COMMUNICATION ROLES AND COMMUNICATION CONTENT IN A BUREAUCRATIC SETTING

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ABSTRACT

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By

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The communication structure of an organization determines, in part, how organizational functions are carried out. This structure may be isomorphic with the expectations represented by policy documents and the organization chart, or may be sharply divergent from managerial expectations that decisional authority and communication centers should coincide. Knowledge of these relationships can be useful in system analysis and planning.

This study investigated the communication structure of the headquarters staff of a federal agency, disregarding formal channels or offices. Three content-functional areas of communication were examined: production, innovation, and maintenance.

Data were obtained by: (1) a Communication Questionnaire requesting a respondent to provide demographic and self-perception data on a number of communication-related issues; (2) a Personal Contact Checklist, in which a respondent indicated with whom and how frequently he communicated in each content-functional area; and (3) a Personal Contact Questionnaire, in which a respondent indicated

perceptions of a frequent communication contact--on the same issues about which he had given self-perceptions.

Analyses were conducted on the basis of reported reciprocated frequent contacts. Considering only reciprocated linkages, communication networks were constructed and two communication-functional roles identified in each content-functional area. Liaisons, defined as analogues to articulation points of graph theory, constituted the role of particular theoretic interest. Nonliaisons, who conduct most of their work communication in relatively stable cliques, were compared with liaisons on several dimensions.

It was predicted that liaisons would be perceived by their frequently-contacted nonliaison co-workers, and would perceive themselves, to have more: (1) communication contacts in the system; (2) generalized influence; (3) production-related information; (4) non-production-related information; and (5) potential control over the flow of work-related messages.

Other hypotheses predicted that liaisons: (1) who were seen as high in message flow control would also be seen as influential; (2) would perceive the organization's communication system as more "open,"; (3) would be more satisfied with communications from top management; and (4) would be more likely to hold formal supervisory office if identified in terms of production communication than if identified in the other functional networks.

Respondents were all of the professional-level employes on the agency's headquarters staff. This census made tests of significance inappropriate; therefore, a statistic was devised to control for

different response ranges from index to index and any difference as predicted was taken to support an hypothesis. A product moment correlation coefficient described the relationship between message flow control and perceived influence.

Twenty-one liaisons were identified in the production communication network, but only five for innovation and two for maintenance communication. With this imbalance, the relationship between formal office and the liaison role could not be tested directly. However, two-thirds of all liaisons were found to hold such positions.

Nonliaisons perceived their liaison contacts to have more communication contacts, more generalized influence, and slightly more production-related information. They also perceived liaisons to have somewhat more non-production information; however, liaisons held the same view of their nonliaison contacts. Liaisons were perceived to have more potential message flow control.

Liaisons seen as having high message flow control were also seen as higher in organizational influence. As predicted, liaisons saw the communication system as more "open," and were more satisfied with communication from top management.

The findings suggest that knowledge of liaison location should be important to management, since some were not in supervisory posts. Top managers apparently see production as much more important than innovation or system-maintenance functions, but there are cracks in the system. Inequities between transmission and feedback loops were described, with the implication that management might well give additional attention to the feedback process, upward and downward.

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CHAPTER I

INTRODUCTION

Theories of organization, as well as theories about organizations, consistently pay obeisance to the importance of communication in human social systems. Each theory, however, views the nature, functions, and effects of communication somewhat differently.

Two theoretical points of particular relevance to the analysis and design of social systems are role theory and systems theory. Roles designate positions delineated by sets of expectations and behaviors, whereas systems theory examines where roles occur and how they evolve in the complex of relationships that describe operating organizations. Cadwallader (1968: p. 438) notes:

> From the point of view of cybernetics, any large scale formal social organization is a communication network. It is assumed that these can display learning and innovative behavior if they possess certain necessary facilities (structure) and certain necessary rules of operation (content).

Historically, a more usual view of the organization is projected by the organizational chart; the hierarchy of positions, rights and functions implied by the "chart" view of social organizations tends to become reified together with an implied rigidity of communication channels. Buckley (1968: p. xxiv) explains the differences resulting when the organization is perceived as an open system:

> The dethronement of material substance as the only reality, the bedrock, has shifted the focus to the fact of organization per se as the more fundamental problem for study. This, in turn, means a shift from statics . . . summativity, and a one-way causality to dynamics, process, emergence, and complex mutual interactions and feedback cycles. It is not the nature of the parts alone that are basic to any whole, but the way they are interrelated that gives them their characteristic properties.

Thus, the bridge is made from a particularistic psychological view of single personalities in environments to the relationships among individuals or groups in varying social settings over time. The way is opened for consideration of the effects of structure upon organizational members and the effects of members upon structure.

Communication is seen by systems-oriented students of human interaction as the glue that holds social systems together. What is glued is roles, as Miller indicates (1955: p. 515):

> Communications make feasible complex organizations of systems. . . . A given individual or behaving subsystem can, of course, be part of several systems at once, equilibrating at least partially with all of them. To deal with this fact the concept of 'role' has been developed in social psychology.

Most of the research contributing theoretically or methodologically to the present study requires application of systems concepts and explication of role concepts.

Among the systems concepts of greatest relevance in terms of the present study are those of boundary and structure.

Boundary is usually defined by inclusion or exclusion of members, depending on the nature and level of inquiry into the system. A person may be a student--in a given discipline, at a specific institution, or a member of some other organization. In each instance the criteria for inclusion are different and therefore the boundaries are different.

Miller's description (1955: p. 516) is apt, for it introduces information into the criteria:

> How does one locate a boundary? . . . One decides upon the order of magnitude of difference in rate or exchange of information or energy which one will accept as indication of boundary.

In other words, boundaries are set somewhat arbitrarily, and are concerned with levels of permeability to information or other energy.

Structure, on the other hand, is seen as more specifically relational in nature. In Buckley's terms (1968: p. 493:

> Interrelations may be mutual or unidirectional, linear, non-linear, or intermittent, and varying in degrees of causal efficacy or priority. The particular kinds of more or less stable interrelationships of components that become established at any time constitute the particular structure of the system at that time.

Both of these concepts, structure and boundary, are central to the present study and its progenitors in method and theory.

Roles are important to the study of human social systems in that after identifying constituent elements of a system one can describe and analyze the multiple relational effects deriving from change in any of the elements. The "sent" and "received" roles postulated by Katz and Kahn (1966: pp. 174-182) in explicating organizational relationships are bases for human interaction in relatively stable collectivities. Jacobson, Charter and Lieberman (1951: pp. 18-27) suggest that analyses of role prescriptions, behaviors and relationships may enable researchers to predict attitudes, perceptions and behavior of system members, especially as these variables affect the success, failure, adaptability or rigidity of the organization. And they add (1951: p. 19):

> People in organizations tend to have relatively uniform expectations about the behavior of persons in various

> positions and the behavior of these persons is interpreted in terms of such expectations.

Roles are usually thought of in the formal context of office incumbents, because of the formulations of Weber and the establishment of bureaus in all political-social entities. Roles require that incumbents be responsible for agreed-on behaviors and that the relationships between roles be more or less stable--thus the ideas of structure and role are intimately related. Weiss (1956: p. 5) comments on this relative stability:

> The over-all system of coordinative relationships changes only slowly in the course of ordinary events, and it is in part this stability which is emphasized by the phrase 'operational structure.' . . . The segmented functional activities of an organization are integrated by means of the organizational structure.

One danger that inheres in viewing an organization as the network of social relationships that enable it to conduct its business lies in regarding the described relationships as the structure of the organization, or as the necessary conditions for survival. Such a view is particularly likely if one applies the concepts of biological systems uncritically to the socially contrived systems that we label organizations. As Katz and Kahn (1966: p. 108) conclude:

> Organizations are less integrated than biological systems; their patterns of cooperative interrelationships also represent constrained adjustments of conflict and struggle. . . . The implication of this model is that organizations are always in process of change and that the constancy is exaggerated by the fact that the verbal label for describing an organization remains the same even when the processes of organization do not.

A plethora of books and articles in the past few years purport to analyze organizations as open systems. Many seek enlarged application of

EDP and computer techniques to production information management; others are specific extensions of decision theory. Among the many the present author has examined, only Katz and Kahn integrate open systems theory, the study of human roles, and the functions of communication in organizations. These authors perceive the organization as comprising energic and information systems; the latter has the function of controlling the former (1966: p. 223):

> Communication--the exchange of information and the transmission of meaning--is the very essence of a social system or an oeganization. The input of physical energy is dependent upon information about it, and the input of human energy is made possible through communicative acts.

Despite an emerging realization that organizations consist largely of patterned networks and flows of communicative relationships (Dorsey, 1957), the bulk of research concerning organizational communication is not amenable to a systems approach.

Given the two aspects of organizational communication systems--structure and flow--the present study proceeds from the position that analysis of structure logically precedes analysis of flow. This approach might be seen as an analogy to a school building; the structure affects what will occur in the building, but is not identical with what will occur.

Therefore, organizational structure is examined from the point of view of communication linkages that members perceive concerning three aspects of their work environments: production, innovation, and system maintenance. The communication roles, or functions, are defined by the number, direction, and nature of communication contacts that a person has with other members of the organization. Different communication-functional roles are compared as to their occurrence in the three

content-functional categories, receipt of work-related communications, control of message flow, perceptions of communication climate openness, and satisfaction with the organization's management communication system.

The Stream of History: Previous Research

A common complaint by scholars who attempt to synthesize research about communication in organizations is that there is a dearth of studies of "live" organizations. Various rationales have been advanced, including the imprecision associated with field studies and experiments, the cost factors involved in constructing experimental organizations for study, theoretical constraints, and others. At the present stage of research development one probably could assemble a maximum of 100 studies whose findings are based on empirical data applied to message content, message flow, perceptual differences between individuals or groups in organizations, and role correlates. Much of this body of research is severely limited, given a view of organizations as open systems and the function of communication as being to explicate and facilitate relationships within or between systems.

One of the limitations is implicit in all organizational research--dependence upon theoretical views of man. The concern with communication in many settings emerged from an hypothesized Rational Man, while a lesser emphasis grew out of Marxist social economics.

The Models:

The "classic" theory, growing directly from Weber's analyses of bureaucracy (Weber, 1947), is also called the "machine" theory.

Its conceptual primogenitor is Adam Smith's Economic Man, who was aware of all relevant variables entering into any decision, and who rationally concludes all agreements to maximize his own best interests. In this approach to organizations, as Leavitt indicates (1965: p. 1146):

> One improves performance of tasks [the manager does] by clarifying and redefining the jobs of people and setting up clearly defined relationships among these jobs, with authority, responsibility, and coordination mechanisms spelled out.

A modification of this position is found in the work of such organizational engineers as Sayles (1958), who attempt to modify people by means of modifying work structure, in order to improve task performance. The assembly line is an example of such modification, designed in part to control the interactions of organizational members; machines determine how people will and/or may interact. A person is regarded mainly as a mechanism to be fed orders and directives; the single goal is efficient production.

A different theoretical position, but one which still limits the nature of research, is what Leavitt (1965: p. 1148) refers to as the "communication network"; it is based on laboratory studies of communication, structure, and task performance (Bavelas, 1950; Shaw, 1954; Mulder, 1960). In this model the communication structure is imposed upon the participants explicitly, being varied according to the nature of the task involved or the hypothesis being tested. The expectations of organizational behavior emerging from the many studies of this genre are that highly structured, centralized communication leads to more efficient production when the task is repetitive and relatively simple, but that a looser structure permitting wide use of a variety of channels

is more productive under conditions of uncertainty, or when tasks require creativity or are relatively complex.

Much alike, although not identical, are what Leavitt describes (1965: p. 1152) as the "people" and "power equalization" approaches:

> Historically, these people approaches moved through at least two phases. The first was essentially manipulative . . . How can we get people to do what we want them to do? . . . Moreover, much of the early work on 'overcoming resistance to change' was still responsive to the same manipulative question.

Later, he writes, other approaches to changing people who are in organizations were developed, but the emphasis remains on changing people first, then changing the organization.

Mayo's dedication to democratic ideals led to the Human Relations emphases concerning the effects of cross pressures upon employes and the importance of affect within formal social systems. It would be superfluous to summarize the Hawthorne Studies (Roethlisberger and Dickson, 1939) here, but it should be noted that through them a view of the worker evolved as <u>not</u> highly rational, <u>not</u> aware of all relevant variables, and possessed of a psychological approach to his "own best interests." Therefore, the Human Relations model suggests that more channels be instituted for upward, downward and lateral communication and that all employes be encouraged to use them. Research interest centers upon superordinate-subordinate relationships, primarily in psychological terms, and assumes a high value for what is described as "communication openness."

The "power equalization" approaches, largely identified with Likert (1961), have much in common with the Human Relations school,

but concentrate on the locus and level of decision-making. Participative management, in one form or another, is their hallmark. Multichannel communication is again called for, but more carefully controlled and with increased emphasis upon frequent measurement of the variables between system input and output.

The idea of an open system is not entirely exclusive of the concepts contained in the Human Relations and "power equalization" approaches; rather, it complements them by viewing each variable as interdependent with all others (Likert, 1961; Katz and Kahn, 1966; Cadwallader, 1968). Recent exponents of the systems approach, such as Blake and Mouton (1964), emphasize a pragmatic balance between concern for people and product, demanding evidence in either case for relationships between expenditure and organizational return.

The Research:

Where the point of departure for communication research is the "classic" model with its mechanistic assumptions, one may trace messages across hierarchical levels or test employe awareness or understanding of specific messages or classes of messages. Such experiments as Dahle's (1954) reveal that certain channel combinations are generally more effective and that certain material is more effective in one channel than in another.

Some studies associated with the "classic" model do attempt to relate the perceptions of one organizational group to the perceptions of another group (Odiorne, 1954), often concluding that a message-source's expectations about message effects are wide of the mark, especially when the characteristics of individuals in the groups are

different. Gustad's study of college faculties and staffs (1962) is cast in this mold and arrives at just such conclusions.

By combining scores into aggregate indices on some variables, Freshley (1955) is able to establish that there are separate, although overlapping, group and individual effects on attitudes supervisors hold toward the functions of communication in organizations. Blau (1960) carries this concept further by use of an analysis of variance technique, but still is constrained to the formal organization.

While Wickesberg (1967) addresses himself to analysis of "communication networks," his assumptions and method do not permit him to specify network membership or the relationships between certain organization members. Two of his findings are significant in the present context: a majority of his respondents reported themselves as concerned mainly with a single functional type of communication; and Wickesberg (1967: p. 257)[1] noted that "individuals move wherever in the organization advice, counsel, information and expertise may be found." Communication roles are explicit in the first finding and recognition of informal communication's role in task attainment is implicit in the second.

Distortion of upward communication is probed in Read's (1962) study of supervisors in a large commercial organization. He establishes that upwardly mobile executives, and those who don't trust their supervisors, filter information in special ways as they report upward. In

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1. Wickesberg considers: information transmission, instruction, problem-solving, approvals, and "scuttlebutt."

similar vein, Triandis (1959a, b) explores the relative effectiveness of communication in boss-employe pairs when their cognitive orientations are similar or disparate, finding greater effectiveness when they think alike about jobs and people.

Another View--Systems

The studies enumerated share two kinds of theoretic and methodological limitations in not adapting to the structural and processual aspects of systems theory. Specifically, they encourage the researcher to conceive of spearate or separable organizational components, usually to be separately analyzed. The theoretic approach advocated in the present study avoids some of the former class of limitations and sets the stage for treatment of the latter class.

In part, these limitations may be attributed to a lack of familiarity with concepts of relationality in communication. When one moves from the molecular "member" level to dyads, triads, groups, or whole organizations as units of analysis, and when one is concerned with the relationships among the units or their members, then the ways in which data are gathered and the questions to which analysis is applied in the cited studies will not provide relevant observations.

Among the clearest exceptions are those studies in whose tradition the present investigation follows. Research in the machine theory tradition conceives of communication between formally prescribed roles, and asks questions about communication between or among classes rather than among relatively role-free individuals. The sociometric approach applied to organizational communication by Jacobson and Seashore (1951)

permits roles to emerge from process, in terms of some set of operating functions rather than by fiat. In short, this organizational model assumes that an adequate description of communication relationships--hence of organizational structure--will not emerge when only formal relationships or positions are considered. It suggests defining "what is" by inquiring how people perceive that they communicate.

Organizational roles are constructed from the resulting networks of relationships, whereupon they may be compared with formal roles or personal or group attributes. Thus, one may generate hypotheses that probably will not be derived from other procedures.[1] This view is systemic in that it requires the researcher to focus on some of the variables that Cadwallader (1968: p. 439) posits as the thrust of cybernetics:

> A cybernetics model would focus the investigator's attention on . . . (1) the quantity and variety of information stores in the system; (2) the pattern of the subsystems; (3) the structure of the communication networks; (4) the number, location, and function of negative feedback loops; . . .

When one begins to examine networks and patterns, the nature of the research problem is changed from that posed by the machine theory. The concepts from which data are obtained, as well as the application of analyses that may be performed, are different.

Structure and Flow:

Before we examine methods as they apply to analysis of communication in organizations, we must define structure and flow as aspects of such communication.

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1. Selltiz, et. al., (1959) present a three-step approach to social research: (1) explore the system to provide empirical bases for other research; (2) describe the system and define its characteristics; and (3) test hypotheses generated by the first two steps.

When an attempt is made to identify the "structure" of communication relationships in a group, a formidable task is encountered: how to separate structure from process in a living system (Schwartz, 1968: p. 21). Although this appears to be a standing problem in organizational communication research, Etzioni (1961: pp. 137-141) provides a point of entry:

> A number of studies relate the amount and nature of communication flow to structure of organizational units. . . . Organization is pursued in the social organization tradition; and structure comes close to what we call communication networks. [Italics mine.]

Yet another approach to defining structure in terms of communication is made by Dorsey (1957: p. 84), who sets forth the basic elements of his network model:

> The net . . . consists physically of a complex of decision centers and channels which seek, receive, select, transmit, subdivide, classify, store, recall, recombine, and retransmit information. . . . The net is formed by the arrangement of decision centers and channels into subsystems or patterns of varying degrees of stability. . . . Action of the net is the manipulating and processing of information. . . . [Italics mine.]

Schwartz (1968: pp. 8-16) adds to the network view of organizational communication, commenting on the positive function of regarding communication networks, first, without regard to the formal constraints of authority, prescribed function, or spatial relation. In other words, he would observe behavior or obtain reports of behavior from organization members, and use the data to construct a "map" of the organization. Only after determining how people do interact would he consider normative or prescriptive variables. The sociometric questions asked in the style he (and the present study) follows permit construction of a more complete map of communication relationships than is possible with those asked in the studies considered on pages 14-18 below.

Structure enters into the conceptualization of communication flow by defining the position at which a message transaction takes place. It is prior to process. The methods for delineating flow are different from those most useful in making clear the communication structure of a social system (see below).

Structure, then, will be taken to mean the functional relationships among discernible parts of a system (Miller, 1965a: p. 349). Flow refers to the movement of messages through channels in the organization, emanating from and directed toward role-positions. Structure is investigated in the present study; flow is not, although one study discussed here provides a partial "map" of communication flow.

Data Gathering:

One may compare several methods as they apply to the explication of structure or flow.

Several observers have commented that the technique of the sample survey is not well suited to the study of organizations, for surveys "atomize" the system into supposedly independent elements by more or less random selection of observation units, ignoring the social context that is central to the concept of "organization" (Blau and Scott, 1962: p. 18; E. Katz, 1960: p. 439; Schwartz, 1968: pp. 9-10). Perhaps the clearest statement of the problem is made by Coleman (1958: p. 28):

> The individual remained the unit of analysis. . . . The very techniques mirrored this well: samples were random, never including (except by accident) two persons who were friends; interviews were with one individual, as an atomistic entity. . . . As a result, the kinds of substantive problems on which such research focused tended to be problems

> of 'aggregate psychology,' that is, within-individual problems, and never problems concerned with relations between people.

