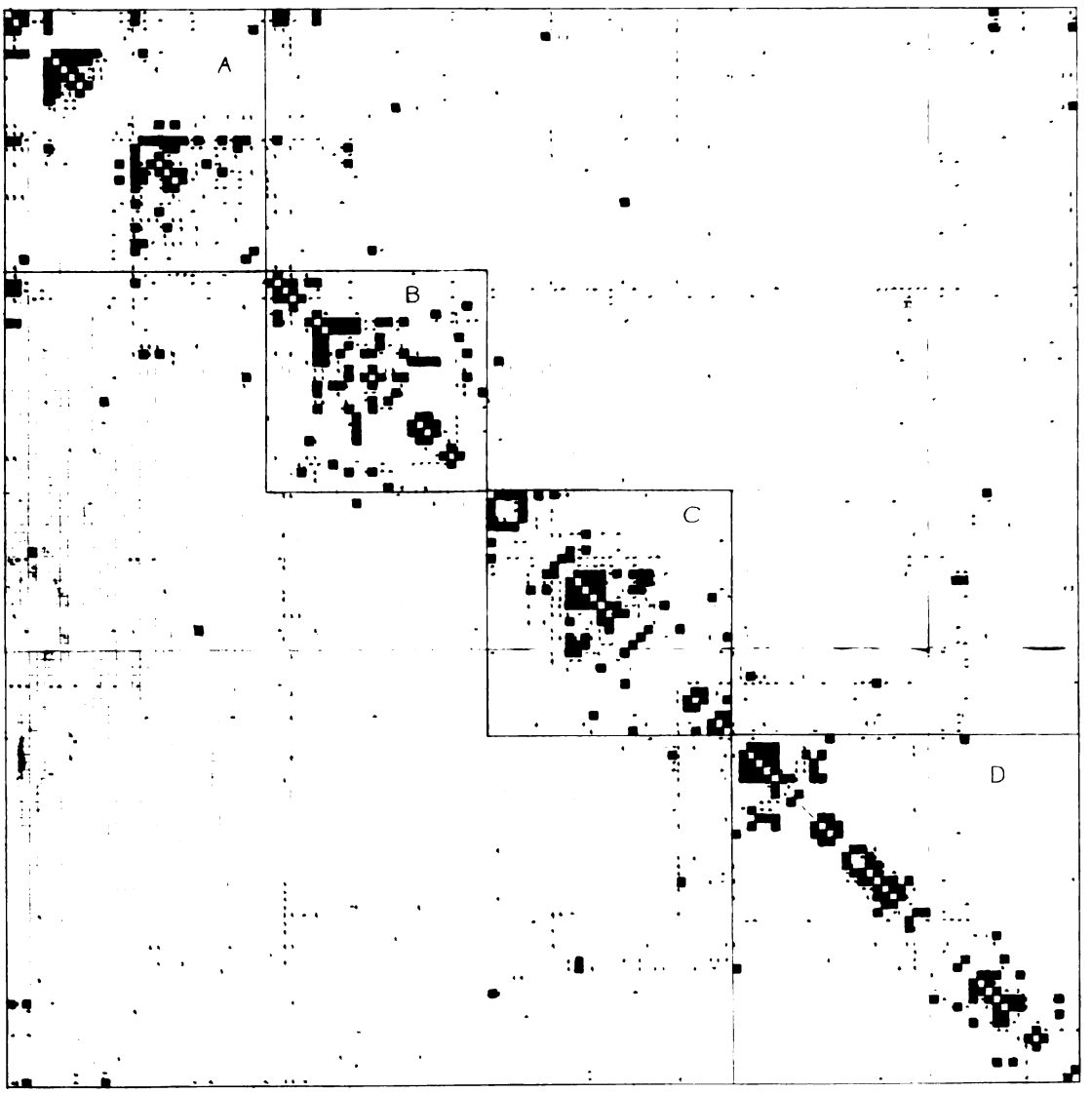

Figure 2. Reproduction of the matrix of reported communication contacts

The shaded cells represent reciprocated contacts, the small numbers unreciprocated contacts. Boundaries of the four segments are outlined.

into four smaller square matrices. Segment A contained 33 individuals, Segment B contained 28, Segment C had 31 and Segment D contained 44. The segments were copied on separate sheets of graph paper and each analyzed individually in order to isolate separate work groups (cliques).

The basic procedure of segment analysis is to remove tentatively identified liaison persons from the segments until separate groups can be identified by inspection as a cluster of reciprocated contacts around the diagonal. The only permissible contact outside a group cluster (i.e., with individuals in other clusters) are single contacts between two individuals in two separate groups. These are bridge contacts in graph theory terminology.

In Segment A the separation of groups in approximately three-quarters of the segment was not clear. It could not be determined by inspection if there were several small separate groups or one large, loosely connected group (a large number of bridge contacts and/or liaison contacts between separate smaller groups would make the group structure ambiguous for separation by inspection). At this point it was necessary to use the method of two-step chain analysis (matrix squaring) described by Weiss (1956, pp. 88-98). This was the only time the two-step chain method was utilized because the group structures in the other three segments could be readily identified by inspection, probably due to the relatively small number of reciprocated contacts in the matrix.

The result of this procedure was a list of the membership of 29 separate work groups (cliques) and a tentative list of 27 liaison persons (those who had been removed from the segments or who were originally listed as tentative liaisons because they had two or more contacts outside of their segment, not counting contacts with individuals already tentatively identified as liaisons). The problem was then to construct a sociogram of the total population and attempt to replace the tentatively identified liaisons to determine if they met all the criteria of the liaison role definition. Based on the information presented by Weiss and the conceptual meaning of an articulation point in graph theory, the following criteria were utilized for the final identification of liaison persons:

1. To be considered a member of a separate group, a liaison must have a majority of his contacts within the group, not counting contacts he has with other liaison persons.[1] These are liaison group members.
2. Not counting contacts he has with already identified liaison persons, a liaison who has membership in a separate group must have a minimum of two contacts outside his group. An exception to this rule is the individual who has contact outside of his group with only one other person in a separate group, but has one or more contacts

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[1]Weiss suggests using high frequency (daily or more often) unreciprocated contacts of liaisons to clarify potential group membership. This procedure resulted in the assignment of only one liaison person to group membership.

with members of the liaison set.

3. A liaison individual is one who does not have membership in a separate group, but has contacts with persons in a minimum of two separate groups. These contacts may be with other liaisons only if these liaisons have membership within their respective groups (in this case, the liaison set may be treated as a separate group).

4. There will probably be a group of liaisons who cannot be characterized as having membership in any separate group, but who have all or nearly all their contacts with other liaisons, at least two of whom must be members of two separate groups. These are members of the liaison set. Liaisons peripheral to the liaison set may be characterized as members of the liaison set if they have a majority of their contacts within the set, or if they have contacts with a majority of the members of the set.

5. There may remain a group of individuals who cannot be characterized as members of a separate group and who have a majority of their contacts with liaison persons. If they cannot be characterized as liaison individuals (based on the matrix segment analysis) consider them non-liaison individuals. (Weiss' instructions on this point are not clear. To be consistent with the graph theory definition of an articulation point, these persons should not be treated as liaisons because they are not associated with separate groups.) Two non-liaison

individuals were found, each linked to a separate liaison.

6. A non-liaison group member may have no more than one contact outside his own group (except with liaisons) and must have a majority of his contacts within the group.

These criteria which were especially appropriate to the analysis of this study population represent only an essential summary of the procedures described by Weiss. The complete instructions contain other criteria for treatment of special cases not encountered in the present study, and a more complete description of the operations necessary in each step of the analysis.

The final sociogram of the communication structure of the organization should be such that if all of the liaisons are removed from the sociogram, the work groups will separate into individual clusters except for bridge contacts between groups. The final test of a liaison person's identification should be as follows:

> Ignoring bridge contacts between groups to which a liaison is connected and ignoring other liaison contacts among those groups and treating the liaison set as a separate group, if the liaison is removed from the sociogram the groups in question should separate. If the liaison has membership in a separate group, when he and only he is removed his group should separate from the other groups to which he is connected leaving no connections among the groups in question (exceptions noted above). If either one of two connected persons could be removed to separate

any two groups, then this is an improper solution; this is a bridge contact.

The sociogram of the communication structure of the study population is reproduced in Figure 3. The end result of the topological analysis was the identification of 22 liaison persons (15.49 percent of the study population), 18 isolates (12.68 percent) and 102 non-liaison persons (71.83 percent), 100 of whom were members of 29 separate groups of varying size. There were two non-liaison individuals. The addition of the liaison set as a separate group brings the total number of sociometric groups to 30. Of the 22 identified liaison individuals, five were members of the liaison set, six were liaison individuals and the remaining 11 were liaison group members.

The range in group size (including liaison group members in their respective groups) was from two to eight members:

Group size	2	3	4	5	6	7	8	
Number of groups	7	11	3	1	4	1	2	N = 29

Sociometric and demographic characteristics of individuals in the topological categories are reported in the following section.

Characteristics of the Respondents

Sociometric data on work-related communication contacts from the 127 Personal Contact Checklists and demographic information from 129 members of the study population

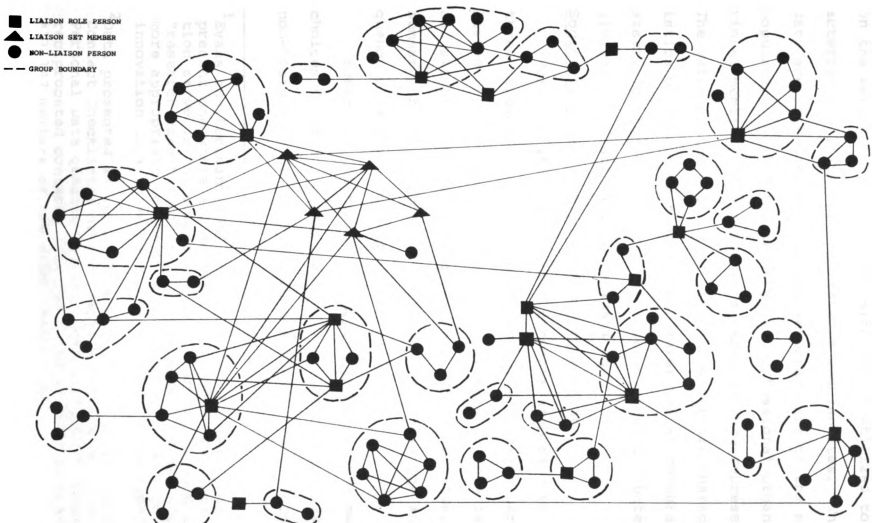

Figure 3. Sociogram of the communication structure of the organization

The 18 isolates are not included. Lines connecting individuals represent weekly or more often communication contacts.

on the Personal Data questionnaire can be utilized to characterize the liaisons, non-liaisons and isolates. These data are presented as descriptive parameters of the study population because the universe of professional organizational members, non-respondents excepted, are represented. The value of the data is in describing certain characteristics of the population and for later use as comparative statistics for other empirical case studies[1] conducted in similar, or dissimilar, organizations.

Sociometric Description of Study Population

Partitioning the reported contacts according to the three topological categories reveals that liaison persons listed nearly twice as many total contacts as non-liaisons and slightly more than twice as many as the isolates. A summary of the reported contacts by classification and frequency category is presented in Table 14.[2]

Regarding the number of choices received, the mean choices directed toward liaison individuals was 12.14, for non-liaisons 5.83 and for isolates 1.83. The liaisons

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[1] Evans and Leppmann (1967, p. xviii) term studies like the present one where all members of a "real life" organization serve as the sources of data (saturation sampling) as "research case histories." The "history" terminology is more appropriate to their study of the introduction of an innovation in a university over a period of two years.

[2] Data presented in Table 14 are based on the 127 Personal Contact Checklists; data in Table 15 are based on the 129 Personal Data questionnaires. Data on choices received and reciprocated contacts (Figures 4 and 5) were tabulated on all 142 members of the study population.

