AN ANALYSIS OF THE COMMUNICATION STRUCTURE OF THREE POLICE ORGANIZATIONS IN RELATION TO PERCEPTIONS OF THE DEPARTMENT AS HELD BY ITS MEMBERS

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ABSTRACT

AN ANALYSIS OF THE COMMUNICATION STRUCTURE OF THREE POLICE ORGANIZATIONS IN RELATION TO PERCEPTIONS OF THE DEPARTMENT AS HELD BY ITS MEMBERS

By

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The research study presented is a comparative analysis of the structure of the internal communication system of three police departments.

The goal of the thesis was to define the impact of various perceptions about the department held by its members upon the direction and frequency of communication contacts between members. The research design used in the study was a mailed questionnaire and a "Communications Map" checklist requesting perceptions of the department along specific variables and evaluations of frequency of contact with other departmental members. Police departments were selected to represent "average" size police departments of 25 to 50 members.

Of the sixteen hypotheses tested, nine were supported, three partially supported, and six were not supported. Two hypotheses proved not testable with available data.

Of the variables analyzed dealing with communication structure (flow), lack of propinquity and lack of perceived ability to

participate in the decision and control processes of the police department negatively affected departmental communication integration and caused communication flow to occur along the formal hierarchical structure of the organization. Lack of propinquity and uncertainty about organizational goals and expectations decreased communication contacts, a finding in the opposite direction than had been posited in the study.

Perceived participation in departmental decision and control also resulted in greater horizontal and upward communications contacts, supporting hypotheses suggested in the study. Job satisfaction was found to correlate positively with horizontal and downward communication satisfaction, but was negative for upward communication. This finding might have resulted because of the degree of uncertainty found in the department reporting the most job satisfaction, effecting the interpretation of the comparison. Participation in the department produced greater job satisfaction and level of perceived innovativeness among departmental members, yet seemed to produce more uncertainty about organizational goals and expectations. One explanation for this inconsistent finding is that the responsibilities and ambiguities inherent in participation would produce uncertainty in organizations that have a hand in deciding departmental policies and procedures than the more autocratic department where members have no input into departmental decision-making.

While all three police departments were to some degree autocratic, the department reporting the greatest perceived

ability to participate chose monomorphic opinion and influence leaders which were more likely to be outside the boundaries of the work group or of status considerations.

Other findings were: lack of propinquity increased level of uncertainty about departmental goals and expectations, perceived innovativeness increased the likelihood of suggestions by departmental members to improve the department, and lack of propinquity reduced the perceived level of participation in the decision and control processes of departmental members.

The research presented indicates the need for increased study of the information and decision centers to overcome problems related to propinquity, uncertainty, and ambiguity in police organizations for successful implementation of innovation and change.

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A DISSERTATION

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To my Son Matthew

Who gave this effort meaning.

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CHAPTER I

INTRODUCTION

The general consensus of the literature on formal organizations suggests that the communication structure of an organization largely determines how organizational functions are discharged. Communication is described by Katz and Kahn (1966, p. 233) as:

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

As early as 1938 Chester Barnard (1938, pp. 175-181) emphasized the "primacy of the 'systems of communication'" as the determinant for bureaucratic 'lines of authority.' Barnard (1938, p. 9) was among the first to suggest that "structure, extensiveness, and scope of organization are almost entirely determined by communication techniques."

Communication is by definition relational--one party is the sender and the other the receiver at a particular point in time. This relational aspect may affect the exchange process. The lack of awareness of the potential for disruption in the organization caused by communication distortion has led to the failure of many organizational attempts to improve operations.

Communications: Review of the Literature

Communications as a determinant of the authority structure of the organization has its roots in the classical school of organizational theory. This view, as exemplified by Max Weber, (1947, pp. 58-60) conceptualized bureaucracies as power bases, having impact on the political structure of society. Bureaucratic authority is vested in a role or position as opposed to individual designation with legitimacy based on the norms and regulations of the organization, and it becomes the basis for coordination between the organizational subunits. The goals of the organization are operationalized as directives (communications) for action that are transmitted through the hierarchy of authority. Thus, bureaucratic authority provides the authorization or legitimization for a particular person to issue commands that are binding upon other persons in a particular situation (Max Weber, 1947, pp. 324-341).

In later views or organization theory, bureaucratic systems are seen as dynamic processes of communication (Barnard, 1938, p. 163). The bureaucracy functions to apprise decision makers of relevant data and to inform those who execute the decisions of their responsibilities. In this connection, it is useful to contrast this later view, exemplified by Chester Barnard, with the Weberian construct.

The basic elements of the Weberian theory comprise power, hierarchy, and legitimacy. On the other hand Barnard views decision-making, communication and rational self-interest as the theoretical conceptions of bureaucratic authority. Hopkins (1966, p. 83)

suggested that while these elements comprise the major concepts currently used in the study of bureaucratic authority, they are seldom combined in research. He stated that many studies of communication systems assume that the exercise of authority is dependent upon the good will and rationality of the participants. Indeed he felt that many studies dealing with power de-emphasize the processes through which authority is exercised.

Barnard (1938) analyzed the relationship of roles in the organization as exemplified by the channel of communication dealing with authoritative messages. The effectiveness of the organization function is defined in terms of the attributes of the communication as well as the attributes of the relationship between the two communicators. The relationship between roles in the organization is determined by status or rank in the organizational hierarchy.

Weber's concept of authority stems from the organization which institutionalizes a rational-legal ideology whose responsibility for implementation is vested in the administrative staff. Barnard views authority as "flowing to those subject to it in the organization through the communications system rather than a legal control exercised by those classified as administrative personnel." For him, the rational-legal basis for these orders differs from the conception held by Weber in that the 'authority' is not vested in the rule makers but is based upon the perception of the subordinate. Barnard (1938, pp. 165-66) posits that acceptable communications must be understood by the receiver, consistent in terms of the purpose of the organization; compatible with the receiver's personal

interests, and must in the final analysis be capable of being executed. In addition, (Barnard, 1938, pp. 180-81) the communication must be capable of being authenticated; the receiver must believe that it comes from a particular role in the organization and the role position has the right to send such a communication. In that regard, the theories of Weber and Barnard are compatible.

In terms of "lines of authority," Barnard again parallels Weber in his assertion that "individuals are able to exercise authority only when they are acting officially." Barnard (1938, p. 1974) goes beyond Weber when he suggested that "objective authority is only maintained if the positions or leaders continue to be adequately informed." Barnard asserted that effective channels formally connect every participant to the organization. The two theorists concur on the premise that the channels of communication must be known to be effective and that persons serving in the role capacity as "communications center" must be perceived by the organization to be competent.

Hopkins (1966, p. 94) argued that Weber and Barnard are basically complementary in terms of their conceptions of authority systems. Their apparent contradictions result from systems differences in emphasis; Weber is concerned with the system structure through which communications flow while Barnard focuses primarily upon the processor, including communications, of an organizational system.

In the classical approach, structure was seen as vertical with communication functioning to "get the job done most efficiently."

The bureaucratic structure developed to meet needs of the organization without consideration of the personal needs of the members. The classical or traditional school reduced all problems of interpersonal relations to questions of authority (Haberstroh, 1965, p. 1201). "Bureaucracy" rested upon formality, which presents the organization as having a definite purpose, clearly defined jobs, written rules, and an established chain of command.

The Classical theory of organization led to the contemporary conception of the post-Weberian school that acted to document the Weberian model through analysis at the organizational level. This approach is seen in the case studies presented by Gouldner, Selznick, Blau and Lipset, who were characterized as Mouzelis (1968, p. 60) as observing the organization not as a static and rigid structure, "but as a going concern, as a system of continual tension and change between the formal and informal."

March and Simon (1968) attempted to integrate the views of bureaucracy as presented by classical theorists and that research which emphasized the influence of bureaucracy on the individual as an isolated unit of analysis. Mouzelis (1969, p. 137) criticizes this approach as stopping "on the level of the individual decision-maker, "as it does not provide an explanation of the ramifications of the communication and its network on the functioning of the organization."

While the classical school of organizational theory concentrated on the structure of the organization; the Human Relations school focused on the impact of the formal structure on the

individual. This approach emphasized horizontal communication patterns and decentralized authority and management. It was mainly concerned with the shared beliefs and informal codes of behavior of the members of the organization. In this view, communications were considered (Carzo and Yanouzas, 1967, p. 107) as more complicated than in the classical school as a result of the decentralization of authority and management. Since differences between superiors and subordinate are de-emphasized, communications expand to fulfill the need for the department of relationships between subordinates. The dimension of lateral communication was added to the conception of "up" and "down" networks as presented by classical theorists.

While the Human Relations school "revolutionized the classical theory of management by breaking through its formalistic approach and opening up the whole problem area of human behavior in the firm," (Mouzelis, 1968, p. 119), it was criticized for its de-emphasis of the formal aspects of the organization and its over-emphasis of its informal aspects.

The Open Systems approach to organizational analysis focused upon the interdependence of the roles or subsystems of the organization. The organization is viewed as a dynamic, everchanging system composed of recurring processes or patterned sequences of events (Jacob, 1971, p. 18). According to proponents of this approach, the static, or "closed" system approach fails to take into consideration the influences of the external environment on the organization.

Katz and Kahn (1966, p. 452) suggested that the "open-system theory is not a theory at all" but rather:

> An approach and a conceptual language for understanding and describing many kinds and levels of phenomena. It is used to describe and explain behavior of living organisms and combinations of organisms, but it is applicable to any dynamic, recurring process, any patterned sequence of events.

The open-systems approach considered the organization as a "learning system which has the capacity to rearrange its internal structure and elicit new self-controlled behavior in its attempts to adapt to a changing environment" (Mouzelis, 1968, p. 131). The classical school viewed the organization in terms of rigid structural components which determined legitimacy and authority. Similarly, while differing in perspective, the human relations school did not allow for much change in the organizational system.

In the open-systems approach, communication is viewed as information processing and in decision-making centers. The communications network was seen as a complex association of subsystems where "the members of smaller subunits communicate with and influence each other to a greater extent than the units communicate with and influence their superiors," (Berrien, 1968, p. 20). Communication is downward, upward, or lateral dependent upon the need of the parts or subunits of the organization. In this conceptualization, the power-structure of the organization is not specifically addressed, indeed, the status system was overlooked in terms of determining the network of decision-centers or information processing system as a dynamic, fluctuating process in the organization.

Communications: Theoretical Considerations

Weber's (1947) classical theory of organization provided the 'machine theory' of communication which attempted to clarify relationships among jobs. Sayles (1958) typified this approach in attempting to improve task performance by modifying work structure to change people. The same basic approach was called 'communication network' by Leavitt (1965) who relied on laboratory studies of communication, structure, and task performance. In this research, the communication structure, varying according to task or hypothesis, was imposed on the participants. This approach was adapted to the increasing interest in human relations which emphasized the effects of cross pressures upon employees and the importance of 'affect' within formal social systems. The Human Relations model suggests that appropriate channels be encouraged for upward, downward, and lateral communication. Research then is centered upon superior-subordinate relationships, primarily in an attempt to achieve 'communication openness.' Similarly, Likert (1961) concentrated on the location and level of decision-making within the organization. This 'power-equalization,' or open systems, approach attempted to develop a balance between concern for people and product (Blake and Mouton, 1964).

'Machine theory' communication research attempted to trace messages across hierarchical levels or test employee awareness or understanding of specific messages. Dahle (1954, pp. 21-28) found that certain communication channels are generally more effective than others and that certain material is more effective in one

channel than in another. Other analyses include the use of aggregate indices (Freshley, 1955) and an analysis of variance (Blau, 1960) to study the function of communication in formal organizations. Another effort has been to examine the flow of upward and downward communications in large organizations as well as that between superior-subordinate pairs. Major limitations of these approaches are that they are not well adapted to the structural and process aspects of systems theory.

The machine approach to communication leads the researcher to analyze separate or separable organization components. MacDonald (1970) posited that the limitations inherent in machine theory can be attributed to a lack of familiarity with concepts of relationality in communications. He stated that data gathered from previous studies is not relevant when one moves from the 'molecular member' to dyads, triads, groups, or whole organizations as units of analysis. Exceptions to this criticism involve research among individuals having no role designation rather than communications between formally prescribed roles as is the case in an organization.

The sociometric approach applied to organizational communication by Jacobson and Seashore (1951, pp. 28-40) allows roles to emerge from process, in terms of a set of operating functions. This organizational model assumes that an adequate description of communication relationships, and thus of the organizational structure, will not emerge when only formal relationships or positions are considered. In this way, communication content becomes operationally defined in terms of the perception of the

sender or receiver. This variable, plus the examination of emerging networks and patterns of organization communication, differentiates the systems approach from machine theory.

A methodological consideration posed by systems theory is to separate structure from process in a 'living system' (Schwartz, 1968, p. 21). Schwartz advocated analyzing communications networks without regard to the formal constraints of authority, prescribed function, or spatial relations (1968, pp. 8-16). He observed behavior or obtained reports of behavior from organization members, using the data to construct a 'map' of the organization. Structure is then derived from the definition of position at which a message transaction takes place. This differs from the machine theory approach where organizational structure is mapped according to task and authority.

Informal Organizational Communications

Thayer (1968, pp. 29-30) observed that internal communication is to an organization what the psychological/conceptual system is to the organism. It is what permits the organization to learn to be aware of itself, to be intelligently adaptive and creatively aggressive vis-a-vis its environment. Any organization's effectiveness is a function of its past and present communication patterns--both internal and external. Its external communication patterns act to determine its internal structure and functions.

Information, not data, is the raw material for thinking, decision-making, attitude development, and learning. In some areas of systems engineering, and computer sciences, the terms

'data' and 'information' are used interchangeably. Human communication distinguishes between what is potentially available (data) and that which is immediately consumable (information). Viewed in this manner, four levels of analysis evolve in which to view communication.

The first level of communication is at an intra-personal level. The focus is upon individual behavior such as observing, problem-solving, thinking, listening, reading, or speaking (Thayer, 1968, p. 30). The next level, interpersonal or intercommunication, involves two-person (or n-person) systems of communication. Of interest, from an organizational viewpoint, is not how an individual is affected by communication, but with how given individuals affect each other through intercommunication to regulate and control each other. The third level of analysis, termed organizational, links organization members together in networks of data systems and provides the means by which the organization relates itself to its environment. At this level, analysis involves the effect of the data or communication systems on task-related decision-making as well as organizational efficiency and effectiveness.

The fourth level of analysis is technological, involving the equipment, apparatus, and/or the formalized 'programs' necessary for generating, storing, processing, translating, distributing, or displaying data. The hardware of communication handles data. Information, which is the ultimate element of human communication, is a functional product or output.

A formal organization is characterized by a rational attempt to structure the transportation of data among the operating and decision-making parts of the organization. The organization's actual structure is formed by the patterns or networks which describe its communication within its environment. Special information systems can be established for certain of the organization's departments, especially in terms of management. These usually are special cases of an interface between organizational communication and data technology. Even though such systems and their associated equipment are usually referred to as 'information' systems, they are actually data transmission and processing systems.