While a type of survey instrument is applied in the present study, the interpersonal behaviors elicited are such that they show the relationships among people and form a base for the study of message flow and the generalized process of formation, maturation, and disintegration of centers of communication.

The strength of statistically valid samples is that they enable the researcher to generalize beyond the limits of the cases involved. When one observes a non-random sample of members of the social unit, findings may be discussed only in terms of that unit; to generalize would require that the social units serve as entities to be sampled, just as people or households are sampled in survey research.

This illustrates the peculiarity of the present approach to organizational research. To describe the communication structure of a small or medium-size organization, one must conduct a census of the members. Such a method of "sampling" imposes limitations on data handling and on size of organization studied, because of the cost to observer and observed. One may use snowball sampling (a form of cluster sample) when the population is large enough, but to date little or no use of such techniques has been reported in organizational communication research. It would require selecting a random sample of respondents, determining their communication contacts, and then "mapping" the communication structure for each resultant cluster of respondents.

Other methods for selecting units of observation have been devised to describe the structure and flow of communication. Schwartz summarizes

the field well, describing how he approached the selection of a research tool (1968: pp. 8-9):

> Four general data-collection methods appear in the literature: (1) sociometric techniques (e.g., Jacobson and 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 period of time (e.g., Burns, 1954), and (4) timed random sampling of messages (e.g., Hinrichs, 1964). . . . Problems in operationalization due to content heterogeneity and noncontinuity of transaction are inherent in each method.

The movement of messages probably has been analyzed most thoroughly by Davis (1953a, b), who devised a research tool labeled Episodic Communication Channels in Organizations (ECCO) to trace the diffusion of specific messages through the target population. By studying the paths of a sufficient sample of messages, the researcher can determine the stability of routes followed and can infer a partial communication structure (as it relates to the message sample). The description of flow is more surely established than the nature of structure by his techniques. Other problems arise with this approach: the method by which messages are generated, and protection from premature diffusion are among them. Davis does not describe clearly how the insertion point is determined for messages--a situation which would be ameliorated were the full communication structure first elucidated, together with its emergent communication-functional roles.

Communication logs have been used in several studies (Burns, 1954; Walton, 1962; Farace and Morris, 1969). The method consists of having the subjects maintain running records of all their communication contacts over some period of time. The contacts can then be mapped to indicate

the total network of relationships. Obtrusiveness is one major weakness of the method: respondents may tire of maintaining the logs for extended periods, and the act of record-keeping may affect communication, depending on the setting and the communication content.[1] Of lesser concern is sample adequacy when messages are considered as units, for there are several available means to randomize at the message, individual or time period levels.[2]

Because of the limited "map" of communication structure produced by ECCO, and because of the cumbersome nature and obtrusiveness of the communication log approach, the present investigation turns to other sources for a research tool.

The remaining techniques that appear to be applicable to groups of a significant size lie in the field of sociometry as modified from Moreno's use of affective choices to a wider range of application (Torrance, 1955). This mode of describing the communication structure of an organization permits the use of several manipulative and statistical techniques falling under several theoretical orientations.

For the purpose of the present study, the "connectedness" of system members (Festinger, et. al., 1950; Milgram, 1969; Shotland, 1969;

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1. Early in 1969 the U.S. Attorney General proposed that government attorneys keep minute-by-minute logs of their communication activities, as a "time-budgeting" device; the resultant outcry concerning invasion of privacy squelched the plan. Similar objections were raised by a small number of respondents during the Farace-Morris study of a Residential College, in which the present investigator took an active part.

2. One suggestion is to use small radio receivers, such as hospital staffs commonly wear, to signal when interactions should be recorded. Without some "cueing" method, there is danger of encountering respondents who let contacts "pile up" for a period of time, attempting to remember times and details; Burns experienced difficulty in this way with one executive in his study.

Guimaraes, 1969) will not be pursued. While these studies do address themselves to the communication structure of social systems, they concentrate on multilink potential influence channels inappropriate to the present concerns, such as communication-functional roles. Rather, concepts of separation, of network decomposition, are used to form the bases for identification of communication roles.

Using sociometric techniques, Jacobson and Seashore (1951) have investigated the use of communication relationships to define organizational structure and to assess communication's effect on the attitudes and behaviors of members. Weiss (1956) is more interested in defining the structural and functional aspects of the over-all organization. Jackson (1959) takes "social worth" as his principal substantive concern, utilizing several of the techniques initiated by Jacobson and Seashore. Marvick (1958) chooses to examine the importance of consensus among organization members as to the perceived "power centers" of the organization, and the implications those perceptions have for the output of the organization.

Schwartz (1968) follows the Jacobson, Seashore, and Weiss leads in describing three communication roles defined by communication contact--liaison, nonliaison, and isolate. He then delves into some liaison role attributes in one organization, testing a series of hypotheses about the salience, power, and communication functions perceived in incumbents of the role.

Each of these sociometrically oriented studies asks a variant of the question, "To whom do you talk about ---?" Given an individual's responses, his communication contacts can then be counted. By analyzing

reciprocated contacts, and questions asked about them, one can determine direction of initiation and influence and confirm the respondent's perceptions of dyadic interaction. When people are grouped according to the nature of their communication contacts, then the correlates of such "groupness" can be examined and the linkage points between groups can be specified. These procedures will be followed in the present study.

Communication Structure--Report and Observation:

Communication is behavior, often the only behavior that can be observed to assess attitude, attraction and other internal-state human conditions. But investigators are limited in how they may obtain communication data. Redding (1966: p. 78) lists the following ways of describing a specific communication event:

> (1) The event as perceived by the sender,
>
> (2) The event as perceived by the receiver,
>
> (3) The event as perceived by some third party, acting as a disinterested observer,
>
> (4) The effect of the communication event [often through other perceptual reports], and
>
> (5) The degree to which senders and receivers . . . report satisfaction with the given communication event or program.

While one might add a sixth mode, agreement between participants that a certain communication event occurred, the common thread remains perception. Burns (1954) commented that his respondents reported what they thought they were doing, and Katz and Kahn (1966: p. 177) state the situation even more generally:

> In the immediate sense, the individual responds not to the objective organization . . . but to that representation of it which is in his psychological environment.

One may assess perceptions by more than one method for a single event, attempting to increase response validity. Fortunately, there is other evidence of the reality of the perceptual report. Goetzinger and Valentine (1962) tested communication log reports against direct observation of respondents and found "satisfactory correlation." Summarizing several other studies of the relationships between the reported and the observed, Videbeck and Bates (1959: p. 7) write:

> Gibb cites two studies in which group member identifications of leaders are substantially comparable to identifications made by independent observers. Bates and Cloyd found that the 'ranks of members based upon the volume of interaction as recorded by the Bales method and rank orders derived from summarized ratings of group members' correlated within the range of .88 to .94.

On the basis of such evidence the present investigator assumes that respondent reports of communication contact, when reciprocated or validated by other reported data, are sufficiently reliable for the analyses intended.

Dimensions of Relationships:

Since the systems approach to organizational communication avoids initial consideration of hierarchy, concepts such as upward communication, downward communication, diagonal communication, and lateral communication lose much of their meaning. A complete model of a communication system would have several dimensions. One provides a trace of a single dyadic relationship; for more than two people, two dimensions are required for a record of contacts. Schwartz (1968: pp. 20-21) suggests that

member attributes would comprise a third dimension. Time would be a fourth permitting the description of process.

An electronics technician can read a wiring diagram and decipher the channels that energy must follow, the capacity of each channel, the amount and location of resistance and other characteristics of the system represented. He can predict the system's operation. In a similar manner the communication researcher attempts to construct a "map" which may be interpreted to show the presence or absence of communication contacts between system members in dyads, in groups, and as a total system. He hopes to observe the direction of communication flow, its frequency and content, and other relevant information. In each case he assumes some system stability, so that he can predict the system's operation within some limits.

If the communication structure is as stable as Weiss and others (see page 4) suggest, the map provides a descriptive base from which other analyses can proceed. If the structure changes over time (see page 5), then some method for detecting and measuring the significance of the change should be employed. One can detect the change, but at this time one cannot accurately assay its significance.

To illustrate, consider a hypothetical case. A group of ten people is questioned at Time 1 and again at Time 2 to determine their communication relationships. On the basis of the members' responses, a two-dimensional map is drawn, showing who communicates with whom. The two maps are different, so the investigator asks whether they are variants of a single network or constitute two networks.

Again, consider the same group, measured at Time 3 and at Time 4. In this case, however, the map appears not to change. Then the

investigator finds that between Time 3 and Time 4 several group members left and were replaced. Is the network the "same" for the two measurements?

Today we have neither conceptual nor mathematical means to answer these questions satisfactorily. We can say that the two groups are different, or that a group does change over time, but we cannot express the statistical significance of the changes. The crux of the statistical problem is that we have been unable to assess the probabilities that each person will communicate with each other person in a social system, and therefore have not derived a theoretical distribution to use in applying known tests of difference (Davis, 1953a, Lingwood, 1969).

If the initial purpose of mapping relationships is to define structure through reports of communication, then a practical solution is suggested by Thayer (1967: p. 67);

> If the individual is viewed as a complex information processing system, research on human behavior in organizations could be based on 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.

Sociometric techniques offer a means to operationalize the "information vector"--and through them to define the communication-functional roles.

When one considers the role-types that may be functional for such an analysis, there are several choices. Walton's Magnetic Centers theory (Walton, 1962) of organizations has appeal; however, the idea that some members of a system have "magnetic" qualities that draw communication to them has an unnecessarily teleological quality. While Davis' ECCO (David 1953a, b) technique charts the paths of messages, it places a considerable burden upon the investigator, who must infer the larger communication structure of the organization.

The technique and assumptions introduced by Jacobson and Seashore (1951), and developed by Weiss (1956) and Schwartz (1968), present both structure and a means for identifying communication roles in a straightforward manner. The present weakness of this approach, as discussed above, lies in an inability to specify the significance of change in a network or of the differences between networks--a weakness shared by the other methods as well. Nevertheless, it offers a "gestalt" that makes it appropriate to the concerns of the present study.

Given the nature of sociometric techniques and the concept that communication linkages can be used to define organizational roles, one may then delimit the interpersonal subsystems more specifically. The next chapter is addressed to that task, as well as to presenting a rationale for hypotheses about communication-functional roles.

CHAPTER II

RESEARCH CONTEXT AND HYPOTHESES

The present study has three purposes. One is to extend description of the liaison role beyond previous research. Another is to compare perceptions of organizational communication climate held by occupants of different communication-defined roles. The third is to begin consideration of some relationships between communication content and communication networks.

Correlates of membership in an organization are examined by Piper (1968), who establishes a set of contacts for each individual observed and applies tests of difference to the perceptions of ego and alter. Cognitive correlates of formal position in organizations are described by Blau (1960), Triandis (1959a, b) and Zajonc and Wolfe (1963). However, there is little research evidence on roles as defined by communication contacts.

If formal roles affect perceptions and perceptions affect behaviors, then roles defined by communication contacts may exhibit similar differences as evinced by the occupants of formal positions. That is, liaison persons might hold one view of "climate," of communication effectiveness, and of the loci of influence in the organization, while nonliaison persons hold a divergent view.

Three communication-functional roles have been defined: however, the limitation is neither conceptual nor methodological. Jacobson and

Seashore (1951: p. 33) take the existing communication structure as an underlying concept for the description and analysis of complex groups:

> '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.

This view is compatible with the open systems concepts enumerated by Buckley (1968), Cadwallader (1968), and Miller (1959).[1] It is further elaborated in the methodological study conducted by Weiss and Jacobson (1955: p. 662):

> An organization's structure reflects the coordination patterns within it, and its analysis and description is essential to the understanding of the division of labor, the communication processes, and the adjustment and growth mechanisms of the complex unit.

The same authors (1955: p. 662 fn), "on theoretical, intuitive and practical grounds," believe that it is more useful to define groups by their distinctiveness or separateness than by indices of cohesion or potential communication contact, when the goal is to describe an organization comprising two or more groups. Rossi (1966: p. 200) makes a further distinction between these approaches to group definition. The interpersonal environment, he relates, is "the set of stimuli presented to an individual by those persons with whom he is in contact on a direct and unmediated basis," a set of forces acting on the individual in a collectivity. Therefore, Rossi eschews potential contact as the basis for group definition, as does the present investigator.

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1. See pages 1-3, above.

Several researchers have addressed themselves to the study of the occupants of "linking" roles in organizations. Davis (1953a, b) labels them as "liaison" persons, but fails to operationalize the term by procedure or location. Walton (1962) describes "magnetic centers" to whom communications are drawn by characteristics of the occupants. Ross and Harary (1959) go beyond the liaison-nonliaison-isolate trichotomy derived and developed by Jacobson, Seashore, Weiss and Schwartz, to conceptualize and describe linking agents who strengthen or who weaken organizations in which they are found.

Rationale for Components in the Present Study

The methods developed by Jacobson and Seashore (1951) and Weiss and Jacobson (1955) enable an investigator to relate sociomatrix (sociometric matrix) data to functional processes in the organization being studied. The form of matrix analysis suggested by Forsyth and Katz (1946) and Festinger (1949) provides a graphic representation of binary-coded contact data (only two entries may be made: "1" = contact, and "0" = not-contact).

In decomposing the matrix into its structural components, a set of concepts is applied to identify and to explain how to derive the components (Weiss and Jacobson, 1955: pp. 663-664):[1]

> 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 contacts between groups).

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1. For a detailed explanation of these concepts and how to apply them to data in an organization, see Weiss (1956: pp. 88-108).

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 otherwise would be classified as separate work groups.

The term work group is not exactly accurate, as applied in the present study, and also could be confused with the formally-established work groups in an organization. Clique is a possible alternative, but the literature relating to interpersonal relationships about work matters is virtually unanimous in using group rather than clique. Therefore, the reader is cautioned that work group does not here possess all the attributes proposed by Shepherd (1964: pp. 1-7) and others, but does possess most of them.

The roles defined in the present study are not dependent on the organization chart. While it is expected that groups as defined by communicative interaction and by the organization chart will overlap, and that some liaison persons will be predicted by the formal structure, that is not a requirement. Describing the loci of liaison persons in a government research agency, Jacobson and Seashore (1951: p. 37) report that they are found "at all status levels in the organization." Among the possible explanations for disjunction of the formal roles or groups and those which are communication-defined would be the existence of a kind of "system openness" that encourages members to deal directly with whatever individuals or groups are found to be functional for job accomplishment.

Jacobson and Seashore define work groups (communication cliques) in terms of communication contacts alone. Schwartz (1968: p. 23) adds

that work groups are separated into segments of the larger organization by means of removing liaison persons from the sociomatrix.

Work groups have been defined differently. Festinger, et. al. (1950), require completely interconnected triadic relationships as the basic units of their groups.[1] That is, each member of a triad must have a relationship to each other member. The task-space analyses conducted commercially by the Herman Miller company[2] are also based on the completely connected triad, but permit lower contact "saturation" in larger groups. Another possibility is to define boundaries by a ratio where in-group choices exceed the out-group choices. The present study follows the procedure established by Weiss and Jacobson, identifying the work group (communication clique) as a matrix segment in which no member has more than one nonliaison contact outside the segment.

The liaison person, here defined as having at least two contacts in work groups (cliques) other than his own,[3] is conceptually different from the contact between groups. Weiss and Jacobson explain (1955: p. 263 fn):

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1. Since they are concerned with other relationships than communication about work, clique is the appropriate term.

2. Members of the Herman Miller, Incorporated, research division discussed their concepts and matrix programs with members of the Michigan State University Psychology and Communication departments on May 12, 1970. It may be noted that set is used in the company's research lexicon much as Jacobson, Seashore, et. al., have used work group.

3. Piper (1968) and others use single links to locate liaison persons. For this reason, and because of less rigorous means of partitioning groups, they experience difficulty in defining either the liaison role or unambiguous groups.

> These concepts correspond in many respects to the concepts of articulation point . . . [and] bridge . . . in the mathematics of graph theory. The concept of separate work groups corresponds to the graph theory concept of component.

It is a dictum of decision theory that decision centers should coincide or be conjunctive with communication centers. A major function of the liaison role logically seems to be that of relating important components, however defined. Ross and Harary (1955: pp. 257-258) comment on the importance of the liaison role:

> Positions in an organization which appear as articulation points in the graph of the organizational structure may be viewed as having special static and dynamic properties. From a static viewpoint, a liaison person is crucial because his loss destroys the connected unity of the organization. Thus an organization or other structure is most vulnerable at articulation points.
>
> 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 of the entire organization.

It is obvious, then, that the liaison person is a communication channel or relay point between at least two groups (cliques). Jacobson and Seashore (1951: p. 37) add a stroke to the picture of this role, noting that liaison persons have "many, frequent, reciprocated, and important contacts that cut across the contact group structure."

There are other links between groups, however. A <u>single contact</u> (between groups) corresponds to a <u>single bridge</u> in graph theory, and a <u>double contact</u> (two people have contacts with another group) is analogous to the <u>double bridge</u>. Perhaps these relationships can best be seen in diagram, as Weiss (1956: pp. 88-89) describes them:

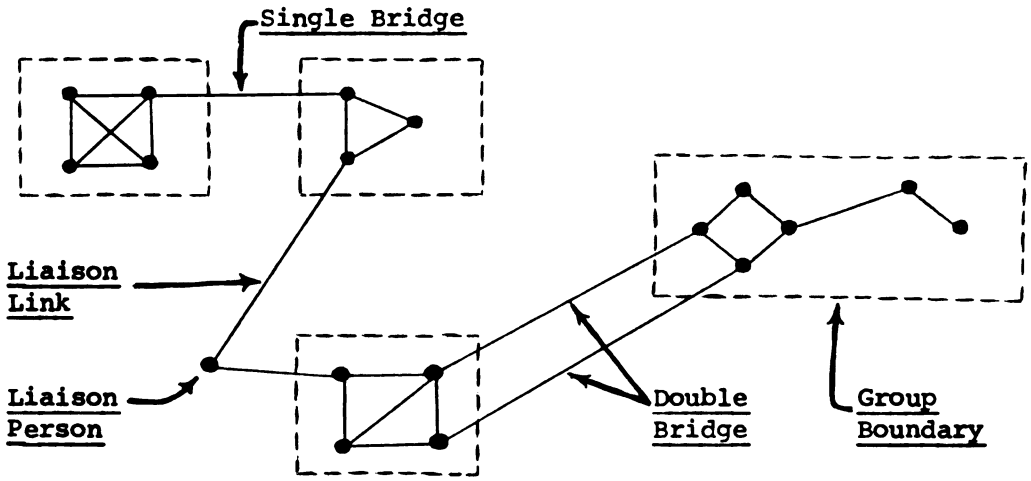

Figure 1: Graph Theory Concepts.

There is a problem, in the case of multiple bridges, of determining whether certain configurations are separate groups connected by bridges or are loosely connected single groups. The solution is idiosyncratic, i.e., the investigator must set some maximum group size based on other considerations, or must apply some ratio of in-group to out-group contacts in order to define boundaries.

The liaison person may be a group member--except for liaison contacts have most of his contacts with one group--or he may not be a member of any regularly defined group. Weiss and Jacobson (1955: p. 666) describe their classification system for liaison persons:

> Tentative liaison persons, whose frequent contacts were all with one of the separated groups, even though some of them were not reciprocated, were considered to have membership in that group. . . . One third of [the total number of the] liaison persons had many contacts with each other and few with any single work group. They were characterized as a liaison set. The rest of the liaison persons were assigned to the primary work groups in which they had frequent contacts as liaison group members, or remained as liaison individuals.