Table 14. Summary of the number of reported communication contacts by liaisons, non-liaisons and isolates

Frequency category	Liaisons (N=21) # contacts	$\bar{X}$	s.d.	Non-liaisons (N=94) # contacts	$\bar{X}$	s.d.	Isolates (N=12) # contacts	$\bar{X}$	s.d.
Several daily	30	1.4	1.8	70	0.7	1.0	2	0.2	0.4
Once per day	65	3.1	2.3	96	1.0	1.1	7	0.6	0.8
2-3 per week	75	3.6	2.9	179	1.9	1.7	17	1.4	1.8
Once per week	75	3.6	1.9	240	2.6	2.2	39	3.3	2.3
* *	*	*	*	*	*	*	*	*	*
Daily or more	95	4.5	3.2	166	1.8	1.5	9	0.8	1.1
2-3 weekly or more	170	8.1	3.4	345	3.7	2.2	26	2.2	2.7
Once weekly or more	245	11.7	3.7	585	6.2	3.4	65	5.4	4.4

received an average of slightly more than twice as many choices as did the non-liaisons. The total choices received by 22 liaisons was 267 and the total received by 102 non-liaisons was 595. The 18 isolates received a total of 33 choices. The raw score frequency polygon for groups appears in Figure 4. It should be noted that the heights of the curves are not comparable due to the differences in the number of individuals in each category.

Excluding three non-liaison individuals who received extreme choices, the general range of choices for non-liaisons is 0 to 12 (the non-liaison who received 29 choices was a non-respondent who was chosen only twice in "once per day" frequency category, thus had only two assumed reciprocated contacts). No liaison individual received less than five choices, while 45.1 percent of the non-liaisons received less than five choices.

The number of reciprocated contacts of liaisons and non-liaisons is charted in Figure 5. The mean number of reciprocated contacts for liaisons was 7.14 (range 2 to 13). The mean for non-liaisons was 2.87 (range 1 to 7). Isolates are not included in Figure 5 but do appear in other sociometric and demographic tables because the operational definition of an isolate is the absence of reciprocated contacts based on work-related content of a minimum frequency of once per week. These persons are "isolated" only within the limits of this operational definition.

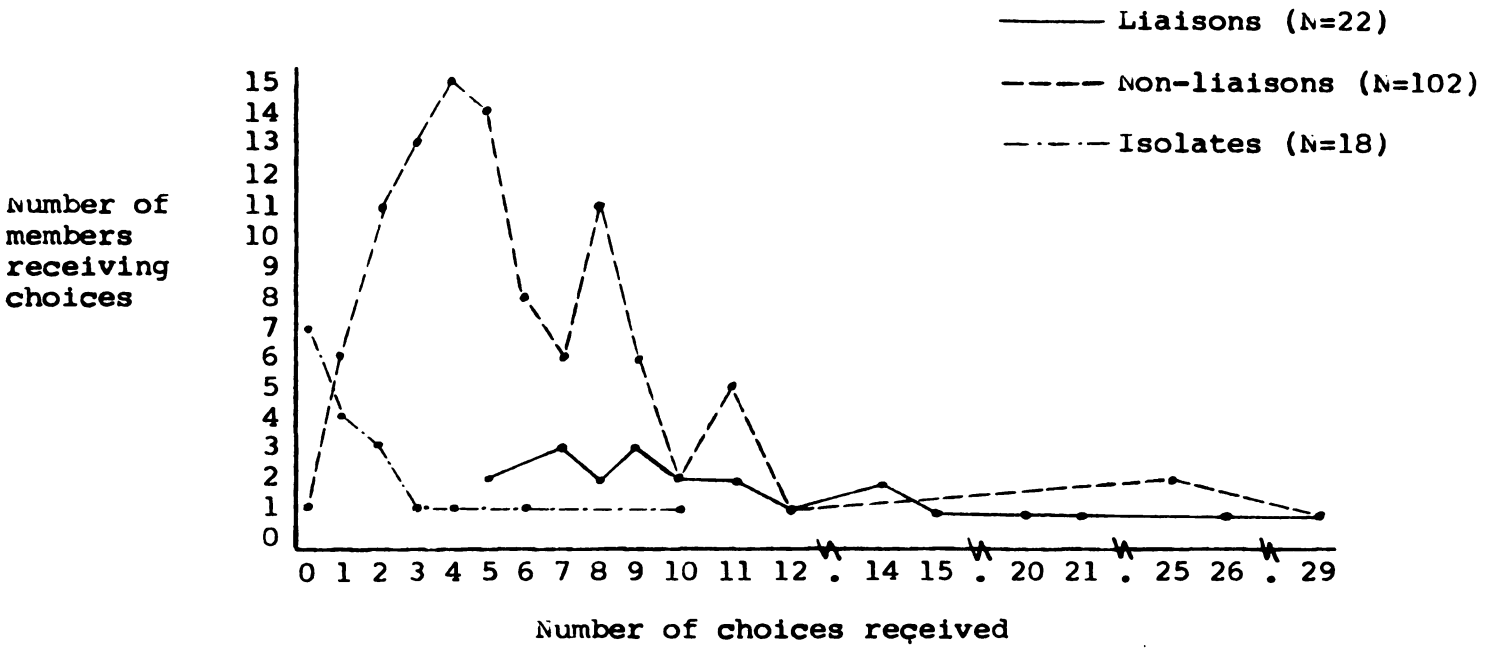

Figure 4. Frequency polygon for the choices received by liaisons, non-liaisons and isolates

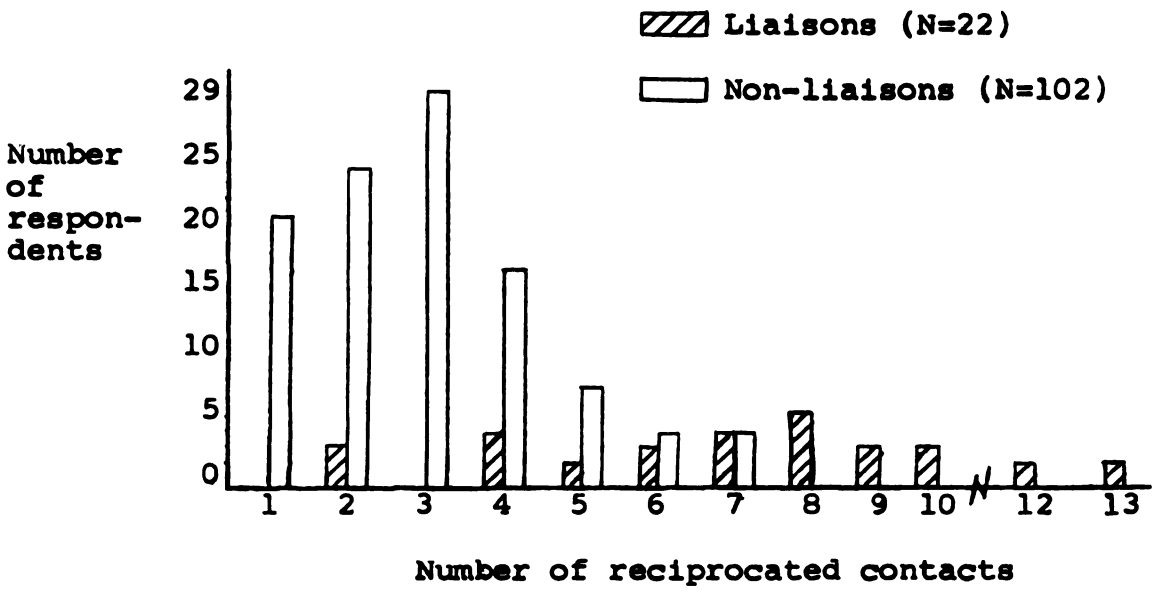

Figure 5. Frequency histogram of the reciprocated communication contacts of liaison and non-liaison individuals

Demographic Characteristics of the Study Population

A summary of selected personal characteristics of individuals in the three topological categories is presented in Tables 15 and 15-A. This information is based on the 129 Personal Data questionnaires.[1]

Comparison of the average ages of individuals in the three categories revealed slight differences, with liaisons averaging approximately four years older than non-liaisons and isolates eight years older than liaisons. Differences

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[1] No-response transformations in the Personal Data questionnaires were required for only two respondents, one question each. One respondent neglected to list his age; the missing data was coded as the mean year of the remaining responses. The other respondent did not report the estimated percentage of time devoted to teaching, research, etc. Based on this person's administrative title, it was assumed he spent 100 percent of his time in administrative work.

Table 15. Characteristics of members of the study population by type

Variable	Liaisons a. Mean b. St. dev. c. Range (N=21)	Non-liaisons a. Mean b. St. dev. c. Range (N=96)	Isolates a. Mean b. St. dev. c. Range (N=12)
Age	a. 46.24 b. 10.26 c. 29-66	a. 42.33 b. 10.04 c. 26-68	a. 54.42 b. 16.76 c. 24-77
Number of years at university	a. 9.90 b. 6.43 c. 2-24	a. 7.34 b. 7.29 c. 1-31	a. 12.67 b. 9.25 c. 2-25
Percentage of time allotted:			
1. Teaching	a. 26.52 b. 33.02 c. 0-100	a. 47.13 b. 43.60 c. 0-100	a. 39.00 b. 37.25 c. 0-100
2. Research	a. 15.00 b. 29.30 c. 0-100	a. 22.17 b. 25.97 c. 0-100	a. 26.00 b. 31.11 c. 0-100
3. Consulting	a. 6.95 b. 7.34 c. 0-100	a. 7.32 b. 13.61 c. 0-50	a. 9.58 b. 14.69 c. 0-15
4. Administrative duty	a. 41.14 b. 37.31 c. 0-100	a. 16.80 b. 29.60 c. 0-100	a. 23.33 b. 37.19 c. 0-100
5. Committee work	a. 10.52 b. 22.38 c. 0-100	a. 5.54 b. 8.37 c. 0-50	a. 2.08 b. 4.50 c. 0-15
Number of committee memberships:			
1. Departmental level	a. 1.95 b. 1.66 c. 0-5	a. 1.61 b. 1.59 c. 0-7	a. 0.75 b. 0.87 c. 0-2
2. College level	a. 1.05 b. 1.53 c. 0-7	a. 0.61 b. 0.81 c. 0-3	a. 0.25 b. 0.62 c. 0-2
3. University level	a. 0.95 b. 1.20 c. 0-4	a. 0.32 b. 0.24 c. 0-5	a. 0.33 b. 0.26 c. 0-2

Table 15. Characteristics of members of the study population by type (continued)

Variable	Liaisons a. Mean b. St. dev. c. Range	Non-liaisons a. Mean b. St. dev. c. Range	Isolates a. Mean b. St. dev. c. Range
Total number of committee memberships	a. 3.95 b. 2.65 c. 0-11	a. 2.55 b. 2.34 c. 0-10	a. 1.33 b. 1.83 c. 0-5
Number of committee meetings in a typical month	a. 7.38 b. 4.95 c. 0-15	a. 4.41 b. 5.09 c. 0-30	a. 2.50 b. 2.84 c. 0-10
Number of articles published or read in past two years	a. 3.62 b. 2.06 c. 0-8	a. 4.00 b. 4.66 c. 0-25	a. 3.25 b. 4.43 c. 0-15
Number of books published in past five years	a. 0.81 b. 1.53 c. 0-5	a. 0.97 b. 1.85 c. 0-9	a. 0.58 b. 0.79 c. 0-2
Percent of time allotted in College	a. 99.76 b. 1.91 c. 95-100	a. 96.73 b. 11.74 c. 33-100	a. 100.00 b. ----- c. -----

Table 15-A. Characteristics of members of the study population by type

Variable	Liaisons N	Liaisons %	Non-liaisons N	Non-liaisons %	Isolates N	Isolates %
Academic rank						
1. Instructor, lecturer, specialist	1	4.76	17	17.71	3	25.00
2. Assistant professor	4	19.05	25	26.04	0	----
3. Associate professor	2	9.52	25	26.04	2	16.67
4. Professor	14	66.67	29	30.21	6	50.00
5. None	0	----	0	----	1	8.33
		100.00		100.00		100.00
Administrative title						
1. Head or assistant head of academic or research unit	10	47.62	11	11.46	2	16.67
2. Head or assistant head of special units or projects	4	19.05	22	22.92	3	25.00
3. None	7	33.33	63	65.63	7	58.33
		100.00		100.01*		100.00
Highest earned degree						
1. Doctorate	19	90.48	81	84.38	7	58.33
2. Masters	2	9.52	13	13.54	4	33.33
3. Bachelors	0	----	2	2.08	1	8.33
		100.00		100.00		99.99*
Joint appointments						
1. None	17	80.95	82	85.42	10	83.33
2. Within College	1	4.76	3	3.13	1	8.33
3. With other College	3	14.29	11	11.46	1	8.33
		100.00		100.01*		99.99*
Appointment basis						
1. Twelve months	16	76.19	63	65.63	7	58.33
2. Nine months	5	23.81	33	34.38	4	33.33
3. Less than nine	0	----	0	----	1	8.33
		100.00		100.01*		99.99*

Table 15-A. Characteristics of members of the study population by type (continued)

Variable	Liaisons N	Liaisons %	Non-liaisons N	Non-liaisons %	Isolates N	Isolates %
Sex						
1. Male	18	85.71	82	85.42	12	100.00
2. Female	3	14.29	14	14.58	0	----
		100.00		100.00		100.00

* Rounding error

in the number of years employed by the university were also minor and ordered the same as age: liaisons had an average of approximately 2½ more years of service at the institution than non-liaisons, and isolates had approximately the same interval more tenure than liaisons.