Two distinctions can be made between data systems and communication systems. Data systems map the flow of data to or from humans or machines from the point at which the data is generated or disseminated to the point of their intended destination. Data systems are rational systems, humanly designed. Communication systems, on the other hand, are natural, emergent systems, resulting from data transportation by the actual communicative behavior of the person who is the locus of consumption (Walton, 1962). They are, in fact, control systems. Control and regulation of behavior in communication systems is a consequence of the people involved and the communication which occurs. The controls of data systems are rationally built into the process before any communication occurs, in anticipation of communication which should occur. People do not, and cannot, control each other communicatively in any absolute sense, even though all communicative encounters are regulatory to some degree.

Despite an emerging realization that organizations consist largely of patterned networks and flows of communicative relationships (Dorsey, 1957, pp. 307-324), the bulk of research concerning organizational communication is not amenable to a systems approach. Wilensky (1967) discussed the limitations of a totally rationalistic approach to organizations when he stated that the fact that communications in organizations should provide accurate information with the appropriate emotional overtones to all members who need the communication content precluded the development of a truly rational communication system. Previous research into communications with findings based on empirical data of message content, message flow, perceptual differences between individuals or groups in organizations, and role correlates are severely limited, since they view organizations as open systems and the function of communication as explicating and facilitating relationships within or between systems (MacDonald, 1970).

While not officially recognized, dynamic relationships in organizations can be found through informal contacts. Pfiffner and Sherwood (1960, p. 20) presented a method of "social overlay," which augmented the design of the organizational structure with lines depicting relationships that exist without official recognition. There is a pattern of relationships which usually are social in nature and exist because of a "net feeling of attraction or rejection."

In many organizations there are certain individuals that are recognized by the members of that system as those who are always able to get information or can cause some action to be taken, although

their position in the hierarchial structure may not appear to be that significant. Pfiffner and Sherwood (1960, pp. 23-24) referred to this phenomena as the "power overlay" or "network of influence," depicted as an informal channel of communications which may or may not be superimposed over the formal hierarchy of the organization. They suggested that perhaps "nowhere is the interrelationship of the various overlays more clearly seen than in communications" (p. 26). Previous research had shown that an important measure of organizational power is access to the information base of the organization.

Sayles and Strauss (1966, p. 353) suggested that:

> Today, organizations hire many managerial, professional, and technical personnel. Since they are often better informed on technical subjects than their superiors, the latter must abdicate certain key decisions to them.

Formal vs. Informal Organization

Barnard (1938, p. 73) suggested that in describing a formal organization "the most useful concept for the analysis of experience of cooperative systems is embodied in the definition of a formal organization as a system of consciously coordinated activities or focus of two or more persons." Coordination of activity for task accomplishment required communication between the parties involved in the effort. He identified the informal organization as consisting of the "aggregate of the personal contacts and interactions and the associated groups of people." The informal organization was seen as being "indefinite and rather structureless." Mitchell (1970, p. 99) observed that while "up" and "down" messages occur,

much of the more important messages flow across organizational lines by means of routes of influence and cooperation. He found that informal messages usually did not reach decision-makers and that cliques existed as result of the informal cross-flow of messages.

The existence of a formal and informal communications system within an organization does not indicate a conflict situation. Davis (1953, p. 43) posited that "communication to a worker and from the worker is dependent on effective management communications; and clearly this in turn requires informal as well as formal channels." He suggested that the active informal communication system is a result of effective formal communication. Thus, organizational study suggests that the organizational chart alone may not exemplify the functional communications dynamics of the organization.

Walton (1963, p. 46) contended that ". . . the most significant factor accounting for the total behavior of the organization can best be understood by understanding its system of communication." Deutsch (1952) suggested that if we can map the patternways by which information is communicated between different parts of an organization and by which it is applied to the outside world, "we will have gone far in understanding the organization."

Literature that presents the elements of organizational communication across multi-disciplines assumed that human organization is centered around role designations, hierarchical statuses, and patterned interactions among persons within the organization (Merton, 1949, p. 151). Thayer (1968, p. 18) observed that what essentially gets organized when people organize themselves into

collective enterprises is the flow of enterprise related information into and out of decision points which act to develop strategic relationships between and among the subunits or the organization. Deutsch (1955) stated that it is the communication that occurs and the patterns of interaction which result that define and determine the structure and the functioning of any organization. Thayer agreed by asserting that informational inputs, operations, and outputs determine the condition and future of the organization. He stated that a formal organization is characterized by rational attempts to structure the transmission of data among the operating and decision-making parts of the organization. The organization's actual structure was seen to be characterized by the pattern or network of information--decision flows within the organization.

Communications: Methodological Considerations

Methods of studying communication problems outside the laboratory have encountered the same difficulties as other field research in social science. One area of particular difficulty has been the inability to record and 'map' actual communication patterns in an organization.

Five methods of performing field studies of communication patterns and networks are found in the literature. The first of these, characterized by Mayo (1945) and Roethlisberger (1939) involved a "living in" type of observation in which members of a small group were interviewed and observed over a period of years. The clinical observers thus got the "feel" of the group and made subjective judgments about communication patterns. Obviously this

methodology has limitations in terms of reliability of data collection and interpretation. Subjective evaluations could result in errors over time as well as in differences in internal consistency based on operational definitions. This method has limited adaptability to larger organizations.

A second method, used by Eugene Jacobsen (1951, pp. 327-335) called "indirect analysis," seems to be the most extensively developed organizational communication research. A derivative of the sociometric technique, this method assumed that communication occurs among members of units with whom they spend the most time. Also determined are the particular classes of information and types of media to characterize communication channels and their effectiveness.

"Duty study," a third method, involves observing communications as they pass a particular spot. It provides information about flows of information but only shows overall patterns of communication. Moore (1950) best exemplified its most profitable and effective use in his study of an Air Force sergeant who spent 14% of his work day communicating by telephone. Obviously this method is restricted in terms of subject locus with a corresponding one-sided evaluation of perception.

A fourth method in which communications at any point in time are recorded and analyzed is termed "cross-section analysis." Generalizations are drawn from the random sample of communications within the organization at a given time. This method is not widely used.

Studying communications sequentially is termed 'ecco analysis.' This approach focused on a unit of information and follows it through time, space, and other dimensions. 'Ecco analysis' has a dynamic quality because it portrays a sequence of communications about an event. For example, it portrays the spread of a unit of information from its origin to all persons in the organization who knew the information at the cutoff point. This communication network can be superimposed on the organizational chart or related to such variables as seniority, age, or proximity of work station. The dynamics of flow could indicate such relationships as the proportion of communications between line and staff and within each, the proportion of communication between each organizational level, the direction of communication in relation to organizational level, the proportion of communication crossing functional lines, the types of communication which hold interest for each occupationally defined group, etc. Since 'ecco' data came from individuals, it required that the researchers attain rapport with the respondent. This type of analysis has been judged to have adequate validity and reliability for business use (Davis, 1953, pp. 307). Accuracy resulted in developing a questionnaire eliciting fact, not opinion. Since the full population was surveyed, problems of population sample did not arise, but there were problems of selecting representative types of information to be surveyed. Large organizations could only be studied

if the organization was broken into small segments and the study developed to mainly show patterns of communication.

Five general data-collection methods appear in the literature: (1) sociometric techniques (Jacobson and Seashore, 1951), (2) tracing a given message after it was diffused through the organization (Davis, 1953), (3) the communication log or audit where a census of messages is recorded by members over a given time period (Burns, 1954), (4) timed random sampling of messages (Hinricks, 1964) and (5) use of trained observers to record all or a sampling of message transactions (Bales, 1951). Obvious problems exist for the operationalization of data collection due to the content heterogeneity and noncontinuity of transactions. Data collection and analysis is further hampered by independent random sampling necessary for statistical models. In the machine theory approach, individuals or dyads can be randomly selected within each unit to be studied. Research involving the total communication system within the organization would require saturation sampling. This is further complicated methodologically in that it is difficult to generalize findings to similar or even dissimilar organizations.

Data Collection

The approach to organizational research in this study describes the communication structure through a survey of members in small or medium size organizations. This method imposes limitations on data handling and on the size of organizations studied,

usually as a result of cost. Another viable method would be to use a snowball sampling (a form of cluster sample) when the population is large enough, but this technique has had little or no use in communication research. It involved selecting a random sample of respondents, determining their communication contacts, and then "mapping" the communication structure for each resultant cluster of respondents (MacDonald, 1970, p. 15).

Another approach to data collection is the use of communications logs where the subjects maintain running records of all their communication contacts over a period of time (Burns, 1954, Walton, 1962, and Farace and Morris, 1969). The contacts can then be mapped to indicate the total network of relationships. One example of the limitations of this type of data gathering was the proposal in 1969 by the U.S. Attorney General that government attorneys keep logs of their communication activities. Opposition based on invasion of privacy killed this project. In addition, the problem of tiring of maintaining logs over extended periods of time and the record-keeping's possible effect upon communication itself could effect data collection. Sample adequacy is questionable when messages are considered as units since there are several available means to randomize at the message, individual, or time period levels.

A technique applicable to groups of significant size has been borrowed from the field of sociometry. Using these techniques, Jacobson and Seashore (1951) have investigated the use of communication relationships to define organization structure and assess communication's effect on the attitudes and behaviors of members. This

approach has been further developed by Schwartz (1968) in describing three communication roles defined by communication contact: liaison, nonliaison, and isolate.

The majority of sociometrically oriented studies count communication contacts which result from inquiries as to communication encounters. By analyzing reciprocated contacts, one can determine direction of initiation and influence and confirm the respondent's perceptions of dyadic interaction. "Groupness" and linkage points can be specified when people are grouped according to the nature of their communication contacts.

Concepts such as upward communication, downward communication, and lateral communication are unimportant in the systems approach to organizational communication since considerations of hierarchy are not stressed. Rather, dimensions of interest to the researcher include the dyadic relationship expanded to the nth degree, as well as member attributes and time. Schwartz attempted to show the presence or absence of communication contacts between system members in dyads, in groups, the total system to show communication flow, frequency and content.

Limitations of this approach are the inability to specify the significance of change in a network or of the differences between networks. It can be specified that two groups are indeed different or that change has occurred, but the statistical significance of these changes cannot be measured. The probability that each person will communicate with each other in the social system cannot be ascertained and therefore no known tests of difference

can be applied if no theoretical distributions can be derived (Davis, 1953).

Critique of Previous Research

The study of communication within 'real' organizations has not seemed to have gone significantly beyond the problem identification stage for several reasons:

1. The bulk of research has maintained a 'machine theory' orientation which encourages a clinical, therapeutic result as exemplified in business-management literature
2. Little attention has been paid to the development of methodology for analyzing the informal communication structure of an organization without the formal, imposed hierarchical structure
3. Too often the research which has been attempted was not conceptualized within the framework of a larger theory of either communication or organization.

Thus the usual approach to organizational communication research has been to attempt to determine how communication operates within the formal 'design' of the organization. Communication has typically been studied in terms of 'vertical' or 'horizontal' relationships between or among hierarchical levels or formally structured task units. This is evident throughout the literature where communication has been viewed as a therapeutic approach for improving organizational members. In this same vein, organizational communication research has also been used to study superior-subordinate relations in the human relations tradition. Both approaches focus upon the formal structure of the organization with little attention to the informal communication structure. Conceptually, communications research in the machine theory tradition encompasses only a few levels or units of the organization and disregards a major

proportion of interaction in the organization's communication system. In the name of practicality, communication has been operationally defined as a control or tool with motivational implications between superior or subordinate while communication as a functional information transmission process is secondary.

The open system approach to the study of organizations and their communication structure in particular would seem to be best suited to an adaptation of communications research as exemplified by researchers whose basis of analysis has its roots in the conceptions of Jacobson and Seashore (1951). This approach is presented further in this text.

Summary

The literature review presented is an overview of attempts by theorists to explain aspects of pattern, structure, and processes of communication to the decision-making and control functions of organizations. The general consensus across theoretical approaches is that communications seems to tie organizations together. Previous research has indicated that a study of communication structure in relation to organizational variables measuring perceived 'quality of life' (for example, job satisfaction, uncertainty, and physical environment) could act to effect the flow of information to the organizational processes of coordination, control, and decision-making. The need for research to integrate the various organizational theoretical positions utilizing organizational and communication variables was adopted in the present study.

CHAPTER II

RATIONALE FOR PRESENT STUDY

This study focuses on a comparative analysis of the structure and function of the internal communication of police agencies. While recent texts on police administration mention the importance of communications in police agencies, little research has been conducted to measure and assess the style and quality of that communication.

The general consensus is that the structure of a communications network in a police organization has a great deal to do with the speed and accuracy of the information transmitted between its personnel. Munro (1974, p. 71) posited that an integral part of a behavioral analysis of any police department is the mapping of the information flow within the organization. A police supervisor decides issues based on information received in conjunction with previously developed strategies, procedures, or rules. Consequently, the communication process becomes vital as the flow of proper information to the decision points of the organization is a necessary requirement for task accomplishment. If supervision were thought of primarily as decision making and if the decision process were considered essentially a communication-process including a network of communications systems, then supervision

could conceivably be viewed as a communication-process. Dorsey (1957, p. 310) concurred in that he said:

> Structurally, administration can be viewed as a configuration of communication patterns relating individuals and collectivities of varying sizes, shapes, and degrees of cohesion and stability. Dynamically, administration appears as a patterned swirl and flow of communications, many of them channeled through transactional 'circuits' between persons and person, persons and groups, and groups and other groups.

Thus the several concepts--communications, control, information, and decision making--are interwoven. Information exchange would seem to have basic significance for both control and decision-making. Communications networks develop to carry requisite information for decision-making to provide task-oriented control. One essential feature of police work is that its rapidly changing external environment requires a high volume of informational messages that need to be transmitted through the organization. The level of the volume of messages in a police organization is determined by six basic factors (Whisenand, 1971, p. 142):

1. The total number of members in the organization.
2. The nature of its communication-networks (downward, upward, or horizontal).
3. The transmission regulations controlling when and to whom messages are sent.
4. The degree of interdependence among the organization's various activities.
5. The speed with which relevant changes occur in its external environment.
6. The search mechanisms and procedures used by the organization to investigate its environment.

A police organization is compelled by its functions to maintain a high volume of messages. Messages, which vary in form and content, include reports, statements, inquiries, questions, accounts, comments, notes, records, recommendations, rejoinders, and instructions

(Eilon, 1968, pp. 266-88). These messages can be transmitted formally or informally through written communication, oral communications through face-to-face contact, or oral communications in telephone conversations. The particular method used by the police organization to collect, select, and transmit information is a critical determinant of the organization's ability to function.

Persons making administrative decisions in any formal organization must examine the consequences of such decision for authority and communications relationships within the organization. In a police organization most information is fed into the system by persons at the bottom of the formal hierarchy. This creates immense problems for authority, for by the very nature of the patrolman's task supervisory control can often come only after a decision has been made. The subordinate's discretion in terms of information-input into the system increases the importance of influences which are not part of a formal authority structure (Simon, 1952, pp. 188-9).

Ericson (1972, p. 89) suggested that the type of authority system which police administrators must develop is that of manipulation rather than domination, using positive incentives and group persuasion as opposed to direct threats and explicit instructions. Such an approach assumes that the administrator knows or has access to the points of the organization where influence can be utilized to maximize decision-making and management.

Pfiffner and Sherwood (1960, p. 137) proposed that the "exception principle"--leaving the routine decision-making to the

lower echelon except for unusual circumstances and the modern concept of communications as a circuit rather than a pyramid preclude the necessity for "a commander on each echelon to have seen and read every message, but only those which require his attention for the purpose of information or decision."