The member of a group who is not a liaison person is termed a nonliaison group member. Jacobson and Seashore found that twenty per cent of their subjects were liaison persons, and that all but one of the others were nonliaison group members. Schwartz, on the other hand, found that fifteen per cent of his subjects were liaison persons, thirteen per cent were isolates, and most of the others were nonliaison group members (there were two nonliaison individuals).

The single isolate found by Jacobson and Seashore was a visitor to the organization; those found by Schwartz were predominantly in similar categories--temporary staff or visitors. Strictly applied, the isolate concept means that a person neither chooses nor is chosen; practically, it is more useful to apply the label to individuals who have few, infrequent, unreciprocated contacts--in the nature of those persons whom Walton (1962) defines as peripherals. Given the stricter definition, one might assume that in a mature organization there would be few if any isolates.

The Content of Communication

Just as Wendell Johnson (1943) observed that "You can't write writing," so it is that a person in an organization must communicate about something. Jacobson and Seashore ask subjects to review in memory the past two or three months, to think of the people with whom they have communicated, and then to name those people. In addition, they ask about the subject matter involved, communication frequency, and importance of contact. Schwartz (1968: p. 180) approaches the matter in similar fashion, asking for reports on people "with whom you have worked most closely. . . . Check how frequently in an average week you have contact with (talk in person, phone, or write) each of them."

One suggestion arising from Schwartz's study is that the reported communication structure might be different if the nature of communication to be reported on were more explicitly described (Schwartz, 1968: p. 150):

> Rather than a general work-related criterion, data based on more specific types of information may reveal transaction initiation differences which were masked in the present study.

While Davis (1953b) states that different liaison persons emerge for different content areas, reports on his ECCO research do not indicate either the sample-base of messages or the selection process used to identify liaison persons. Wickesberg (1967) also notes that most of his 93 respondents function mainly within single content areas.

Given these findings, it is surprising that later research has not tested content category systems in field studies. There is no dearth of proposals. Guetzkow (1965: pp. 542-550) discusses experimental approaches to communication in networks, suggesting five content categories for such transactions: authority, task-expertise, status, information, and friendship. Katz and Kahn (1966: pp. 39-47, pp. 239-241) offer two categorizations. The more general is based on Parsonian concepts and presents a set of five types of organizational subsystems: production, support, maintenance, adaption, and management. The second concerns superior-subordinate communication: Job instructions, job rationale, procedures and practices, feedback, and indoctrination of goals. Referring to the former of these Katz and Kahn taxonomies, Schwartz (1968: p. 8) suggests attaching communication content to each system and then trying to extract the relevant communication networks.

Schwartz's study, however, describes a communication network (structure) in generic terms (1968: p. 12), i.e., he looks toward a record of all message transactions that occur between all organization members, regardless of the frequency or content of those messages. While he comments that separate content categories might yield separable communication networks, with overlapping membership across substructures of the organization, he does not test the proposition. Instead, he concludes that "procedures yielding a best-approximation of extant communication structures represent an improvement over previous research strictured by the machine theory conceptualization."

Two classifications with fewer categories are offered. Thayer (1967: pp. 94-96) proposes three information systems: operation, regulation, and maintenance-development. Similar in maintaining the simplicity of three categories, but appearing to be somewhat more inclusive, is a suggestion made in a recent essay by Berlo (1970: pp. 8-11):

> There are three classes of uses that people make of communication: production, innovation, and maintenance of the social system in which communication occurs. . . . I am suggesting three kinds of functions: getting a job done (productivity), exploring new behavioral alternatives (innovation), and keeping the system--and its components--functioning (maintenance).

The present study attempts to operationalize Berlo's three content areas, assuming that they present members of an organization with a meaningful and relatively inclusive way of looking at their communication within the system.

Berlo does not contend that a transaction is likely to be concerned with only one of the categories--quite the contrary. For present purposes, however, the requirements of isolating communication structures in terms

of content demand an artificial separation. One must keep in mind throughout the ensuing discussion and analysis that any single communicative act may include elements of any or all of these categories.

Elucidating his concepts, Berlo equates production communication with "an instructional pattern and a review procedure to insure compliance with a predetermined position." It is, he says, the mechanism of control, involving the giving and taking of orders and more than a trace of persuasion. Innovation, on the other hand, shuts out consideration of predetermined positions, inhibits habitual methods of thought and action, and searches for the unique or untried.

Maintenance communication is different from the other categories both substantively and conceptually. For one thing, production and innovation systems often have maintenance subsystems built into them. More crucial, however, is the nature of the concept; in Berlo's framework, maintenance includes establishing and changing concepts of self and other, and the generation and control of rules for interpersonal relationships.

In addition, he observes, each participant must determine in each communicative transaction whether control, search, or maintenance are relevant to his needs and purposes, and what his responsibilities toward it are in relation to those of the other participant(s).

The present study cannot accomodate all of the dimensions of the maintenance modality as described above. Rather, it takes maintenance to "mean" primarily the establishment and management of interpersonal relationships and socialization as to the "rules about the rules" of an organization.

Variables and Hypotheses

The variables selected are directly related to communication behavior in organizations. They will be reported as the perceptions of respondents about their own attributes and as the perceptions that respondents have of other members of the organization. In each instance where a person acts as an informant about another person, the two must agree that they are in direct contact. Where, however, a person reports his perceptions of himself or of organizational attributes, such agreement is irrelevant.

Since structure, rather than flow, is investigated in the present study, data may be gathered at one point in time. Causal statements cannot be made, although perceived differences in the behavior of individuals and groups will be used to describe the organization's communication structure.

The variables will be treated as members of the following variable-classes: (1) perceived interpersonal communication behavior; (2) perceived influence in the work group; (3) perceived degree of control over messages; (4) perceived openness of the organization's communication system; and (5) reported member satisfaction with the organization's communication system. A sixth variable-class concerns network differentiation by message content.

The first five hypotheses, below, are directly related to the first purpose stated for the present study, positing correlates of the liaison role in a formal organization. The final three hypotheses are devoted to aspects of the second stated purpose, that of comparing organizational perceptions held by occupants of different communication roles. Network differentiation is explored rather than tested in this study.

Communication Behavior and Personal Influence.--One of Schwartz's initial findings (1968: pp. 122-123) is that the professional staff of a college within a university recognize those persons who have more--and more structurally diverse--communication contacts than other persons in the organization. The staff also perceive liaison persons to have more influence than other members have over the "power structure" of the college. Walton (1962) hypothesizes that Centrals differ from Peripherals in having more power, authority, and expertise--and supports these predictions. While it seems clear that nonliaison members recognize these characteristics, communication role research to date has not examined self-perceptions of liaison roles.

If the role is understood by others even though they do not know the term, then the liaison role may also be understood by its occupants. Indeed, one reason for becoming a liaison person may be that such a person is active in seeking out other people in order to request and give information or advice.

H1: Liaison persons perceive themselves to have a greater number of communication contacts than nonliaison persons have.

H2: Liaison persons perceive themselves to have more influence in the organization than nonliaison persons have.

The Weberian view of formal social systems implies that liaison persons will have more work-related information than nonliaison persons have, since this approach to the concept of hierarchy includes the assumption that supervisors know more than their subordinates about the tasks and techniques attendant on group goals. The Walton finding on expertise of communication Centrals supports this position to some degree.

It is proposed here that high information level about task-related communication content is a facet of expertise.

If a liaison person seeks the role, he should perceive himself as having such information. Thus, two hypotheses may be stated relative to role positions:

H3: Nonliaison persons perceive liaison persons to have more production information than nonliaison persons have.

H3a: Liaison persons perceive themselves to have more production information than nonliaison persons have.

There is little empirical basis for predicting the distribution of perceptions about innovation or maintenance communication in organizations. However, if communication serves social-emotional needs as indicated by Bales (1958) and others, then liaison persons may be expected to have a wider access to information than indicated by the statement of Hypotheses 3 and 3a. Katz and Lazarsfeld (1955: pp. 113-114) report on the generality of the role:

> Strategic social location seems to lead to a key communication role. Thus, 'centrality' tends to be the most significant location. . . . An important clue to the discovery of significant points of interpersonal communication is tied up with the idea of location within a group structure.

Liaison persons, by definition, are "central" between groups if not within them. In such positions they are exposed to more information from more varied sources than are their workmates. For example, Becker (1970: p. 268) considers the communication position of initial adopters of innovations in social units:

> Most investigations are able to show that opinion leaders utilize a greater number of outside-the-group sources of information about new things than do their followers.

If liaison persons are central between groups, and if being in a central position means that the occupant has more organization-relevant

stimuli impinging upon him then such persons should be centers of a broad range of information. Again, one may compare the perceptions held by liaison and nonliaison individuals.

> H4: Nonliaison persons perceive liaison persons to have more information related to innovation and maintenance than nonliaison persons have.
>
> H4a: Liaison persons perceive themselves to have more information related to innovation and maintenance than nonliaison persons have.

Message control.--Laboratory studies of organizational structure and message flow have delved into the effects of communication control. Generally, communication has been presented as a dependent variable (Bavelas, 1950; Leavitt, 1960). There are exceptions to this model, however, one being Hickey's manipulation of control, with centrality as a dependent variable. He describes three types of communication control within a structured social system (Hickey, 1968: p. 51):

> Three elements of information control can be distinguished. One can control--in a transmit or not-transmit sense--by handling the messages, or . . . by arranging the channels, or . . . by manipulating the content of the messages.

Hickey hypothesizes that the "status perceptions [that] peripherals hold of the central position will increase as the latter's power to control information increases." The hypothesis is supported for channel and content control, but not for transmission alone. "It may be," he concludes (1968: p. 53), "that this . . . role, while it is seemingly quite common in society [the lobbyist and public relations man are examples], is not often distinguished in lay conceptions of roles, functions, and statuses."

Of course, when one considers the control over information that people have in organizations, one must also consider the relationships

between such control and the formal authority to control. In other words, certain information will be found at points predicted to have it by organization planners. Simon (1957: p. 306) expresses this expectation most succinctly: "Decision centers must of necessity either coincide with or be in conjunction with communication centers."

Keeping this in mind, message control may be seen as the power to modify messages or to initiate new messages affecting work related conditions. Organization members who are perceived to have such control ought also to be perceived as "central." Thus, hypotheses may be stated concerning perceived interpersonal communication behavior:

H5: Nonliaison persons perceive liaison persons to have more control over flow of messages than non-liaison persons have.

H6: Persons who are perceived by their communication contacts to have high control over message flow are also perceived to have more influence in the organization than other members have.

Perceived system openness.--Formal position in an organization has been found to predict attitude toward the system's communication program--toward whether the system is perceived as "open" or "closed." For example, Gustad (1962) finds significant differences between perceptions of professors and their deans and department heads; supervisors see the system as more "open" than do their subordinates. Halpin (1966) obtains essentially the same results from his investigation of the Organizational Climate in public schools. By "open," Halpin means that certain kinds of attitudes and behaviors predominate. Among the 67 items comprising his eight descriptive scales are several statements of particular relevance to the analysis of the communication structure of an organization:

1. Supervisors behave so that subordinates feel free to discuss important things about their jobs with their supervisors.

2. Supervisors try to get their subordinates' ideas and opinions and to make constructive use of them.

3. Supervisors willingly share information with their subordinates.

4. Subordinates accept communications from their supervisors at face value.

5. Decision-makers are perceived (and perceive themselves) to be aware of subordinates' problems.

Pelz and Andrews (1966), who investigate the behavior and attitudes of scientists and engineers in a variety of settings, conclude that "system openness" is importantly related to innovative output and to willingness to participate in an organization. The more highly trained scientists appear to feel the effect of degree of system openness more than their technical colleagues and assistants.

Jackson (1959), inquiring into the communication activities and perceived "social worth" of the staff members of a child welfare agency, finds the idea of openness a better predictor of status among professional than among administrative staff members.

It should follow that occupants of "superior" communication roles will also see the job related information system as more open.

H7: Liaison persons perceive the organization's communication system for work-related matters to be more "open" than do nonliaison members.

Satisfaction with the communication system.--The correlates of satisfaction are complex, considered in the context of a social organization. Some of the same concerns involved in system openness appear also

to be related to satisfaction. Blau (Blau and Scott, 1962: p. 130), for example, finds that the inability to go to one's supervisor for advice has an adverse effect on satisfaction among professional employes in a government agency. He also notes, however, that the degree of satisfaction is highly related to "supplying advice and information when needed. . . . " In the instances he discusses, formal means were inadequate to the needs of the employes for consultation on specific and immediate problems; therefore, they developed informal, extralegal means--consultation pairs.

The present study approaches the concept of satisfaction through positing a need for timely, accurate, easily used information, obtained through appropriate channels. In a sense, the proposition is that people who have access to more work-relevant information have, in fact, more potential power; that having such power is self-assuring; and that people with such information will therefore report being more satisfied with the work related information system.

H8: Liaison persons are more satisfied with the organizations system of work-related information communication than are nonliaison persons. [SOCS]

Content and Communication

Three particular problems must be addressed here: (1) the content categories chosen have not previously been tested as to respondent recognition or as to relative exclusivity; (2) there is little evidence upon which to base predictions about relationships between content and organizational communication role; and (3) there are no adequate statistical measures of the significance of observed differences between matrices when the matrix entries are reports of contact or non-contact between members of a social unit.

Content categories.--Several classifications of communication have been discussed (see pages 34-37, above), none of which has been tested in an organizational population. The categorization used here (Berlo, 1970: pp. 8-11) suggests that communication has a few broad utilities which cover all or most situations. In hopes of avoiding situation-specific definitions of the categories--production, innovation, and maintenance--of communication in various social systems, a means was devised to provide organization members with category descriptions that are familiar to them and which they can reliably assign to the categories. The procedure adopted is introduced at this point in order to provide background for later discussion of specialized networks.

A series of 39 statements was assembled, each statement describing or illustrating a kind of communication behavior found in organizations. The statements were selected from survey instruments that have been used to test perceptions of communicative and administrative styles in organizations,[1] as well as from the present author's experience as a member of two organizational communication research teams.[2]

These statements were prepared in two forms: 1) as a list, with columns representing the three categories at one side of the list; and as 39 slips of paper, each bearing one of the statements and an index number. In the former case, respondents were asked to assign each statement to one of three named categories, having received a one-sentence

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1. Administrative Rating Scale (Wagner & Knower, 1959), Task Communication Questionnaire (Harkin, 1968), Organizational Climate Description Questionnaire (Halpin and Croft, 1963).

2. Faculty and student communication in a residential college were found to be mainly about class and administrative matters, contrary to expectations of the college's founders. Employes of a large company placed almost total emphasis on task-communication.

description of the category. In the latter case, respondents were asked to separate the 39 statements into three piles, based on whatever themes they perceived in the statements. In this instance, no description or key-word was given to respondents to help them sort the statements into categories. Respondents were also solicited for additional statements appropriate to each of the categories. Forty members of the agency were test respondents, 20 to each version.

The most frequently chosen statements for each category became the foundation for compressed descriptions of the categories. These descriptions, in turn, were used to help respondents in the main study sort out the nature of their communication with different co-workers. Given this "meaning" for the content categories, one may consider how the content is used.

Relationships of Content to Position or Role.--Two studies of organizations[1] indicate that a majority of organizational communication is task specific. Other research (Wickesberg, 1967; Odiorne, 1954; Dahle, 1954) largely neglects examination of non-task content. The available evidence does little to help generate expected relationships, although there is some implied correspondence between production information communication and the organization chart.

> H9: Liaison persons identified primarily in terms of production content are more likely to hold supervisory positions than are liaison persons identified primarily in terms of innovation or maintenance communication content.

Because the networks that are associated with the proposed content categories have not previously been explored in relation to an

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1. See page 42, above.

organization's communication structure, the present study will be directed toward explication rather than toward prediction.

Significance of Difference.--Guimaraes[1] suggests that the possible responses in any Boolean matrix (permissible codes are 1 or 0)--0,0, 0,1, 1,0, and 1,1--can be placed into the appropriate cells of a two-by-two contingency table:

	0	1
0	0,0	0,1
1	1,0	1,1

Figure 2.--Distribution of matrix combinations into a two-by-two contingency table.

He reasons that if one can generate a theoretical distribution, then one can evaluate matrix differences by means of the X^2 statistic. Without such a distribution, it must be noted, comparison of matrices involves unknown sampling errors in each matrix, vitiating the obtained chi-square value.

Lingwood (1970) also has approached assaying matrix differences, using a somewhat different rationale but again relying on the X^2 statistic. He, too, is unsure of the theoretical distribution of communication contacts in terms of expected accessibility of one organizational member to another, but suggests a random model as a starting point.

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1. A proposal made to members of the faculty, Department of Communication, Michigan State University, in May, 1970.

Davis (1963) suggests that "a reasonable standard for emergent structures might be 'equalitarianism'." None of these approaches seems tenable to the present author, in that their assumptions of random access are antithetical to the concept of structure in organizations.

Starbuck (1965: pp. 373-379) demonstrates that an organization chart can be graphed in terms of relations, given a Boolean matrix of the relations; he describes a six person matrix to illustrate hierarchical status. Perhaps, he suggests, such analysis will lead to explanation of complex activities such as communication and problem-solving. He adds an important caveat (1965: p. 381):

> However, effective treatments of complex phenomena [he includes communication] are probably several years and many contributors in the future. Hierarchical status does illustrate how relations among people can be cast into rigorous symbolic networks and useful conclusions drawn--and that is the essence of applied mathematics.

In view of such cautions and the present state of mathematics as art or science, the procedures proposed in the present study are suggestive and descriptive, rather than inferential and generalizable.

CHAPTER III

THE RESEARCH DESIGN

Sociometric techniques have previously been adapted to communication data, in attempts to reflect the operational structure of the social units being investigated.[1] Two of these studies chose to define the role-structure of the organization in terms of work-contacts--communication interaction--between pairs of members.

The liaison concept appears to be important to the study of communication systems in that the nature, location, and frequency of "linking" roles has many implications for uncertainty absorption in the systems, organizational design, and communication climate.

Jacobson and Seashore (1951), in the process of looking at a wide array of communication behavior in a newly formed government research agency, conceive and explicate three roles: Liaison, nonliaison, and isolate persons. Schwartz's study (1968), which lends direct impetus to the present investigation, examines the liaison role in a college faculty through the eyes of nonliaison faculty members who regularly communicate with the liaison persons.

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1. Davis (1969: p. 93) writes: "Structures that emerge within a group already possessing a formal structure are called operating structures. [They] may indeed be partly a function of the formal structure, but they also are a response to the actual demands of the task, people and setting. . . ."

Both of these studies entail analysis of responses garnered from organizations with relatively "flat" formal structures and strong academic orientations. Evidence from investigations in similar agencies (Pelz and Andrews, 1966) supports the view that the desire for personal autonomy is higher in such organizations than in many other settings--with effects upon communication networks.

The present study establishes and probes the nature of communication roles in a hierarchical government bureau that is relatively stable, differentiated as to tasks, and with a wide range of education and work experience on its staff.

The organization has responsibilities to survey an important part of the social-physical environment and to establish and carry out programs designed to improve that environment. The present study was addressed only to those members of the organization officed in one large building which is the headquarters location for several organizations.