Exactly two-thirds of the liaison persons held academic rank as full professor, while approximately one-third of the non-liaisons were full professors. Considerably larger percentages of non-liaisons held rank as instructors and associate professors than did liaisons. Differences between the liaisons and non-liaisons in highest earned degree were slight with a minor tendency for more doctorates among liaisons and more masters degrees among non-liaisons. Isolates, however, showed higher percentages in the masters degree category in comparison to liaisons and non-liaisons.

Approximately three-fourths of the liaisons were

employed on a twelve month basis (vs. nine months) with two-thirds of the non-liaisons and three-fifths of the isolates on twelve month appointment.

On one common professional evaluative measure -- publication -- there were only slight differences among the three types, with non-liaisons having the highest book and article publication average and isolates the smallest average.

In the estimates of the percentage of time devoted to several major activities typical of faculty, non-liaisons reported nearly double the average of liaisons in time devoted to teaching, and a slightly higher average in time devoted to research activities. There were minor differences among the types in time devoted to consulting.

In estimated time devoted to administrative duties, liaisons reported an average nearly 2.5 times the non-liaison average. The average time devoted to <u>administrative duties</u> by liaisons (41 percent) approached equaling the average time non-liaisons devoted to <u>teaching</u> (47 percent). The stronger representation of administrators in the liaison group is also revealed by the percentages holding administrative titles -- two-thirds of the liaisons held formal administrative titles (including major titles, assistant unit heads, administrative assistants, and directors of special projects), while only one-third of the non-liaisons held similar titles. Surprisingly, a little over 40 percent of the isolates reported holding an administrative

title and devoting an average of nearly one-fourth of their time to administrative duties.

Membership in committees which may cut across clique group and formal unit lines would appear to put an individual in a structural position from which liaison-type communication contacts could develop. As anticipated liaisons reported devoting an average of nearly twice as much time to committee work as did non-liaisons (11 percent vs. 6 percent) and approximately five times as much as isolates. In terms of the average number of committees in which they had membership, liaisons reported about one and one-half as many <u>total</u> committees as non-liaisons, and three times as many as isolates. Comparing only liaisons and non-liaisons, the tendency was for liaisons to belong to an increasing number of committees as the administrative level of the committees increased; i.e., liaisons reported roughly the same average number of memberships on departmental level committees, slightly less than twice the average of non-liaisons on college level committees, and on the average of three times as many university level committees. The greater involvement of liaisons in committee work is also verified by the estimated number of committee meetings attended in a "typical" month -- nearly double the average number reported by non-liaisons and three times that reported by isolates.

The remaining variables reported in Table 15, namely sex, joint appointments and the related percentage of time

allotted in the college, did not reveal any noteworthy differences among the three topological categories.

Selection of the Samples

Following the procedures specified in Chapter II, all of the liaison individuals on whom Personal Contact questionnaires had been completed by their reciprocated non-liaison contacts constituted the liaison person sample. Of the 22 identified liaisons, 17 met this criterion (three of the five liaisons who dropped out of the sample were members of the liaison set and were the top level administrators of the College). A total of 30 Personal Contact questionnaires[1] were completed on the 17 liaison persons by 26 of their reciprocated non-liaison contacts. These 30 questionnaires served as the source of data for the tests of the hypotheses. Of the 17 liaisons, Personal Data questionnaires were available on 16 of them and served as the source of data for the description of the sample to follow.

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[1]Of the total of 224 Personal Contact questionnaires completed by members of the study population, 166 were completed by at least one member of a reciprocated dyad (72 of the 166 were completed by reflex pairs; i.e., both members of the dyad). Of the 166, 30 were completed by non-liaisons on liaisons, 45 were completed by liaisons on non-liaisons, 18 were completed by liaisons on liaisons, and 73 were completed by non-liaisons on non-liaisons. Of the latter group, 28 questionnaires were completed by non-liaisons who were sources of data in the liaison sample and, to maintain independence of data sources between the two samples, these questionnaires were deleted from possible selection into the non-liaison sample.

Procedure required selecting 17 non-liaison persons on a random basis and utilizing Personal Contact questionnaires completed on them by their reciprocated non-liaison contacts as the source of data for the tests of the hypotheses. The first step in selection of the sample consisted of identifying all the non-liaison persons in the study population on whom Personal Contact questionnaires had been completed by other non-liaisons who were their reciprocated contacts. Then these reciprocated dyads were listed, deleting questionnaires completed by reciprocated non-liaison contacts who had served as sources of data for individuals in the liaison sample. This resulted in the final identification of 38 non-liaisons on whom a total of 45 Personal Contact questionnaires had been completed by reciprocated non-liaison contacts. Each of the 38 individuals was assigned an identification number and a table of random numbers used to select the 17-member non-liaison sample. In order to maintain independence of source data <u>within</u> the sample (as described in Chapter II), whenever both members of a reflex pair[1] were selected into the sample, a random procedure was used to delete one source respondent of the reflex pair. If this procedure deleted a non-liaison on

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[1] A reflex pair is defined as the instance when both members of a reciprocated dyad complete a Personal Contact questionnaire on the other member. For example, given the dyad A, B; if A completes a questionnaire on B and B completes a questionnaire on A, the dyad is termed a reflex pair.

whom only one questionnaire had been completed, an additional random number was selected to replace this person in order to reach the predetermined total of 17 non-liaisons in the sample.

The result of these procedures yielded a total of 21 Personal Contact questionnaires completed on the 17 randomly selected non-liaisons by 16 of their reciprocated non-liaison contacts. These 21 questionnaires served as the source of data for the tests of hypotheses. Of the 17 individuals in the non-liaison sample, Personal Data questionnaires were completed by 14 of them and these questionnaires became the source of data for the description of the sample to follow.

Description of the Samples A summary of selected characteristics of individuals in the liaison and non-liaison samples is presented in Tables 16 and 16-A. Of 23 variables reported in the tables, only three indicate statistically significant differences[1] between the two samples. Liaison individuals reported a higher mean number of committee meetings attended in a typical month than did non-liaisons (.05 level of significance, two alternative "t"

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[1] Statistical tests of differences in this section and in the hypothesis testing section are applied in a heuristic sense to attempt to provide an approximation of potential parameters. Two problems plague the application of statistical tests to the data of this study: (1) the study population from which the samples were taken is not randomly drawn and the generalizability of the findings must depend on future comparative studies to determine the representativeness of the population; (2) the "sample" of liaison persons is not a random sample hence violates a basic assumption of the statistical tests.

Table 16. Comparison of selected characteristics of the liaison and non-liaison samples

Variable	Liaison sample a. Mean b. St. dev.	Non-liaison sample a. Mean b. St. dev.	Mean difference tests: "t" value
Age	a. 45.75 b. 11.05	a. 43.36 b. 11.72	0.5752
Number of years at university	a. 10.25 b. 7.02	a. 9.57 b. 8.16	0.2450
Percentage of time allotted:			
1. Teaching	a. 27.94 b. 30.58	a. 42.86 b. 33.32	1.2786
2. Research	a. 18.63 b. 32.86	a. 27.14 b. 27.01	0.7686
3. Consulting	a. 6.37 b. 7.50	a. 13.21 b. 25.91	1.0107
4. Administrative duty	a. 33.69 b. 35.22	a. 13.93 b. 28.83	1.6659
5. Committee work	a. 13.38 b. 25.08	a. 2.85 b. 5.71	1.5307
Number of committee memberships:			
1. Departmental level	a. 2.31 b. 1.62	a. 2.00 b. 1.92	0.4832
2. College level	a. 1.31 b. 1.66	a. 0.79 b. 0.97	1.0385
3. University level	a. 0.81 b. 1.22	a. 0.64 b. 1.34	0.3630
4. Total committees	a. 4.44 b. 2.85	a. 3.43 b. 3.39	0.8856
Number of committee meetings in a typical month	a. 7.69 b. 4.71	a. 4.07 b. 4.29	2.1816*

Table 16. Comparison of selected characteristics of the liaison and non-liaison samples (continued)

Variable	Liaison sample a. Mean b. St. dev.	Non-liaison sample a. Mean b. St. dev.	Mean difference tests: "t" value
Number of articles published or read in past two years	a. 3.56 b. 2.19	a. 6.07 b. 7.11	1.3437
Number of books published in past five years	a. 1.00 b. 1.71	a. 0.93 b. 2.40	0.0947
Percentage of time allotted in the College	a. 99.69 b. 1.25	a. 98.07 b. 6.66	0.9537
Total number of contacts reported on Personal Contact Checklist	a. 11.69 b. 4.01	a. 7.28 b. 3.45	3.1971**
Number of reciprocated contacts	a. 7.29 b. 3.18	a. 3.53 b. 1.55	4.3927***

Liaison sample N = 16; Non-liaison sample N = 14

* Significantly different means, 0.05 level, two alternative test, df=28

** Significantly different means, 0.01 level, two alternative test, df=28

*** Significantly different means, 0.001 level, two alternative test, critical value of "t" computed by Cochran and Cox formula = 4.0143 (the F ratio of variances was significant at the 0.02 level, two alternative test: obtained F = 4.2246; critical $F_{(16,16)}$ .02=3.37); Liaison N=17, Non-liaison N=17.

Table 16-A. Comparison of selected characteristics of the liaison and non-liaison samples

Variable	Liaison sample N	Liaison sample %	Non-liaison sample N	Non-liaison sample %	Difference tests: X^2 value
Academic rank					
1. Instructor	1	6.25	3	21.43	
2. Assistant professor	2	12.50	1	7.14[a]	
3. Associate professor	2	12.50	4	28.57	
4. Professor	11	68.75	6	42.86	
1. Less than professor	5	31.25	8	57.14	0.9843
2. Professor	11	68.75	6	42.86	n.s.*
Administrative title					
1. Have title	10	62.50	5	35.71	1.0588
2. No title	6	37.50	9	64.29	n.s.*
Highest earned degree					
1. Doctorate	15	93.75	11	78.57	n.s.**
2. Masters	1	6.25	3	21.43	
Joint appointment					
1. None	13	81.25	12	85.71	n.s.**
2. Within College	1	6.25	0		
3. With other College	2	12.50	2	14.29	
Appointment basis					
1. Twelve months	12	75.00	12	85.71	n.s.**
2. Nine months	4	25.00	2	14.29	
Sex					
1. Male	14	87.50	11	78.57	n.s.**
2. Female	2	12.50	3	21.43	

* X^2 values calculated with Yates correction, df=1.

** X^2 values were not calculated due to expected frequencies of less than 5 in one or more cells. The obtained differences between types are less extreme than the two tested and would not be significant.

[a] The different percentage in this cell compared to Table 15 appears to be an aberration of random selection made more likely by the larger number of categories under this heading.

test, df=28). Comparing the mean number of contacts reported by members of each type on the original Personal Contact Checklists, liaisons had listed a significantly higher number of contacts than had the non-liaisons (.01 level of significance). Comparing the number of reciprocated contacts, liaisons had a significantly higher mean number than non-liaisons (.001 level, two alternative test, df=16 and 16 for the Cochran and Cox corrected "t" value). Although the differences on a number of other variables appear substantially large, the relatively small sample size and, in many cases, large standard deviations reduced the possibility of finding statistically significant differences between the samples. With the exception of the three variables cited above (and at appropriate confidence levels), differences are within the expectations of random error and the samples can be assumed relatively homogeneous on the reported variables.

Tests of Hypotheses

Findings dealing with the tests of hypotheses are presented under each major variable category. In each case the method of evaluating the hypothesis was to compute the "t" test for independent sample means with unequal numbers in each sample (McNemar, 1962, pp. 102-3). The assumption of homogeneity of variance between populations was tested for each variable by computation of the F ratio (Walker and Lev, 1953. p. 186; Downie and Heath, 1965, p. 141).

Awareness of Liaison Roles

Two hypotheses were postulated regarding awareness by non-liaison persons of the actual structural diversity and span of contacts of their respective reciprocated liaison and non-liaison contacts.

H1: Liaison persons are perceived to have more structurally diverse communication contacts in the organization than are non-liaison persons.