The proposition that in a police organization the staff has as influence on major operational policy even though formally it has no operating authority is supported by Kenney (1972, p. 47) who stated that:

> The myth that administrative policy for the police department is made by the chief of police needs to be scotched. . . . It is inherent . . . that the policy is made at all levels of organization and in essence all personnel are ultimately involved in the policy-making process.

In police organizations, although decisions as to the administration of the organization might be made more frequently by those in higher positions, actual working-policies regarding "discretionary" decision-making are often formulated at the operational, or working level.

The Police Bureaucracy

The police bureaucracy differs from most other bureaucracies in the way in which activities are originated. In an industrial organization, the pattern of line work activity is in most cases initiated by the higher administrative level of the organizational hierarchy. A police bureaucracy is also different in that most information crucial to the organization's operation is fed into the system by those at the lowest levels of the formal hierarchy.

This creates problems of authority, for by the very nature of the patrolman's task supervisory control can often come only after a decision has been made.

Ericson (1972) posits that the police bureaucracy must be "representative" in nature, where operating norms are initiated collaboratively (Gouldner, 1959, pp. 403-4). Traditionally, police organizations have been viewed as "punishment-centered" where the imposition of rules and subsequent obedience are viewed for their own sake (Gouldner, 1954, p. 24). He suggests that an informal authority structure largely controls activities relative to police exercise of discretionary decision-making. Tolerance of this informal system is seen as an exchange for compliance with organizational policy. Organizationally useful communication is not confined to formal channels based upon the authority structure of organizational hierarchy. Informal and personal communication is a supportive and frequently necessary process for effective functioning. The unofficial communication channels has been suggested as a prime means for studying informal organization.

Messages transmitted along informal communication channels can be characterized as being of three categories (Whisenand, 1976, pp. 314-15). The first type are subformal channels that carry messages arising from the informal power structure existent within the organization. Every member of the organization is expected to know and observe informal rules and procedures about what to communicate and to whom. Such rules are rarely written and must be learned by experience.

Whisenand (1976, p. 314) suggests that the majority of communications in police organizations are subformal. Downs (1967, p. 113) presents two types of subformal communications: those that flow along formal channels, but not as formal communications, and those that flow along purely informal channels. Since neither are official, they have the advantage (and sometimes disadvantage) of being withdrawn or changed without an official record. As a result, Downs posits that new ideas are first proposed and tested as subformal communications. While subformal communications act to meet the communications requirements not met by formal channels, they tend to become increasingly important under certain organizational situations. Whisenand suggests that these conditions include:

1. The greater the degree of interdependence among activities within the department, the greater the number and use of subformal channels.

2. The more uncertainty about the objectives of the department, the greater the number and use of subformal channels.

3. When a police organization is operating under the pressure of time, it tends to use subformal channels extensively, since there is often no time to use the formal channels.

4. If the divisions of a police department are in strong competition, they tend to avoid subformal channels and communicate only formally.

5. Subformal communications channels are used more frequently if departmental members have stable, rather than constantly changing relationships with each other.

Whisenand does not document these contentions. Rather, he seems to infer these relationships from tested hypotheses gleaned from various sources in organizational communications. Research that has been specifically conducted in a law enforcement agency is that reported by Blau (1954) where the frequency of informal

communications contacts were dependent upon the competency of the individual acting as the receiver. Blau was concerned with a systematic analysis of the processes of interaction in a "natural" group, especially in relation to the status differences that emerge in the interaction process. The study focused upon a work group of sixteen agents, who, together with a supervisor and a clerk, composed a department in a 'law enforcement' agency. (The function of this quasi-criminal justice agency was to investigate business establishments to determine whether any violation of the laws the agency administered had occurred.)

Blau found that unofficial status and quality of performance were mutually related in this department. An integrated status in the group was attained by superior competence, with departmental members being attracted to those colleagues whose ability they respected. Blau also suggests that a substitute for attaining status for those less proficient in the organization was the establishment of extensive informal relations with colleagues who are highly respected in the organization. Blau found that agents who received the largest percentage of informal contacts tended to assume dominant roles in group situations.

Blau postulates that the attention paid to the agent receiving many contacts provides a sense of security that allows the individual to make recommendations and provide input above the average level of the members of that peer group. By directing a disproportionate number of contacts to one member of the work group, the members were seen to have expressed their collective

regard for and deference to the receiving member, and thus have bestowed superior status, power, and prestige on that member.

Berelson and Steiner (1964, p. 370) agree with Whisenand when they state:

> The efficiency of a large formal organization is sizably enhanced when its own chain of command or decision or communication is tied into the informal network of groups within the organization, so that the network can be used to support the organizations goals.

Like Blau (1964, p. 356) they also note that recognized leaders occur at the position of highest centrality in the communication net.

The purpose of this study is to determine the structure of communication flow in police organizations. An organization may be analyzed on at least three different levels: (1) The systems level, that is the organization as a whole, (2) The sybsystem level, concentrating on the various groups which make up an organization, and (3) The intrapersonal level which involves data collection relevant to the attitudes, roles, abilities, etc. of the individual members of the organization. The research undertaken views the police agency as a total organization at the systems level of analysis. Subsystems or small groups existent either informally or as a result of formal work assignment will be considered in the context of the larger organization. Mouzelis (1968, p. 131) characterized this open-system approach as considering the organization as a "learning system" which has the capacity to rearrange its internal structure and elicit new self-controlled behavior in its attempt to adapt to a changing environment." The advantage of

viewing the organization as an open system is in its emphasis on information processing and decision centers.

An approach taken by F. Kenneth Berrien (1968, p. 20), treated communications first in terms of the entire organization and then specifically in relation to the subsystems of the organization. He posits that "in a social system, the members of smaller sub-units communicate with and influence each other to a greater extent than the units communicate with and influence their superiors." In this approach, the communication network is seen as a complex association of subsystems. Berrien states that the need for a degree of stability by the formal organization required management to provide or make possible functional connectedness of the parts of subsystems.

Communication integration is defined as the degree to which all members of an organization relate to each other through the exchange of information with symbolic content. One simple sociometric index of this variable at the social systems level is the proportion of mutually chosen pairs of the total number of pairs of individuals in an organization (Proctor and Loomis, 1951: Kerlinger, 1966). Reindl (1970, p. 107) stated the proposition:

> The degree of internal integration of the (organization) communication network is positively related to the rate of change implementation in the organization.

Guimaraes (1970, p. 68) in studies of the integration of the communication network of four rural social systems of Brazil stated that the degree of the organization's communication integration may explain how members of a social system (of which that

communication system is a part) accept, reject, or modify innovations which are diffused from other systems. Richard K. Allen (1970, p. 108) found that innovative schools have a higher degree of communication integration than non-innovative schools.

The concept, integration of the network, gives the degree of 'connectiveness' within the organization. Another dimension of the communication network structure is "how" this connectiveness is patterned. This view of communication structure was a major dimension in the Jacobson and Seashore study (1951, p. 29):

> The communication structure is seen as existing in the patterns of actual contact among subgroups that are established by the inter-individual contacts.

While recent texts on Police Administration mention the importance of communications in the police organization, little research has been conducted to measure and assess the style and quality of that communication in relation to how the organization functions. Indeed, Whisenand (1971, p. 131) proposes that:

> Communication is the vehicle for supervisory control. In other words, the police supervisor is a key person in building and maintaining effective organizational communications as he interacts with subordinates, peers, supervisors, and the citizenry. . . . A communications, or in terms of organizational setting a communication system, provides the means by which information, statements, views, and instructions are transmitted through an organization. . . . A police supervisor decides issues based on information received in conjunction with previously developed strategies, procedures, or rules. . . . In fact, if supervision were thought of primarily as decision making and if the decision were considered essentially a communication process including a network of communication systems, then supervision could be viewed as a communication process.

Increasingly, police administrators are faced with the problem of police officers who insist upon their right to be

involved in decision-making processes of the police organization. Moore (1976, p. 76) asserts that this is inconsistent with the classical model of bureaucracy in which authority flows from a position at the top of the hierarchical structure to a position at the bottom--with no authority flowing from the bottom upwards. An important element of this study will be to test the pattern of formal and informal communications flow in police departments in terms of decision-making processes in relation to the existent bureaucratic structure.

As police organizations become larger, so do the systems which operate from within. In the case of communications, the task becomes a hundred--or a thousandfold. Clement (1976, p. 53) observes that police administration must "avail ourselves of all communications systems and develop them to the degree that they are useful in assisting us to run our organizations efficiently and effectively. We must, of necessity, employ both formal and informal systems of communication." This sentiment is echoed by those in the field such as Chief Richard R. Anderson (1976, p. 54) who said, "I think internal communications are vital because not only should you as chief know what is going on within your own department in all areas, but you have an obligation to your officers and civilian employees to make sure they know what is going on within the organization."

The Police Department as the Subject of Communications Net Study

The present study focused on the variations in the internal communication network structure and functions present in police organizations. It provides an understanding of the communication structure and flow among personnel of local government police department as formal organizations. Formal and informal channels of information transmission are identified. The communication behaviors of the individual respondents were then mapped in sociometric form to provide a picture of the extant communication structure of the police departments under study. The 'map,' based upon a refinement of the Jacobson and Seashore technique (1951) was computerized by Mitchell (1970) and Farace (1972) to provide for data manipulation to perform a communications network analysis.

The organizations selected for the present study were five local police departments operating under city chartered governmental bodies which provide law enforcement and crime prevention functions in their respective communities. The departments were selected initially for the willingness of the top administrators to allow research to be conducted in their respective departments. The difficulty of admittance for a research effort have lessened considerably in recent years as police agencies became more accustomed to the scrutiny to their operations and records, a situation that historically was not tolerated.

Several variables were considered important in selecting the particular police departments to undergo study. The investigator

wished to limit consideration to 'typical' police agencies rather than upon departments of unique function or unusual size. Based upon an analysis of the police agencies reporting to the Federal Bureau of Investigation Uniform Crime Reports, it was determined that the greatest percentage of police departments in the three Midwestern States represented in the study under the jurisdiction of local government units were under 25 sowrn personnel in size (78 to 86%) (1974).

Table 1.--Number of Full-Time Law Enforcement Officers, October 31, 1973; All Cities Reporting to F.B.I.

Table 1	State 1[a]		State 2[b]		State 3[c]	
Under 25	86	84.3%	322	85.4%	122	77.7%
26- 50	9	8.8	31	8.2	15	9.6
51- 75	1	0.98	10	2.6	8	5.1
76-100	2	1.96	4	1.1	6	3.8
101-125	-		1	0.3	-	1.9
126-150	3	2.94	3	0.8	3	1.9
151-200	-		1	0.3	1	0.6
201-250	-		1	0.3	0	
251-275	-		1	0.3	-	
276-300	-		-		1	0.6
Over 300	1	0.98	3	0.8	1	0.6
	102		377		157	

[a]Department Exter.

[b]Department Bentley.

[c]Department Deerfield.

Source: Data derived from Crime in the United States, 1973, Uniform Reports. Tables 70 and 71.

Since the research effort is generally concerned with a study of communication networks in average police organizations, it was decided to limit the analysis to agencies of representative size. The number of personnel of police agencies of this size was desirable in terms of being small enough for one investigator to study in a reasonable amount of time yet be significant in terms of being representative to police organizations. Expediency also limited the geographic scope of the study to the Midwestern region of the United States. It was felt that political influences acting on the department would be more significant than the geographic variable for the purposes of this analysis.

While governmental units at federal, state, county, and municipal levels vest various organizations with law enforcement responsibilities, the majority of such organizations are at the municipal level. The present study, therefore, is restricted to those agencies that derive their jurisdictional power and authority from municipal governments.

Thirdly, the police agencies selected for study were similar in formal hierarchical structure in relation to the quasi-militaristic pattern of traditional police organizations. Few local police agencies in the United States have developed and maintained non-traditional organizational structures. Since the communication patterns of traditional police departments have not been documented by research, a comparative analysis of the differing structural arrangements of police organizations was deemed premature. Instead, police departments were chosen for their similarity of

function and authority and the delegation of responsibility to corresponding organizational subunits, e.g. a detective bureau for the investigation of crime.

Fox and Lundman (1974) stated that the problems encountered in researching police organizations are different from those involved in researching other formal organizations. They suggested that these difficulties result from the lack of systematic techniques for entry into the departments. The problem of entry was faced by this study in that traditionally police organizations have been leery of academic research efforts. As found by Fox and Lundman, the most viable mode of access into the department was dependent upon informal social organizational contacts and contingent acceptance at the administrative level of the organization.

The participant agencies for this study were self-selected in that entry was dependent upon information held by the organization about the researcher. Social and professional contacts led to positive response to overtures for research participation. This type of selection lends itself to possible considerations of bias in the research, with participation acceptance being indicative of organizational openness to a certain extent. While a random selection of police departments would have been the ideal, the researcher was careful to neutralize the possible incidence of bias in the final selection procedure. The attempts to ameliorate these conditions involved selecting police departments with varying access determinants. In addition, selection of participants was based upon absence of possible inter-departmental contact between

police departments undergoing study. The departments were chosen for their representation in terms of demographic characteristics of typical United States police departments (FBI Uniform Crime Reports, 1973).

Data analysis excludes two of the original five police departments studied. The Chief of Police in Department A (70 men) resigned unexpectedly under great controversy at the point of 48% return of research questionnaires. The City Council and the subsequent Acting Chief prohibited the completion of data collection. The data to date was deemed inadequate in terms of significant analysis. For that reason, the analysis of Department A is not presented.

In addition, the Chief of Police in Department C resigned his position to accept another. At his request, data analysis, although virtually completed, is not presented in deference to professional relationships. The remaining participating police departments, although presenting a variation in size, are presented as it was felt that while organizational size could have impact upon the analysis of informal communication network development, it was not as important in relation to the hypotheses being presented.

Summary

The lack of research in the area of administration in police organizations based upon an analysis of the efficacy of communication flow in relation to control and decision-making suggested

the need for research that would 'map' the communication structure (flow) found in an average police department along with the identification of organizational variables that act to impede or enhance that structure. The present study attempts to consider the police department as an organizational bureaucracy whose communication patterns are affected by departmental conditions perceived to be existent by its members. The perceived openness and use of the communication structure of personnel employed in police departments was measured and analyzed across four major areas: (1) Propinquity, (2) Uncertainty, (3) Innovativeness, and (4) Level of Participation in Decision-Making and Control. An attempt was made to identify liaison and opinion/influence leaders in the organization in order to suggest a method for the facilitation of information, dissemination, and introduction of change into a police department.

Five police agencies were selected for inclusion in the research effort. Two departments were subsequently excluded from the analysis presented. Three police departments were approached through the use of a mailed questionnaire to collect data concerning communication behavior and perceptions concerning organization variables selected as affecting communication activity.

CHAPTER III

DEVELOPMENT OF HYPOTHESES

The literature review presented in Chapter I is an overview of attempts by theorists to explain aspects of pattern, structure, and processes of communication activity in organizations. The general consensus across theoretical approaches is that communication seems to tie organizations together. According to Roberts, et al. (1974), the relationship of various facets of communication to organizational processes such as coordination and decision-making would provide an understanding of organizational behavior. Additionally, they stated that the relationships among communication, organizational efficiency, and 'quality of human life' (for example, job satisfaction, motivation, and morale) variables are equally important.