The total headquarters staff of this organization includes 288 persons, ranging in grade from clerk to very senior executive. Most of the staff are civilians, but there are a few military positions. Civil Service grades represented range from GS-4 (clerk) through GS-18 (senior executive), as well as Public Law 313 appointees and one Executive Level appointee.[1]

Each person was asked to complete three instruments: (1) a questionnaire providing demographic and self-perception data on issues

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1. In general, grades four through eight are clerical. A GS-9 normally requires the baccalaureate degree. Grades 16 through 18 are equivalent to general or admiral military ranks. P.L. 313 appointees are usually persons of special technical or professional qualifications. The Executive Level is actually outside the civil service system, being a Presidential appointee.

relevant to this study; (2) a checklist of the names of people within the office with whom the respondent communicates (indexed by content-functional area, frequency, and contact importance); and (3) a questionnaire eliciting perceptions about the people with whom a respondent reports frequent communication contact.

The communication contact data were entered into matrices, each matrix cell representing a possible conjunction of comunication contact reports, with the following possibilities:

a. A does not contact B and B does not contact A.

b. A contacts B, but B does not contact A.

c. B contacts A, but A does not contact B.

d. Each reports contacting the other.

From the matrices of reciprocated contacts, communication-defined groups were constructed. Through this procedure, described in detail by Weiss (1956: pp. 88-108), the investigator identified liaison and nonliaison members of the organization. Questionnaire responses provided by liaison and nonliaison respondents became the data for role analysis and hypothesis testing. To qualify as a data source, a person completing a questionnaire must have reported contact with the person(s) about whom he was an informant.

The Study Population

Two groups of people served as data sources for the present study: one comprised all of the emergent liaison persons; the other comprised all nonliaison persons who were in frequent reciprocated contact with liaison persons.

Jacobson and Seashore (1951) found 35 liaison persons in a population of 196; most liaisons were also members of regular work groups,

but a few had contact mainly with other liaison persons, forming a liaison set. Schwartz (1968) identified 21 liaison persons among 142 faculty and administrative members of a college. Using roughly the same proportions to predict the incidence of liaison persons in the present case, one would expect about 30 such individuals for each content-functional area. Schwartz (1968: p. 30) observes that prediction is risky; the number and nature of liaison persons in an organization will depend on, at least, "the task coordination demands or the degree of rigidity in adhering to formal hierarchical lines"; one organization may have many more liaison persons than another per unit of membership.

A further limitation placed on data analysis in the present study was this: where the communication structure is partitioned in terms of one of the three content-functional areas, the sample size was likely to be reduced. Were the study to be conducted in a very large population, or in a random selection of organizations, communication networks could be derived by sampling respondents and then using the "snowball" cluster sampling technique to generate a network for each initially-selected respondent. This procedure, however, would be very costly.

Therefore, all liaison persons identified in the professional staff of the organization comprised one "sample." Compared with them was a group of nonliaison persons who were in frequent contact with liaison persons. Thus, self-perceptions held by liaisons and nonliaisons, and other-perceptions held by liaison-nonliaison dyad members, could be examined to determine whether their perceptions of the organization and of communication behavior were similar or dissimilar.

Generalizability of Results. Before one may apply tests of significance of observed differences, certain assumptions must be met which seldom arise in a case study. Jacobson and Seashore (1951) and Weiss (1956) observe this limitation and report their data as percentages and frequencies not amenable to much further statistical manipulation. Schwartz, however, applies the t-test for independent means to two bodies of data in testing his hypotheses. It is significant that Schwartz (1968: p. 117) comments on this:

> 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 [sic] hence violates a basic assumption of the statistical tests.

The matter of the proper use of such tests became a center of interest following Selvin's article (1957) criticizing their use in survey research. Different schools of thought on the use of inferential statistics in case studies have generated at least a score of articles in the literature.[1] One view is that since inferential statistics rest on an assumption of samples that are somehow randomly drawn, that is the one condition of their use that cannot be violated. The other extreme position (not adopted here) is that one may describe the

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1. Morrison and Henkel (1969) provide an example of the first position; Winch and Campbell (1969) illustrate the "middle" way; Gold (1969) presents a case for wider use of inference in such studies. All agree that inference is widely used in case studies.

significance of an observed difference between two categories that exhaust the population in regard to some population variable, regardless of the sample base, as reporting an attempt to fit data to a model, and is "superior to subjective variable judgments of importance." The moderate position (in relation to the above positions) is that one may apply inferential tests only if one first generates a large set of randomly drawn observations on the same population and then compares the set of experimental interest with this derived distribution.[1]

One of the more recent articles summarizes the uses and misuses of such tests (Morrison and Henkel, 1969: p. 133):

> Significance tests are not legitimately used for any purpose other than that of assessing the sampling error of a statistic designed to describe a particular population on the basis of a probability sample. The notions of sampling distribution and sampling error have no meaning in statistical inference apart from the assumption of randomness in the selection process--randomness being a central feature in all probability designs.

There are opposing views, but all assume that the results have somehow been drawn from a larger set of results. Schwartz attempts to circumvent this problem by selecting two somewhat independent groups of nonliaison persons as data bases for reports on the behavior of liaison and nonliaison groups. Since the people reported on are not a random sample in terms of selection or allocation, he only partly succeeds.

The essential position adopted in the present study is discussed by Lipset, Trow, and Coleman in their book, Union Democracy (1953: pp.

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1. Drs. Verling C. Troldahl and Lawrence Sarbaugh, of the Department of Communication, Michigan State University, are planning to generate a distribution for certain factor analytic data.

478-485). When the goal is to delineate relationships on a single organization, they posit, statistical tests such as the X^2, which is most often used in social research, may be too strong, too weak, or simply irrelevant. Pursuing the third of these possibilities, they address themselves to the basic question of how a social scientist approaches the notion of significance (pp. 483-484):

> Further studies upon different organizations will constitute more reliable confirmation, for they test the hypotheses in a different population, which a [chi square] test used on this data could never do. . . . Even if all assumptions for such tests are fulfilled, the population to which the result is generalized is not the population from which the sample was drawn. It is a theoretical population, of all men in certain kinds of organizations. [My italics.]

In summary, under the conditions of the present study the assessment of meaning to differences in either self-perception or other-perception cannot rest on t-tests or other statistical tests of difference to which significance levels are ascribed. A difference may be described in terms of percentage or relative frequency on some characteristic, or by means and standard deviations of index scores. Whether the difference is "significant" cannot be defended on statistical grounds.

There are "certain kinds of organizations" to whose members one might generalize the results of the present study. These more or less similar organizations may include the headquarters units of large governmental control or development programs. Here, however, the study organization was chosen in part because its management permitted its members to be observed; within the organization, all relevant people became respondents. How much more, or how much less, similar the organizations are is a matter to be explored through replication rather than to be assumed.

To date, the communication-functional roles of interest here have been studied in another government bureau and in the faculty of a specialized college. The present study should help to confirm concepts arising in those studies. But the nature of the roles, and their correlates, will be adequately confirmed only when other studies have been completed in other settings.

Operationalizing Variables

By use of responses that describe the self- and other-perceptions of respondents, one may compare the perceptions each role holds of the other. Nine hypotheses and two corollaries were examined in the present study; all but two made use of Likert-type scales to operationalize variables (Edwards, 1957: pp. 155-157; Oppenheim, 1966: 133-142). One hypothesis was tested by means of a correlational technique; the final hypothesis was tested by comparison of identified liaison persons with the organizational chart.

Where possible, questions or entire scales were taken from previous research in order to insure useful measurement by utilizing experience reported in the literature. In such cases, the sources are noted (see below); in other cases, however, scales were changed from their original applications or were entirely new.

Five choice-points were provided for each Likert-type item, on the basis that a greater selection becomes difficult for the respondent. The steps used in Likert-type items closely follow the Dodd and Gerbrick model (1960: pp. 30-31), except for the use of "neither agree nor disagree" rather than their term, "indifferent," which may have negative rather than neutral connotations in some settings.

Some way must be devised for deciding whether items contributing to an index do indeed appear to measure the same thing, or "go together." The scales used here include at most five items, a fact which limits the techniques available to test scale internal consistencies. Item inter-correlations were used; items that correlated poorly or negatively with other items considered for index inclusion were deleted (Nunnally, 1967: pp. 364-365).

The items used to operationalize variables are stated below. To preclude confusion, only one version of each statement will be listed; it should be noted that most of the statements will have a "This person" version in addition to the "I" version contained here. The instruments are reproduced in the appendix.

All items using the Likert-type responses to form summated scale ratings use either the strongly agree, agree, neither agree nor disagree, disagree, and strongly disagree foils or a set composed of much more than, above, about the same as, below, and much less than.

Number of Communication Contacts. Three of the four items used to measure this variable were abstracted by Schwartz (1968: pp. 47-49) from Walton's model-testing study of the "magnetic centers" of communication in an organization (Walton, 1962: pp. 79-109). Whereas Schwartz used the words "contact with people in more or fewer clique groups" to operationalize the structural diversity of contacts, the concept appeared to measure perceived number of contacts as well. The fourth item contributing to this index was devised by the study staff, primarily as a means of differentiating seeking and being sought for information. The items are:

> I communicate with more people in this organization than most people who work here do.
>
> I have access to very few supervisors and managers, compared to most people around here.
>
> In most organizations there are small groups of people who prefer to work or relax together. I have contacts in more of these groups than most people do around here.
>
> We want you to think of the persons you know in the AGENCY and to compare yourself with them on several questions. First, people differ with respect to the number of other people they communicate with each week about work-related activities (getting the job done, thinking of new ideas, etc.). As compared to other AGENCY employes, how do you rate yourself--is the number of people you communicate with: [Well above average, etc.]

Responses values to the second item, above, were inverted, then the numerical values of responses to the four items summed into one score. The higher this score the more communication contacts the respondent should perceive himself (or be perceived) to have.

Influence in the Organization. Schwartz (1968: pp. 55-57) labels this variable "diffuse opinion leadership," rather than the more general "influence." However, he defines the variable in terms of influence. Again, Walton's concept of magnetic centers of communication (Walton, 1962: pp. 83, 87, 91) is germane, in that his respondents apparently see influence over other contacts by a magnetic center as enhancing communication with persons occupying that role. The first of the three items contributing to this index was adapted by Schwartz from Walton; the other two items were adapted from an extensive study of scientific and engineering personnel in a variety of agencies by Pelz and Andrews (1966: pp. 17-18). The items are:

> The people who have a lot to say about what goes on around here respect the suggestions that I make.

> Compare the amount of influence you have on what goes on around here, in terms of work-related activities. Compared to other AGENCY employes, is the amount of influence you have: [Well above average, etc.]
>
> Now about matters not specifically related to work--such as teaching new people the ropes, helping to smooth out interpersonal problems, etc. Is the influence you have on these kinds of things: [Well above average, etc.]

Responses to these items were summed into one score. The higher this score the more the respondent should perceive himself (or be perceived) to have influence in the organization.

Possession of Work-Related Information. If an instrument is to be made generalizable across settings it must use general rather than highly specific categories to elicit responses about what people talk about or what they know. Therefore, the present study asked respondents to respond to statements about all three content-functional categories--production, innovation, and maintenance--at tentatively general levels. The item used to elicit responses about production communication is straightforward:

> Compared to other AGENCY employes, how do you rate the level of knowledge you have about work-related activities? Is it: [Well above average, etc.]

The wording used to obtain perceptions of a person's communication knowledge about non-production matters is slightly different in referring to "this person," or "he."

Possession of Non-Production Information. Rather than attempt to measure knowledge of innovation and maintenance matters separately in this exploratory study,[1] it was decided to ask respondents about

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1. Questionnaire length precluded more items for several scales.

topics "not related to work," defining these by example in the question asked. The single final item is:

> How about your knowledge level about topics that are not related to work . . . what's going on within the agency, who works well with whom, who's happy here and who's not, etc? Is your level of knowledge:
> [Well above average, etc.]

The higher the score on this item, the more such information the respondent should perceive himself (or be perceived) to have.

Control over Message Flow. The published reports of Hickey's (1968) experiments with communication control and perceived centrality in five-person networks do not operationalize control in terms of voluntary communication behavior; rather, a confederate imposes the various forms of control. In field investigations such as the present study, such a control is not available. To cope with the role of passive observer, therefore, two items were used to elicit reports of perceived control. The statements were abstracted from the propositions advanced by Hickey (1968: pp. 51-53):

> When someone needs to get a message to some group or person in the AGENCY, I can usually tell him the best way to do it.
>
> When I think it's best for the group I work with, I can control . . . expedite or delay . . . messages about our work.

The numeric responses to these statements were summed into one score for each respondent. The higher the score, the more message flow control the respondent should perceive himself (or be perceived) to have.

Openness of the Work-Related Communication System. Halpin (1963) conceives of the organizational climate as a continuum from closed to open, measured by eight scales which were factor analyzed from responses made

by more than 1700 persons to 80 statements. He uses 64 of the statements in his Organizational Climate Description Questionnaire.

He describes an open climate, in part, as one imbued with feelings of trust and freedom from secretiveness; people do not hoard information to gain or maintain power. Pelz and Andrews (1966: pp. 248-249) also suggest secretiveness as dysfunctional to creativity and productivity. From these sources a series of statements was constructed to measure the variable of communication system openness in the present study.

> People around here are really encouraged to take any kind of work-related problems to their supervisors.
>
> When suggestions are made by employes around here, managers seldom give the suggestions serious consideration.
>
> At our staff meetings or work-group meetings there is free, two-way discussion of any problems that are brought up.

The numeric responses to these three statements were summed into one score for each respondent, after inverting scores for the second item. The higher the score the more open the respondent should perceive the system to be.

Satisfaction with the Work-Related Communication System. This variable was operationalized by five statements, each touching on a different aspect of the communication system.

> The information we get from top management (Director, Assistant or Deputy Directors) is usually in very useful form--easy to use.
>
> Generally speaking, the information we get from top management about work-related matters is accurate.
>
> When top management puts out information to employes, you can believe it completely.
>
> One trouble with work-related information we get from top management is that it's usually late--not here when we really need it.

> The information that we get about work-matters from top management is usually complete--we are told all that's necessary.

Response values to the fourth statement were inverted and the numeric scores for all five summed into one satisfaction score for each respondent. The higher this score the higher the satisfaction of the respondent with the communication system. It should be noted that the items concern content and style rather than medium or channel.

Pretests

While a majority of the scales assembled for the present study have been used successfully elsewhere, they have not been used in juxtaposition. Further, the items used in the present study comprise only part of a larger set of items, all administered to the study population at the same time.

In order to pretest the items, the author visited the offices of the study population and administered the complete set of instruments to four persons. The fact that the main study would be conducted in that population within a week precluded more extensive tests, in order to avoid sensitization.

Pretest purposes included the following: (1) to evaluate data collection procedures; (2) to uncover ambiguous wording of instructions or test items; (3) to predict the number of frequent contacts and gauge how many Personal Contact Questionnaires would be required for each respondent; and (4) to determine special limiting factors of organizational history that might affect the study.

Interviews with the pretest respondents indicated that the stable employment pattern in the agency resulted in a very wide circle of

contacts; therefore, it was planned to permit each person 32 line spaces on the Personal Contact Checklist. Twelve Personal Contact Questionnaires appeared to be adequate. Since, however, the instruments were to be group-administered, with a study staff member present, respondents might obtain more if needed.

Legitimation occurred prior to the period of pre-test. The Chairman of the Department of Communication, who has been a communication consultant with the agency for several years, met with most of the study population. Together, the agency Director and the consultant notified employes that a series of communication studies would be conducted throughout the organization; the consultant outlined the general tenor of such studies and was strongly and publicly supported by the agency Director. Employe questions were answered and the entire group assured of response anonymity during the studies.

Pretest interviews revealed two examples of perceived ambiguity in question wording, in that it was not clear whether respondents were being asked to reply in relation to the entire headquarters staff, or only in relation to their own offices or divisions. The pretest respondents felt that the set of instruments was too lengthy; none completed them in less than an hour, although asked to complete only <u>one</u> Personal Contact Questionnaire.

Special environmental conditions include the following: (1) a dozen surveys and studies had been conducted on the study population within recent years, several in progress at the time of the present study; (2) some employes perceive any new study as an attempt to "finger" people for dismissal or reduction in grade. Therefore, it became imperative that

fear-arousal be kept to a minimum; on that basis, several proposed items were deleted from the over-all study, although none pertained to the present study directly.

Data Collection

Respondents were scheduled for specific rooms and times to complete the study instruments. Scheduling was coordinated by two representatives of the study staff, who were attached to the agency for several weeks prior to and following the study. One of these persons was an employe of another unit of the agency, and one a recent graduate of the present author's department. These two persons rescheduled respondents who could not meet the schedule and provided study instrument packets to employes who were absent during the principal data collection period.

Four days were planned for the administration of the study instruments to all respondents present for work. The headquarters staff of the agency included 288 employes, of whom 185 "professional level" persons became the study population. Identical instruments were administered to all other employes as well.

Four persons comprised the study staff. One monitored each scheduled data-collection session, introducing the study and answering questions about "how to do" various parts of the instruments. In addition, each instrument had a set of instructions attached. To attain minimum variation in the introductory statements, staff members rehearsed and each referred to a written outline as he spoke.

To control within-group interaction effects and to minimize between-group interaction outside the data gathering session, several precautions were taken. Employes were scheduled into one of four reserved conference

rooms, in the case of professional employes, or a small theater in the case of clerical level employes. Each group size was controlled so as to permit physical spacing that would preclude one person seeing what another wrote. Employes were scheduled in advance from an organizational roster, in such manner as to enable most members of an office to complete the instruments within a short time period. Groups were stratified by civil service grade so far as possible, to reduce the psychological pressures that might attend having one's supervisor in the same room. When all scheduled respondents had arrived, or 15 minutes after the scheduled meeting time, monitors (members of the study staff) introduced the study and repeated assurances of the confidential nature of the information that employes would provide. To about ten per cent of the employes this was new information, for they had not attended the legitimation meetings held three weeks earlier by the agency director and the communication consultant.

Monitors said nothing to indicate that respondents could or could not refuse to participate. Three employes asked such questions prior to data collection, and were told: (1) the nature of the study required virtually total participation; and (2) the study had the personal and public support of the agency's director.

Two employes refused to complete the instruments at all; one was a secretary and the other a professional level employe. When the secretary objected, another employe apologized for her conduct to the entire group, indicating strong support for the stated goals of the study. Four other employes remarked orally that they had not completed the instruments in good faith; only one of those was a professional employee. During the

two subsequent weeks the study staff representatives with the organization reported three similar remarks, only one from a professional-level employe.

The monitor for each data collection session distributed packets of the study instruments to each respondent. Each packet, in a large unsealed envelope, contained: (1) a Communication Questionnaire with its own instruction sheet; (2) a letter explaining the Personal Contact Checklist; (3) the Personal Contact Checklist with spaces for 32 contact nominations; (4) a letter explaining the Personal Contact Questionnaires; and (5) twelve Personal Contact Questionnaires.

Each respondent was asked to place all used and unused materials in the large envelope after completing the study instruments, and to seal the envelope. Persons who requested additional Personal Contact Checklist sheets or Personal Contact Questionnaires were provided them by the monitor from a supply maintained for the purpose.

The agency Director, his two principal assistants, and eleven other high-ranking persons were permitted to complete the study instruments in their offices. All but one did complete them and make the additions or corrections requested after initial screening of the data by members of the study staff. The packets for these persons were delivered and picked up by the study staff, and questions were answered personally or by telephone.

At the end of four days, 255 of the 288 persons on the headquarters staff had completed the instruments; at the end of 15 days 179 of the 185 professional level employes had completed the instruments. Employes who were ill, on vacation, or on duty away from the central offices were contacted immediately upon return by one of the two staff liaison representatives, with packets of the instruments and a request for completion.

Questionnaires and Personal Contact Checklists were tallied, identified, and checked for omissions or logical errors within 72 hours after completion of the initial data collection period. A list of discrepancies was mailed to the two staff liaison representatives, who then contacted the appropriate respondents with requests for completion or revision of instruments.