The variable was measured by a three item scale with a potential summed range from 3 to 21. The findings are as follows:

	Liaison sample	Non-liaison sample	"t" value	F ratio
Mean scale score	15.67	12.81	2.4401	
Sample standard deviation	3.59	4.77		1.7618
Obtained range of scores	8-21	5-20		

The obtained difference between the sample means is significant beyond the 0.05 level (two alternative test, df=49, critical value of "t" = 2.0116); the hypothesis is confirmed. The obtained value of F does not reach significance at the 0.05 level (critical value of $F_{(20,29)}=2.24$, two alternative test); the assumption of homogeneity of variance is not rejected.

H2: Liaison persons are perceived to have more communication contacts in the organization than are non-liaison persons.

This variable was measured with a two item scale with a potential summed range from 2 to 14. The findings:

	Liaison sample	Non-liaison sample	"t" value	F ratio
Mean scale score	10.80	8.76	2.3114	
Standard deviation	2.61	3.70		2.0174
Obtained range of scores	5-14	2-14		

The obtained difference between the sample means is significant beyond the 0.05 level (two alternative test, df=49); the hypothesis is confirmed. The obtained value of $F_{(20,29)}$ does not reach significance at the 0.05 level.

Interpersonal Communication Behavior

Two hypotheses posited differences between liaison -- non-liaison dyads and non-liaison -- non-liaison dyads in terms of the frequency and directional ratio of deliberate message transaction initiation.

H3: Liaison -- non-liaison dyads more frequently participate in deliberately initiated message transactions than do non-liaison -- non-liaison dyads.

The variable was measured by respondents' direct estimates of the frequency of deliberate initiation of contact out of a hypothetical 100 contact occasions. The estimates could vary from 0 to 100. The findings:

	Liaison-- Non-liaison dyad sample	Non-liaison-- non-liaison dyad sample	"t" value	F ratio
Mean frequency estimate	87.17	90.71	0.7870	
Standard deviation	17.60	12.87		1.8695
Obtained range	40-100	60-100		

The obtained mean frequency estimates are in the opposite direction from predicted, but the difference does not reach significance at the 0.05 level (two alternative test, df= 49); the hypothesis is not supported. The F value does not reach significance at the 0.05 level (critical value of $F_{(29.20)}$= 2.358, two alternative test).

H4: The directionality of deliberate message transaction initiation is more disproportionate in liaison -- non-liaison dyads than in non-liaison -- non-liaison dyads.

The measure of this variable was respondents' estimates of the frequency of respondent deliberate initiation of contact compared to his contact's initiation of contact. The ratio of the larger frequency to the smaller frequency provides a measure of the proportionality of contact initiation in the dyad. The more this ratio deviates from one, the more disproportionate is the directionality of message transaction initiation. Theoretically the ratios could vary from 0.00 to 1.00. The findings are:

	Liaison-- Non-liaison dyad sample	Non-liaison-- non-liaison dyad sample	"t" value	F ratio
Mean directional ratio	0.7529	0.7035	0.6161	
Standard deviation	0.2851	0.2772		1.0581
Obtained range	0.111-1.000	0.111-1.000		

The obtained mean directional ratios are in the opposite direction from predicted, but the difference does not reach

significance at the 0.05 level (two alternative test, df= 49); the hypothesis is not supported. The obtained value of $F_{(29.20)}$ is not significant at the 0.05 level.

Information Relay Function

A single hypothesis in this category predicted differences between liaison persons and non-liaison persons in information relay functions, specifically in terms of serving as a first source of information.

H5: Liaison persons are more likely to serve as first sources of organization-related information than are non-liaison persons.

This variable was measured as a two item scale with a potential summed range from 2 to 14. The findings:

	Liaison sample	Non-liaison sample	"t" value	F ratio
Mean scale score	9.33	6.62	3.2835	
Standard deviation	2.90	2.91		1.0013
Obtained range	2-14	2-13		

The obtained difference between the sample means is significant beyond the 0.01 level (two alternative test, df=49, critical value of "t"= 2.684); the hypothesis is confirmed. The obtained value of $F_{(20,29)}$ is not significant at the 0.05 level.

Perceived Personal Attributes

The variable of interest in this category was source credibility, more precisely, the qualification and safety dimensions of that concept.

H6: Liaison persons are perceived to have higher source credibility (qualification and safety dimensions) than are non-liaison persons.

Each dimension was measured with a set of five semantic differential scales with the possible summed range for each being 5 to 35. The findings for the qualification dimension are:

	Liaison sample	Non-liaison sample	"t" value	F ratio
Mean scale score	30.97	31.62	0.6102	
Standard deviation	4.54	2.16		4.4440
Obtained range	14-35	28-35		

The obtained sample means are in the opposite direction from predicted, but the difference does not reach significance at the 0.05 level (two alternative test, df=49); the hypothesis is not supported. The obtained value of F is significant at the 0.02 level (two alternative test, df= 29,20) indicating that the population variances were not homogeneous. However, it was unnecessary to compute a corrected critical value of "t" by the Cochran and Cox formula (Downie and Heath, 1965, pp. 143-4) since the obtained value of "t" was not significant at the tabled critical value and the adjusted critical value is larger than the tabled value.

The findings for the safety dimension are as follows:

	Liaison sample	Non-liaison sample	"t" value	F ratio
Mean scale score	31.87	30.76	1.1555	
Standard deviation	3.3604	3.3601		1.0001
Obtained range	20-35	21-35		

The obtained difference between sample means does not reach significance at the 0.05 level (two alternative test, df= 49); the hypothesis is not supported. The obtained value of $F_{(29,20)}$ is not significant.

Influence Potential

Three original hypotheses predicted differences between liaisons and non-liaisons in terms of the perceived importance of their secondary communication contacts, diffuse opinion leadership, and specific opinion leadership. However, findings from the scale analysis of both the pretest and main study indicated the Diffuse Opinion Leadership scale had two dimensions, leading to two corollary hypotheses in place of the original.

H7: Liaison persons are perceived to have more important secondary contacts in the organization than are non-liaison persons.

This variable was measured by a three item scale having a potential summed range from 3 to 21. The findings:

	Liaison sample	Non-liaison sample	"t" value	F ratio
Mean scale score	17.63	14.29	3.5336	
Standard deviation	3.31	3.36		1.0352
Obtained range	9-21	10-21		

The obtained difference between sample means is significant beyond the 0.001 level (two alternative test, df=49, critical value of "t" = 3.510); the hypothesis is confirmed. The $F_{(20,29)}$ value does not reach significance at the 0.05 level.

Corollary H8A: Liaison persons are perceived to have more influence over members of the "power structure" than are non-liaison persons.

This variable is one of two dimensions of the original Diffuse Opinion Leadership scale. Its measure consisted of a three item sub-scale with a potential summed range from 3 to 21. The findings are:

	Liaison sample	Non-liaison sample	"t" value	F ratio
Mean scale score	16.03	13.33	2.4728	
Standard deviation	3.81	3.88		1.0361
Obtained range	7-21	6-20		

The obtained difference between sample means is significant beyond the 0.05 level (two alternative test, df=49); the corollary hypothesis is confirmed. The obtained $F_{(20,29)}$ is not significant.

Corollary H8B: Liaison persons are perceived to be more generally persuasive across all their communication contacts than are non-liaison persons.

This variable is the second of the two dimensions of the original Diffuse Opinion Leadership scale and was measured with a two item sub-scale having a potential range from 2 to 14. The findings are:

	Liaison sample	Non-liaison sample	"t" value	F ratio
Mean scale score	11.67	10.67	1.4721	
Standard deviation	2.43	2.33		1.0831
Obtained range	4-14	6-14		

The obtained difference between sample means does not reach significance at the 0.05 level (two alternative test, df= 49); the corollary hypothesis is not supported. The obtained $F_{(29,20)}$ ratio is not significant.

The original five item Diffuse Opinion Leadership scale was also submitted to evaluation. The obtained mean scale score for liaisons was 27.70 and for non-liaisons the mean was 24.00. The obtained "t" value was 2.3134 which is significant at the 0.05 level, but untenable in support of the original hypothesis since the scale actually contained two dimensions.

H9: Liaison persons are more likely to be perceived as personal opinion leaders for their dyadic contacts than are non-liaison persons (specific opinion leadership).

The specific opinion leadership variable was measured by a five item scale with a potential summed range from 5 to 35. The findings are as follows:

	Liaison sample	Non-liaison sample	"t" value	F ratio
Mean scale score	23.30	21.19	1.4408	
Standard deviation	4.62	5.82		1.5831
Obtained range	12-30	13-35		

The obtained difference between sample means does not reach significance at the 0.05 level (two alternative test, df= 49); the hypothesis is not supported. The obtained value of $F_{(20,29)}$ does not reach significance at the 0.05 level.

In the pretest scale analysis the Specific Opinion Leadership scale emerged as having two dimensions, although these results were not obtained in the main study scale analysis. To cross-check, however, each sub-scale was tested. On the "information-advice dependency" dimension, the obtained mean for the liaison sample was 14.13 and the mean for non-liaisons was 12.76. The "t" value was 1.3853 which does not reach significance at the 0.05 level. For the "asking behavior" dimension of the scale, the obtained mean for liaisons was 9.17 and for non-liaisons 8.43 with a "t" value of 1.2376 which also does not reach significance at the 0.05 level.

CHAPTER V

CONCLUSION

The basic objectives of the present work were (1) to develop a conceptual and methodological framework for study of the extant functional communication structure of a formalized social system and (2) to apply this framework to an empirical examination of phenomenological attributes associated with certain topological features of the communication structure.

The present chapter contains a summary and discussion of the findings of the study, concluding with suggestions for future research.

Summary

Most previous communication research in formal organizations has focused on aspects of the formal structure with particular emphasis on superior-subordinate relations. The intent of this study was to map the extant functional communication structure of an organization including both formal and informal aspects, then to differentiate this sociometric map into two structural types based on topological concepts from graph theory, and, finally, to describe differences on specified variables between the two structural types. An assumption undergirding this approach is that the most definitive understanding of organizational processes may be arrived at by study of generic communica-

tion patterns and events in organizations as opposed to partial analyses based on elements of only the formal structure.

The primary structural type examined was the liaison communication role. Individuals who function in liaison roles have interlinking communication contacts with two or more separate sociometric work groups (cliques) in the organization. Essentially, when liaison role persons are removed from the sociogram of communication contacts, work groups to which they are connected separate into isolated entities with the exception of single communication contacts (bridges) between two members of different groups. Thus, the liaison role, which is a conceptual analogue to the articulation point in graph theory, is a critical location in the communication structure of an organization.

The organization selected for this study was a College within the formal boundary of a large university. All of the 142 professional staff of the College (faculty and administrators) who were officed in a single building served as the study population. Each staff member was asked to complete a short biographical questionnaire, a Personal Contact Checklist on which they listed all of their regular, work-related communication contacts of a frequency of once per week or more often, and a Personal Contact questionnaire for each contact named on a daily or more often basis. The 127 respondents to the Personal Contact Checklist listed a total of 270 daily or more

often communication contacts and completed a total of 224 Personal Contact questionnaires. A total of 895 regular communication contacts of a minimum frequency of once per week were reported by the 127 respondents.

In preparation for differentiating the communication structure of the organization into topological types, information from the Personal Contact Checklists was utilized to determine reciprocation of contact among members of the organization. The topological and empirical analysis was based upon reciprocated contacts only. From a population of 142 members with a potential total of 10,011 reciprocated pairs, 225 pairs were found. Approximately 50 percent of the reported contacts were reciprocated. These reciprocated contacts were cast into a sociomatrix and, using procedures described by Weiss (1956, pp. 88-108), analyzed to yield identification of 22 liaison role persons, 18 isolates, and 102 non-liaison persons who had sociometric membership in 29 separate work groups of varying size.

For the tests of hypotheses regarding differences between liaison and non-liaison role persons perceived by their respective non-liaison communication contacts, all of the Personal Contact questionnaires completed by non-liaison persons on liaisons were the sources of data for the liaison sample. A total of 30 questionnaires were completed on 17 of the 22 liaison role persons. A random sample of 17 non-liaison persons yielded a total of 21 questionnaires completed on them by their non-liaison contacts.

These questionnaires were the sources of data for the non-liaison sample.

The liaison and non-liaison persons evaluated in each sample were comparatively similar in terms of age, sex, academic rank, degrees held, administrative positions, years employed by the university, percentages of time allotted to teaching, research, consulting, administration and committee work, number of committee memberships at various levels, number of books or articles published recently, appointment time basis, and number with joint appointments. The two samples did differ in the average number of reported committee meetings per month (0.05 level, two alternative "t" test, df=28) with liaison persons reporting a higher mean number of meetings, and in the average number of reciprocated contacts (0.001 level, two alternative "t" test, df=16 and 16 for Cochran and Cox formula) with liaisons reporting the larger mean number of contacts.