Roberts et al. (1974) further presented an analysis of communication variables which they purport emerged as important because the variables are mentioned or implied by a number of organizational writers. These variables, presented in Figure 1, have not been fully integrated into a general theory of organizational communication. Rather, existing definitions of organization communication facets have, in many cases, yet to be developed and linked across levels of analysis in research efforts. Indeed, organizational researchers generally have not taken communication as

Theorists	Organizational Characteristics Stressed		Relevant Communication Characteristics
Classical	Formal structure Work Specialization	Work efficiency Coordination	Identification of formal channels Impersonal nature of content Interaction usually written
Humanist	Informal Work Groups Interlocked Work Groups	Individual Motivation Participative Decision-Making	Description of Informal Channels Dynamics of Accurate Information Flow Interaction usually face-to-face
Behavioral-Decision	Unit Interdependence Work specialization Role standardization Nature and locus of rational decision-making	Centralization of Authority Formalization Division of Labor	Defining formal channels Process of uncertainty absorption Message volume/accuracy Directionality Communication purpose Information control
Systems or Process	Inputs and Outputs Environmental Uncertainty Organizational Viability		Process of information entry Information as an exchange commodity

Figure 1. Organizational Characteristics Stressed by Theorists and Relevant Communication Variables.

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their primary focus. This oversight has underscored the lack of integration between communication and other organizational variables. The need for research to integrate the various organizational theoretical positions utilizing organizational and communication variables was adopted in the present study.

The analysis of organizational theory from a communication perspective presented a common definition for 'communication' and communication theory involving information exchange and the transfer of meaning. For organizational research purposes, appropriate definitions of aspects of communication must also consider the multiple level of analyses inherent in all organizational research (Pugh, 1970). Communication must be explicated within and across the "domains of interpersonal interactions, within and between organizational sub-units, and across organizational-environmental interactions" (Roberts, et al., 1974, p. 502). Previous research in organizational communications has concerned itself with interpersonal communication (Barnlund, 1968 and Weiner, 1968) and with information exchanges within and between organizational sub-units (Likert, 1967 and Schein, 1965). Since organizational writers have not primarily focused on communication, implications between communication and characteristics of organizational behavior can only be inferred. The research presented attempts to integrate the two theoretical approaches to provide an understanding of the relationship of communication and organizational variables within and across analytic levels.

The research focused upon several categories of communication and organizational behavior characteristics to integrate extant findings from relevent interpersonal and sub-unit communication behavior. Basic organizational dimensions such as structure (hierarchy), decision-making patterns, and locus of authority were examined in light of organizational communication characteristics: (1) communication structure (flow), (2) modality of communication, (3) perceived communication satisfaction, and (4) integration. Organizational variables selected for comparison include: (1) uncertainty, (2) propinquity, (3) status, (4) perceived innovativeness, (5) job satisfaction, (6) organizational decision-making style, and (7) opinion/influence leadership.

Operationalization of Variables

Structure

Blau (1960, p. 178) has stated that the two basic types of "social facts" that relate to complex organization's (social collectives) include common values and norms and "networks of social relation in which the social position of individuals and subgroups become differentiated." Jacobson and Seashore (1951, p. 29) called these "networks" the communication structure of the organization.

The concept, structure, implies relatively unchanging elements which influence or constrain important aspects of the organization's total behavior (Haberstroh, 1965, p. 1171). Katz and Kahn also develop organizational structure in relation to patterns of communication in stating:

> All social systems, including organizations, consist of the patterned activities of a number of individuals . . . these patterned activities are complementary or interdependent with respect to some common output. . . . If the activity pattern occurs only once or at unpredictable intervals, we could not speak of an organization.

Integration

Reindl (1970, p. 106) discussed the general relationship between integration of the internal communication network and change in one organization over time.

> The degree of communication integration in an organization . . . is closely associated with the uninterrupted flow of information. For that reason, communication integration is also related to various concepts . . . such as change, effectiveness, and creativity.

As communication integration is defined as the degree to which all members of an organization relate to each other through the exchange of communication, measurement might consist of the proportion of mutually chosen pairs to the total number of possible pairs in the organization (Proctor and Loomis, 1951; Kerlinger, 1966). Reindl (1970, p. 107) goes further to propose that "the degree of internal integration of the communication network is positively related to the rate of change implementation in the organization." Yet Jacob (1971, p. 192) found that the hypothesis positively relating innovation in organizations to an integrated communication network was not supported in her research. A better source is L. Guimaraes (1970, p. 68) who studied the integration of the communication network of four rural social system in Brazil. He stated that:

> The notion that the diverse parts of a communication system normally cohere in some determinate fashion . . . may help to explain . . . how members of a social system (of which

> that communication system is part) accept, reject, or modify innovations which are diffused from other systems.

Richard Allen (1970, p. 108) also found that innovative schools had a higher degree of sociometric communication integration than non-innovative schools.

The concept, integration of the network, quantifies the "connectiveness" within an organization. An important dimension of the connectiveness of the communication network structure can be found in the pattern of organizational connectiveness. This view of communication structure was presented in Jacobson and Seashore (1951, p. 29) where "the communication structure is seen as existing in the patterns of actual contact among subgroups that are established by the inter-individual contacts."

It is generally assumed that groupings in organizations provide fast and accurate communication links and assist the formal organization in task accomplishment (Davis, 1968 and Wickesberg, 1968). Duncan (1972) stated that this type of utilization requires the identification of the influence centers of the informal organization. In his research, Duncan found that the best-liked individuals were frequently not the desired leaders of informal behavior. He further asserted that research in various high-performing military groups have indicated that those holding formal organizational authority frequently emerge as informal leaders (Hutchins, 1960). Thus, the identification of informal leaders in an organization would be based solely upon the popularity of individual group members. Rather, Duncan (1972) suggested that informal leaders of groups tend to "personify the attitudes of values of the group."

He further contended that in the instance where the formal and informal leader proved to be the same, the dissemination and feedback of information to and from groupings should be greatly facilitated.

Based upon a further analysis of the data generated in 1951 by Jacobson and Seashore, Weiss and Jacobson (1955) developed a method for the analysis of the structure of complex organizations. They assumed that a complex organization consisted of the roles which, when structured, defined the organization. Organizational structure was also assumed to be relatively stable, regardless of personnel changes.

Reducing their sociometric data to graphic form, Weiss and Jacobson (1955) divided their original matrix based upon a sociometric analysis to its structural components. Having identified specific work groups, they then isolated the separate work groups by removing liaison persons from the matrix to remove contacts between the work groups. Further analysis by Weiss and Jacobson (1955) identified the variable of:

A. Groupness: the clustering of individuals into sets, each set having some specified high degree of internal communication and some specified low degree of external communication (Jacobson and Seashore, 1951, p. 36).

Amend (1971, p. 42) reported that in his discussion of the study by Schwartz (1968) it called for additional comparative studies to validate the ability of his findings to be generalized, especially across different types and sizes of organizations.

B. Integrativeness: integrativeness is the extent to which interpersonal contacts permeate a social system. For the present study, the operational definition of integrativeness is based on a semantic differentiation form of a concept termed "cohesiveness" by Kerlinger (1966, p. 559). The level of cohesiveness or integration was measured by applying an integration score based upon "the proportion of mutual choices to the total number of possible pairs."

C. Liaisonness: liaisonness was measured by its structural components or subsystems rather than the whole system approach to integrativeness. Each person in the subsystem is assigned a score for liaisonness dependent upon the number of reciprocated contacts received during data collection. Briefly, the possible roles assigned to group members would include, under the typology modified by Amend (1971):

1. Isolate: member of the organization with no communication contact with other members of his work group or organization. Score value - 0

2. Group Member: contact with immediate group, no more than one contact outside group, except with liaison persons. Score value - 1

3. Bridge: single contact outside the immédiate work group, with contact being other than liaison person. Contact with own primary group may or may not exist. Score value - 2

4. Liaison: Majority of contact not in any one group, but has contacts with members of two or more groups. Score value - 3

5. Liaisonness: member of a communication group with a majority of his contacts, not including contacts with other liaison persons, within the group. Score value - 4

6. Liaison set: respondents who have half or more of their contacts with other liaison persons. Score value - 5.

Each respondent was classified into one of the six categories defined above through the use of the communication network analysis program developed by Farace and Richards (1969). Based on the reciprocated contacts, each individual was assigned a numerical index value of Liaisonness. The sum of the respondents in each organizational sub-unit provides an index of the liaisonness of that group.

Structure Measures

The dimensions of structure, groupness, and liaisonness were measured by the reciprocation of contacts by individuals who mutually list each other on the Communications Map Checklist regardless of the frequency of contact or the discrepancy between the reported extent of frequency between the members of the dyad. Given the understanding of the reluctance of police officers to respond to questionnaires, a decision was made to count as a reciprocated contact those non-respondents mentioned as a contact of at least daily frequency by a respondent. Schwartz (1968) stated that this approach was reasonable as Jacobson and Weiss (1955) found a close relationship between reciprocation and high-frequency contact.

Propinquity

In their study of the influence of propinquity on networks of interpersonal communication, Barnlund and Harland (1963, p. 467) indicated that prestige acted to polarize communication along status lines even in situations presenting adverse physical conditions. Previous studies of propinquity, or physical distance, differed from that focusing upon human communication patterns in that friendship

patterns were emphasized (Caplow and Forman, 1950; Festinger, Schachter, and Back, 1950). These same situational results were documented in quasi-work groups by Gullahorn (1952) who found an inverse relationship between physical distance separating persons and the likelihood of communication between them, with interaction generally increasing as distance decreases.

Barnlund and Harland found that propinquity does not seem to exercise control over interpersonal communication once a 'social structure' evolves and is recognized. They suggest that once a social system evolves from communication, physical forces tend to polarize these communication channels around high status figures. The patterns of interaction dictated by physical proximity were found to alter or even reverse by the effects of status or emerging status.

Price (1972) defined propinquity in his study of part-time preceptors in a medical college as nearness in time and place. He studied propinquity factors with respect to setting associated with self-reported communication behavior. Price found that an association existed between propinquity factors and the frequency and duration of informal oral communication. Further, Price found that frequency and duration of informal communication were positively associated with more favorable perceptions of information about the organization and perceived clarity of organizational expectations. The flow of communication was greatly enhanced by prolonged and frequent contact between members of the organization.

Police departments provide the same services to essentially the same clients using teams of employees who are on duty varying times during the day. In addition to division of work by differing time span, police work is also performed with a great degree of physical separation. Officers are separated by geographic assignment and by working conditions that necessitate working individually or at most in pairs. The organization also divides the tasks and services comprising the police function to separate and distinct departmental units. Officially, officers only communicate with one another on duty to transfer information related to present case situations or in providing assistance in resolving the 'trip,' (call for police service). Previous research indicates that police organizations might have difficulties in organizational function in terms of communication flow based upon needs for propinquity not provided by the formal organization.

An indication of cross-shift member relationships despite time and physical separation in police organizations was found by Duncan (1972, p. 37) in his study of the selection of socio-central group members where a socio-gram based upon friendship indicated ties between the eighteen members of the third shift and five police officers on other shifts.

Propinquity Measures

The extent of propinquity in police departments was measured by responses to the following questions dealing with:

A. Duty Assignment

5. Which of the following describes your present regular duty assignment?

6. Which of the following duties have you had in the past?

B. Time

7. What shift or watch do you currently work?

8. Does your assignment entail a shift rotation?

C. Physical Proximity

9. If you rotate, how often?

10. Does your whole unit rotate together?

11. How long have you been on your present assignment?

12. In an average week, how many hours do you usually work on the following types of assignments?

    a. On foot patrol

    b. In a one-man car

    c. In a two-man car

    d. On a motorcycle

    e. In a police station or office

13. In an average week, how many hours do you usually work:

    a. Alone

    b. With an assigned partner

    c. With more than one person

16. Do the members of your department belong to a union or professional association?

Satisfaction

Research conducted in a set of health and social welfare agencies by Marrett, Hage, and Aiken, (1975) attempted to develop measures for examining organizational communication in relation to worker satisfaction. Of concern were primarily the formality of the communication network and the direction of communication flow in the organization. The authors contend that while previous research has documented the importance of an effective communication network on the organization, it does not resolve the dilemma of which is preferable--a planned, formal network or an unplanned, informal one.

Marrett, Hage, and Aiken suggested that there is a positive association between unstructured interaction and satisfaction (1975, p. 612). They stated that Blau (1955) and Blau and Scott (1962), among others, found that informal communication patterns help elevate employee morale. Communication among peers in an organization, which generally occur outside of organizational channels, are more likely to prove satisfying to the individual (Cohen, 1958; Berkowitz and Bennis, 1961). Studies on horizontal communication in organizations tended to be unplanned by the organization, yet had a positive relationship with satisfaction. Marrett, Hage, and Aiken have posited that levels of satisfaction would be highest in those organizations where the staff established its own informal communication system.

Yet, it has also been hypothesized that scheduled or formal communications and satisfaction also tend to be positively associated

(Katz and Kahn, 1966; Miller, 1972). The essential argument that supports this hypothesis is based upon the relatively error free formal communications importance in decision-making. The reduction of distrust based upon ignorance and an increased sense of involvement in organizational determination lend themselves to satisfaction with work.

This apparent conflict in research findings is explained by Miller (1972, p. 97) who suggested that informal channels tend to emerge when formal ones become inoperative. Indeed, Guetzkow (1965) proposed that "formal and informal systems tend to be jointly active or jointly inactive."

The definition of formal and informal communications itself are not consistent throughout the literature. Marrett, Hage, and Aiken defined formal communications as scheduled communications; either written records, formal conferences, interviews, or meetings, or other official dictates. Informal communications, or 'unscheduled communications' were defined as task-oriented interchanges, generally verbal. March and Simon (1958, pp. 167-168) suggested that since the communicator, the choice would usually be based upon friendly relationships and relates positively to satisfaction with colleagues.

Satisfaction Measures

For work satisfaction, two dimensions of the concept were studied: satisfaction with job and satisfaction with work associates. The index of job satisfaction was constructed from responses to the following questions:

18. How satisfied are you with the sort of work you are doing?
20. How satisfied are you with your possibilities of being promoted to a better position in your department?
21. How satisfied are you with your present salary?
22. In general, how satisfied are you with efforts made by your department to modernize and keep up with the field of law enforcement?
25. Do you receive a feeling of accomplishment from the work you are doing?
26. My work is interesting to do. (Strongly agree to disagree)
52. The role of a police officer has changed for the better over the last few years. (Strongly agree to disagree)
53. The duties of a police officer have expanded for the better over the last few years. (Strongly agree to disagree).

The responses to the following items provided the measure of work associate satisfaction.

19. How satisfied are you with the type of leadership you receive from your supervisor?
20. What value does your supervisor show for a job well done?
27. How much pressure do you feel in meeting the work demands of your job?

28. How much does your supervisor observe your work?

Uncertainty

Downs (1967) hypothesized that organizations operating in rapidly changing and highly uncertain environments tended to rely heavily on informal structures and procedures. While police work has always been considered as being changeable and uncertain as to demands for service, the police officer is trained and the police organization is structured to deal with these conditions. Uncertainty for police officers, given the high incidence of required decision-making caused by job demands, is hypothesized to occur not by the impact of the environment on the individual per se but by the individual's uncertainty as to expectations and goals of the organization.

Uncertainty Measures

Previous research (Downs, 1967) has shown that individuals deliberately seek out information to reinforce shaken convictions or to consolidate convictions recently acquired. At the intra-personal level, organizational change can produce various types of anxiety in its members, either in terms of role uncertainty or ambiguity, differing expectations, and perception of the extent of sharing of available information.