Data Analysis

The Sociomatrix. Reported communication contacts were used to construct three matrices; each contained only the reports of reciprocated contacts that occur weekly or more often within a single content-functional area.

Liaison and nonliaison persons were identified in each matrix, following the procedures described by Weiss (1956: pp. 88-108) and Schwartz (1968: pp. 61-66), so that hypotheses concerning self- and other-perceptions could be evaluated.

To arrive at the reciprocated dyads, reciprocation was operationalized as mutual listing on the Checklists, regardless of reported contact frequency or of discrepancy between reported contact frequencies. Although Schwartz assumed reciprocation in some cases when a population member was a non-respondent, the present study makes no such assumption. Virtually 100 per cent participation was anticipated, so the assumption was not necessary.

Missing Data.

A Personal Contact Checklist line entry was used only when it included the name of a person in the study population and a contact frequency for that name within a content-functional area. Omission of the

"importance" dimension did not affect hypothesized relationships, although future analyses should be conducted on this dimension.

A Personal Contact Questionnaire was not used unless at least half its entries were completed. The actual cutting point did not require amplification of this rule. In those cases where most entries were completed, but one or more response was missing, the average response on that item made by other people in the appropriate communication-functional role (liaison or nonliaison) became the value ascribed to the missing response. Where no response was made to a set of items constituting an index, the index was not used for that person.

Hypothesis Evaluation.

The study design must be described as an exploratory, empirically-based case study, without random sampling of respondents or observations on respondents. The effects of this condition upon the use of inferential statistics have been treated earlier.[1] Therefore, a statistic was devised to provide a response-range-free description of the degree to which role behaviors "go together" for all hypotheses except number six, which required a correlational approach, and Hypothesis 9, which compared incidence of liaisonness with formal organizational position.

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1. See pp. 50-52, above.

CHAPTER IV

FINDINGS

This chapter summarizes and describes the sociometric analysis and liaison person identification procedures used, presents an analysis of index scales, describes respondent characteristics, and discusses tests of the hypotheses.

General Analysis

By the means described in Chapter III, 97 per cent of the study population completed questionnaires and checklists within 15 days after data collection began. Two Communication Questionnaires were discarded because they still contained less than 50 per cent useable responses; thus, 96 per cent of the respondents provided useable data.

There were 875 frequent (daily or more often) contact nominations by 179 respondents in the study population; 844 Personal Contact Questionnaires were completed for those responses after follow-up action by the staff liaison representatives--a 96 per cent success rate. At least one Personal Contact Questionnaire was completed by 176 persons, or 98 per cent of the population responding at all. The frequency distribution of frequent nominations is presented in Table 1.

Table 1. Frequency Distribution of contact nominations at the daily or more often levels by 179 respondents.

Number of PCQ	0	1	2	3	4	5	6	7	8	9	10	11	12	13	15	16	23
F.	3	10	28	29	25	25	13	11	11	7	7	1	3	1	1	1	1

Range = 0-23 Mean = 4.97 Median = 4.82

Based on the experience of the Jacobson and Seashore study in a governmental bureau and the Schwartz study in a college, as well as the four pretest cases in the present study, 32 line spaces were available on the Personal Contact Checklist. Counting only the first 30 nominations by each respondent, a total of 3130 nominations were made at all frequencies. The limit of 30 nominations was necessitated by the following circumstances: (1) one person listed 158 contacts and two other respondents listed more than 60; (2) several respondents wrote comments indicating that at one time or another they contact virtually all members of the staff; (3) other respondents appended an "etc." to the bottom of their lists of contacts.

Examination of the Personal Contact Checklist form revealed a likely cause of this problem. Pretest interviews indicated that the number of people contacted in the "less than once or twice a month" category might be very large, so it was planned to delete that category, leaving "once or twice a month" as the least frequent possible nomination. The author inadvertently deleted the "once or twice a month" category instead. The omission was not noted under the pressure of time in revising the instruments for main study administration.

Because of this situation, only contacts in the "once or twice a week" or more frequent categories were considered in the present study. The frequency distribution of contact nominations within this restriction, and given the artificial top limit of 30 nominations per respondent, is presented in Table 2.

Table 2. Grouped frequency distribution for contact nominations at all frequencies by 179 respondents.

Category	0-3	4-6	7-9	10-12	13-15	16-18	19-21	22-24	25-27	28-29	30 or more
F	7	20	21	13	24	15	17	10	8	14	30

Range = 1-30 (158) Mean = 17.6 Median = 16.5

Of the 844 completed Personal Contact Questionnaires, 11 were rejected because they were less than 50 per cent complete. They were the products of seven respondents. Missing values were found in 12 of the Communication Questionnaires, or 7 per cent, and in 142 of the Personal Contact Questionnaires, or 17 per cent. Table 3 presents a summary of the data missing from the Personal Contact Questionnaires that is germane to the present study.

Table 3. Frequency of non-response to Personal Contact Questionnaire items, from 177 respondents.

Number of items not completed	1	2	3	4	5	6	10	11-18	19[1]
Frequency	44	19	6	34	22	6	1	8	2

1. One respondent appended a note indicating that newness in the organization precluded judgments of communication behavior or of

There were missing items in 12 of the Communication Questionnaires, aside from the two from which more than half the responses were missing. Not counting the two rejected Questionnaires, there were 23 item-responses missing.

Missing data were recorded as indicated in Chapter III.[2] All analyses which follow are based on the recoded data, except for Pearson product-moment correlations, which were calculated with a computer program that accounts for missing data.[3]

Sociometric Analysis

The data for sociometric mapping of the perceived communication structure of the agency's professional-level employes were taken from the Personal Contact Checklist. The total number of contacts reported resulted in an average of almost 17 contacts per person, considering only the top three frequency categories and an arbitrary limitation of 30 contacts per person. Schwartz (1968: pp. 91-93) reported an average span of seven contacts; Weiss and Jacobson (1955: p. 663) reported an average span of about 12 contacts per respondent. Schwartz limited his respondents to reporting weekly or more frequent contacts, while Weiss and Jacobson permitted reports of frequencies as low as "several times a year." It is likely that the employment stability and the coordinative nature of the agency examined in the

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characteristics of other employes. This accounts for both cases in the "19" category.

2. See page 69 above.

3. MDSTAT, a Michigan State University Agricultural Experiment Station program written for the CDC 3600 and 6500 computers. The program is on file at the university Computer Laboratory library.

present study contributed to the much higher average number of contacts reported. People who have been members of a given staff or of field branches of the same agency for as long as 20 years probably know and communicate with most of their fellow employes at one time or another.

Only reciprocated contacts were used to identify the properties of the communication structure required for the present study. This means that not only must a person nominate another as a communication contact, but that person must agree by naming the first person as a communication contact also.

To determine reciprocation in a form that could be analyzed visually, a matrix was constructed with code numbers for the 185 professional-level employes placed at the top and left margins of the matrix in alphabetical order. Although both the Weiss and Jacobson and the Schwartz studies began with a semi-ordered listing based on organization charts, the present study based the entry of contact nominations on an alphabetic list, using the instructions contained in Weiss' "pure conceptual model" description (1956: pp. 90-91).

This procedure was adopted for two reasons. The first was to facilitate coding of the instruments in the initial data-checking phase, and the second was to preclude any effect of listing-order upon identification of groups and liaisons. To further test whether the order of listing would affect results, one matrix segment was analyzed four times, selecting a different entry point each time. The final results were identical in terms of group membership and liaison identification. What did differ was the number of successive iterations required to group contacts closely around the main diagonal;

when the early entries have many contacts themselves, all sense of pattern is lost. Weiss's admonition to begin with people having few contacts is mandatory.

While the test procedure discussed here lends support to the contention that entry order does not affect outcome, it was necessary to test the proposition in the present study, since the nominations had to be partitioned into three matrices according to the content-functional area involved. An adequate test, analyzing an entire matrix using both initial order procedures and comparing outputs, is not likely, considering the labor involved.

Initially, a "1" was entered into the appropriate cell for every communication contact nomination in the "more than once a day" category; a "2" was entered for a nomination in the "once a day" category; and a "3" was entered for each "once or twice a week" nomination.

The second phase required matching nominations to determine reciprocation. The procedure used in the present study was somewhat different than that adopted by the earlier studies, but performed the same tasks. Here, two investigators were required to concur on matching entries, one in each axis. Thus, one analyst would report that respondent number 100 chose respondent number 41 as a "2" and the other might report that number 41 did not indicate contact with respondent number 100 at all.

The result of this procedure was a second matrix containing only reciprocated contact nominations. A series of symbol and color codes was established for this matrix, in order to facilitate later examination

of specific frequency levels of contact. An "X" was used to refer to a reciprocated contact at the daily or more frequent levels; a "O" meant that one person reported daily or more frequent contact, but that the other person in the dyad reported contact only once or twice a week; and a "1" meant that one person nominated another as a "more than once a day" contact, while the second person did not mention the first at all. This last category was not used in any subsequent analysis. Reciprocated weekly contacts were indicated by the symbol "3".

Yet a third matrix was constructed for each content-functional area. Following the instructions given by Weiss, communication groups were identified by reports of contact made by the respondents (1956: p. 90):

> According to the conceptual model, persons with few contacts (small row totals in the matrix) would not be liaison persons; their contacts would be among members of the same subgroup. Listing such a person first followed in turn by his contacts, the separate groups should fall into place. . . . to avoid successive listing of unrelated individuals in divergent chains. . . . a fresh start could be made with another person having fewer contacts.

Schwartz describes the re-ordering and its purpose (1968: p. 94):

> Groupings of individuals in the final matrix was accomplished by inspecting the locations of 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 contacts. The purpose of the re-ordering was to create clusters of contacts around the diagonal as required for matrix analysis.

This matrix, of course, made use of reciprocated contacts at all three frequencies. Final analysis, utilizing reciprocal contacts in the daily or more frequent categories, provided the basis for hypothesis testing.

When the third matrix had been constructed for each content functional area, it was found that the numbers of participants varied according to the area involved. That is, for each content-functional area a different subset of respondents agreed that they did indeed communicate with one another. The production communication matrix, as expected, was largest, with 166 participants. The innovation matrix included 93 participants; and the maintenance communication matrix included only 71 respondents. The data on groupings within each matrix prior to segment analysis are presented in Table 4.

Table 4. Reciprocated contact groupings by content-functional area prior to segment analysis.

Number in group	2	3	4	5	6	7	8	9	10	11	13	16	19	21	60	Total
Number of groups	9	5	4	6	1	4	1	1	2	1	1	1	3	1	1	41
Production groups only	1	1	1	4	-	2	1	-	1	1	1	-	1	-	1	15
Innovation groups only	4	2	1	1	1	1	-	1	1	-	-	-	2	-	-	14
Maintenance groups only	4	2	2	1	-	1	-	-	-	-	-	1	-	1	-	12

The number of reciprocated contacts also varied by content-functional area, even when controlling for the number of persons in the matrices. There were 588 reciprocated contacts among the 166 persons in the production matrix ($\bar{X} = 3.5$), 244 reciprocated contacts among the 93 persons in the innovation communication matrix ($\bar{X} = 2.6$), and

144 reciprocated contacts among the 71 contributors to the maintenance communication matrix ($\bar{X}$ = 2.0). The distribution of reciprocated contacts by matrix is presented in Table 5.

Table 5. Frequency of reciprocated contacts by content-functional area matrix.

Reciprocated contacts	1	2	3	4	5	6	7	8	9	10	11	n
Production	34	35	33	16	17	7	12	7	2	2	1	588
Innovation	45	17	19	6	3	2	1	-	-	-	-	244
Maintenance	35	15	13	4	2	2	-	-	-	-	-	144

These frequencies represent one-way communication linkages, since they were taken from both halves of a symmetrical matrix. Therefore, the production communication matrix represented 294 reciprocated dyads, or two-way pairs. Similarly, there were 122 reciprocated dyads in the innovation communication matrix and 72 in the maintenance communication matrix.

Using these reciprocated contacts, Weiss's procedures were followed to specify group members and liaison persons.

First, the matrix for a content-functional area was partitioned, or divided into groups that included most of the non-zero cells pertaining to their members' contacts. Weiss explains (1956: p. 91):

> The same partitioning is applied to both the rows and the columns, so that the principal submatrices (those lying along the diagonal) are square. The set of individuals identified with each principal submatrix is called a segment. The concrete interpretation is that, except for liaison persons, each individual is included

> in the same segment with the people he contacts, i.e., each segment contains one or more of the conceptual separate groups.

Although Weiss recommends that the researcher limit segments to 50 members, one segment of the production communication matrix contained 60 persons. The others were all of smaller size, in part because of the division of communication into three content-functional areas, and also because of the three step iterative process utilized in grouping responses as closely about the main diagonal as possible.

There were 16 segments in the production communication matrix, most of them irreducible by further analysis because of the iterative process followed to this point. The innovation communication matrix contained 12 subgroupings with as few as two members in a group. The maintenance communication matrix contained 13 groups, also ranging upward from two members.

Where there were any outside contacts, the segment members with such contacts were listed, as were their outside contacts, and the number of such contacts for each person was determined. Weiss notes that (1956: p. 91):

> The person having the highest total obviously is a liaison person and he is deleted from the matrix. When that person and all of his contacts are deleted, the process is repeated until no member has more than one outside contact.

What remains from this process is known as a <u>reduced segment</u>.

Each reduced segment was the considered separately, re-ordering its rows and columns so that contacts were adjacent. At this point, whatever conceptual groups existed were within the boundaries of their segments. The goal of this process was to identify work-communication

groups and the liaison persons who linked those groups together. The most general rule within segments is that if two groups would be separated upon the removal of an individual and his contacts,[1] then that person functions as a liaison and should be deleted from the matrix.

Many of the tests for liaison status did not apply to innovation or maintenance communication matrices: (1) their members were easily separated into communication groups without interconnection; and (2) the re-ordering described above had already grouped most communication contacts very closely.

Only two liaisons were identified within the 71-person maintenance communication matrix, and five in the 93-person innovation matrix. Therefore, most of the following discussion applies only to the production communication matrix. Possible reasons for the paucity of liaison persons in the other networks are discussed in Chapter V.

Segment analysis added to the numbers of separable groups and tentative liaison persons. The maintenance communication matrix now had 15 groups, innovation 20, and production 27. Nine of the 35 tentatively identified liaisons served that function only within their own segments. Table 6 presents the frequency-by-size distribution of groups after segment analysis.

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1. Some other contacts are permitted. Where one person in a group contacts one in another group, the graph theory analogue is the single bridge. As in the Schwartz study, the present study permits as many as three bridge contacts between otherwise separated groups. Weiss cautions (1956: p. 105): "A reasonable number when a group is called for, and no decision rule was necessary in the present study.

Table 6. Reciprocated contact communication groups, by content-functional area, after segment analysis.

Number in group	2	3	4	5	6	7	8	9	11	14	16	Total
Total groups	12	6	16	6	6	6	4	2	2	1	1	62
Production groups	3	1	9	2	3	3	2	2	1	1	0	27
Innovation groups	5	3	3	2	3	2	1	0	0	0	1	20
Maintenance groups	4	2	4	2	0	1	1	0	1	0	0	15

Tentative liaison persons were so identified because they were removed from segments on the basis of multiple contacts outside their segments. Following procedures devised by Weiss and applied also by Schwartz (1968: pp. 99-102), based on the concept of the articulation point in graph theory, criteria were set for final identification of liaison persons:

> 1. A liaison person is considered a member of a communication group if a majority of his contacts, not including contacts with other liaison persons, are within the group. These are liaison group members.[1]
>
> 2. A liaison person must have at least two contacts outside his group, not counting other liaison persons. An exception occurs if he has contact with two or more liaison persons outside his group.
>
> 3. A liaison individual does not have a majority of contacts in any one group, but has contacts with members

1. A more complete description of checks is presented by Weiss (1956: pp. 106-108), including matrix squaring to resolve ambiguities and the use of additional data in determining communication roles. These procedures were not required.

> of two or more groups. These contacts may be with other liaison persons only where those persons are themselves members of groups. If there is a liaison set its members qualify as a group for this purpose.
>
> 4. The liaison set consists of respondents who have all or nearly all of their contacts with other liaison persons, at least two of whom must be members of more than one group, i.e., liaison individuals.
>
> 5. If a person is not a liaison individual by these criteria, but also is not a member of any group, and if such a person has all or nearly all of his contacts with the members of a liaison set, he should be classed as a liaison individual.
>
> 6. A nonliaison group member may have no more than one contact outside his own group, except with liaison persons, and must have a majority of his contacts within his own group.

One exception to these criteria was taken in the present study. Rather than requiring an absolute majority of contacts in one group in order to qualify for membership in the group, a person may have a plurality, or more contacts in that group than in any other.[1] The status of each tentative liaison person was evaluated to determine whether each served the necessary linking functions and was not a bridge contact. The results are presented in Table 7.

This topological analysis of the production communication matrix identified eight of the tentative liaisons as bridge contacts instead. That is, each had two contacts outside his own group, one of whom was another liaison person; deleting the contact of either the bridge contact person or of the liaison person had the same result--communication between two groups was reduced to a single link.

Considering also the liaison persons identified in the simpler maintenance and innovation communication matrices, 26 persons were

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1. See footnote, p. 76, above.

Table 7. Categorization of tentative liaison persons within the production communication matrix, by contact structure.

Respondent code no.	Final category assigned	Contacts in own group	Contacts out of own group	Liaison contacts	Nonliaison contacts	Groups contacted
073	Liaison individual	0	3	1	2	2
065	Liaison group member	3	2	0	2	2
391*	Not a liaison person	6	2	1	1	2
367	Liaison group member	3	4	1	3	3
143	Liaison individual	0	3	1	2	3
272	Liaison group member	4	2	0	2	2
144	Liaison group member	3	4	2	2	2
022	Liaison group member	5	2	0	2	2
075	Liaison group member	4	3	1	2	2
048*	Not a liaison person	2	2	1	1	2
472	Liaison individual	0	4	2	2	2
469*	Not a liaison person	6	2	1	1	2
461	Liaison group member	6	2	2	0	2
393	Liaison group member	4	4	2	2	1

(continued)

Table 7. Categorization of tentative liaison persons within the production communication matrix, by contact structure. (Continued)

Respondent code no.	Final category assigned	Contacts in own group	Contacts out of own group	Liaison contacts	Nonliaison contacts	Groups contacted
420	Liaison group member	4	2	0	2	2
209*	Not a liaison person	2	2	1	1	1
206	Liaison group member	8	3	1	2	2
064*	Not a liaison person	5	2	1	1	2
076	Liaison group member	4	3	2	1	3
404	Liaison group member	5	4	2	2	1
365*	Not a liaison person	6	2	1	1	2
358	Liaison group member	3	3	0	3	3
366	Liaison group member	3	2	2	0	1
392	Liaison group member	3	2	2	0	1
172	Liaison individual	0	5	1	4	3
163*	Not a liaison person	4	2	1	1	2
400*	Not a liaison person	7	2	1	1	2

(continued)

Table 7. Categorization of tentative liaison persons within the production communication matrix, by contact structure. (Continued)

Respondent code no.	Final category assigned	Contacts in own group	Contacts out of own group	Liaison contacts	Nonliaison contacts	Groups contacted
205	Liaison group member	3	2	2	0	2
364	Liaison group member	5	3	1	2	1

* These tentatively identified liaison persons are deleted because, aside from other liaison persons, they have only a single contact outside their own groups, but have a majority of all their contacts within their own single groups. Therefore, they function as bridge contacts. The number of production communication liaison persons is reduced to 21 as a result of this final analysis.

found to be performing the liaison function among the 185 members of the population. Two respondents served as liaison members of two communication structures. The remaining members of each communication matrix were determined to be nonliaison group members; every respondent had reciprocated communication contact, at some frequency, with at least one other person.