Nine primary hypotheses predicted differences between liaison and non-liaison persons in terms of certain communication behavior and personal attributes perceived by their reciprocated non-liaison contacts. Each hypothesis was evaluated by the "t" test for independent samples with degrees of freedom equal to 49 in each case (two alternative test).

Awareness of Liaison Roles

Two hypotheses dealing with awareness of actual structural attributes of liaisons and non-liaisons by their

respective reciprocated non-liaison contacts were postulated and tested.

Hypothesis 1 stated that liaison role persons would be perceived to have greater structural diversity of communication contacts in the organization than would non-liaison persons. By definition, the liaison role person does have greater structural diversity of contacts among sociometrically defined groups. Since these groups are determined only through analysis of sociometric data and may not be concretely visible to members of the organization, the question was whether or not individuals who have contact with liaisons and non-liaisons are aware of their actual pattern of contacts. The obtained means were in the hypothesized direction and the difference between the means was significant at the five percent level. The hypothesis was supported.

Hypothesis 2 was also a reality testing hypothesis and stated that liaison role persons would be perceived to have a larger number of communication contacts than non-liaisons. The obtained means were in the direction hypothesized and the difference between means was significant at the five percent level. The hypothesis was confirmed.

Interpersonal Communication Behavior

Two hypotheses posited differences between liaison -- non-liaison dyads and non-liaison -- non-liaison dyads in terms of the frequency and directional ratio of deliberate message transaction initiation. In this case, dyadic

communication behavior as perceived by one member of the dyad was the unit of analysis.

The expectation stated in Hypothesis 3 was that out of 100 hypothetical contact situations liaison -- non-liaison dyad members have more frequently sought one another deliberately (as opposed to chance meeting) than has been the case between members of non-liaison -- non-liaison dyads. The obtained means were opposite from the direction predicted, but the difference was not significant at the five percent level. The hypothesis was not supported. Both obtained means (87 and 91) indicated a general tendency among members of the study population for approximately only one in ten message transaction occasions to be on a chance basis.

Hypothesis 4 suggested that, of the deliberately initiated message transaction occasions, the directional ratio of initiation in liaison -- non-liaison dyads would be more disproportionate than in non-liaison -- non-liaison dyads; i.e., the frequency of each member of the dyad seeking the other would be more nearly 50-50 in non-liaison -- non-liaison dyads. The obtained mean directional ratios were opposite from the direction predicted, but the difference between means was not significant at the five percent level. The hypothesis was not supported.

Information Relay Function

Hypothesis 5 stated that liaison persons would be more likely to serve as the initial source of organization-

related information for their contacts than would non-liaisons for their contacts. The obtained means were in the direction predicted and the difference between means was significant at the one percent level. The hypothesis was confirmed.

Perceived Personal Attributes

Source credibility was the concept examined in this category, specifically the qualification and safety dimensions of that concept. Hypotheses 6A and 6B stated that as information sources liaisons would be attributed higher qualification and safety by their contacts than would non-liaisons by their contacts. The obtained means for the qualification dimension were opposite to the predicted direction, but in the hypothesized direction for the safety dimension. However, the difference between means was not significant at the five percent level for either dimension. The hypotheses were not supported.

Influence Potential

Originally three hypotheses were presented in this category, but pretest and main study analysis of the scale developed to measure the diffuse opinion leadership concept indicated the scale contained two dimensions requiring treatment as two sub-scales and recasting of the original hypothesis into two corollary hypotheses.

Hypothesis 7 concerned the perceived importance[1] of

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[1]Operationally defined in terms of access to the "power structure" and individuals knowledgeable of activities in the organization.

individuals other than the respondent with whom liaisons and non-liaisons had contact (secondary contacts). The expectation was that liaisons would be perceived by their non-liaison contacts to have more important secondary contacts than would non-liaisons by their contacts. The obtained means were in the predicted direction and the difference significant at the 0.001 level. The hypothesis was confirmed.

The original statement of Hypothesis 8 concerning diffuse opinion leadership[1] was that liaisons would be perceived by their non-liaison contacts to have more influence over their secondary contacts than would non-liaisons as perceived by their non-liaison contacts. The obtained means were in the predicted direction and significantly different at the five percent level, but the finding could not be accepted in support of the hypothesis because the scale contained two dimensions requiring treatment as separate variables. One sub-scale was termed "perceived persuasiveness within the 'power structure'" and the second "general persuasiveness with other contacts." Restatement of Hypothesis 8 in terms of the first sub-scale was to the effect that liaisons would be perceived to have more influence over members of the power structure than would non-liaisons. The obtained means were in the

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[1] Defined as the extent to which an individual is perceived to influence the opinions of others in the organization.

predicted direction and the difference significant at the five percent level. The first corollary hypothesis was confirmed. Restatement of the original hypothesis for the second sub-scale contained the expectation that liaisons would be perceived to be more persuasive across all their secondary communication contacts than would non-liaisons. The obtained means were in the predicted direction but the difference was not significant at the five percent level. The second corollary hypothesis was not supported.

Hypothesis 9 concerned the concept of specific opinion leadership[1] wherein, again, the dyad as perceived by one member was the unit of analysis. The expectation was that liaison persons would be perceived to exercise more opinion leadership over their non-liaison dyadic contacts than would non-liaisons over their non-liaison dyadic contacts. In other words, a non-liaison reporting on the personal relationship he has with a liaison would be more likely to indicate the liaison as exercising more opinion leadership for him than would another non-liaison reporting on the personal relationship he has with another non-liaison. The obtained means were in the hypothesized direction, but the difference was not significant at the five percent level. The hypothesis was not supported.

Other Findings

Consideration of some of the characteristics of the

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[1]Defined as the extent to which one member of a dyad influences the opinions of the other member of a dyad.

responding population of liaison (N=21) and non-liaison (N=96) persons suggests heuristic descriptive parameters for individuals in the two topological classes.

On the Personal Contact Checklist, liaisons listed nearly twice the average number of total contacts as non-liaisons (11.7 vs. 6.1) and received more than twice the mean number of choices as non-liaisons (12.1 vs. 5.8). No liaison person received fewer than five choices, while 45.1 percent of the non-liaisons received less than five choices. Considering only reciprocated contacts, the overall average (mean) number of reciprocated contacts for the 142 members of the study population was 3.17; however, breaking the number of reciprocated contacts down by classification reveals that liaisons had nearly two and one-half times the average number as non-liaisons (7.14 vs. 2.87).

Comparison of certain demographic characteristics indicated liaisons to be slightly older on the average than non-liaisons (46 years vs. 42) and to have slightly longer tenure at the university (9.9 years vs. 7.3). Considering the four usual categories of academic rank, exactly two-thirds of the liaisons were full professors while the non-liaisons tended to be fairly evenly distributed throughout the four categories of rank. Administrators were more strongly represented in the liaison group as indicated by the larger number holding some administrative title (67 percent of the liaisons vs. 34 percent of the non-liaisons)

and reporting a greater percentage of their time devoted to administrative work (an average of 41 percent among liaisons vs. an average of 17 percent among the non-liaisons). As would be expected from the latter findings, non-liaisons reported a considerably larger portion of time devoted to teaching than did liaisons (an average of 47 percent for non-liaisons vs. 27 percent for liaisons). In committee work, liaisons reported an average proportion of time devoted to committees nearly double that reported by non-liaisons (11 percent vs. 6 percent), a larger average number of total committee memberships (4 vs. 2.5), and nearly twice as many committee meetings in a typical month (7 vs. 4). There was an apparent tendency for liaisons to have membership in an increasing number of committees as the administrative level of the committee increased from departmental level to university level.

There were only minor differences between liaisons and non-liaisons in rates of publication, with non-liaisons holding a slight edge over liaisons. Differences were also minor in terms of the numbers of individuals holding joint appointments, average percentage of time allotted within the College, appointment basis, and highest earned degree. The male-female distribution was almost exactly equal between the two types (approximately 85 percent males and 15 percent females).

Discussion

A total of nine main hypotheses and two corollary hypotheses were postulated and tested. Of the 11 hypotheses, five were supported by the data and six were not. A summary of the findings is presented in Table 17.

Before discussing the findings it is appropriate to review major limitations which must be placed upon the generalizability of conclusions drawn from the present study.

1. The study population from which data was collected and samples drawn was selected for availability and access and is not a randomly selected population. The study design is essentially that of an empirical case study utilizing saturation sampling. In addition, one sample upon which tests of hypotheses were based was a non-random sample, although the second was randomly drawn from the study population. Whether or not the findings are generalizable beyond the study population is unknown and can only be demonstrated by later comparative studies. One qualitative contrast with the previous study reported by Jacobson and Weiss (1955) is apparent in the nature of the work relationships; although the populations of both studies were academic personnel, the nature of the work performed was different. The Jacobson and Weiss study was of a government agency concerned with the processing and granting of research project applications; the work-flow likely required more inter-personal and inter-unit coordinating communication than would be the case in the present study of

Table 17. Summary of results from tests of hypotheses

Variable	Hypothesis number	Result	Significance level*
Perceived structural diversity of contacts	1	Supported	0.05
Perceived number of contacts	2	Supported	0.05
Frequency of deliberately initiated message transactions	3	Not supported	
Directional ratio of deliberate message transaction initiation	4	Not supported	
First source of information	5	Supported	0.01
Source credibility			
Safety dimension	6A	Not supported	
Qualification dimension	6B	Not supported	
Importance of secondary contacts	7	Supported	0.001
Diffuse opinion leadership			
Persuasiveness within power structure	8A	Supported	0.05
General persuasiveness with secondary contacts	8B	Not supported	
Specific opinion leadership	9	Not supported	

* "t" test of difference between two independent means, two alternative test, df=49

university faculty members whose main work -- teaching and research -- places emphasis on independence and individual autonomy. This unique work-pattern may partially account for the relatively small number of reciprocated contacts which emerged from the sociometric analysis in the present study.

It should also be noted that the study population in the present work is the membership of a sub-unit of a larger formal organization and does not include the parent organization boundary or contacts outside the sub-unit boundary. The study population is limited to the formal prescription of the sub-unit boundary and, in addition, includes only individuals officed in a single building. This latter geographic boundary criterion was presumed to reduce the probability of a large number of high frequency contacts outside the boundary making the study population similar in most aspects to a single, autonomous formal organization.

It should be further noted that the study population includes only professional members of the staff of the organization, thus is not a total census of the communication contacts among all individuals who could be defined within the boundary of the organization. Excluded are clerical staff, maintenance personnel and students. It was assumed, however, that the nature of the sociometric criterion utilized for mapping the communication structure was not especially relevant to the information functions which might

be performed by the excluded personnel and their inclusion would likely result in the mapping of loosely connected sub-structures within which information content would differ qualitatively from that among the professional staff.

2. A second limitation stems from the phenomenological nature of the data, especially in regard to estimates of dyadic behavior. The assumed congruence of actual dyadic behavior with the behavior perceived and reported by one member of the dyad must be tempered by recognition of the possibility of perceptual distortion on the part of the perceiver.

3. A third limitation of generalizability of the findings is that conclusions drawn from the study must be limited to topological concepts identified on the basis of reciprocated contacts of a minimum contact-frequency of once per week, and hypothesis testing data based on reciprocated contacts of a minimum frequency of once per day. The latter contact-frequency criterion was assumed to provide more reliable data than would be obtained from less frequent contact categories.

4. A final limitation relates to the nature of the sampling model used to define sources of data for the tests of hypotheses. The sampling unit was liaison and non-liaison role persons, but the source of data was non-liaisons who had <u>direct</u> reciprocated contact with members in the samples. Perceptions of liaisons and non-liaisons by others in the organization who are not in direct contact

with them are not included in the analysis.

The sampling model also did not provide for random selection of the liaison sample. This limitation was a practical necessity based on the small number of liaisons who emerge from topological analysis of a single organization of this size. The result is that the application of statistical tests to the data is heuristic and can only be assumed to provide an approximation of potential parameters.

Unsupported Hypotheses

Of the six unsupported hypotheses, three were in the expected direction and three were opposite to the direction predicted. Following are some of the methodological and theoretic factors which may be related to these outcomes.

Methodological Factors One of the major methodological reasons which may have contributed to Type II error could be that the sample sizes were not adequate. There were 30 source questionnaires in the liaison sample and 21 in the non-liaison sample. Two of the six unsupported hypotheses approached significance: Corollary Hypothesis 8B (general persuasiveness with secondary contacts) and Hypothesis 9 (specific opinion leadership) were in the predicted direction and significant at the 0.20 level (two alternative test) indicating there were four chances in five that the obtained differences were "real" and that Type II error had been committed. A third hypothesis regarding the safety dimension of source credibility reached significance at the 0.30 level.