The level of uncertainty about organization goals, objectives, policies, and information sharing were determined by the responses of department members to the following questions:

38. I feel I usually know what is expected of me by my fellow departmental members in doing my job. (Strongly agree to disagree)
39. I feel I usually know what is expected of me by my superiors in doing my job. (Strongly agree to disagree)
42. My immediate supervisor keeps me well informed. (Strongly agree to disagree)
50. Officers in this department are quickly informed about policy changes. (Strongly agree to disagree)
51. Department policies are communicated clearly to all members of the department. (Strongly agree to disagree).

Status

Research with restricted communication networks have generally shown that decentralized networks (where decision-making is shared by the members of the unit) are more satisfying to members than are centralized networks (where decision-making is vested in one person) when dealing with complex tasks. Moore, Johnson, and Arnold (1972) argued that it was not centralization or decentralization per se which resulted in differing levels of member satisfaction with their jobs and the organization, but rather the congruence or incongruence of the network structure with previously existing status distinctions among members that had import. The researchers indicated that network position alone had no significant impact on communication role satisfaction measures. They posited that in studies of communication

networks the critical concern should be with the interaction between communication network structure and the relative status ranks of the participants.

Status Measures

Status and prestige of individuals in police organizations based upon predetermined sources of status in police departments were measured for each respondent through the responses to the following questions:

1. Age
2. Sex
3. How long have you worked for your present department?
4. What is your present rank?
5. Which of the following describes your present regular duty assignment?
14. In your job, do you usually have direct supervisory responsibility over other officers or civilian employees?
15. If yes, how many people do you usually supervise?
17. Are you a shift representative for your department?

Innovativeness

Innovativeness is defined as the degree to which one organization is open to adopting new ideas, practices and/or inventions which are new to the department (Jacob, 1971, p. 102). While the original definition of the concept of innovativeness was used to predesignate innovativeness in the organizations studied by Jacob,

the present study expanded the concept to include members' perception of organizational propensity to innovation. Of importance in defining innovation in police organizations in terms of decision-making to implement innovation (change), perception of group members to the probability of innovation adoption becomes relevant.

Perception of Innovativeness

Innovative acts were those perceived primarily as exploring new ways of doing things, new ideas, or as attempts to solicit new ideas from the organization members. The operational definition of the perceived ability of the department to innovate was measured through responses to the following questions:

22. In general, how satisfied are you with efforts made by your department to modernize and keep up with the field of law enforcement? (Greatly dissatisfied to satisfied)
41. The department encourages discussion among its members to come up with new ways of doing things. (Strongly disagree to agree)
43. My fellow officers talk about new and different ways for the department to do things frequently (Strongly disagree to agree)
60. Within the last year, how often have you volunteered ideas to change the departments's practices, either to others in the department or to your superior. (Based upon the variance of response, the question

was ranked according to relative number of contacts primarily of the type described.)

61. Within the last year, how often has the department requested ideas from the members of the department through formal channels. Give examples, if possible. (To be ranked as above).

Communications Satisfaction

Mazza (1975) in his study of formal organizational communications climates found that the satisfaction of an employee for the communication patterns existent within the organization were primarily dependent upon supervisory feedback receptiveness and responsiveness. He further discovered that employees distinguished between their relative satisfaction with organizational communications activities and supervisory communication interactions. As a whole, employees at the supervisory and line levels desired increased interaction both at the peer level and in increased upward-downward communication flow.

Mazza limited his study to formal communications patterns, finding a small, limited communication circuit that was not, both actually and perceptually, sufficient in terms of providing informational input at the decision-making level of the organization.

Communication Satisfaction Measures

Member perception of their satisfaction with communication activities provided the attitudinal dimension of communication climate. Mazza (1975) defined employee communication satisfaction

as: the satisfaction with information seeking and reception activities, supervisory feedback receptiveness and responsiveness, and supervisory evaluative communication behavior.

The measure of these dimensions are determined by the following questions:

A. Horizontal Communications

32. There's pretty good sharing of information among the various units on my shift. (Strongly disagree to agree)

33. There's pretty good sharing of information among the officers on all the shifts. (Strongly disagree to agree)

34. The officers who work the same shift with me are the ones I talk to socially the most. (Strongly disagree to agree)

46. The officers I work with don't get much chance to talk to each other. (Strongly disagree to agree)

49. I don't feel there is enough communication among the officers on different shifts or watches. (Strongly disagree to agree)

B. Downward Communications

29. How much confidence do you feel that your supervisor keeps you fully informed about things that might concern you? (None to a lot)

37. My supervisor is usually quick to respond to my requests to talk to him. (Strongly disagree to agree)

50. Officers in this department are quickly informed about policy changes. (Strongly disagree to agree)

51. Department policies are communicated clearly to all members of the department. (Strongly disagree to agree)

C. Upward Communications

36. My supervisor(s) doesn't care who I go to with information as long as the work gets done. (Strongly disagree to agree)

40. My supervisor does not like me to go over his head to talk to anyone in a higher rank. (Strongly disagree to agree)

44. My supervisor is easy to talk to. (Strongly disagree to agree)

45. It is relatively easy to get an opportunity to talk to my supervisor alone. (Strongly disagree to agree)

47. My immediate supervisor is willing to listen to suggestions. (Strongly disagree to agree)

48. If I have an idea about a way to improve the department, I take that idea to my immediate supervisor. (Strongly disagree to agree)

Autocratic vs. Participatory Decision-Making

Angell (1971) postulated that the structural model utilized in organizing American police departments was the classical,

normative organization theory first presented by Weber (1947). Critics of this approach to organization study purported that it mandated attitudes toward employees and clients that are inconsistent with the humanistic democratic values that are inherent in U.S. culture. Additionally, they suggested that an organization that could not cope with environmental changes would eventually become dysfunctional and obsolete. Angell concurred in that he felt the existing conditions of low police morale, poor police-community relations, and the inadequacy of communication flow concerning policies for decision-making in police departments were indicative of organizational dysfunction. Angell posited that one approach to resolving these problems entailed the existence of a flexible, participatory organizational structure for police organizations. In the conceptualization of a participatory organization, Angell envisioned policy flexibility that allowed input from all segments of the organization.

Police organizations have traditionally been viewed as being quasi-military in that their hierarchical structure and bases for authority were formally constructed along classical lines but with, as a result of societal influence, humanistic tendencies. Although numerous studies have investigated the sociometry of industrial and military groups, little attention has been directed toward those organizations possessing both 'classical' and 'humanistic' characteristics. Duncan (1972, p. 36) suggested that police organizations, being a type of 'commonweal' organization

(Blau and Scott, 1962, pp. 54-55), have been overlooked in literature and research with respect to group study.

Autocratic vs. Participatory Authority Measures

Measures of the level of participation of departmental members in the decision-making process of the department are to be generated through the compilation of an aggregate indices based upon response with the questions listed below.

24. To what extent do you get to participate in the supervisory decisions that effect your job? (None to a lot)
26. In your daily work how much freedom do you have to make decisions and act on them? (None to a lot)
28. How much does your supervisor observe your work? (None to a lot)
31. I often have to 'bend' department policies and procedures in order to get my job done. (Strongly disagree to agree)
35. My department doesn't like us to talk to anyone outside of channels. (Strongly disagree to agree)
36. My supervisor(s) doesn't care who I go to with information as long as the work gets done. (Strongly disagree to agree)
40. My supervisor does not like me to go over his head to talk to anyone in a higher rank. (Strongly disagree to agree)

41. The department encourages discussions among its members to come up with new ways of doing things. (Strongly disagree to agree)
47. My immediate supervisor is willing to listen to suggestions. (Strongly disagree to agree)
48. If I have an idea about a way to improve the department, I take that idea to my immediate supervisor. (Strongly disagree to agree)
54. How much responsibility do you have for the functions of your unit? (Very little to very much)
55. How much do you participate with others in determining the ways things are done on your job? (Very little to very much)
56. How much freedom do you have in arranging your work hours and days off? (Very little to very much)
57. How much do you decide with others what part of a task you will do? (Very little to very much)
58. How much do you participate with others in making decisions that affect you? (Very little to very much)

Opinion Leadership

Opinion leaders are those members of the organization who have the ability informally to influence other individual's attitudes or behavior in a desired way with relative frequency (Rogers, 1962, Jacob, 1971). Opinion leadership is a continuous variable, that is,

there are degrees of opinion leadership for everyone in an established group, varying by individuals.

Merton (1957, p. 414) distinguished between two types of opinion leaders-monomorphic and polymorphic. A monomorphic leader is sought for advice on one or at least a select few topics. Polymorphic leaders are sought for information about a variety of topics. Monomorphic opinion leaders were by definition considered to be 'experts' in specific areas as a result of the diversity of job assignments in the organization. Polymorphic leaders, on the other hand, were seen to evolve as a result of the status hierarchy of the organization (seniority, authority, etc.).

Duncan and Roberts (1972) presented research in their study of chosen informal leaders in police organizations that suggested that 'sociocentrality' alone did not appear to be synonymous with leadership. Rather, informal leaders seemed to attain their position in the organization through a combination of such factors as seniority, perceived competence, and conformity to the departmental regulations. This finding parallels Merton's conception of polymorphic leaders.

Jacob (1971) presented evidence to partially support the hypothesis that innovative organizations tend to generate monomorphic opinion leaders. Organizations that traditionally have been viewed as conservative in terms of change, as the police have been characterized, would seem to tend to generate polymorphic leaders, even though such researchers as Katz and Lazarsfeld (1955) do not support the concept of this type of leadership. Rather, the generation of

monomorphic leaders could be viewed as a result of innovation. Polymorphic leaders with clearly defined status linkages could be consistent with organizations that are relatively 'static' in terms of change.

Opinion Leadership Measures

Rodgers and Shoemaker (1971) purported that the sociometric technique of determining the opinion leaders in an organization as developed by Jacobson and Seashore (1951) is the most valid measure when all members of the system to be studied are interviewed. This method consisted of questioning respondents as to whom they sought (or might seek) advice, information, or an opinion about an idea they might have or information they wish to clarify. Opinion leaders were those members of a unit who received the greatest number of choices by members of the group. The arbitrary delineation established by Rogers and Van Es (1964) is that members receiving the highest number of nominations (in the top 10%) were opinion leaders.

This approach was utilized in the present study where respondents were asked:

> 62. If you want an opinion about a new idea you have for the department (investigatory technique, theory on a crime, equipment change, etc.) which members of the department would you ask? (Write names in blanks)

Influence Leadership

The designation of the influence leader by a member(s) of the organization is based upon the Normative-Sponsorship Theory of Dr. Christopher Sower (1957) which states that an idea will be sponsored if it is within the limits of standards established by the organization. Central to the theory is the belief that members of a group independently select an individual who is viewed as being competent and knowledgeable about the system as well as seen as being able to influence that system. The influence leader need not necessarily hold high formal rank in the department, but may exert influence through the informal structure.

Influence Leadership Measure

Identification of influence leaders was accomplished through sampling department members response to the following question. Individuals listed most often are construed to be the influence leaders.

63. If you want someone to go to bat for you (sponsor) or to go to bat for one of your ideas who would you contact in your department?

Rationale and Hypotheses

As police organizations become larger and more specialized, so do the systems which operate the organization from within. In the case of communications, the task becomes much more complex. Clement (1976, p. 53) observed that police administrators must "avail ourselves of all communications systems and develop them to

the degree that they are useful in assisting us to run our organizations efficiently and effectively. We must, of necessity, employ both formal and informal systems of communication."

The purpose of the present study is to increase knowledge about the flow of communication among members of police departments. The study is designed to yield information about patterns of interpersonal communication contacts among the various individuals and work units that comprise the police department. The knowledge of the communication structure and the degree to which individuals and work groups are integrated into the larger organization are the basis for the objectives of investigating the effect of problems of propinquity and communication blockage upon the organization.

The focus of this study was upon the comparison of organizational variables existent within 'average' police departments in relation to organizational communication behavior. In addition, an attempt was made to distinguish opinion and influence leaders in police organizations to suggest methods of implementing departmental change and innovation. General classification of the variables selected for study include (1) propinquity; (2) job satisfaction; (3) status; (4) uncertainty; (4) structure (integration); (5) communication satisfaction; (6) perceived innovativeness; (7) extent of participation in organizational decision-making; (8) opinion leadership; and (9) influence leadership. While an in-depth study of the range of these variables within each of the organizations would be possible and perhaps desirable, this study will only focus on an assessment of the importance of the variable

to the concern for the efficacy of the communication structure of the department.

The Effects of Propinquity on Organizational Communication

Many design features of an organization can be employed to facilitate or control the communication level and pattern in an organization. These features include location of personnel, physical proximity over a duration of time, mechanical connections between individuals and groups (e.g., telephones, transceivers, two-way radios) and regulation of personnel movement. By virtue of the method in which police departments organize and schedule personnel to provide their law enforcement and service function, problems of propinquity of departmental members arise. Police work requires a great degree of coordination and information sharing activity, yet the physical demands of the job reduce the opportunity for various work units to have contact on a regular basis. Besides such physical constraints as differing geographic assignment, differing work hours, the designation of function to various specialized units in the department, and the high percentage of time spent alone on the job, the organization also seeks to control conditions that enhance or impede the flow of communication to various segments of the organization.

Communication provides the means for directing and integrating system and subsystem activities. Longnecker (1969) stated that the process of communication may be visualized as the functioning of organizational subsystems. The formal communications system or

network is the decision-making system in that it brings problems and relation information to personnel in the organization that act as decision-makers.

The design of the formal structure provides a set of officially established and approved communication channels, yet, the formal organizational structure does not circumscribe the total communications network structure in an organization. Members of the department may develop an informal organization, less susceptible to control by the formal structure, to overcome either formal communication insufficiency or ambiguity.

Informal communication networks refer to the pattern of informal relationships which are used in transmitting information through unofficial channels. Although formal channels of communication presumably carry official information, much of what an organizational member knows is gleaned from other sources. Informal communications supplement and amplify that information emanating from official sources. The informal communication channel transmits useful information and clarifications that cannot easily be transmitted through formal channels. If organization members are not afforded the opportunity to regulate their communication contacts, the flow of communication both formally and informally in the organization will be affected.

H 1.0: The degree of lack of propinquity between departmental members will result in less integration of the department.

H 1.1: The degree of lack of propinquity between departmental members will increase the level of uncertainty of the department.

H 1.2: The degree of lack of propinquity between departmental members will increase vertical (upward/downward) communication patterns in the department.

H 1.3: The degree of lack of propinquity between departmental members will decrease the level of horizontal (peer) communication contacts in the department.

H 1.4: The degree of lack of propinquity between departmental members will decrease the perceived level of participation of members in the organizational decision-making process.

Communication Structure and Level of Participation in Decision-Making

The communication network, including the formal organizational structure and supplementary informal channels, act as an informational system which is used to direct and coordinate the activities of the various subsystems of the organization. The degree of access to the various communications channels is dependent to a certain extent upon accessability based upon propinquity and also upon the degree of freedom afforded by the authority structure of the organization to utilize channels outside of formally designated information flow routes. The perceived degree of control and use of sanctions will determine the manner in which communication contacts take place in the department.

H 2.0: The structure of communication flow consistent with the formal hierarchical structure will occur in departments having less perception of participation in organizational decision-making.