Description of the Population

Sociometric and demographic data characterize the occupants of liaison and nonliaison roles; such information is also useful for comparison of role occupants between studies. Demographic data were obtained from two sources: the Communication Questionnaire and the agency's most current personnel roster. Sociometric data were taken from information supplied by the Personal Contact Checklist and its resultant matrices.

Sociometric Description. Liaison persons made and received more communication choices than did their nonliaison fellow employes. It is not necessary to have many contacts in order to be a liaison person, although Hypothesis 1 dealt with the perceptions that, as a class, liaison persons will have more; rather, the contacts must be strategically placed. Table 8 describes the nominations made.

It can be seen from Table 8 that liaison persons made roughly twice as many nominations, on the average, than nonliaison persons made, depending on the interaction frequency level. Schwartz (1968: p. 104) reported much the same pattern; in his study liaison people

Table 8. Communication contact choices made by liaison and nonliaison respondents.

Contact frequency	More than once a day		Once a day		Once or twice a week	
	n	Mean	n	Mean	n	Mean
Liaison members (n=26)	124	4.8	91	3.5	201	7.7
Nonliaison members (n=153)	409	2.7	265	1.7	645	4.2

had an average of 1.4 contacts in the most frequent category, versus 0.7 for nonliaisons; 3.1 in the "once per day" category, as compared with 1.0 for nonliaisons; and 3.6 in the "2-3 per week" category, compared with 1.9 for nonliaison respondents.

In choices received from other persons, as well, the liaison members of the population exceed the nonliaison members. A total of 330 choices (at all interaction frequencies) were received by liaison persons ($\bar{X}$ = 12.7), which may be compared with the 958 choices received by 153 nonliaison members ($\bar{X}$ = 6.3)--half the liaison rate of being chosen.

Figure 2, depicts the distribution of contacts received by the two respondent categories. Numbers of persons receiving choices have been computed as percentages, in order to remove the distortion induced by great numerical differences in category membership.

It can be seen in Figure 2 that no liaison person received fewer than six choices, while about 53 per cent (n = 81) of the

nonliaison persons received fewer than six choices; 78 per cent of the liaison persons received more than ten choices (n = 20), as compared with 13.7 per cent for nonliaisons (n = 21).

The proportion of liaison persons to the study population is similar to that found by Schwartz. Twenty-six liaison persons represent 14.1 per cent of the present study population of 185 employes; Schwartz found 21 persons, or 15.5 per cent in his 142 college faculty members.

In the present study, 21 persons were identified as liaison persons in the production communication function, five in the innovation communication function (one was also a production function liaison person), and two in the maintenance communication function (one also served as a liaison person for the innovation communication function). Of these 26 persons, four were determined to be liaison individuals, without membership in any one group. They did not, however, constitute a liaison set, for the majority of their contacts were not with other liaison persons.

Demographic Characteristics. The data discussed here were obtained from the 177 useable Communication Questionnaires and an agency personnel roster corrected to the date of the study administration. Year of birth and civil service grade data were taken from the latter source. Data on the education of respondents and on other jobs they had held inside or out of the agency were not accessible to the study staff.

The average civil service grade of liaison persons was almost one full grade-level higher than that for nonliaisons. The mean

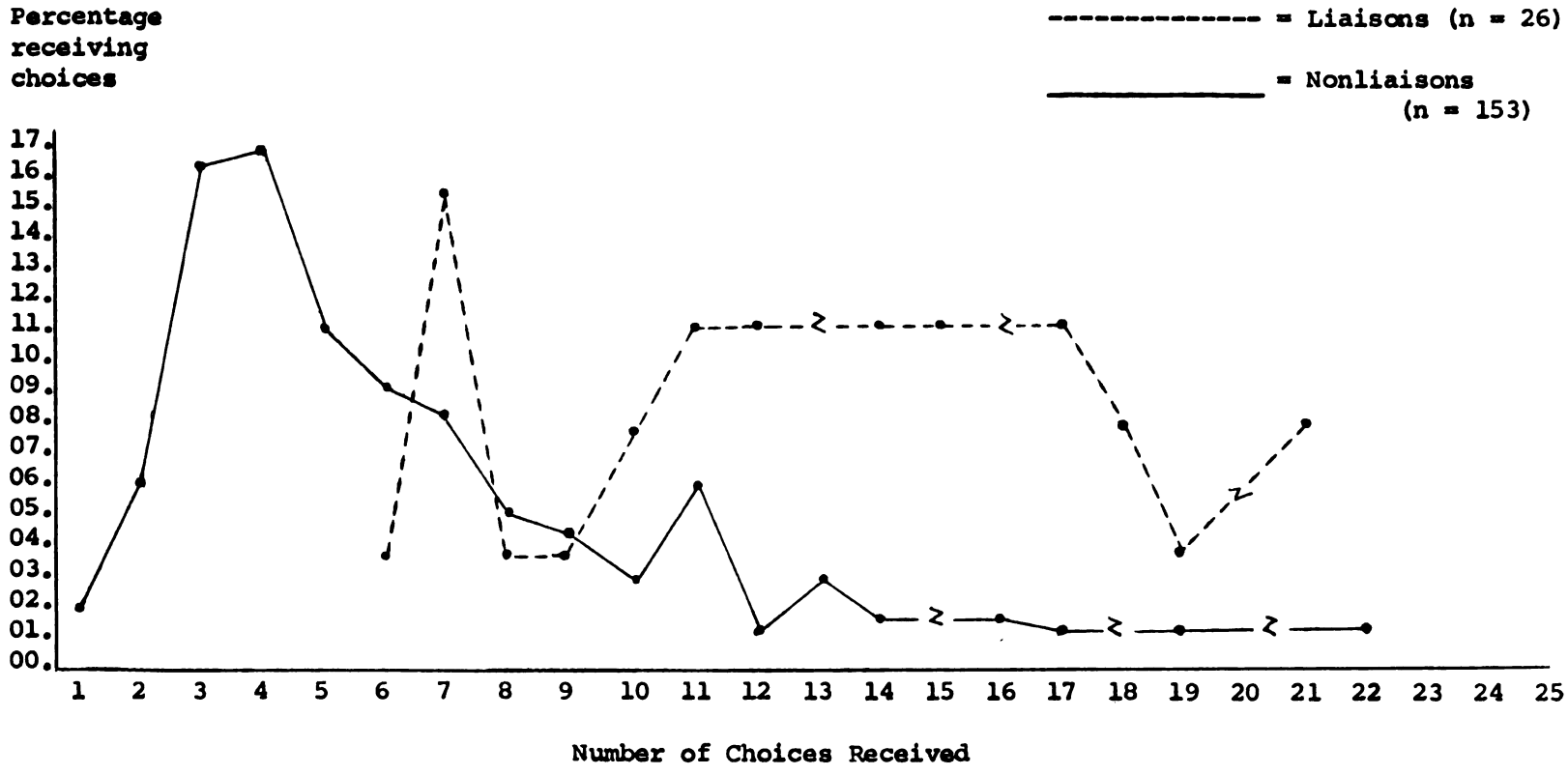

Figure 3. Frequency polygon for choices received by liaison and nonliaison persons.

for liaisons was 15.1 (range = 12-19), while that for nonliaisons was 14.3 (range = 11-19).[1]

In terms of age, liaison respondents were not much different from the nonliaisons, averaging about a year younger than their nonliaison co-workers. The respective ranges were 1907-1936 for liaisons and 1902-1942 for nonliaisons.

Liaison role occupants appear to have served in the agency, at some level, somewhat longer than nonliaisons. Because of the categorical responses permitted to the question used to elicit tenure information, a mean could not be computed. Therefore, Table 9 presents the percentage of n for each group within each category.

Table 9. Duration of employment in the agency at any level.

Tenure Category	Liaison (n = 26)	Nonliaison (n = 153)
	% of n	% of n
Less than 1 yr	0.0	3.3
1 yr, less than 2	0.0	3.9
2 yrs, less than 5	0.0	13.1
5 yrs, less than 10	50.0	32.7
10 yrs, less than 15	34.0	28.7
15 yrs, less than 20	15.4	18.3
20 yrs or more	0.0	0.0

Length of employment with the agency appears to differentiate between liaison and nonliaison role occupants in at least one way. While a fifth (n = 31) of the nonliaison respondents have been employed in the

1. There is no grade 19; it is used here to designate special high-level appointees under Public Law 313. The agency Director is not included in these calculations.

agency less than five years, no liaison person has so little agency service. The important difference, therefore, appears to be that a person must be with the organization some minimum length of time--at least five years in this case--in order to function as a liaison member. Half of each group, liaison and nonliaison, has been with the agency more than a decade, indicating its relatively stable nature.

One other question was asked about the personal backgrounds of respondents: the existence or general nature of previous military service. The question was deemed germane because of the chain-of-authority location of the agency within government and because of the quasi-military nature of some of the agency's mission. The response distributions are presented in Table 10.

Table 10. Previous military service of respondents.

Response Category	Liaison (n = 26) % of n	Nonliaison (n = 153) % of n
Retired for longevity or medical reasons	15.4	11.8
Previous service: did not retire	57.1	58.8
No previous service	23.1[2]	27.5[2]
Now on active duty	0.0[1]	2.0

Previous military service is not highly correlated with filling the liaison role. Further investigation, however, might reveal that

1. There was, however, one "No response" to this question.

2. One liaison person and four nonliaisons were female. It is unlikely that they have records of military service, although at least two clerical-level female employes do have such service.

certain kinds of such service differentiate in terms of communication structure of the organization. For example, a former general might be perceived as a particularly credible or reliable information source.

Data Sources for Hypothesis Tests. The data from the Communication Questionnaires and Personal Contact Questionnaires were both used as sources of mean scores on self-perception and other-perception of liaison and nonliaison respondents.

A Personal Contact Questionnaire was used only where it represented a report on a reciprocal contact, i.e., the two people agreed that they communicated at some frequency, and at least one of the pair completed a Personal Contact Questionnaire on the other. Twenty-four liaison persons completed 47 Personal Contact Questionnaires on their reciprocated nonliaison contacts; these questionnaires became one data source. Forty-five nonliaison persons completed 55 Personal Contact Questionnaires on 24 reciprocated liaison contacts; these questionnaires became a second data source. The Communication Questionnaires completed by the 24 liaison and 45 nonliaison persons described above became the other major sources of data. Where, however, an hypothesis was based only on self-perceptions within roles, all Communication Questionnaires within each role were used to provide data.

Scale Analysis for Hypothesis Tests

Missing data transformations were accomplished for the 12 Communication Questionnaires which had data missing from columns pertaining to the present study, and for the 131 Personal Contact Questionnaires with 9 or fewer missing responses. The 11 Personal Contact Questionnaires with 10 or more missing responses were deleted from the analysis.

Pearson product-moment correlations were calculated. The correlations were inspected to determine whether any item contributing to an index scale correlated poorly or negatively with other contributing items. On the basis of this test, two items were deleted from indices.

The first of these, Question 39 on the Communication Questionnaire, was intended to measure the perceived number of communication contacts.[1] Schwartz (1968: p. 47) had used the item as part of an index of the structural diversity of communication contacts. The low correlation in the present study between this question and others asking directly how many communications a respondent perceived himself having in the organization (r ranged from .0255 to .2451) indicated that the item did not measure the same things as the more direct questions.

The second item deleted, Question 23 on the Communication Questionnaire, was intended to measure satisfaction with the organization's work-related communication system. However, the item correlated either very low or negatively with every other item contributing to the index. The question asks whether work-related communication (from top management) is timely, while the other items ask about the accuracy, credibility, utility, and completeness of communications from top management. It is not illogical that accuracy, credibility, utility, and completeness occur in a slow-moving information system.

The inter-item correlation matrices described below all represent correlations that explain substantial amounts of variance and are relatively consistent within a given index.[2]

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1. The same question, as number 18 on the Personal Contact Questionnaire, was also deleted from analysis.

2. Were a sampling model used, the correlations would all be statistically different from zero at or beyond the .001 level. See Walker, Helen W.,

The matrix for the index of number of communication contacts is presented in Table 11--self-perceptions of the respondents--and in Table 12--perceptions about one's frequent contacts. Item numbers in the former matrix refer to items on the Communication Questionnaire; item numbers in the latter matrix refer to items on the Personal Contact Questionnaire.

Table 11. Inter-item correlations for the index of number of communication contacts (self-perception).

Item	27	35	39	50
27	x			
35	.42	x		
39	.25	.03	x	
50	.67	.45	.14	x

n ranges from 178 to 179

Table 12. Inter-item correlations for the index of number of communication contacts (other-perception).

Item	14	17	18	19
14	x			
17	.50	x		
18	.35	.13	x	
19	.70	.51	.33	x

n ranges from 813 to 819.

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and Joseph Lev. Statistical Inference. New York: Holt, 1953, p. 470.

The inter-item correlations for questions used to index influence in the organization are presented in Table 13--self-perceptions of respondents--and Table 14--other-perceptions by respondents of their frequent contacts. Here, all correlations warrant retention. Again, item numbers in Table 13 refer to questions on the Communication Questionnaire and item numbers in Table 14 refer to questions on the Personal Contact Questionnaire.

Table 13. Inter-item correlations for the index of organizational influence (self-perceptions).

Item	28	58	59
28	x		
58	.60	x	
59	.29	.51	x

n ranges from 176 to 178.

Table 14. Inter-item correlations for the index of organizational influence (other-perceptions).

Item	15	27	28
15	x		
27	.73	x	
28	.47	.50	x

n ranges from 785 to 796.

The correlations for the two questions contributing to the index scale for control over message flow, numbers 16 and 29 from the Personal Contact Questionnaire, are at an adequate level: $r_{16,29} = .40$ ($n = 784$).

Inter-item correlations for questions contributing to the index of communication system openness are presented in Table 15. It will be noted that correlations are consistent and relatively strong, so that all three items may be retained in the index. Item numbers refer to the Communication Questionnaire.

Table 15. Inter-item correlations for the index of communication system openness (self-perceptions).

Item	34	37	41
34	x		
37	.50	x	
41	.41	.38	x

n ranges from 156 to 210.

The inter-item correlations for questions contributing to the index of communication system openness are presented in Table 16. Item number refers to questions in the Communication Questionnaire.

Table 16. Inter-item correlations for the index of communication system satisfaction (self-perceptions).

Item	20	21	22	23	24
20	x				
21	.63	x			
22	.55	.65	x		
23	.26	.16	.28	x	
24	.62	.57	.51	.41	x

n ranges from 265 to 268.

Item 23, which concerns the timeliness of work-related information communicated from top management, correlates weakly with other items contributing to the index, when compared with the correlations among those other items. Therefore, question 23 was deleted from analysis.

Testing Hypotheses

The hypotheses are discussed below, in order, together with the major variables under which they were introduced in Chapter II. The effects of the absence of a probability model, chiefly to render the tests of significance inappropriate, were discussed in Chapter III.

Hypotheses were evaluated by comparing mean values of scales, using reports of respondents who functioned as liaison or nonliaison persons and who agreed that they were in communication contact. In some cases the perceptions of a group about its own characteristics were used for comparison with the perceptions of another group.

The numbers of observations on which data were computed range from 26 in the case of liaison person self-perceptions to 55 in the case of liaison person self-perceptions to 55 in the case of non-liaison perceptions of their liaison reciprocated contacts. In addition, scores could vary in range from the five-point scale where single questions were used to a 20-point scale used to assess satisfaction with the communication system.

Therefore, it was necessary to provide a statistic that would indicate how much scores differed between groups in relation to how much they could differ. To accomplish this, the mean difference

between group scores was computed and this mean difference was divided by the average standard deviation between groups.

The term "support," as applied to findings, refers to any difference in the hypothesized direction, using the statistic described above. The absence of random observations or of treatment groups to which subjects could be randomly assigned precludes the assessment of statistical significance to observed differences. "Not supported" refers to zero differences or to differences in a direction opposite to that predicted.

The data bases used are summarized and labelled as follows: Liaison person self-perceptions, defined as the responses made by 26 liaison persons identified in this study on Communication Questionnaires, are labelled LSELF. Liaison perceptions of nonliaison frequent reciprocated contacts, based on the responses contained in 45 Personal Contact Questionnaires, are labelled L-NL. There are also nonliaison person self-perceptions, based on 47 Communication Questionnaires completed by nonliaisons in frequent contact with liaison persons; these are labelled as NLSELF. Finally, there are nonliaison perceptions of their liaison frequent reciprocated contacts; these are based on 55 Personal Contact Questionnaires completed by the nonliaisons on their frequent liaison contacts, and are labelled NL-L.

Number of Communication Contacts. The first hypothesis concerns perceptions that liaison persons have of themselves and of their nonliaison contacts. Thus, 26 LSELF questionnaires and 45 L-NL questionnaires furnished the data sources. The hypothesis states:

> H1: Liaison persons perceive themselves to have a greater number of communication contacts than they perceive nonliaison persons to have.

This variable was measured by a three-item scale with a possible range in scores from 0 to 15. The findings are:

	n	Range	Mean	S.D.
Liaison LSELF	26	6-15	12.0	2.3
Nonliaison L-NL	45	5-15	11.1	2.8

The obtained mean difference was .9 in the predicted direction. Following the procedure described above, the range-free difference was computed as .36, and the hypothesis was supported.

Influence in the Organization. The second hypothesis established the expectation that liaison persons see themselves as influential, compared with their nonliaison contacts. The data groups compared were LSELF and L-NL, as for the first hypothesis.

> H2: Liaison persons perceive themselves to have more influence in the organization than they perceive nonliaison persons to have.

This variable also was measured by a three-item scale with a possible range of scores from 0 to 15. The findings are:

	n	Range	Mean	S.D.
Liaison LSELF	26	6-14	10.8	1.7
Nonliaison L-NL	45	5-15	10.6	2.4

The obtained mean difference was .2 in the predicted direction. The standard deviation for the L-NL perceptions, however, is considerably greater than that for the liaison self-perceptions (LSELF); the

statistic used for evaluation results in a computed value of .1--less than a third of the difference noted in Hypothesis I. While the hypothesis is supported, it can be seen that the support is weaker in this case.

Possession of Work-Related Information. Two hypotheses were posited, one in regard to nonliaison perceptions of liaison persons and the other concerning liaison self-perceptions. Each was measured by use of a single five-point scale. The sources of data were NLSELF (47 Communication Questionnaires completed by nonliaison persons about themselves) and NL-L (55 Personal Contact Questionnaires completed by nonliaisons on their frequent reciprocated liaison contacts) for the third hypothesis, and LSELF and L-NL for the corollary.

> H3: Nonliaison persons perceive liaison persons to have more work-related information than nonliaison persons perceive themselves to have.

The findings are:

	n	Range	Mean	S.D.
Liaison NL-L	55	3-5	4.3	0.7
Nonliaison NLSELF	47	0-5	4.1	1.0

The obtained mean difference was .2 in the predicted direction. Because of the larger variation in NLSELF scores, however, the range-free statistic computed value was a minimal .02; although the hypothesis is supported, the evidence is weak.

> H3a: Liaison persons perceive themselves to have more work-related information than they perceive nonliaison persons to possess.

	n	Range	Mean	S.D.
Liaison LSELF	26	4-5	4.4	0.5
Nonliaison L-NL	45	3-5	4.3	0.7

The obtained mean difference was .1 in the predicted direction. Applying the correction for variation, the difference is seen to be .06, providing only minimal support for the hypothesis.