In regard to Hypothesis 9, another test of the specific opinion leadership data is to treat the measure as a discrete variable (scale scores of 21 or higher)[1] and apply a one-sample X^2 test to the frequency distribution of dyadic opinion leaders in the liaison sample, using the non-liaison sample distribution as a check on expected. The expectation stated in the hypothesis implies that specific opinion leadership among non-liaison -- non-liaison dyads will be equally distributed; i.e., about half of the dyads will have the respondent as the opinion leader and half will have the respondent's contact as the opinion leader. The data support this expectation; 11 of the 21 dyads (52 percent) had the respondent's contact as the dyadic opinion leader and ten (48 percent) had the respondent as the dyadic opinion leader or indicated equal opinion leadership in the dyad. In contrast the 30 liaison -- non-liaison dyads included 23 dyads (77 percent) in which the liaison was the opinion leader and seven (23 percent) with either the non-liaison as the opinion leader or equal dyadic opinion leadership. The setup for the one-sample X^2 is as follows:

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[1]Each item in the scale contained seven response alternatives. The item midpoint (4) would indicate equal opinion leadership in the dyad, higher than 4 would indicate opinion leadership on the part of the respondent's contact, and less than 4 would indicate dyadic opinion leadership by the respondent. Summing across the five items, scores above 20 would indicate a tendency for the respondent's contact to be the dyadic opinion leader.

	Observed	Expected (50-50)
Liaison opinion leader dyads	23	15
Not liaison opinion leader dyads	7	15
	N = 30	30

The obtained X^2 equals 8.54 which is significant at the 0.01 level (critical value of X^2 = 6.64, df=1, two alternative test). There were more liaison -- non-liaison dyads in which the liaison was the opinion leader than would be expected if opinion leadership were equally distributed among the dyads. This secondary analysis, however, cannot be accepted as confirmation of the hypothesis because more evidence is necessary to support the contention that specific opinion leadership is always distributed equally among non-liaison -- non-liaison dyads. Without this evidence, the better estimate of expected distribution is obtained by use of a two-sample (2x2) X^2 test which, with this data, does not reach significance at the 0.05 level (obtained X^2 = 2.277). The one-sample result does, nonetheless, reinforce the investigator's feeling that, treating specific opinion leadership as a continuous variable, a larger sample size may yield support for the hypothesis.

A second methodological problem was that the variances of estimates of deliberate and directional message transaction initiation frequencies, Hypotheses 3 and 4, were relatively large. It may be that measurement error occurred here as a result of asking respondents to provide a single estimate of initiation frequency based on 100

hypothetical contact situations. Such estimates may be extremely difficult to make and the resulting unreliability may have contributed to inflated variances.

A third methodological problem, especially regarding source credibility and specific opinion leadership, may stem from the nature of the sampling model utilized. Evaluations of liaisons and non-liaisons were made by independent samples of non-liaisons. Each dyad within each sample category was closely related from a communication viewpoint (contact-frequency of at least once per day), probably indicating, in addition to a close working relationship, a personal friendship. Homans (1950) asserted that the more frequently individuals interact with one another the more nearly alike they become in the norms and expectations they hold. In this light, perhaps a better sampling model for testing these hypotheses would be one which utilizes the same non-liaison respondent as the source of data for comparison of a liaison and another non-liaison with whom the respondent has contact. The contrast in perceptions obtained using this model may be more consistent with the different structural positions of the two individuals evaluated since these are the specific linkages which serve to maintain an individual in his structural role. The theoretic position for evaluating the findings, however, would need to change to account for the fact that now three-person connected chains of individuals are involved from which a directional hierarchy of information

and influence flow may be inferred.

Theoretic Factors As pointed out in Chapter I, a limiting factor in the derivation of hypotheses about the liaison role was the complete lack of previous evidence regarding the concept. Utilization of other frameworks and findings required making a number of heuristic assumptions.

Hypotheses 3 and 4 (deliberate -- directional initiation) were undergirded by the exploratory assumption that there might be physical or psychological propinquity differentials between liaison dyads and non-liaison dyads. Evidence from this study does not reinforce the assumption, or deny it. Further study of homophily[1] within dyads may provide more concrete evidence upon which to formulate later hypotheses.

Another problem may be in the nature of the sociometric criterion utilized in the present study. Rather than a general work-related criterion, data based on more specific types of information content may reveal transaction initiation differences which were masked in the present study. Support for the liaison's function as a first source of organization-related information (H5) suggests that his information relay function may be more specific than general. Initiation frequencies related only to this "grapevine" information may be in the direction hypothesized.

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[1]Defined as the degree to which individuals with a certain attribute have interpersonal communication contacts with other individuals with a similar attribute (Yadav, 1967, p. 167).

It also appears possible that non-liaison individuals who have contact with liaisons may not perceive the deliberateness of some liaison-initiated message transactions. Perhaps liaison persons purposely initiate some transactions in socially-oriented "information markets" (like the coffee room) where individuals whom they contact are less likely to interpret the meeting as planned. Given the stronger representation of administrators in the liaison sample, this misperception may partially account for the higher mean frequency of reported happenstance communication with liaisons. To avoid the formality of calling a subordinate into the office, an administrator may plan to "bump into" that subordinate at coffee or some other non-office location. Certain subordinates may use the same procedure, sublimating the deliberate nature of the meeting.

Hypotheses 6A and 6B results (qualification and safety dimensions of source credibility) may also have been confounded by the nature of the sociometric criterion used. Reciprocal source credibility in closely associated dyads as formed the basis for these data might be relatively high given the likelyhood of a friendship bond. This assumption is reinforced by the skewness of the obtained distributions. Given high mutual trust and professional respect between closely associated individuals, source credibility differentials may be very specific to certain types of information content, or even to specific message

transactions within given situational fields.

Non-support for the general persuasiveness with secondary contacts (H8B) and specific opinion leadership (H9) hypotheses is an interesting paradox considering the found support for Hypotheses 5 (first source) and Corollary Hypothesis 8A (persuasiveness within the power structure). A recent study by Hickey (1968, pp. 49-54) reports a positive relationship between perceived information control and status, and points out the already well established positive link between status and influence. Since non-liaisons are aware of the structural diversity and broad span of contacts of liaisons to whom they are connected (H1 and H2) and recognize the liaison as a first source of information (H5) it might be inferred that they are also aware of their potential for information control. However, even assuming this inference to be correct, the liaison status which may arise from these cognitions may be of a special nature and not appropriate to the more general finding. Again, more definitive results might be obtained by investigating opinion leadership within the context of specific information contents and situational fields.

The findings in regard to specific opinion leadership may have tended to err on the conservative side (Type II error) because some non-liaison individuals who were bridge contacts or who had inter-group contacts with liaison persons were the objects of evaluation in the non-liaison sample. These individuals have, to a lesser degree, some of

the structural characteristics associated with liaison role persons. Ten of the 17 evaluated non-liaisons had bridge or inter-group liaison contacts. To the extent that structural diversity is related to the occurence of specific opinion leadership, this group in the non-liaison sample would tend to attenuate the differences between the liaison and non-liaison samples.

Another factor which might have reduced differences between the samples is the structural similarity between data-source non-liaisons in the liaison sample and their evaluated liaison contact. Treating the midpoint of the summed scale score for specific opinion leadership as a cutting point for determining which member of the dyad was reported as an opinion leader for the other[1], 23 of the 30 dyads had the liaison member of the dyad as the opinion leader, one indicated equal opinion leadership in the dyad and six had the non-liaison member as the opinion leader. Comparing the 23 liaison opinion leader dyads to the six non-liaison opinion leader dyads reveals that in the latter all six non-liaisons were either bridge contacts or had other inter-group liaison contacts, while 15 of the 23 non-liaison respondents (65 percent) in the liaison opinion leader dyads had only in-group non-liaison contacts. In other words there was greater similarity of structural characteristics between members in the non-liaison opinion

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[1]Refer to footnote on page 147.

leader dyads of the liaison sample than in the liaison opinion leader dyads. This similarity may have contributed to lower scale scores for the six liaisons in the non-liaison opinion leader dyads also causing decision-making error on the conservative side.

Supported Hypotheses

Two objectively defined structural characteristics of liaison persons are their structural diversity and broader span of communication contacts as compared to non-liaisons. Evidence from the present study indicates that individuals connected to liaisons are generally aware of these two structural characteristics, even though the diversity of contacts characteristic is sociometrically defined and not objectively visible to members of the organization in the course of their day-to-day activities. This latter finding, however, may be partially artifactual due to the greater representation of administrators in the liaison sample. Their contacts may have attributed greater structural diversity to them simply based on the assumption that, as an administrator, they should have more diverse contacts. But whether or not this assumption did in fact affect responses is a moot question. The point is that individuals who have daily contact with liaisons and non-liaisons are differentially aware of these two structural aspects of the role.

Findings from the Jacobson and Seashore study indicate that liaisons and their reciprocated contacts generally report each other as important contacts. The present

study provides evidence that, looking beyond the immediate dyad, non-liaison contacts of liaisons attribute greater importance to the other contacts of the liaison than do the contacts of non-liaisons for the non-liaison's other contacts. Thus the present study extends the evidence reported by Jacobson and Seashore and may suggest one reason why the liaison himself is considered an important contact by non-liaisons. The finding supplements the Katz assertion (1957, pp. 74-5) that an individual may be valued by a group not only for what he knows, but also for whom he knows outside of the group.

Related to the above finding is support for the hypothesis that liaisons are perceived by their contacts to be more influential within the "power structure" of the organization than are non-liaisons. The Importance of Secondary Contacts scale included reference to having assess to members of the power structure. Linking these two findings[1] supports the contention stated in Chapter I that an individual, in addition to being valued by a group for whom he knows outside the group, may be of increased value for how much influence he has, or is perceived to have, with particular outside contacts. This finding may imply another reason why the liaison is considered an important contact.

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[1] Without the related items in the two scales, the influence in the power structure finding could be artifactual. If an individual was not perceived to be linked to the power structure he likely would not be perceived as influential within that structure.

The exact meaning respondents had for the term "power structure" is, of course, unknown, but the findings provide some general definition of phenomenologically important substructures within a formal organization and of the perceived linkages with those substructures within the extant communication network of the organization. Clearly, the liaison role has meaning to organizational members within this context.

The findings reported above give some descriptive perceived characteristics of liaison role persons, but do not provide concrete evidence of their function within the organization's extant communication network. One such function for which evidence is provided in this study is the liaison person's greater likelihood of being the first source of organization-related information[1] for his non-liaison contacts than is the non-liaison for his non-liaison contacts. The finding leads to the interpretation that liaisons are "early knowers" who are also "early disseminators" within the organization's information relay network. Whether or not this function is related to the apparent motivational bases Davis (1953b, p. 46) suggested, or simply the result of the unique structural location of the role cannot be detected from the present data. What is supported is the fact that not only is the liaison role

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[1]Operationally defined in the questionnaire items as information relating to changes or new ideas being proposed or discussed, or new developments which have occurred in the organization.

person in a potentially important location in the extant communication network, he functions to provide early dissemination of certain information through the network.

In summary, contrasting the liaison role person and the non-liaison role person as perceived by their reciprocated non-liaison contacts, evidence was found in the present study that liaisons are characterized as having a larger number, more structurally diverse, and more important contacts in the organization and are perceived as being more influential within the organizational power structure. In the organization's information relay network, liaisons were reported to more frequently serve as first sources of organization-related information for their reciprocated daily non-liaison contacts.

Other Findings

Although the primary focus of the present study was on perceived attributes of liaison and non-liaison role persons, some demographic information was collected from the study population and bears comment.

The broader span of reciprocated contacts of liaisons has been adequately discussed. The percentage of reported contacts which were reciprocated was 51 compared to 44 percent in the Jacobson and Seashore study. The higher percentage in the present study is probably due to having limited the lowest frequency of contact reported on the Personal Contact Checklist to a "once per week" category, as opposed to a lower limit of "several times per year"

in the Jacobson and Seashore study. Jacobson and Weiss report a lower percentage of reciprocation among the lower frequency of contact categories -- 80 percent of the "several times daily" and reportedly high importance contacts were reciprocated, while only 19 percent of the "several times monthly" or "several times yearly" and low importance contacts were reciprocated. Also related to a comparison of the two studies is the fewer number of total contacts reported -- an average of seven in the present study compared to an average of 12 in the previous study. This difference may be partially accounted for by the difference in the lower limit frequency of contact categories and, perhaps, partially by qualitative and quantitative differences between the two types of organizations studied.