H 2.1: The more autocratic departments will have greater formal communication channel contacts based upon the formal hierarchical (upward/downward) and in-group communication channel contacts.

H 2.2: The more participatory departments will have greater informal (horizontal) and inter-group communication channel contacts.

Organizational Uncertainty

The communication system takes overall organizational plans and objectives, as formulated by top administrators, and carries them downward through the organization to the operative level. The organization also carries information upward to facilitate decision-making as well as provides for a horizontal exchange of information necessary to the operation of the organization. The organization structure can be construed to be developed for the optimum gathering, evaluation, and dissemination of information to the various working parts of the organization.

In police work, much of the information entering the organization is introduced at the line level. Based upon the amount and type of information directed upward in the system, the command level develops policy for uniform decision-making control. Members are expected to conform to policies that regulate organizational behavior. Downward communication is often incomplete. Although instructions and directions are given, there is often a failure to communicate the rationale behind the decision, especially if there is little participation by subordinates in the developmental process. The greater role members of the department have in the decision-making processes of the organization will act to reduce uncertainty.

H 3.0: The more participatory the department is perceived to be by its members, the less uncertainty will exist.

Horizontal communication is particulary important among positions or work groups involving extensive coordination or teamwork. In some administrative situations, the volume of necessary horizontal communication is as great as the volume of vertical

communication. One barrier to horizontal communication is the threat it can pose to the power of an autocratic organization. Activity that reduces uncertainty occurs at a level that is most acceptable to the formal organization. This thesis is presented in the following hypotheses.

H 4.0: The more uncertainty that exists by departmental members about organizational goals and objectives, the greater the number of communication contacts will occur.

H 4.1: The more uncertainty of departmental members in autocratic departments, the greater the number of formal (upward) communication contacts will occur.

H 4.2: The more uncertainty of departmental members in participatory departments, the greater the number of informal (horizontal) contacts will occur.

Communication Satisfaction and Job Satisfaction

The direct correlation between downward communication and job satisfaction is consistent throughout organizational literature with most studies finding that superiors regard communications with subordinates as essentially satisfying (Blau, 1955;, Blau and Scott, 1962). Similarly, research has corroborated a negative correlation for upward communication and job satisfaction (Blau and Scott, 1962; Read, 1962). Marrett, Hage, and Aiken (1974, p. 622) discovered a negative association between horizontal communication and job satisfaction that contradicts prior research which found peer contact satisfying. These authors suggested that this unexpected result could be explained in that peers might perceive horizontal communications to be intrusive. They discovered that where

horizontal communication was typical, scheduled communication was not; thus suggesting communication contacts were aimed at uncertainty reduction. Job dissatisfaction might not be the result of increased horizontal communication, but rather of the organizational climate producing the degree of uncertainty.

The implications of these findings were addressed in the present study where the additional variable of level of participation in decision-making was introduced.

H 5.0: The more participatory the department, the greater the level of job satisfaction will exist in the department.

H 5.1: The more satisfaction of departmental members with horizontal communications, the more job satisfaction will exist.

H 5.2: The more satisfaction of departmental members with downward communications, the more job satisfaction will exist.

H 5.3: The more satisfaction of departmental members with upward communication, the more job satisfaction will exist.

Perception of Innovation and Level of Decision-Making

In his research of organizational climates in police organizations, Duncan (1972) found that a turbulent external environment involving both client and governmental demands had an effect upon the (1) level of participation in decision-making by various departmental members; upon (2) increased criticism between superiors and subordinates; and upon (3) the decreased level of support for interpersonal relationships in the department. Openness to change, or perception of innovativeness, was found to differ between command-level staff and other departmental personnel.

Duncan did not control for the level of input both in terms of information and decision-making by those at the line and staff position in the organizational hierarchy. Organizations which provide little opportunity for upward communication or control would be perceived to be closed in terms of change by departmental members. The ability to have an effect upon the department would increase perceptions of openness and innovativeness on the part of organizational members. The degree to which line staff members participate in the decision-making process defines their perception of their ability to control the organization. By virtue of organizational position, the perception of ability to control the organizational environment would be more pronounced by those at the command level. Perception of innovativeness would then vary in relation to position in the hierarchical structure and with degree of participation in decision-making which has an impact on organizational functioning.

In the theoretical approach of open systems study, the difference in level of participation in decision-making would result in varying perceptions as the degree of innovation of the organization.

H 6.0: The more participatory departments will be perceived as more innovative by departmental members at both command and staff levels.

H 7.0: The more innovative the department is perceived to be by its members, the more likely ideas will be suggested by departmental members to improve the department.

Participatory Decision-Making and Selection of Opinion and Influence Leaders

Likert (1964, p. 16), in discussing and comparing systems of management at the systems level of analysis, postulated that as an organization moved from an autocratic to a participatory operation, job satisfaction, satisfaction with downward communication, and leadership satisfaction increased. As an organization became more participatory in terms of diffusion of decision-making capabilities throughout the organization, restrictions on communication were perceived to be reduced. Reindl (1970) stated that this perception of reduction resulted in the activation of informal channels of communication and thus new ideas spread more rapidly through the organization. Because in the organizations under study in the present thesis the more autocratic departments were expected to rely more on status characteristics of formal hierarchy (length of time in organization, authority, assignment prestige) for direction and uncertainty reduction, opinion leadership was expected to be more polymorphic. Influence leaders were expected to be selected for considerations also connected to status characteristics.

H 8.0: The more participatory department will be more likely to designate monomorphic opinion leaders.

H 9.0: The more participatory department will be more likely to designate influence leaders outside of the boundaries of work groups or along status (rank) lines.

CHAPTER IV

RESEARCH ANALYSIS

The raw data generated by each question contained in the questionnaire was initially analyzed as being a separate variable for each of the three police departments. Negatively worded questions were recoded prior to transfer of the data to punched computer cards to provide consistency of direction in scale construction. Initial analysis involved the generation of descriptive statistics for each question. These statistics included a frequency count, range, mean, plus standard deviation for each question as a category.

Questions designated as measuring a specific concept were compared through the generation of a Pearson product-moment correlation coefficient to determine whether any item contributing to the stated index scale correlated poorly or negatively with other contributing items. The Pearson product-moment correlation was made first on the three police departments combined with separate runs then made for each department separately. These correlations, when compared to a given index (Guilford, 1954), proved to be significant and were retained as a cumulative index for the variable.

Tests of statistical significance were not used to assess the meaning of differences as many of the assumptions of statistical

significance were violated by the present study. The most basic of these assumptions is that of the randomness of selection both of the organizations studied and in the random selection of members for inclusion in the research effort. While the statistics generated by the study are not amenable to further statistical manipulation (MacDonald, 1970, p. 58), the derived statistics are acceptable for comparison across organizations.

Data generated by the mailed questionnaire to participatory agency members were transferred, with the appropriate variables utilized in the analysis, onto computer cards for all respondents. Basic descriptive statistics as well as frequency counts were measured utilizing the SPSS package for the CDC 6500 computer at Michigan State University. To maintain consistency in terms of variable direction, negatively worded items were recoded.

The Communications Questionnaire (Appendix 1) was mailed to the respective chiefs-of-police for selected police departments for distribution to the members of the department. Each member was afforded a stamped, self-addressed envelope for the return of the completed questionnaire to the researcher. It was necessary to elicit the support of the chiefs, as well as to allow them to distribute the instrument, in order to gain formal organizational support for the research effort. Unlike many other formal organizations, the control of the administrator over organizational members in police departments is more stringent, with a number of options available to the administrator to apply sanctions against members whose actions cause displeasure. A research effort in law enforcement agencies

usually requires the cooperation of both administration and appropriate professional associations or unions. The implied sponsorship of the chief of this or any research effort can produce bias in terms of degree of participation. While not validated, it is conceivable that rank and file members might elect not to participate in fear of providing information to administration concerning true individual opinions of the department and its supervision. Additionally, members might refuse or elect not to participate in defiance of top administration. Conversely, the middle management and supervision members might elect to participate based upon considerations of compliance of administration wishes, thus producing a heavier response in that level of the organization.

An analysis of questionnaire response for the three police agencies included in the final analysis are as follows:

TABLE 2.--Questionnaire Response.

	All Depts.		Dept. Exter		Dept. Bentley		Dept. Deerfield	
	No.	%	No.	%	No.	%	No.	%
Total Membership	80	100%	23	100%	32*	100%	23	100%
Respondents	41	51.3%	16	70%	17	61%*	8	35%
Refusals	6	7.5%	0		0		6**	24%
No Response	29	36.2%	7	30%	11	39%	11	44%
Other*	4	5.0%	-	-	4*	-	-	-

*Officers laid-off, on extended sick leave, and on educational leave were not contacted by the study.

**Questionnaires returned with notation or letter of refusal.

The questionnaire contained sixty-three items asking for information on the designated variables as well as demographic data such as age, sex, rank, seniority, and job assignment. The majority of the questions were multiple choice except for questions dealing with opinion and sponsorship, a set of questions pertaining to the communication mode of the organization, and pattern of solicitation of opinions and ideas.

While the percentage of participation by police department members is low in terms of the response elicited by previous researchers (Jacob, 1971) it was felt that given the problems of data collection in general in police organizations, the data generated would provide a significant analysis. An attempt was made to increase the level of response through a second request for participation coming five weeks after the initial request. This request directed that if the member wished to participate anonymously, the questionnaire could be completed deleting any identifying variables.

Besides the general reluctance of police officers to respond to questionnaires due to the high demand from outside sources for their participation, the historical police value of secrecy, especially in those matters where it may affect their colleagues and organization (Niederhoffer and Blumberg, 1976, p. 137) reduced the level of participation. This value was illustrated by the clarifications presented by those officers who indicated their refusal to participate.

Further complicating the secrecy ethic of the police organization were special circumstances that existed during data collection. The Exter Police Department had just joined a national union pursuant to a change in state law that allowed such membership. The delineation between the line level and management was exaggerated due to feelings that existed within the department about unionization and police professionalism. In addition, the final selection of the representative union created some conflict within the department. Final membership had occurred just prior to the research effort. The chief of police, while disagreeing with the unionization movement, is essentially progressive and open, interested in generating any data that might improve the operation of the department.

The Bentley Police Department was in the throes of reaction to municipal financial troubles that necessitated laying-off some of the police officers on the department. The operation and structure of the organization was somewhat disrupted due to efforts to cover for the reduced manpower situation. The police chief in this department is relatively new, coming from out-of-state rather than in-house through the ranks, and possesses a very high level educational, unusual for a chief of police.

The Deerfield Police Department was just beginning to experience the financial situation found in Department Bentley at the start of data collection. There was uncertainty as to the impact the financial situation might have upon the department. The chief of police in this department was seen by the researcher to be progressive, not unlike the chief of Department Exter. The

organizational structure of Department Deerfield differed slightly from that of the other organizations in that members of the police department were expected to supplement the fire protection-service in the municipality, thus constituting a department of public safety. In actuality, the operation of the department differed little from the other departments under study.

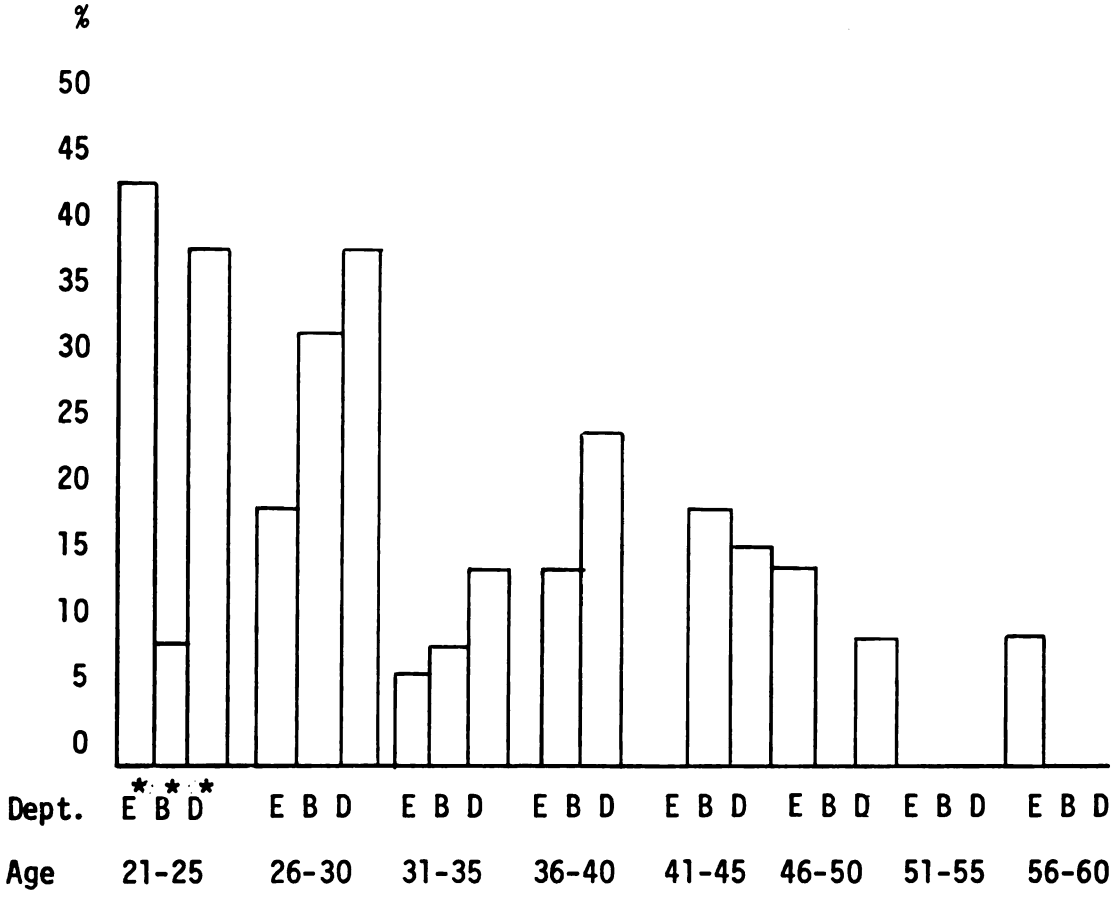
Two of the departments selected for study had prohibitions concerning participation in research study. One prohibition was stated in the General Orders (policy statements) of the department and required the agreement of the chief to participate, on a voluntary basis, to over-ride the restriction. The other department had a union contract statement that prohibited participation except upon a voluntary, paid (time-and-one-half) basis. This researcher procured an exception from this agreement to allow for voluntary, unpaid participation. The resulting response for this department was low. All departments stipulated that the data collection effort must be structured to allow for a minimum time for participation which would not hamper the operation of the department. As a consequence, the mailed questionnaire approach was used in spite of its inherent problems relating to the previously observed low percentage of response.

A summary of the demographic characteristics of the individuals in each of the three police departments is presented in the following tables.

Demographic Characteristics

Age

An analysis of the age of the respondents, divided into five year increments starting at the earliest age allowable for employment as a sworn police officer by law (age 21) to mandatory retirement (age 65) produced the following:



*Department E - Exter, Department B - Bentley, Department D - Deerfield.

Figure 2.--Age of Respondents.