Possession of Non-Production Information. Two hypotheses predict that liaison persons will be viewed, and will view themselves, as having more information about the organization that is not directly work-related than their contacts in the other groups. Each hypothesis was measured on a single-item scale with a possible range of scores from 0 to 5.

> H4: Nonliaison persons perceive liaison persons to have more information related to innovation and maintenance than nonliaison persons possess.

Data for testing this corollary hypothesis were LSELF and L-NL, as for the first hypothesis. A single item was used to measure, with possible scores ranging from 0 to 5.

	n	Range	Mean	S.D.
Liaison LSELF	26	1-5	3.1	1.1
Nonliaison L-NL	45	1-5	3.8	1.1

The obtained mean difference was in the opposite direction from that predicted, with a value of .6; the value of the computed measurement statistic is .39. Therefore, the hypothesis is not supported.

Control of Message Flow. The two hypotheses coming under this rubric predict that liaison persons will be perceived to have high control over message flow, and that any person so perceived will also be perceived as possessing high organizational influence. The former of these two hypotheses can be tested using the same procedures that were used for the previous hypotheses. The latter of these hypotheses required comparison of scores on message flow control and organizational influence through computation of a product-moment correlation statistic.

> H5: Nonliaison persons perceive liaison persons to possess more control over message flow than they perceive nonliaison persons to possess.

The data for testing this hypothesis were taken from the same sources used to test Hypothesis 4--NL-L and NLSELF. The findings are:

	n	Range	Mean	S.D.
Liaison NL-L	55	5-10	8.1	1.3
Nonliaison NLSELF	47	0-9	6.5	1.5

The obtained mean difference was 1.6 in the predicted direction. The computed value of the range-free statistic is 1.4, and the hypothesis is supported.

> H6: Persons who are perceived by their communication contacts to have high control over message flow will also be perceived to possess more influence in the organization than other members have.

The relationships between message flow control and perceived influence in the organization has been of theoretical interest for some time.

Hickey (1968) used a Bavelas network apparatus to test several hypotheses about the nature and effects of control. He used his assistants as network "central" persons and had them systematically vary the wording, timing, and channels for messages in relation to task accomplishment. Hypothesis 6 tests one of his findings in an ongoing, formal organization where control could not be an experimental variable.

The Pearson product-moment correlation was computed on pairs of scores representing message control and organizational influence scales for the two data groups, L-NL and NL-L; that is, the 45 Personal Contact Questionnaires completed by liaison persons on their frequent reciprocated nonliaison contacts, and the 55 Personal Contact Questionnaires completed (in the other direction) by nonliaison persons on their frequent reciprocated liaison persons.

The obtained value of r_{xy} was .57, which explains 33 per cent of the variance in perceived influence. On this basis, the hypothesis is supported.

System Openness. The hypothesis concerning system openness postulated that liaison persons would perceive the management communication system of the organization as more amenable to the exchange of ideas and suggestions than would their nonliaison co-workers.

> H7: Liaison persons perceive the organization's communication system for work-related matters to be more "open" than do nonliaison members.

This variable was measured by a three-item scale with a possible range of scores from 0 to 15. The data sources for testing the hypothesis are those used for Hypothesis 1. The findings are:

	n	Range	Mean	S.D.
Liaison LSELF	26	8-12	10.2	1.1
Nonliaison L-NL	47	6-12	9.9	1.3

The obtained mean difference was .3 in the predicted direction, and the value of the computed statistic used to test the hypothesis is .22. The hypothesis is supported.

Communication Satisfaction. This hypothesis follows from those concerning the possession of information and suggests that possession and satisfaction co-vary.

> H8: Liaison persons are more satisfied with the organization's communication system for work-related information than are nonliaison persons.

The hypothesis was measured on a scale consisting of four items concerning different aspects of the communication from top management. The possible range of scores was from 0 to 20. Data sources, LSELF and L-NL were the same as for the preceding hypothesis. The findings are:

	n	Range	Mean	S.D.
Liaison LSELF	26	10-19	14.0	2.9
Nonliaison L-NL	47	0-17	12.2	3.6

The mean difference obtained was 1.8 in the predicted direction. The computed value of the test statistic is .5; the hypothesis is supported.

Content and Communication Role. Although there has been little or no previous research relating communication-defined functional roles

and formal position in an organization, this hypothesis predicts that work-related communication and formal authority go hand-in-hand.

> H9: Liaison persons identified primarily in terms of production content are more likely to hold supervisory positions than are liaison persons identified primarily in terms of innovation and maintenance communication.

It was expected that there would be enough liaison persons in each matrix to permit comparing the role incidence with supervisory office across matrices, thus testing the hypothesis. Too few liaisons were identified in the innovation and maintenance communication networks to permit such comparison.

However, it was determined that, of the 21 liaison persons identified by analysis of production-communication reciprocated contacts, 67 per cent (n = 14) held formal supervisory positions. Three of the five innovation-communication liaison persons, and both liaison persons identified in the maintenance communication network, also held positions of formally-designated authority.

To determine whether a position was supervisory, the agency's most recent personnel roster was checked; on it, the head of each office was listed at the beginning of a section, followed by the names and grades of office members, in descending rank order. An additional check was provided by referring to the wording of titles, such as "Supervisor," or "Chief."

Over all, 70 per cent of the identified liaison persons held formal supervisory authority, lending some support to the concept expressed by Simon, that positions of communication and decision importance do coincide.

CHAPTER V

CONCLUSION

The present study examined communication linkages perceived by the members of an organization concerning the production, innovation, and maintenance aspects of their work environment. From these reported linkages, networks of communication structure were constructed and the persons performing two structural functions identified. These communication functional roles were compared as to their occurrence within each content-functional network, irrespective of formal organizational rules, and on several variables relating to receipt of work-related information, satisfaction with the management information communication system, perceived control over message flow, and the perceived openness of communication climate.

This chapter summarizes and discusses the study findings, suggests practical implications to management, and suggests further research into communication functions and communication roles in formal organizations.

Summary

With few exceptions, communication research in formal organizations has concentrated on ascribed relationships, positing that certain interactions will or will not occur between particular formally-defined roles.

The present study identified two structural communication roles--liaison and nonliaison--in each of three content-functional areas of organizational communication. Schwartz (1968: p. 150) suggested that his examination of communication in an academic setting might have profited from separation of communication "about work" into some more specific categories, enabling the researcher to discern differences between liaison and nonliaison role occupants according to the content of communication. In the present study an attempt was made to determine whether liaison persons who are identified serve in single content-functional networks or across networks.

Liaison persons were identified in terms of the structural diversity of their communication contacts, i.e., as analogues to graph theory articulation points, whose removal from the matrix separates communication groups except for single links known as bridge contacts. Earlier research emphasized the importance of the liaison position as a source of information and of opinion leadership (influence in the organization), and made clear that other members of an organization have relatively clear perceptions of the liaison function in those respects.

To extend these perceptions, and to determine whether liaison persons perceive themselves in similar ways, nine primary and two corollary hypotheses were posited and tested.

Each respondent in the study population was asked to complete three instruments: (1) a questionnaire providing demographic and self-perception data on issues relevant to this and the larger study of which it was part; (2) a checklist of the names of people within the population with whom the respondent communicated, indexed by content,

importance and frequency; and (3) a questionnaire eliciting perceptions of the communication characteristics of people with whom the respondent reported frequent contact. Of the 185 population members, 179 completed the Communication Questionnaire (177 were useable) and Personal Contact Checklist. Personal Contact Questionnaires were completed from the 875 contact nominations listed as daily or more frequent (844 were useable).

Information from the Personal Contact Checklists was entered into matrices--the frequent contacts reported from nominator to nominee. Reciprocated nominations were determined and entered into second-stage matrices; the network and other empirical analyses were based on these reciprocated nominations.

In all, there were 986 reciprocated contact nominations, 588 in the production communication matrix. Thus, there were 493 communication dyads over the three matrices, 294 in the production matrix alone.

Reciprocated contacts were entered into the matrices so that a respondent's contacts were grouped as close together as possible. This resulted in the isolation of 62 communication groups; these groups, in turn, yielded identification of 21 liaison persons in the production communication matrix, five in the innovation communication matrix, and two in the maintenance communication matrix. Since two persons served the liaison function in more than one matrix, the actual total was 26 liaison persons. There were no communication isolates.

Data for testing hypotheses were taken from the Communication Questionnaires completed by all liaison persons and by 47 nonliaisons in frequent reciprocated contact with them, and by Personal Contact Questionnaires completed on each group by the other.

Number of Communication Contacts. The crux of concern in the present study is whether liaison persons perceive themselves to possess the structural characteristics that their nonliaison contacts perceive them to have, as measured by the comparison of self- and other-perceptions.

The first hypothesis stated that liaison persons would perceive themselves to have more communication contacts than their nonliaison co-workers. While the definition of the liaison role demands sociometrically diverse contacts, it does not specify that liaison persons will contact more other people. Schwartz (1968: p. 135) found that the nonliaison members of his population did perceive liaison persons to have communication contact with more people than did the nonliaisons other nonliaison contacts. The present study supports the proposition that liaison persons also perceive themselves to have more contacts than nonliaison persons.

Influence in the Organization. The second hypothesis, too, acted to test perceptions that liaison persons held of their own communication position in the organization. This prediction stated that liaison persons would view themselves as possessing more potential influence in the work setting than their nonliaison contacts. The observed difference was in the predicted direction, supporting the hypothesis. As with the first hypothesis, the prediction was based on the perceptions that liaison members had of themselves in relation to their communication contacts, rather than the perceptions held of liaison members of the population.

Possession of Work-Related Information. Two hypotheses were posited, one dealing with perceptions held by one's communication contacts and the other with perceptions of one's own level of information.

Hypothesis 3, that nonliaison persons would perceive their liaison contacts to have more work-related information, received support.

Hypothesis 3a, that the 26 liaison persons would perceive themselves to possess more such information than their frequent nonliaison contacts, received minimal support. Because the standard deviation of scores on liaison perception of nonliaison contacts was half again as large as that for liaison self-perceptions, there may be no real difference.

Possession of Non-Production Information. The item used to elicit information about these two hypotheses described the nature of communication involved as "not related to work--what's going on within the agency, who works well with whom, who's happy here and who's not, etc."

Hypothesis 4 utilized reports from nonliaison persons on their liaison contacts, with the expectation that liaison members would be perceived to possess more work-related information than nonliaisons perceived themselves to possess. The hypothesis was supported.

The corollary, that liaison persons would also perceive themselves to possess more information not related to production, was not supported. The observed difference was clearly in the opposite direction, indicating that liaison persons perceived their nonliaison contacts to have more such information than liaison persons possessed. Since two-thirds of the liaison persons identified were found to hold positions of formal authority, the observed difference may indicate also that office and section heads in this organization repose considerable confidence in the knowledge levels of their technical and advisory staff members.

Control of Message Flow. The obtained mean difference (corrected to the statistic used to test the hypotheses) supported the hypothesis that liaison persons would be viewed as possessing more control over message flow than nonliaisons possessed.

Hickey (1968) found that network members in a laboratory situation who were seen as having high control over message content, timing, and distribution channel were also seen as having high influence in the network. Hypothesis 6 was designed as a partial test of this proposition in a formal organization. The index scales for control of message flow and for organizational influence, based on the perceptions of liaison and nonliaison persons reporting frequent communication contact, became data for the computation of a product-moment correlation coefficient. The obtained value of r_{xy}, .57, explains about one-third of the variance. Therefore, the hypothesis was supported.

Perceived System Openness. Hypothesis 7 predicted that liaison persons would feel that the work-related communication system was more open than nonliaison persons would perceive it to be, on the dimensions of supportive supervisors and the free exchange of ideas and information. The hypothesis was supported.

Communication System Satisfaction. The prediction of Hypothesis 8, that liaison persons would feel more satisfied with the management communication system than nonliaisons would feel themselves to be, was given strong support, with the observed difference in the predicted direction. The aspects of communication measured were accuracy, credibility, completeness, and utility (ease of use) of work-related communication from top management.

Content and Communication Role. It was hypothesized that the liaison role would be widely distributed in each of the three communication-functional networks. However, only two maintenance communication liaison persons were identified, one of those serving also as a liaison person in the innovation communication network. Five liaison persons were identified in the innovation communication network--one serving the same function for maintenance, as noted above--and one performing as a production communication liaison person. This distribution precluded useful comparison of the relationships of official position to the liaison communication role across the three networks.

The hypothesis stated that production network liaison persons would be more likely to hold official supervisory positions than would liaison persons in the other networks. Of the 26 persons identified as occupying this role, 70 per cent (n = 19) held official supervisory positions. This was true for three of the five persons in the innovation communication network, for both liaisons in the maintenance communication network, and for 67 per cent (n = 14) of the 21 liaison persons in the production communication network. On the basis of these findings, it is considered that the hypothesis is at least partially supported.

Additional Findings. A summary of topological and demographic characteristics of liaison and nonliaison members of the population will provide an overview of their functions.

Respondents in this study made almost 17 communication contact nominations apiece, on the average, compared with 12 per respondent in the Jacobson and Weiss investigation and the seven per respondent in

Schwartz's examination of a college faculty. Liaison persons nominated more people than did nonliaisons at every contact frequency: 4.77 for liaisons and 2.69 for nonliaisons at the "more than once a day" frequency; 3.50 versus 1.74 at the "once a day" frequency; and 7.73 versus 4.24 at the "once or twice a week" level.

Liaison members also received more contact nominations than their nonliaison co-workers; the mean over all frequencies of contact was 12.69 for liaison persons and 6.30 for nonliaison persons.

The liaison person averaged about one full civil service rank higher than nonliaison respondents--15.1 versus 14.3. And there was evidence that liaison persons had been employed somewhere within the agency's national system longer than their nonliaison contacts. It appears that, for this organization at least, one cannot perform the liaison function until some threshhold level of service is reached. In this case, the threshhold was five years.

Discussion

The design of this study placed limitations on interpretation of the findings. The most important limiting factors were: (1) the study population was selected for availability, and was in no way a random choice; (2) even with this limitation, were there a well-defined larger conceptual population, a case could be made for the use of statistical tests of significance--but no such population was defined; and (3) within the organization studied the applicable population was censused, removing from consideration a third level at which a probability model might have been applied.

The organization's history is such that findings must be applied to other government agencies with great caution. During the past decade the organization has undergone several personnel reductions; at the time of the present study, no less than three other investigations were proceeding; and the agency anticipated imminent announcement of decisions that would affect its future mission and structure. Therefore, mission-related communication may have been in a state of somnolence, and the networks derived may be untypical of the organization's long-term performance. Replication, of course, would be the test.

As Schwartz noted (1968: p. 145), the phenomenological nature of the data imposed a further limitation, in that the relationships between perceived and reported behavior may have induced distortion. There was anecdotal evidence during data collection that some employes saw the present study as another attempt to reduce the number and the pay grades of staff members. If that feeling were widespread, it could influence perceived and reported communication behaviors; (1) respondents might decide to rate their communication contacts artificially high, restricting the range of responses; or (2) respondents might decide to emphasize inoffensive responses, neither very high nor very low. There was no evidence of the former ploy, but a few respondents observed that they had used middle-range responses. Although such action would tend to mask perceived differences, its widespread operation could not be substantiated in the present instance.

Had respondents been provided lists of all staff members and asked to base their responses on that list, then responses in the least frequent category would have been relatively reliable. However, since all nominations and other responses were based on unaided recall, it was

decided that the "once or twice a month" category demanded too much of the respondents and was not reliable.

Several respondents listed contacts who were not members of the population, but who were attached to "field units" of the agency. Inquiry revealed that some headquarters staff members communicate more frequently with field personnel than with other people in the headquarters. Schwartz noted a similar problem in selecting a population imbedded in a larger, functionally adjacent population. It is possible that if the population had been defined to include field units, at least some different liaison persons would have been identified.

Two research staff members gave different replies to the question, "On what basis should I select names to list?" on the Personal Contact Checklist. One replied that respondents should list a "good sample" of their contacts, while the other told respondents to list the"contacts you usually make." Either of these instructions could result in reducing the number of persons listed and change the nature of the communication networks. The degree to which they had that effect is not known.

Hypothesis 3a stated that liaisons would view themselves as possessing more work-related communication than their nonliaison contacts. Actually, liaisons perceived themselves as having about the <u>same</u> amount of work-related information as their nonliaison contacts.

Several factors could have contributed to this finding, in addition to the factor of confidence in technical staff as noted above: (1) a relatively small sample of observations might have operated to reduce variance; (2) there may have been a response bias to the mean; and (3) since the same persons reported on themselves and on their contacts, the single source of data might have served to reduce perceived differences.

Schwartz noted (1968: p. 149) that close working relationships, possibly indicating friendship, could result in similar norms and perceptions by dyad members. Similarly, a person may perceive the communication behaviors and knowledge levels of his frequent contacts to be close to his own. Blau and Scott (1962: pp. 129-131) concluded that members of a government regulatory agency selected their co-workers as peer-consultants largely on the basis of homophily; they tended not to choose people as consultants who were too expert relative to themselves.

Hypothesis 4a, that liaison persons would perceive themselves to have more non-production information than their nonliaison contacts, was not supported. In this instance, both liaison and nonliaison persons reported their frequent contacts in the other functional role to have higher levels of such information about the agency and its personnel. Comparing only the self-perceptions of liaison and nonliaison personnel, however, it becomes clear that liaisons see their own information level as higher than nonliaisons view theirs: the means were 3.15 for the 26 liaison persons and 3.09 for their frequent liaison contacts.

One plausible explanation, since each group saw the other as posessing a higher level of information about non-production affairs, is a courtesy bias. This was not apparent on other variables, and thus is not accepted in the present case.

A second possible explanation is that the nonliaison group included some respondents whose communication behavior was critically important to the attainment of the assigned missions. Where such people maintained many contacts but did not meet the criteria to be liaison persons, they may have served to decrease the apparent difference between liaisons and

nonliaisons. Further research into the part played within networks by high-contact bridge role occupants might lead to explanation of the unexpected lack of support for these two hypotheses.

In Chapter III it was noted that decision and communication centers should coincide; that expectation was confirmed. Schwartz expresses concern that the diversity of contacts that nonliaison college staff members perceived liaison persons to have might be ascribed to the administrative posts held by many of those liaison persons. The present study could not determine whether administrators should have more diverse contacts, but it did determine that some top level adminstrators did not function in the liaison role.

This may be the result of conscious managerial style, or it may be regarded as undesirable by the administrators concerned. The agency director, for example, nominated and was nominated by a relatively small group of the 183 professional level staff members. That this state was perceived as undesirable by many members of his staff became evident to the research team through frequently volunteered comments that he had isolated himself from meaningful contact with members of his executive staff.

Some examples may illustrate. A middle-level executive stated that he was "always second-guessing what other people want done, without having the opportunity to check with them." A higher level executive noted that he needed better feedback on his contributions to the system, needed more information about the goals and mission priorities of the agency, and would function more effectively if he had more contact two or three levels "up the line." A third responsibly placed executive observed that, "Relative lack of contact with the Director, Deputy Directors, and our Assistant Director makes it difficult to know what they want." Similar

views were expressed at all levels, from clerical to executives with important contributions to the agency's mission.

At the same time, the present study did determine that a majority of liaison persons are administrators, and that they appear to be aware of the importance of their communication role in the organization.

The practical implication of this, admittedly anecdotal, evidence is that while the transmission loops for management communications may occasionally encompass most of the organization, the feedback loops are inordinately restricted. That is, the organization has provided little or no means for taking into account cognitive or affective expressions for the planning of future management communications.

Comparison of sociometric data between the present study and its predecessors may illustrate some significant differences in both design and populations.