There was an apparent tendency for more individuals with administrative positions to be liaisons although nearly one-third of the non-liaisons were also administrative personnel. Being an administrator may be sufficient but not a necessary condition for assuming a liaison communication role.

There was also an apparent tendency for liaisons to have membership in more committees than non-liaisons, to devote more of their time to committee work, and to attend more committee meetings in a "typical" month. These findings do not, however, reveal a causal relationship. It may be that individuals develop liaison contacts as a result of greater participation in committee work, but it is

also possible that having liaison contacts makes one more visible to those who create the committees. More evidence is needed before assuming that manipulation of committee assignments will create regular liaison-like communication channels for an individual.

One comment should be made regarding the 18 individuals identified as isolates. It is likely that they are not totally isolated from the organization's communication structure as may be implied by their descriptive label. Their identification as isolates is a consequence of utilizing a sociometric criterion limited to work-related contacts, and limited to a minimum frequency of once per week. These individuals are isolated only within these limits, plus the possibility of measurement error in completing the sociometric instrument.

Contributions of the Study

The primary contribution of the present study has been to provide evidence that the liaison communication role does have meaning to members of a formal organization; meaning at least in the sense of their awareness of the structural characteristics of the role, the importance of the role incumbent's linkages within the communication structure, and one aspect of the role incumbent's influence potential; and meaning also in terms of one facet of the liaison person's function in the organization's information relay network. The consequence of these preliminary

indications is to establish an empirical rationale and highlight a need for additional research on the liaison communication role.

Jacobson, Seashore and Weiss originally identified the logical importance of the liaison role based on its location in the communication structure. Ross and Harary (1955, p. 258) have called this view of the concept its static property: "a liaison is critical because his loss destroys the connected unity of the organization. Thus an organization or other structure is most vulnerable at articulation points." Delineation of the static properties of the liaison role is simply a mapping process; a topological description of an organization. Leavitt (1964, p. 230) asserts, "These diagrams are structural. They tell us nothing about the people involved -- just something about the system." The thrust of Leavitt's admonition is for investigators to go beyond the simple mapping of structure and examine what Ross and Harary label, in regard to the liaison role, as dynamic properties: "The critical nature of the liaison person for the dynamic or flow functions of an organization arises from his non-substitutability in paths. For example if a liaison person is a 'bottleneck' the organization suffers badly, while if he is efficient he tends to expedite the flow in the entire organization." The present study touches only lightly on examination of the dynamic properties of the liaison communication role, but helps set the stage for more definitive work. The

study was exploratory. A more detailed description of actual and perceived characteristics of liaison role incumbents, the broader functional meaning of the role, and the in-depth implications for development of organizational communication theory remain to be uncovered. What has been demonstrated is a conceptual and methodological framework for topological-analytic, or communimetric[1], study of the extant communication structure of formal organizations.

A second noteworthy contribution of this study has been the demonstration of a methodological schema, what Coleman refers to as the method of relational analysis, which has two major advantages when applied to examination of extant communication structures. The first advantage is the provision, based on graph theory concepts, of objectively determined, discrete categories for classification of topological properties as a prelude to descriptive or functional analysis. The categories are discrete in the same sense as utilized in the analysis of formally prescribed topological properties (e.g., superior, subordinate) but offer the advantage of admitting facets of the informal communication structure into the analytical frame. In addition, the categories are objectively defined as opposed to the arbitrary definition of constructs based on unvalidated criteria; e.g., the definition of an opinion

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[1]Defined as that branch of sociometry which utilizes only a criterion of communication contact for operationalizing social system topologies, followed by analysis of structural and/or process characteristics of the system.

leader as one who receives some minimum number of sociometric choices within a given social system.

Secondly the communimetric approach is of major advantage because it permits partitioning interpersonal relationships and data on a number of different dimensions such as other topologically-defined roles, formal roles, various contact-frequency categories, directional flow of messages and so forth.

Perhaps one of the more intriguing possibilities of communimetrics is the potential establishment of a bridge between small group communication network research and organizational research. The topological definition of an organization can be utilized as a preliminary step toward identification of various configurations in natural small groups within the organization and for the comparative study of group structures within natural social systems, or between natural social systems and contrived experimental small groups. Another broader application could be the study of unique sets of inter-group linkages or linkage configurations.

Finally, there are at least two advantages of the conceptual and methodological framework demonstrated in this study which have both pragmatic and theoretic interest. The first is the finding that liaison persons tend to function as first sources of information for their contacts. The implication is that organizations with higher concentrations of liaison persons should be characterized

by swift and efficient diffusion of information within the system. Thus the liaison role concept should be of interest to administrators and students of administration and of particular interest to students of innovation diffusion who have used time of awareness as a central criterion variable in their research.

The second advantage of pragmatic and theoretic interest rests in the basic assumption which undergirds both the conceptual and methodological framework. The assumption, as defined earlier, is that the approach should permit gaining broader insight into the total dynamic of an organization because it is based on study of extant communication structures instead of the more limiting study of only formal, prescribed structures. The approach can be utilized to reveal how people behave in formalized social systems independent of, and/or concomitant with, formal prescriptions and as a result may be of considerable value in the design of formalized systems based on principles of "natural" structural development.

Suggestions for Further Research

As anticipated, the present exploratory study raises more questions than it answers. A number of implied suggestions for additional research have been adequately covered in the previous text. Following are other general suggestions.

1. Further exploration of the characteristics and

behavioral attributes of liaison role persons. Given the problem of application of statistical tests to samples and populations derived from saturation sampling, additional comparative studies are called for to validate the generalizability of the present findings, to extend these findings, and to compare findings across different types and sizes of organizations. One development which would greatly facilitate studies of this type would be a computer program designed to treat communimetric data for indentification and classification of topological properties such as the liaison role. This tool would be of great benefit not only for descriptive studies, but also for field experiments involving the implantation and tracing of messages, and comparative studies over time in single organizations intended to examine changes, and variables related to change, in the communication structure.

The greatest theoretic utility of the liaison role concept will come from study of dynamic properties of the role. It is necessary to distinguish the functions of the information treated and relayed by liaisons both in terms of source purpose and receiver effect. The liaison person is a critical path in the control of information within the communication structure. Hickey (1968, p. 51) points out three elements of information control:

> One can control -- in a transmit or non-transmit sense -- by handling the messages, or one can control by arranging the channels, or one can control by manipulating the content of the messages.

All three forms of information handling might be examined in terms of the liaison role. Additionally, the following questions may be fruitfully explored: What kind of information filter is the liaison? What are the uses and purposes the liaison makes of his information handling position? What are the uses the liaison's contacts make of information received? What are the uses and purposes intended by information transmitted to the liaison by his contacts? and finally, How do these dynamics change for different information contents or situations?

More advanced structural distinctions may also be developed in regard to the liaison role. One would be to go beyond treating the liaison role as a discrete category to the development of a continuous measure of "liaisonness" based either on the number of intergroup links of a given liaison, or on the number of reciprocated contacts of a given liaison, or a weighed measure of both. Another more advanced concept of the liaison role may be a higher-order category labeled a "group-set liaison." Careful examination of the sociogram drawn from the present study reveals eight higher order "groups of groups", or group-sets[1]. With the exception of only two bridge contacts between group-sets, all of the sets are interconnected entirely by

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[1] The identification of the group sets is admittedly heuristic. The found configurations may be an idiosyncrasy of this particular study population, or may be directly related to the formal structure of the organization. Further exploration is necessary before formalizing the concept.

liaison contacts across group-set boundaries. Considering the static connectivity of the total organization, these group-set liaisons are of special significance. Further development of this concept may lead to yet another research application of the liaison role.

2. Exploration of other topological properties of the communication structure. Study of the liaison role does not exhaust the possible categories of topological concepts which can be examined. One other concept is the bridge contact which has some of the characteristics of the liaison role. In addition, certain kinds of group configurations, inter-group configurations, and interpersonal chains may lend themselves to objective definition and analysis.

3. Other partitions of interpersonal relations. The present study examined the liaison role only from the standpoint of perceptions of liaisons and non-liaisons by non-liaisons. Other dyadic partitions which may be examined are liaison --liaison dyads, and unreciprocated liaison -- isolate dyads and non-liaison -- isolate dyads. Reverse direction perceptions in liaison -- non-liaison dyads may also be examined; i.e., the perceptions liaisons have of their non-liaison contacts is the reverse of the pattern of the present study.

Of particular methodological interest would be examination of the congruence of perceptions of dyadic behavior in reflex pairs.

Finally, other partitions of interpersonal relations

and data may be based on use of questionnaires from unreciprocated contacts, different frequency of contact categories and administrative -- non-administrative classifications.

The potential application of the methodological and conceptual framework demonstrated in the present work open a generally unexplored area of research in organization and communication theory.

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APPENDICES

APPENDIX A

ENTRY LETTER

We have often wondered why university faculty are frequently required to spend so much time communicating to the wrong people about the right thing, or to the right people about the wrong thing. This is only one of the many "communication problems" which exist in a large university. I could, and often do, go on and on talking about these kinds of problems. Fortunately, I (and you) have a chance to help get this discussion from the "armchair" stage to something more concrete.

Sometime this week you will receive a telephone call from Don Schwartz. He will ask for an appointment with you for delivery and pickup of a questionnaire entitled UNIVERSITY COMMUNICATION STUDY. Mr. Schwartz has a unique method for studying faculty communication patterns and effects. His study, which is a Ph.D. dissertation, promises to yield better understanding of communication in a college within a university. This study won't reveal all the problems or solutions (that questionnaire would take us all day to complete!), but will make a potentially useful contribution to both theory and practice.

It's because I believe this study is important to you and me, and because I'm convinced of the integrity and competance of the investigator, that I've agreed to write this letter asking you to participate in the study by completing the self-administered instrument. The special method of analysis requires Mr. Schwartz to get nearly 100% participation by the faculty officed in this building. With this requirement, he is understandably concerned about the proportion of response he can obtain. I'm sure we'll do both him and ourselves a favor by participating. The time involved for each of us is about one coffee break.

Rest assured that the completed questionnaire will be seen only by Mr. Schwartz. Perhaps that's not important because the questions are not that "personal", but I mention it because some may wonder.

Mr. Schwartz will provide each participant with a summary of the findings when the study is completed. I encourage you to participate when he telephones for an appointment.

Sincerely yours,

(Signed)

Professor

APPENDIX B

QUESTIONNAIRE PACKET

a. Cover Letter

b. Part I -- Personal Data Questionnaire

c. Part II -- Personal Contact Checklist

d. Part III -- Personal Contact Questionnaire

UNIVERSITY COMMUNICATION STUDY

May 9, 1967

Thank you for agreeing to complete the enclosed study questionnaire. Don't be alarmed by the bulk of this packet. Pretest experience indicates that most respondents can complete all necessary forms in 15 to 30 minutes.

Broadly speaking, this study is aimed at investigating an aspect of communication patterns and effects among university faculty members. The plethora of "communication problems" in large universities foster a need to develop more efficient and effective means of communication. As Dr. (---) suggested in his letter, your cooperation in this study will contribute to better understanding both of the problem and potential solutions. I will provide you with an abstract of the results of the study after it is completed.

All individual questionnaires are strictly confidential. No one but myself will see them. In any report written from this study, it will not be possible to identify any individual nor will the College be identified in any way. Names become numbers and after the data are transferred to IBM cards the original questionnaires will be destroyed.

The questionnaire is in three parts. It is important that you complete them in the order they are numbered.

After you complete all three parts of the questionnaire, insert the completed forms in the enclosed envelope, seal, and give the envelope to your secretary. I will pick it up from her at the time on which we agreed.

I will be available this week at (phone number) if you have any questions.

Again, thank you.

Sincerely,

(Signed)

Donald F. Schwartz

PART I (PINK SHEETS)

UNIVERSITY COMMUNICATION STUDY

Project Number 551A Deck Number 2 Subject Number ____

First of all, a few vital statistics.....

1. In what year were you born? ____

2. What is your academic rank? (Check one)

___1. Instructor
___2. Assistant Professor
___3. Associate Professor
___4. Professor
___5. Other (Please specify) _____

3. If you have departmental (Institute) or College level administrative duties, what is your formal title? (Check one)

___1. Assistant or Associate Department Chairman (Institute Director)
___2. Department Chairman or Institute Director
___3. Assistant or Associate Dean
___4. Dean
___5. Director (Coordinator) of (Please specify)_____
___6. Other (Please specify) _____
___7. None

4. Of your time devoted to only the following activities, approximately what proportion is devoted to each? (Do not list others; just indicate the proportions only among these.)