Each of the three police departments was characterized by youthfulness on the force, at least to those responding to the questionnaire. Since the majority of non-responses occurred at the lower ranks where seniority is traditionally less, the three police agencies could be assumed as having relatively youthful members. Most police organizations restrict new recruits (entrants on the force) to a qualifying age range of 31 to 32 years of age which places a greater number of members at the lower end of the age scale. Further reducing the median age of each of the departments is the existence of an early retirement option after 20 years of service. An analysis of seniority rolls of each of the departments concludes that the age range of respondents to the questionnaire is consistent with that in each agency.

The Bentley police department is characterized by a relatively flat distribution of age throughout the organization with a low response from officers in the 21-25 years of age bracket. This trend reflects the stable growth of the department which in the last few years has not seen expansion due to economic constraints. Agencies Exter and Deerfield, on the other hand, are located in jurisdictions whose municipal populations are rapidly increasing, thus reflecting a growth in departmental numbers consistent with recruitment of young applicants at the lowest rank level of the department.

Sex

The majority of police department officers surveyed were male, with the exception of one female of high rank. All the other women responding to the questionnaire were in clerical or dispatch positions. The low percentage of women found in the sworn ranks is consistent with most police departments. The pattern of allowing women at the sworn level for specialized assignment in the detective bureau accounted for the high rank of the one female officer employed in Department Exter (FBI Uniform Crime Reports, 1973).

Rank

Respondents to the questionnaire reflected the various levels of rank usually delineated in police departments structured on the militaristic model of organizational level designation. The majority of those who refused to participate and those not responding to the questionnaire request were at the patrol officer rank. This is significant in that it is consistent with prior problems experienced by researchers in entry into police organizations (Fox and Lundman, 1974). A "code of silence" concerning departmental matters with the public has been shown by previous researchers to be exceptionally strong in most police organizations (Niederhoffer and Blumberg, 1976). Those refusing to cooperate or to respond to the questionnaire but who returned their blank instrument commented that fear of departmental retaliation, though not specifically defined, as well as fear of outside interference

TABLE 3.--Sex of Respondents.

Sex	Male						Female					
	Dept. Exter		Dept. Bentley		Dept. Deerfield		Dept. Exter		Dept. Bentley		Dept. Deerfield	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
Total	11	68.8	15	88.2	8	100.0	5	31.3	2	11.8	--	--
Sworn	11		15		8		1	6.3	--	--	--	--
Non-Sworn	--	--	--	--	--	--	4	25.0	2	11.8	--	--
TOTAL	34						7					

or knowledge of the department led to their decision tends to support this explanation. One officer who elected not to participate sent the following explanation:

> It appears that you have put a lot of time and effort into this questionnaire and I feel that I must give you an explanation as to why I have not filled out the questionnaire.
>
> Many of the questions are in fact dangerous to many officers. They feel that they would be harming themselves if they answered truthfully or at least they are afraid of the interpretation that you or others might give the answers. It is a difficult area which you have chosen to study and the questionnaire you have designed is a good one. . . .

The distribution of respondents reflected the range of rank usually found in a police organization. For the most part, except in Department Deerfield, all ranks are represented. The Bentley police department accounted for the lowest percentage of returns at the rank-and-file (patrol) level of the organization.

Seniority

The majority of officers participating in the study have been on the department for over two years. This pattern is consistent with the trend of lack of employee turnover as well as static manpower levels existent in most police departments today. The positive correlation between seniority and rank is also consistent with the practice of recruiting and promotion within police departments.

The greater median seniority for police departments Bentley and Deerfield reflects the economic constraints placed on these

TABLE 4.--Rank of Respondents.

	Dept. Exter			Dept. Bentley			Dept. Deerfield		
	Resp.		Agency	Resp.		Agency	Resp.		Agency
	No.	%	No.	No.	%	No.	No.	%	No.
Sworn									
Probationary Officer*	2	(12.5)	3	--	--	--	--	--	--
Patrol Officer	4	(25.0)	6	4	(23.5)	15	4	(50.0)	11
Detective	2	(12.5)	3	5	(29.5)	5	--		1
Sergeant	2	(12.5)	3	2	(11.8)	6	1	(12.5)	4
Lieutenant	1	(6.3)	2	2	(11.8)	4	--		1
Captain	--		--	1	(5.9)	1	--		1
Chief	1	(6.3)	1	1	(5.9)	1	1	(12.5)	1
Non-Sworn									
Clerical/ Dispatch	4	(25.0)	5	2	(11.8)		2	(25.0)	4
	16		23	17			8		23

*Service less than one year or in recruit school.

agencies by their corresponding municipal governments. This has curtailed the growth of the organizations and increased the level of seniority in these departments. Department Exter, on the other hand, has experienced some change through attrition of older members reaching retirement age which accounts for the lack of seniority for a significant percentage of its membership. Department Deerfield also lacks members with tenure at the higher end of the scale due to the relative newness of the municipality and the department.

Shift Representation

Respondents to the questionnaire reflect assignment to various shift or watch time periods for the police departments. For departments Exter and Bentley, the greatest proportion of responses occurred from members of the day shift, weighted by the number of administrative and clerical staff who are generally assigned to the normal day business hours. This trend is not reflected in Department Deerfield where the only day person responding was the Chief. In that department, the greatest response was received from the members of the afternoon and evening shifts. An analysis of the rank of respondents in each shift category shows that patrol officers are evenly distributed throughout the time periods (except for the Deerfield department, which has only two officers assigned to the day shift), thus removing the suggestion of an organized boycott of research participation.

TABLE 5.--Seniority of Respondents.

Seniority	Dept. Exter		Dept. Bentley		Dept. Deerfield	
	No.	%	No.	%	No.	%
Under 1 yr.*	3	(18.8)	--		--	
1-2 yrs.	4	(25.0)	--		--	
2-3 yrs.**	1	(6.3)	2	(11.8)	2	(25.0)
3-5 yrs.	2	(12.5)	4	(23.5)	1	(12.5)
5-7 yrs.	1	(6.3)	1	(5.9)	4	(50.0)
7-10 yrs.	4	(25.0)	4	(23.5)	1	(12.5)
10-15 yrs.	1	(6.3)	--		--	
15-20 yrs.	--		3	(17.7)	--	
Over 20 yrs.***	--		3	(17.7)	--	

*Probationary Period.

**Three years experience necessary to take Sergeants examination for promotion.

***20 yrs. Minimum necessary for earliest retirement.

TABLE 6.--Shift Assignments of Respondents.

Shift	Dept. Exter		Dept. Bentley		Dept. Deerfield	
	No.	%	No.	%	No.	%
Day	7	(43.8)	11	(64.7)	1	(12.5)
Afternoon	3	(18.8)	4	(23.5)	3	(37.5)
Swing (7p.m.-4a.m.)	1	(6.3)	--		2	(25.0)
Evening	4	(25.0)	2	(11.8)	2	(25.0)
No Regular Shift*	1	(6.3)	--		--	

*No department presently has a scheduled rotation schedule with the exception of necessary shift changes for manpower considerations. One dispatcher responding floats on a need basis.

The lack of response from the day shift of department Deerfield is further significant in that those line officers with the greatest seniority are on day shift. Responses from that department do not reflect the middle and upper ends of the seniority scale for that reason.

Duty Assignment

The greatest percentage of respondents were officers assigned to the patrol function of the organization, the largest single unit in any police department. Civilians (non-sworn personnel) were found to be assigned to the Communications, Records, and Administrative functions of the departments. The duty assignments of the respondents were proportionately evenly distributed through the various organizational units of each of the three police departments.

Analysis of Variables

The first step in the analysis of the raw data was to combine the responses of members of each department of the groups of questions previously defined as forming an index of the concept to be studied through the use of the SPSS program developing cumulative indices for groups of data. Each of the variables defined through the operationalization of the combined means for each group were compared as were Pearson product moment correlations to determine which questions hypothesized as contributing to an index scale correlated positively. The adjusted cumulative index

TABLE 7.--Duty Assignments of Respondents.

Duty	Dept. Exter		Dept. Bentley		Dept. Deerfield	
	No.	%	No.	%	No.	%
Patrol	8	(50.0)	7	(41.2)	5	(62.5)
Detective Bureau	--		2	(11.8)	--	
Narcotics	--		1	(5.9)	--	
Juvenile	1	(6.3)	1	(5.9)	--	
Internal Affairs	1	(6.3)	--		--	
Communications	3	(18.8)	--		2	(25.0)
Records	--		2	(11.8)	--	
Administration	3	(18.8)	3	(17.7)	1	(2.5)
Personnel	--		1	(5.9)	--	
Total	16	(100)	17	(100)	8	(100)

for each variable (concept) was then calculated to allow for cross-departmental comparison. A Pearson product-moment correlation coefficient was calculated for each department for all concept indices generated (see Appendix 2).

The study reported focused upon the variations in internal communication structure and in communication function efficacy for each of the three police departments. The assessment of the meaning to differences between the three organizations on each of the specific variables under study were determined by the comparison of the generated range-free means of the aggregate indices.

Uncertainty

Of the departments under consideration, the responses to the questions used to develop the aggregate index of level of uncertainty about the department and its organizational goals and expectations, Department Exter was found to have the least degree of uncertainty (mean = 4.13). Members of Department Bentley expressed the highest degree of uncertainty (mean = 3.63) with a score of 1 being the highest level of uncertainty possible under the present construction.

TABLE 8.--Level of Uncertainty Perceived by Departmental Members.

Department	N	Range	Mean	SD
Exter	16	17	4.13	1.04
Bentley	13	17	3.49	1.20
Deerfield	8	14	3.63	1.01

Job Satisfaction

The perceived job satisfaction of members in each of the departments were measured along two scales; the first producing an aggregate index of perceived satisfaction pertaining to the police job itself and the second involving an aggregate index of satisfaction with work associates.

The combined aggregate indices reflects a higher degree of job satisfaction total in members of Department Exter (mean = 3.67) while the lowest overall level of job satisfaction was found in Department Bentley (mean = 3.22). The highest mean necessary to reflect total satisfaction would be 5.00. (See Table 9.)

Autocratic vs. Participatory Decision-Making

All three departments surveyed reflected a negative perception of amount of control over, and participation in, the decision-making activities of their departments. Of the three departments, members of Department Bentley perceived the most amount of personal input into the decision processes of their department (mean = 2.99). Department Deerfield was perceived by its members as being the least responsive in terms of member participation (mean = 2.51). This analysis is compared with a possible total participation score of 5.00. (See Table 10.)

Horizontal Communication

The level of horizontal communication based upon the perceived freedom and satisfaction with the occurrence of horizontal

TABLE 9.--Overall Job Satisfaction Expressed by Departmental Members.

Department	N	Range	Mean	SD
Exter	16	14	3.67	0.57
Bentley	13	19	3.22	1.19
Deerfield	8	10	3.35	0.94
		Job Satisfaction		
Exter	16	16	4.04	0.09
Bentley	13	21	3.56	1.12
Deerfield	8	8	3.75	0.58
		Work Associate Satisfaction		
Exter	16	13	3.30	1.04
Bentley	13	15	2.87	1.25
Deerfield	8	13	2.94	1.30

TABLE 10.--Perception of Participation in Department.

Department	N	Mean	SD
Exter	16	2.87	1.17
Bentley	13	2.99	1.21
Deerfield	8	2.51	1.09

communication was highest in Department Deerfield (mean = 3.45). Department Bentley also showed a slight positive degree of satisfaction (mean = 3.00 being neutral) with a generated mean of 3.39. The level of horizontal communication was decidedly negative for Department Bentley which produced a mean of 2.54. (A mean of 5.00 denotes complete satisfaction.)

Downward Communication

Satisfaction of departmental members for downward communication in their respective departments was positive for all three police departments. Department Exter showed strong positive feelings for the communication process transferring messages and information from the top of the organization to the bottom with a mean of 4.09. Departments Bentley and Deerfield showed similar positive reactions to their downward communications patterns with means of 3.50 and 3.53 respectively. (A score denoting complete satisfaction would be a mean of 5.00.)

TABLE 11.--Autocratic vs. Participatory Decision-Making Control Concepts.

Department	N	Range	Mean	SD
Participation in Department Activities				
Exter	16	23	3.23	1.26
Bentley	13	20	3.44	1.07
Deerfield	8	19	2.79	1.17
Direct Communication Patterns				
Exter	16	15	2.52	1.19
Bentley	13	16	2.51	1.43
Deerfield	8	10	1.91	0.97
Faith in Supervisory Channels				
Exter	16	5	2.97	0.75
Bentley	13	7	3.12	0.99
Deerfield	8	6	3.06	1.13
Individual Control				
Exter	16	12	2.74	1.46
Bentley	13	12	2.90	1.34
Deerfield	8	12	2.29	1.10

TABLE 12.--Perceived Satisfaction with Horizontal Communication.

Department	N	Range	Mean	SD
Exter	16	2-20	3.39	1.28
Bentley	13	7-18	2.54	1.32
Deerfield	8	3-15	3.45	1.26

TABLE 13.--Perceived Satisfaction with Downward Communication.

Department	N	Range	Mean	SD
Exter	16	13	4.09	1.04
Bentley	13	14	3.50	1.20
Deerfield	8	12	3.53	1.18

Upward Communication

Reactions to the perceived satisfaction with upward communications in the police departments based upon satisfaction with the opportunity to and acceptance of transmission of messages and information up the hierarchical structure of the organization produced neutral to slightly negative reactions for police department members. Responses from all three departments centered around the neutral mean of 3.00 with Department Bentley indicating a slight positive inclination (mean = 3.18). Departments Exter and Deerfield reported similar means of 3.01 and 2.96 in relation to the variable.

TABLE 14.--Perceived Satisfaction with Upward Communication.

Department	N	Range	Mean	SD
Exter	16	20	3.01	1.06
Bentley	13	20	3.18	1.03
Deerfield	8	17	2.96	1.08

Perceived Innovativeness

Since police departments differ as to the definition of, and movement to, adoption of innovative procedures, policies, and equipment in organizations, a decision was made to measure the level of innovativeness of each of the three departments through the perceptions of innovativeness of the members.

As perceived by its members, Department Exter was seen to be the most innovative (mean = 3.93) with Department Deerfield being the least innovative (mean = 3.15). Maximum perception of innovation required a mean of 5.00.

TABLE 15.--Perception of Departmental Innovativeness.

Department	N	Range	Mean	SD
Exter	16	17	3.93	0.98
Bentley	13	20	3.25	1.37
Deerfield	8	10	3.15	0.78

Propinquity

Propinquity, as measured by closeness in time and/or place, was calculated for each of the departments based upon the distribution of shift assignments, duty assignments, and working environment of the members. Respondents were asked to designate the percentage of time spent in situations allowing contact with other members of the organization. As is characteristic of police work, much of the reported time spend 'on duty' involved assignment in situations that did not institutionalize sustained contact with fellow members. The means for the measure for propinquity indicate time intervals spent in the performance of duties place a mean of 9.0 for a duration of over 40 hours. A score of 8.0 would indicate time spent in that category at 36 to 40 hours per week. A mean of 7.00 represents a time interval of 31-35 hours, 5.00 for 21-25 hours, and 1.00 for 1-5 hours.

Members of Department Deerfield expressed the greatest degree of physical separation while "on the job" with 100% of its membership reporting working alone during the forty hour a week work period. Members defined work environment as occurring mainly in a one-man car (75%). Called a beat car, the one-man car patrols a specific non-overlapping geographic boundary staffed by only one officer. Physical contact with another officer would only occur if back-up assistance was needed or upon return to the station.