Schwartz suggested that his respondents reported an average of only seven contacts because of the "once a week" minimum response category imposed in his study, while there was an average of 12 in the Jacobson and Weiss study, where there was a greater contact frequency range permitted. He then observed that the organization investigated by Jacobson, Seashore and Weiss was rather new and required much coordination in order to accomplish its assigned mission. The college setting, on the other hand, makes fewer demands on its members to closely coordinate many of their activities. The organization investigated in the present study was not new, but did require extensive coordination of communication among its staff members. Therefore, the nature of the organization seems likely to be the principal determinant of interaction frequency, other things being relatively equal.

The three content-functional communication networks differed markedly in size. One hundred and sixty-six persons reported reciprocated contacts about production matters, compared with 93 for innovation and 71 for maintenance communication matters. However, all members of the maintenance communication network except one were also members of the innovation communication network; in turn, all but two members of the innovation communication network were also members of the production communication network.

Despite this, there was little overlap among networks in terms of liaison persons. Given these data, one may conclude that there is a single large network, of which subsets are activated for different content-functional matters. With so few unique members, the concept of separate communication networks is uncertain at best.

The instructions for the Personal Contact Checklist may have affected network membership; descriptions of the content-functional areas were very brief, and oral introductions to the data collection sessions did not elucidate on the descriptions. Where individuals asked about the "meaning" of a content-functional area, they were given little extra information for fear of introducing systematic bias. It may be that the population did not understand the concepts of innovation and maintenance communication as stated, although members of the population assisted in generating the descriptions.

Suggestions for Further Research

Before additional research is conducted on communication structure using the present model, intensive work must be done to devise a computer program that will perform topological analysis. An example exists in the

Ross-Harary MIDAC program, although it is limited by the computer technology of that period (1956) and small matrix dimensions (44 x 44).

The sheer mass of labor, and hence the possibility of error involved in the present method of identifying communication groups and roles is prejudicial to replication. Computer technology has advanced by quantum leaps in the past 15 years, so the problem should not be insurmountable. Its solution would contribute to many analyses planned or contemplated by students of communication, in many social settings. Until or unless such a program is tested and implemented it is highly unlikely that replications over time, or over groups within a system, will be accomplished.

Given such a program, analysis could proceed beyond the present descriptive level to identification of network partitions along several dimensions--perhaps such concepts as central and peripheral persons and group cohesion, which are already programmed into incompatible and less heuristic computer analyses.[1] With identification of communication group membership and various communication roles or functions, techniques could easily be applied to test the dynamics of communication. Schwartz aptly concluded (1968: p. 164):

> The greatest theoretic utility of the liaison role concept will come from the study of dynamic properties of the role. It is necessary to distinguish the functions of the information treated and relayed by liaisons in terms of source purpose or receiver effect.

One technique that can be applied to findings of the present study is Davis's ECCO analysis (1953a,b), used to trace the flow of messages through

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1. Dr. Nan Lin devised two programs that group system members into cliques using matrix multiplication procedures. Mr. Lytton Guimaraes modified these programs to accept more dimensions and to compute more indices of sociometric interest. Both programs are available through the Department of Communication, Michigan State University, East Lansing. With the procedures adopted in the present study, the criteria are available for writing a topological analysis program for networks as large as several hundred members.

the structure of a social system. Messages can be introduced into the system at predetermined times and points and their diffusion traced. Predictions would concern the centrality of liaisons and bridge contacts in such diffusion.

The bridge contact function was not analyzed in the present study. It was only in the final stages of testing the qualification of potential liaison persons that several bridge contacts were differentiated. They appeared to have many of the characteristics of liaison persons, such as frequently choosing and being chosen, and thus may represent part of a continuum of "liaison-ness." Schwartz, Rogers, Amend and others have suggested that variables contributing to an index of the degree to which a person might be regarded as a liaison role occupant would include: the total number of contacts; the number of intergroup contacts; and the number of reciprocated contacts. The present author suggests at least these others: proportion of out-group to in-group contacts, perceived importance of contacts, and whether the contacts are seen as sporadic or continuous (or at least cyclical). Certainly, there are similarities and differences of degree between the liaison person with few but strategically placed contacts, the liaison person with numerous links outside the organization, the liaison with many links but within the organization, and the bridge contact person with similar sets of links.

There is yet another approach to the analysis of the liaison role, that of determining the functions performed by the linking process in the organization. Ross and Harary (1959) have described system members who "strengthen" and those who "weaken," according to how they function as points of uncertainty absorption. Schwartz, similarly, casts the analysis

of the liaison function in terms of the forms of message control exercised. Does the liaison person control the timing, channel, or wording of messages, or some combination of these? Again, the possibility of a continuous variable is presented.

Finally, Mitchell (1970: pp. 235-236), in his list of propositions about the diffusion of an educational innovation, suggests not only that liaison persons are likely to be in strategic important positions, but that some liaisons function as informal opinion leaders, without the benefit of formal authority position. As the diffusion progresses, he contends, the network of liaison persons changes, with some people becoming less important and others gaining importance. One change noted was that early liaisons were more likely than later liaisons to be persons in positions of formal authority. Thus, Mitchell lends support to the position taken throughout the present study, that replications over time are critical to the analysis of the liaison function in a social system, if one accepts communication as process.

The persons identified in the liaison role through the present study reported considerably higher satisfaction with the management communication system. Interviews with staff members indicated that communication was differentially distributed in the system, to the extent that some agency members did not have information needed for efficient job planning.

The relationship between satisfaction with the system and increased system efficiency (or effectiveness) is by no means monotonic. However, much previous research does show a positive correlation between prompt, broadly-disseminated information about organizational policies that affect employes and their commitment to the system. The burden of evidence in the

present instance is that widespread employe disaffection may be traced in part to perceived withholding of information by senior staff members. Differential access to information, insofar as that information is perceived to be one's due, or is perceived to be needed for effective goal-attainment, can result in unintended and dysfunctional power relationships. The suggestion is made, therefore, that both transmission and feedback loops be extended for a greater variety of organizationally-relevant information, especially in time of organizational flux.

In extending these loops, maximum use could be made of the formally-constituted, as well as the sociometrically-defined, liaison members of the organization.

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APPENDIX

APPENDIX

STUDY INSTRUMENTS

a. Communication Questionnaire

b. Instructions for Personal Contact Checklist

c. Personal Contact Checklist

d. Instructions for Personal Contact Questionnaire

e. Personal Contact Questionnaire

COMMUNICATION QUESTIONNAIRE July, 1970

Department of Communication
Michigan State University
East Lansing, Michigan 48823

As Dave Berlo said to all of the staff at the Meetings with [DIRECTOR] three weeks ago, no one in [AGENCY] will see any of the completed questionnaires, nor will anyone be identified by name with any of his answers. We need your full and frank answers; however, we can promise you that only the Michigan State research team will see individual questionnaires.

We do ask for your name because we are charting the communication "map" of [AGENCY]; however, names will be transferred to numbers immediately.

1. MY NAME IS: _____
(Remember, only the MSU research staff will read this)

PLEASE MARK AN "X" BESIDE JUST ONE OF THE POSSIBLE RESPONSES TO EACH QUESTIONNAIRE NUMBERED ITEM:

EXAMPLE: How frequently do you read the FEDERAL TIMES?

____Every issue
____Three out of four issues
__X__About half of the issues
____ About one out of four issues
____ Very seldom
____ I have never read it

2. Before I took the job I have now, I . . .

____ Worked inthis agency at a very similar job
____ Worked in this agency at a different kind of job
____ Worked for another government agency at a very similar job
____ Worked for another government agency at a different kind of job
____ Worked for a non-government organization at a very similar job
____ Worked for a non-government agency at a different kind of job
____ Other: (What, please?) _____

_____

3. In regard to armed forces service, I . . .

____ Retired, for longevity or medical reasons
____ Served on active duty, but not until retirement eligibility
____ Have not served in the U.S. armed forces

4. I have been employed in the [AGENCY] organization (at any level) for . . .

____ Less than 1 year
____ A year, but less than 2 years
____ Two years, but less than 5 years
____ Five years, but less than 10 years
____ Ten years, but less than 15 years
____ Fifteen years, but less than 20 years
____ Twenty years or more

Now, let's turn to the first of the Communication questions

[ONLY QUESTIONS PERTINENT TO THE PRESENT STUDY ARE INCLUDED]

20. The information we get from top management (Director, Deputy or Assistant Directors) is usually in very <u>useful</u> form--easy to use.

____ Strongly agree
____ Agree
____ Neither agree nor disagree
____ Disagree
____ Strongly disagree

21. Generally speaking, the information we get from top management about work-related matters is <u>accurate</u>.

____ Strongly agree
____ Agree
____ Neither agree nor disagree
____ Disagree
____ Strongly disagree

22. When top management puts out information to employes, you can <u>believe</u> it, <u>completely</u>.

____ Strongly agree
____ Agree
____ Neither agree nor disagree
____ Disagree
____ Strongly disagree

23. One trouble with the work-related information we get from top management is that it's usually late--not here when we need it.

____ Strongly agree
____ Agree
____ Neither agree nor disagree
____ Disagree
____ Strongly disagree

24. The information we get about work-matters from top management is usually complete--we are told all that's necessary.

____ Strongly agree
____ Agree
____ Neither agree nor disagree
____ Disagree
____ Strongly disagree

26. When someone needs to get a message to some group or person in Headquarter, [AGENCY], I can usually tell him the best way to do it.

____ Strongly agree
____ Agree
____ Neither agree nor disagree
____ Disagree
____ Strongly disagree

27. I communicate with more people in this organization than most people who work here do.

____ Strongly agree
____ Agree
____ Neither agree nor disagree
____ Disagree
____ Strongly disagree

28. The people who have a lot to say about what goes on around here respect the suggestions that I make.

____ Strongly agree
____ Agree
____ Neither agree nor disagree
____ Disagree
____ Strongly disagree

30. When I think it's best for the group I work with, I can control--expedite or delay--messages about our work.

____ Strongly agree
____ Agree
____ Neither agree nor disagree
____ Disagree
____ Strongly disagree

34. People around here are really encouraged to take any kind of work-related problems to their supervisors.

____ Strongly agree
____ Agree
____ Neither agree nor disagree
____ Disagree
____ Strongly disagree

35. I have access to very few supervisors and managers, compared to other people around here.

____ Strongly agree
____ Agree
____ Neither agree nor disagree
____ Disagree
____ Strongly disagree

37. When suggestions are made by employes around here, managers seldom give the suggestions serious consideration.

____ Strongly agree
____ Agree
____ Neither agree nor disagree
____ Disagree
____ Strongly disagree

39. In most organizations there are small groups of people who prefer to work or relax together. I have contacts in more of these groups than most other people do around here.

____ Strongly agree
____ Agree
____ Neither agree nor disagree
____ Disagree
____ Strongly disagree

41. At our staff meetings or work-group meetings there is free, two-way discussion of any problems that are brought up.

____ Strongly agree
____ Agree
____ Neither agree nor disagree
____ Disagree
____ Strongly disagree

We want you to think of the persons you know in [AGENCY] headquarters, and to compare yourself with them on several questions.

50. First, people differ with respect to the number of other people they communicate with each week about work-related activities (getting the job done, thinking of new ideas, etc.). As compared

to other [AGENCY] employes, how do you rate yourself--is the number of people you communicate with:

____ Well above average for [AGENCY]
____ Above average
____ About the same as for other [AGENCY] staff
____ Below average
____ Well below average

51. How about the number of people you communicate with about other things (the 'grapevine,' generally what's going on around here, etc.). How do you rate yourself--is the number you communicate with:

____ Well above average for [AGENCY]
____ Above average
____ About the same as for other [AGENCY] staff
____ Below average
____ Well below average

56. Now, instead of thinking about communication contacts, think about how much you know about work-related activities. Compared to other [AGENCY] employes, how do you rate the level of knowledge you have about work-related activities? Is it:

____ Well above average for [AGENCY]
____ Above average
____ About the same as for other [AGENCY] staff
____ Below average
____ Well below average

57. How about your knowledge level about topics that are not related to work...what's going on within the agency, who works well with whom, who's happy here and who's not, etc.? Is your level of knowledge:

____ Well above average for [AGENCY]
____ Above average
____ About the same as for other [AGENCY] staff
____ Below average
____ Well below average

58. Finally, compare the amount of influence you have on what goes on around here, in terms of work-related activities. Compared to other [AGENCY] employes, is the amount of influence you have:

____ Well above average for [AGENCY]
____ Above average
____ About the same as for other [AGENCY] employes
____ Below average
____ Well below average

59. How about matters not specifically related to work--such as teaching new people the ropes, helping to smooth out interpersonal problems, etc. Is the influence you have on these kinds of things:

_____ Well above average for [AGENCY]
_____ Above average
_____ About the same as for other [AGENCY] staff
_____ Below average
_____ Well below average

PERSONAL CONTACT CHECKLIST

_____
(Write your name here)

INSTRUCTIONS

1. On the attached Checklist are spaces for certain information about your work-related communication with other members of this organization. You will be asked: their names, how important the contacts are, and how frequent they are, and generally what function such contact serves.

2. The names are needed to complete the "mapping" of the "communication territory" here; however, no one within OCD will see any of the names you use.

3. Please print, or write clearly, so the coder can read it.

4. Consider only the poeple who work in Headquarters, OCD!

5. "Communicate" includes: face-to-face conversation, formal or informal meetings, memos, letters, intercom, telephone conversations, etc.

6. About the "functions" of your contacts with the people you name.... There are three types of communication listed on the Checklist: they are headed Production, Innovation, and Maintenance. There is a short description of each function in the heading. For each person you communicate with about work, indicate...

   a. In what area or areas you communicate. If only one, all right. If you communicate in all three areas, mark responses for all three. If you don't communicate in some area, don't mark any responses for that area.

   b. How important is it to you, when you communicate with this person about this?

   c. How frequently do you communicate with this person about this?

EXAMPLE:

	PRODUCTION							INNOVATION							MAINTENANCE						
	Impor.			Freq.				Impor.			Freq.				Impor.			Freq.			
	1	2	3	1	2	3	4	1	2	3	1	2	3	4	1	2	3	1	2	3	4
Joe Smith	X					X			X			X									
Harry Brown	X				X												X				X

IN OCD HEADQUARTERS, WHOM DO YOU COMMUNICATE WITH ABOUT..... REMEMBER, YOUR REPLIES ARE CONFIDENTIAL, AND NAMES WILL BE CHANGED TO NUMBERS BY THE RESEARCHER:	PRODUCTION: Telling or asking how-to-do things; Decreasing errors; Meeting deadlines; "Getting the work out."				INNOVATION: New ways to do things; New things to do; New sources of information; New channels for communicating about something.				MAINTENANCE: Interpersonal relationships; Setting rules; Monitoring peoples' behavior; Settling arguments; Helping others; Counseling people.			
	Importance			How often?					Importance			How Often?					Importance			How Often?			
	1	2	3	1	2	3	4		1	2	3	1	2	3	4		1	2	3	1	2	3	4
LIST NAMES BELOW:	More important than most	About average	Less important than most	More than once a day	Once a day	Once or twice a week	Less often		More important than most	About average	Less important than most	More than once a day	Once a day	Once or twice a week	Less often		More important than most	About average	Less important than most	More than once a day	Once a day	Once or twice a week	Less Often

INSTRUCTIONS FOR PERSONAL CONTACT QUESTIONNAIRES

In order to complete the attached questionnaires, you will have to look again at the Personal Contact Checklist you just finished. The Checklist is a record of the people in this organization with whom you communicate about work-related matters.

At the top of each one of the attached questionnaires are the words NAME OF CONTACT, followed by a blank line. Look at the Checklist--and determine which is the first name that has a "more than once a day" or "once a day" contact frequency checked off.

Write that person's name on the first questionnaire, after the words NAME OF CONTACT. Then, complete the questionnaire keeping only that person in mind. When you have completed the first questionnaire, look at the checklist to select the next person with whom you have at least daily contact about work matters; write that person's name in the blank at the top of the second questionnaire, etc.

Continue this process until you have completed a Personal Contact questionnaire for each person with whom you have at least daily contact about any of the three categories; Do not complete a questionnaire for any person with whom you interact less often than once a day.

There may be more questionnaires than you need; if so, please return both the unused and the completed questionnaires. If you need extra questionnaires, tell the survey staff member in the room, and he will provide them.

Your cooperation and patience are greatly appreciated. Thank you.

PERSONAL CONTACT QUESTIONNAIRE

NAME OF CONTACT: _____
(Print clearly--only the researcher will see it)

INSTRUCTIONS: The name above is one you have listed as a "once a day" or "more than once a day" communication contact. Please answer the following questions about this person. Give your first impressions, and mark only one response to each question.

1. This person communicates with more people in this organization than most other people who work here do.

   ____ Strongly agree
   ____ Agree
   ____ Neither agree nor disagree
   ____ Disagree
   ____ Strongly disagree

2. The people who have a lot to say about what goes on around here respect the suggestions that this person makes.

   ____ Strongly agree
   ____ Agree
   ____ Neither agree nor disagree
   ____ Disagree
   ____ Strongly disagree

3. When someone needs to get a message to some group or person in Headquarters, [AGENCY], this person can usually tell him the best way to do it.

   ____ Strongly agree
   ____ Agree
   ____ Neither agree nor disagree
   ____ Disagree
   ____ Strongly disagree

4. This person has access to very few supervisors and managers, compared with other people around here.

   ____ Strongly agree
   ____ Agree
   ____ Neither agree nor disagree
   ____ Disagree
   ____ Strongly disagree

5. In most organizations there are small groups of people who prefer to work and relax together. This person has contacts in more of these groups than most other people do around here.

____ Strongly agree
____ Agree
____ Neither agree nor disagree
____ Disagree
____ Strongly disagree

We want you to think of the persons you know in [AGENCY] Headquarters, and to compare this person with them on several questions.

6. First, people differ with respect to the number of other people they communicate with each week about work-related activities (getting the job done, thinking of new ideas, (etc.). How do you rate this person--is the number of people he communicates with:

____ Well above average [for AGENCY]
____ Above average
____ About the same as for other [AGENCY] staff
____ Below average
____ Well below average

7. How about the number of people he communicates with about other things (the 'grapevine,' generally what is going on around here, etc.). How do you rate this person--is the number he communicates with:

____ Well above average [for AGENCY]
____ Above average
____ About the same as for other [AGENCY] staff
____ Below average
____ Well below average

[QUESTIONS NOT PERTAINING TO THE PRESENT STUDY ARE DELETED.]

12. Now, instead of thinking about communication contacts, think about how much he knows about work-related activities. Compared to other [AGENCY] employes, how do you rate the level of knowledge he has about work-related activities?

____ Well above average [for AGENCY]
____ Above average
____ About the same as for most other [AGENCY] staff
____ Below average
____ Well below average

13. How about his knowledge level about topics that are not related to work--what's going on within the Agency, who works well with whom, who's happy here and who's not, etc.? Is his level of knowledge:

____ Well above average [for AGENCY]
____ Above average
____ About the same as for other [AGENCY] staff
____ Below average
____ Well below average

14. Finally, compare the amount of influence he has on what goes on around here, in terms of work-related activities. Compared to other [AGENCY] employes, is the amount of influence he has:

____ Well above average [for AGENCY]
____ Above average
____ About the same as for other [AGENCY] staff
____ Below average
____ Well below average

15. How about matters not specifically related to work--such as teaching new people the ropes, helping to smooth out interpersonal problems, etc. Is the influence he has on these kinds of things:

____ Well above average [for AGENCY]
____ Above average
____ About the same as for other [AGENCY] staff
____ Below average
____ Well below average

16. When he thinks it's best for the group he works with, this person can control--expedite or delay--messages about the group's work.

____ Strongly agree
____ Agree
____ Neither agree nor disagree
____ Disagree
____ Strongly disagree