1. Classroom teaching (include preparation time and student advising). . . . . ___%
2. Research (include time spent preparing papers) ___%
3. Consulting (for the University and/or on a private basis) . . . . . ___%
4. University, College, Departmental, or Institute level committee work . . . . . ___%
5. Administrative duties (answer this only if you have a formal administrative title). . . ___%

TOTAL 100%

5. What is your highest degree? (Check one)

___1. Doctorate (or equivalent)
___2. Masters (or equivalent)
___3. Bachelors (or equivalent)
___4. Other (Please specify) _____

6. Where did you obtain your highest degree? (Check one)

___1. (This University)
___2. Other institution

7. In what year were you first employed at (this University)? ____

7A. Have you been continuously employed (no gaps of less than one year) at (this University) since that year? (Check one)

___1. Yes
___2. No → In what year was your most recent appointment? ____

8. On what time basis are you employed at (this University)? (Check one)

___1. Academic year (9 months)
___2. Calendar year (12 months)
___3. Other (Please specify) _____

9. During the present school year (September 1966 to now) have you been absent from the campus for 3 or more consecutive months? (Check one)

___1. No
___2. Yes → Which months were you gone? (Circle appropriate months)
Sept. Oct. Nov. Dec. Jan. Feb. Mar. Apr.

10. How many faculty or administrative committees do you belong to including both standing and ad hoc committees? (Indicate number in box)

____ 1. Departmental (or Institute) level committees

____ 2. College level committees

____ 3. University level committees

11. In an "average" month during this year, how many faculty or administrative committee meetings would you say you attended? ____

12. Do you currently have a joint appointment? (Check one)

___1. No
___2. Joint appointment with another department, institute, or office within the College of (---)
___3. Joint appointment with another department, institute, or office in another College.

12A. If you check (3) above, what actual proportion of your time do you spend in (this College)? ▱%

13. How many professional journal articles have you published (or had accepted for publication) and how many papers have you presented at professional meetings since September 1965? ▱ (Combined total)

14. How many books have you published, either as sole author (editor) or co-author (editor), since September 1962? ▱

PART II (YELLOW SHEET)

PERSONAL CONTACT CHECKLIST

Project Number 551A Deck Number 3 Subject Number ____

Now go back over the past two or three months and think of the professional people in the College of (---) with whom you have worked most closely. We would like to have you list below the names of the people in the College with whom you work most closely.

By "work with most closely" we mean the professional people with whom you usually have at least one contact per week on matters related to programs or activities of the College, or on teaching, research, or consulting in which you or the other person is engaged. You need only list people who are officed in (---) Hall.

By "professional people" we mean faculty with academic rank of instructor or higher and/or administrators.

For each of the individuals you list below, check how frequently in an "average" week you have contact with (talk to in person or on the phone, write) each of them.

Name as many or as few people as accurately describe your usual contacts.

(A) List the name of each person in the College with whom you work most closely.		(B) For each person listed, check the appropriate frequency column.			
		FREQUENCY OF CONTACT			
NAME	(Please print or write clearly)	Several times daily	About once per day	2 or 3 times per wk.	About once per wk.
1.	_____	____	____	____	____
2.	_____	____	____	____	____
.					
.					
.					
.					
16.	_____	____	____	____	____

PART III (WHITE SHEET)

INSTRUCTIONS FOR PART III

Completion of this part of the questionnaire will require you to work with the Personal Contact Checklist (Part II, yellow sheet). Please place it alongside this sheet for easy reference.

Clipped to this sheet are several separate Personal Contact questionnaires. At the top of each questionnaire are the words, "Name of Contact", followed by a blank space. Take the first questionnaire and, looking at the names listed on the yellow sheet, write in the blank space the name of the first person on your list for whom you have checked either "several times daily" or "daily" as the frequency with which you have contact with this person. Then complete the questionnaire keeping only that person in mind. The questions generally relate to your communication with that person.

Next, take the second questionnaire and repeat the above procedure; in other words, write in the blank space the name of the second person on your list for whom you have checked either "several times daily" or "daily", and then complete the questionnaire keeping only this second person in mind.

Repeat this procedure for each other person on your list for whom you have checked either "several times daily" or "daily" as the frequency of contact. Do not complete a questionnaire for anyone for whom you have checked any other frequency of contact column. There probably are more questionnaires than you need; if so, please return the unused ones along with the completed ones. If you need more Personal Contact questionnaires, please call me at (---) and I will immediately deliver more to you.

AFTER YOU COMPLETE a Personal Contact questionnaire for each person on your list with whom you have contact "several times daily" or "daily", insert Parts I, II, and all Part III questionnaires in the enclosed envelope, seal, and give to your secretary. I will pick up the packet from her.

Your cooperation and patience are greatly appreciated. Thank you.

NOTE: In the questions in each Personal Contact questionnaire references to "people (or faculty) in the College", or just to "people (or faculty)" should be interpreted to mean faculty with rank of instructor or higher and/or administrators.

PART III (WHITE SHEETS)

PERSONAL CONTACT QUESTIONNAIRE

Name of Contact _____
(Please print or write clearly)

Project Number 551A Deck Number 4 Subject Number ____

INSTRUCTIONS: Please complete this questionnaire in terms of the person whose name you have written in above as one with whom you have indicated contact "several times daily" or "daily" on the Personal Contact Checklist (Part II, yellow sheet). Keep only this person in mind when answering the following questions.

Work through these questions without dwelling on any one -- give your first impression.

* * * * *

1. Out of 100 times you might have contact with this person, about how many times would: (Fill in each blank)

   a. you seek him or initiate the contact (you go to see him, place the phone call, write). . . . ___
   b. he seek you or initiate the contact (he comes to you, places the phone call, writes). . . . . ___
   c. none of the above, we just happen to meet (Neither of us deliberately goes to the other.) ___

   TOTAL = 100 contacts

For each of the following five items, circle the number preceding one response for each item which best completes the sentence.

2. Considering the relationship I have with this person, when it comes to advice on matters related to teaching, research, or consulting, I depend on him:

   1. a lot more
   2. a good deal more
   3. a little more
   4. about as much
   5. a little less
   6. a good deal less
   7. a lot less

   } than (as) he depends on me.

3. During the discussions I've had with this person in the past week or so about activities, programs, or people in the College of (---), I asked him questions:

   1. a lot more often
   2. a good deal more often
   3. a little more often
   4. about as often
   5. a little less often
   6. a good deal less often
   7. a lot less often

   : than (as) he asked me.

4. When this person and I discuss activities of the College or any of its sub-units, usually he tells me:

   1. very many more
   2. many more
   3. a few more
   4. the same number of
   5. a few less
   6. many less
   7. very many less

   : things than (as) I tell him.

5. Across a number of contacts I may have with this person, I am:

   1. a lot more likely
   2. a good deal more likely
   3. a little more likely
   4. about as likely
   5. a little less likely
   6. a good deal less likely
   7. a lot less likely

   : to ask his opinions than (as) he is to ask mine.

6. In regard to <u>information</u> about activities and personalities in the College of (---), generally speaking this person depends on me:

   1. a lot more
   2. a good deal more
   3. a little more
   4. about as much
   5. a little less
   6. a good deal less
   7. a lot less

   : than (as) I depend on him.

Please evaluate this person as a source of information in terms of the following adjective pairs. Check only one of the seven points for each pair. For example:

Introverted				X				Extroverted

	Extremely	Quite	Somewhat	So, so	Somewhat	Quite	Extremely	
7A. Friendly								Unfriendly
7B. Informed								Uninformed
7C. Just								Unjust
7D. Experienced								Inexperienced
7E. Safe								Unsafe
7F. Trained								Untrained
7G. Cruel								Kind
7H. Skilled								Unskilled
7I. Qualified								Unqualified
7J. Honest								Dishonest

For the remaining, circle the number preceding one response for each item which best represents your reaction to the item.

8. As new developments occur in the College of (---), I usually "get the word" from someone other than this person.

   1. agree very strongly
   2. agree quite a bit
   3. agree moderately
   4. neither agree nor disagree
   5. disagree moderately
   6. disagree quite a bit
   7. disagree very strongly

9. When interacting with other faculty members in the College, this person isn't a very good convincer.

   1. agree very strongly
   2. agree quite a bit
   3. agree moderately
   4. neither agree nor disagree
   5. disagree moderately
   6. disagree quite a bit
   7. disagree very strongly

10. This person has access to individuals who are relatively high in the "power structure" of the College of (---).

   1. agree very strongly
   2. agree quite a bit
   3. agree moderately
   4. neither agree nor disagree
   5. disagree moderately
   6. disagree quite a bit
   7. disagree very strongly

11. Those individuals who have a lot to say about what goes on in the College respect the suggestions this person makes.

   1. agree very strongly
   2. agree quite a bit
   3. agree moderately
   4. neither agree nor disagree
   5. disagree moderately
   6. disagree quite a bit
   7. disagree very strongly

12. This person communicates with <u>very</u> <u>few</u> administrators and faculty members in the College of (---).

   1. agree very strongly
   2. agree quite a bit
   3. agree moderately
   4. neither agree nor disagree
   5. disagree moderately
   6. disagree quite a bit
   7. disagree very strongly

13. This person doesn't have much influence with the other people he works with in the College of (---).

    1. agree very strongly
    2. agree quite a bit
    3. agree moderately
    4. neither agree nor disagree
    5. disagree moderately
    6. disagree quite a bit
    7. disagree very strongly

14. This person works with people whose offices are located in several different areas in (---) Hall (different floors, different ends of the building).

    1. agree very strongly
    2. agree quite a bit
    3. agree moderately
    4. neither agree nor disagree
    5. disagree moderately
    6. disagree quite a bit
    7. disagree very strongly

15. This person works with faculty in the College of (---) who are "in the know" about what's going on in the College.

    1. agree very strongly
    2. agree quite a bit
    3. agree moderately
    4. neither agree nor disagree
    5. disagree moderately
    6. disagree quite a bit
    7. disagree very strongly

16. I see this person as a key figure who can support or block proposals made in the College of (---).

    1. agree very strongly
    2. agree quite a bit
    3. agree moderately
    4. neither agree nor disagree
    5. disagree moderately
    6. disagree quite a bit
    7. disagree very strongly

17. This person has access to more members of the faculty of the College of (---) than do most others in the College.

    1. agree very strongly
    2. agree quite a bit
    3. agree moderately
    4. neither agree nor disagree
    5. disagree moderately
    6. disagree quite a bit
    7. disagree very strongly

18. Those relatively high in the "power structure" of the College of (---) have been very receptive to this person's suggestions and opinions.

    1. agree very strongly
    2. agree quite a bit
    3. agree moderately
    4. neither agree nor disagree
    5. disagree moderately
    6. disagree quite a bit
    7. disagree very strongly

19. In any organization like this College, clique groups develop. Would you say that this person has contact with people in more or fewer clique groups in the College than do most other faculty members?

    1. very many more
    2. many more
    3. a few more
    4. about the same number
    5. a few less
    6. many less
    7. very many less

20. When you learn about some change or new idea being proposed or discussed in the College of (---) or any of its departments or institutes, how likely are you to hear about it first from this person?

    1. extremely likely
    2. very likely
    3. fairly likely
    4. about 50 - 50
    5. fairly unlikely
    6. very unlikely
    7. extremely unlikely

21. Would you say this person works with people in more or fewer different departments and administrative offices than most other members of the faculty in the College of (---)?

    1. very many more
    2. many more
    3. a few more
    4. about the same number
    5. a few less
    6. many less
    7. very many less

22. How important are the members of the College of (---) faculty with whom this person works most closely?

    1. extremely important
    2. very important
    3. fairly important
    4. so, so
    5. fairly unimportant
    6. very unimportant
    7. extremely unimportant

APPENDIX C

VARIABLE INDEX FOR

PART III - PERSONAL CONTACT QUESTIONNAIRE

Item Number(s)	Variable
1a, 1b	1. Directional ratio of deliberate message transaction initiation
1c	2. Frequency of deliberately initiated message transactions (100 - 1c)
2,3,4,5,6	3. Specific opinion leadership
(2,4,6)	a. a. Pretest Type I: Information-advice dependency
(3,5)	b. Pretest Type II: Asking behavior
7A - 7J	4. Source credibility
(7A,7C,7E,7G,7J)	a. Safety
(7B,7D,7F,7H,7I)	b. Qualification
8,20	5. First source of information
9,11,13,16,18	6. Diffuse opinion leadership
(9,13)	a. Type I: General persuasiveness
(11,16,18)	b. Type II: Persuasiveness within "power structure"
10,15,22	7. Importance of secondary contacts
12,17	8. Perceived number of contacts
14,19,21	9. Perceived structural diversity of contacts