Department Bentley ranked second in membership reporting working alone for forty or more hours by 92.3% of the respondents. Assignment to a one-man car was indicated by 61.5% of the respondents.

TABLE 16.--Physical Contact and Duty Assignment of Departmental Members.

	N	Range	Mean	SD	Variance	%
Dept. Bentley	13					
Foot Patrol	2	2-3	2.5*	2.1	4.5	
One man car	8	3-7	6.9	2.5	6.4	61.5
Two man car	-	-	-	-	-	
Cycle	-	-	-	-	-	
In station	8	1-8	5.8	2.9	8.2	61.5
Alone	12	2-7	8.1	0.5	0.3	92.3
With partner	2	1-8	5.0	5.7	8.0	
With others	-	-	-	-	-	
Dept. Exter	16					
Foot patrol	2	1-7	4.5	5.0	7	
One man car	7	2-7	8.3	0.8	0.6	43.8
Two man car	-	-	-	-	-	
Cycle	-	-	-	-	-	
In station	8	1	7.3	2.5	6.5	61.5
Alone	10	1	8.5	0.5	0.3	76.9
With partner	-	-	-	-	-	
With others	5	-	8.0	-	-	38.5
Dept. Deerfield	8					
Foot patrol	3	1	1.3	0.6	0.3	37.5
One man car	6	1-7	5.3	3.4	11.9	75.0
Two man car	-	-	-	-	-	
Cycle	-	-	-	-	-	
In station	4	1-2	7.3	0	0	50.0
Alone	8	10	8.0	0	0	100.
With partner	-	-	-	-	-	
With others	-	-	-	-	-	

*1.00 = 1-5 hours
2.00 = 6-10 hours
3.00 = 11-15 hours
4.00 = 16-20 hours
5.00 = 21-25 hours
6.00 = 26=30 hours
7.00 = 31-35 hours
8.00 = 36-40 hours
9.00 = over 40 hours

Department Exter listed time spend alone for forty or more hours per week by 76.9% of its membership. The number of responses by administrative/clerical workers increased the percentage of members working in the station, but the majority of these members also reported working alone. Fewer respondents described a working environment of a one-man car, thus accounting for the increase in propinquity.

Integration

Integration of departments based upon departmental communications systems was viewed as the degree to which the department subunits and members are interconnected. The formula reported by Jacob (1971, p. 151) used to test for integrativeness was;

$$I = \frac{\Sigma \text{ of choices}}{\frac{\text{\# of possible choices} \times \text{\# of respondents}}{2}}$$

Department Exter had an integration index of .8366 or approximately 84% integration. The 16 participants reported a total of 380 contacts.

The members of Department Bentley, the most participatory police department, reported a total of 566 contacts. The integration index for this department was .8395 or approximately 84% integration.

Department Deerfield, ranked as the most autocratic department, had an integration score of .8463 or 85% integration with 308 contacts named.

TABLE 17.--Communication Contacts.

Department	N	Number	Range	Mean	Integration Index
Exter	16	380	15-24	23.75	.8366
Bentley	13	566	4-45	43.54	.8395
Deerfield	8	308	1- 8	38.50	.8463

Organizational Communications Patterns

The analysis of the Communications Map Checklist allowed the use of the Communications Network Analysis (NEGOPY) program developed by William D. Richards, Jr. for the CDC 6500 computer at Michigan State University. The analysis consisted of three parts: (1) ordering the communications matrix so that people who talk to each other are close in the matrix; (2) identifying the liaisons; and (3) separating the small groups within the organization. Each member of the department was assigned a number that was used by the respondent to indicate the frequency of communication contact with that member. The means of the weighted frequency of respondents to communication contacts were obtained and compared. When rank ordered, members with similar distributions were placed near each other. When put in the form of a binary matrix, non-zero entries will cluster around the major diagonal.

Each respondent in the separate departments received a code number punched onto a computer card along with the number of the stated departmental communication contact followed by a code

for frequency of contact. (See the Communications Map in Appendix 1 for the categories of communication frequency.)

The program gave a listing of all contacts by the respondent, then a list indicating how many persons to whom each respondent indicating they talked. Next the program determined all reciprocated contacts for each person responding in the department. "Reciprocated" means that one person naming a departmental member as a contact must be named by that contact in return. Due to the low response level of departmental members to the Communications Map, a decision was made to allow the program to designate as a pair all named contacts in order to include for consideration non-respondents. This was deemed acceptable as departmental members indicated at least some level of contact with all members when given a list of organizational population.

The perceived frequency of communication contact was obtained by weighting the scores for the reciprocated pairs to allow the more frequent designation to have more influence on the position of the contact in the matrix than the lower frequency stipulated by the pair. Unreciprocated pairs received the frequency score designated by the respondent member.

The program then squared each of the matrices showing different frequencies. Each respondent was ranked according to the mean of those reported as contacts. The computer then printed the total number of changed ranks and the sum differences of these ranks each time it re-ranked all respondents (Richards, 1971). The results were printed as a binary matrix with the code numbers

for the respondents placed at the top and left margins of the matrix (see Appendix 3).

The program further allowed a reduction of the matrix to identify distinct groups in each of the departments based upon actual reported communication behavior. As a result of research by Weiss (1956, p. 91) who posited that "the person having the highest total obviously is a liaison person," the respondent so scoring was deleted from the matrix along with that member's contacts. This process was continued until the only persons remaining in the "reduction matrix' were those with one or no contacts outside their segment. The process continued in the program until respondents and their contacts were grouped in isolation segments.

The smallness of the departments under study and the high percentage of communication contact reported among members resulted in the inability of the NEGOPY program to identify more than one distinct group. The analysis of the communication structure of the departments was based upon the Density Histogram which did allow identification of groups and group members, along with an indication of group scores for integrativeness and connectiveness (see Appendix 4).

Analysis of Hypotheses

Propinquity and Integration

H 1.0: The degree of lack of propinquity between departmental members will result in less integration of the department.

The police department reporting the least degree of propinquity, Department Deerfield, had an integration index of .8463 or 84% integration. This compares with a .8366 integration index for Department Exter, defined as having the most propinquity. The slight difference in the two indices does not support H 1.0. A further analysis utilizing the "connectiveness" score generated by the NEGOPY program (see Appendix 3) reported a difference in "connection" between members of each organization based upon reciprocated communication contact nominations at .4738 for Department Deerfield and .7510 for Department Exter. 'Connectiveness' provided the more reliable measure as the integration scale evolved by the NEGOPY program was negatively influenced by the low participation level of the research. The direction of this finding is consistent with that proposed by H 1.0 and thus provides support for the hypothesis.

TABLE 18.--Departmental Integration.

Department	Integrativeness Index	Connectiveness Index
Deerfield	.8463	.4738
Bentley	.8395	.4756
Exter	.8366	.7510

Propinquity and Uncertainty

To determine propinquity based upon probability for contact that would allow communication, respondents were asked to designate the number of hours normally spent in one week in various assignments allowing for physical contact as well as to evaluate the percentage of time spent in performing their duties alone. To a degree, the nature of police work requires a high level of individual activity. All departmental members reported spending over 75% of their time alone. Department Deerfield reported the highest percentage (100%) of time spent alone, estimating that in each case that time accounted for all 40 or more hours spent on the job during the week. Department Bentley reported the next highest degree of lack of propinquity with 92.3% of its members spending 40 or more hours weekly alone. Department Exter reported 76.9% of its membership spending 40 or more hours alone.

H 1.1: The degree of lack of propinquity between departmental members will increase the level of uncertainty of the department.

The department exhibiting more contact based upon a 40 hour week reported the highest level of certainty concerning organizational goals and expectations (mean = 4.13) thus supporting H 1.1. (Table 19).

Propinquity and Organizational Communications Patterns

H 1.2: The degree of lack of propinquity between departmental members will increase vertical (upward/downward) communication patterns in the department.

TABLE 19.--Comparison of Propinquity vs. Uncertainty.

Department	Time Spent Alone %	Uncertainty Mean
Exter	76.9	4.13
Bentley	92.3	3.49
Deerfield	100.0	3.63

The frequency of contact expressed by members of each department did not differ across rank, shift, or duty assignment. Each department member reported some degree of communication contact with each member of their respective organizations. Attempts by the NEGOPY program to split each department into sub-units failed (see Communication matrices presented in Appendix 4).

Further analysis generated from the Distribution Histogram (Appendix 5) for each of the police departments partially supports H 1.2 in that members of Department Deerfield describe the greatest percentage of their communication contacts as occurring three of four times a week. The expected direction of Department Exter, where communication contact frequencies are less frequent at the higher end of the scale than Department Bentley, is inconsistent with the hypothesis. When frequency categories are cumulated to develop a frequency designated as 'many times per week' (frequencies '1-2 times a week' to 'several times a day') it appears that the uncertainty ranking would correlate positively with increased communication. The high incidence of frequent communications

TABLE 20.--Frequency of Communication Contact.

	Total Links	No. Comm. Contact		Less Than Once A Month		1-2 Times A Month		1-2 Times A Week		3-4 Times A Week		Once A Day		Several Times A Day		Cumulative Weekly Index	
Department	N	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%
Exter	380	3	0.8	8	2.1	26	6.8	91	24.0	118	31.1	51	13.4	83	21.8	252	66.3
Bentley	566	8	1.4	60	10.6	31	5.5	86	15.2	114	20.1	161	28.5	106	18.7	381	67.3
Deerfield	308	2	0.7	5	1.6	15	4.9	49	15.9	104	33.8	53	17.2	80	26.0	237	80.0

contacts in Department Deerfield tends to refute H 1.2. The Density Histogram prepared by the NEGOPY program grouping respondents of all ranks into distinct groups also does not support the hypothesis presented in H 1.2.

Propinquity and Peer Contacts

H 1.3: The degree of lack of propinquity between departmental members will decrease the level of horizontal (peer) communication contacts in the departments.

Hypothesis 1.3 proved to be untestable from the data given the failure of attempts to identify communication groups in each of the three departments. The Density Histogram developed in the NEGOPY program does not suggest the exclusion or isolation of other ranks in any of the department's communication patterns (based upon an analysis of rank of members reported by I.D. number). In addition, the mean level of perceived horizontal communication satisfaction provided data that indicated a lack of support for H 1.3 in that the department with the lowest degree of satisfaction for horizontal (peer) communication was not the department reporting the greatest degree of lack of propinquity.

The development of a cumulative index for satisfaction with departmental vertical communication patterns suggests that as lack of propinquity increases, satisfaction with vertical communication decreases. The relationship between downward and upward communication satisfaction is consistent with the following reported Pearson product moment correlations, with the exception of Department Bentley.

TABLE 21.--Comparison of Propinquity and Communication Satisfaction.

Department	% Time 'Alone' %	Horizontal Comm. Sat. Mean	Downward Comm. Sat. Mean	Upward Comm. Sat. Mean	Cumulative Vertical Comm. Sat.* Mean
Exter	76.9	3.39	4.09	3.01	3.55
Bentley	92.3	2.54	3.50	3.18	3.34
Deerfield	100.0	3.45	3.53	2.96	3.25

*Upward and Downward Communication Satisfaction.

Pearson Product Moment Correlation
Downward with Upward Communication Satisfaction

Department	Pearsons γ
Exter	.7891
Bentley	.1393
Deerfield	.8128

H 1.4: The degree of lack of propinquity between departmental members will decrease the perceived level of participation of members in the organizational decision-making process.

Hypothesis 1.4 suggested that as lack of propinquity increased in a department, the perceived level of participation in the decision-making and control functions of the organization by its members would also decrease. This hypothesis is weakly supported by the curvilinear relationship indicated by a comparison of the mean level of perceived participation for the department reporting the most propinquity, Department Exter, whose participation

mean is placed at 2.87, and the department expressing the greatest lack of propinquity, Department Deerfield, whose participation mean is 2.51. The data provides support for H 1.4.

TABLE 22.--Comparison of Propinquity and Perceived Level of Participation.

	% Time Alone	Level of Participation
Department	%	Mean
Exter	76.9	2.87
Bentley	92.3	2.99
Deerfield	100.0	2.51

Communication Patterns and Level of Participation in Organizations

The present thesis of this research suggested that propinquity of members would have an effect upon the type and frequency of the communication contacts that occur within the department. Lack of participation would require the adherence to formal organizational structures in order to facilitate effective communication.

H 2.0: The structure of communication flow consistent with the formal hierarchical structure will occur in departments having less perception of participation in organizational decision-making.

The group communimatrix for each department does not allow analysis for group structure as each reflects only one group, the department as a whole. An alternate method of analysis is provided

through the density of communication histogram prepared by NEGOPY (see Appendix 4). The concentration of communication in terms of frequency of occurrence suggests that Department Bentley can be characterized as having more frequent communication between all ranks of the department. The density groupings projected indicate membership from the various supervision and management personnel in the department as well as line staff. This finding is consistent with hypothesis H 2.0 in that Department Bentley proved to be the most participatory of the police agencies represented.

Department Deerfield, the most autocratic department, reflected communication density configurations that include various rank levels of the organization in the groupings but which also reflected formal work units in the department. Department Exter, to a lesser extent, has similar characterizations in grouping.

The cross-structured and multi-rank configuration exhibited in the Density Histogram for Department Bentley as well as the corresponding displays for the other two police departments provide support for H 2.0.

H 2.1: The more autocratic departments will have greater formal communication channel contacts based upon the formal hierarchical (upward/downward) and in-group communication channel contacts.

H 2.2: The more participatory departments will have greater informal (horizontal) and inter-group communication channel contacts.

The analysis afforded by the communimatrices generated by NEGOPY as well as the Density Histogram do not provide the level of refinement necessary to test Hypothesses 2.1 and 2.2. Therefore, H 2.1 and 2.2 proved to be untestable with available data.

Participatory Organization and Uncertainty

H 3.0: The more participatory the department in perceived to be by its members, the less uncertainty will exist.

The more perceived uncertainty occurred in Department Bentley (mean = 3.49) which proved to be the most participatory agency. The department reporting the greatest level of certainty was the second most participatory department according to the perceptions of its members. Indeed, the relationship which the three organizations under investigation present between perceived participation and uncertainty was curvilinear; higher uncertainty was found in the most participatory department than was found in the more autocratic department. Thus H 3.0 was not supported.

TABLE 23.--Comparison of Level of Participation and Uncertainty.

	Level of Participation	Uncertainty
Department	Mean	Mean
Exter	2.87	4.13
Bentley	2.99	3.49
Deerfield	2.51	3.63

An analysis of the various facets used to develop the index that measures level of participation in the police departments based upon a comparison of aggregate scores also showed support of hypothesis 3.0.

Uncertainty and Communication Flow

The analysis of communication contacts listed on the Personal Communications Checklist Map for each of the respondents indicated a high degree of contact reported by departmental members with other members of all ranks and shifts with the exception of the Chief (see Communigram, Appendix 4). Hypothesis 4.0, 4.1, and 4.2 dealing with the level of uncertainty held by members about organizational expectations and goals proposed that the existence of uncertainty would cause an increase in the amount of messages transmitted between members of the organization.

H 4.0: The more uncertainty that exists by departmental members about organizational goals and objectives, the greater the number of communication contacts will occur.

Based upon an analysis of uncertainty with the number of communication contacts reported of weekly frequency, the police department recording the most uncertainty, Department Bentley, had a mean number of weekly member contacts of 10.89 per person. The most certain department, Exter, exhibited a mean weekly number of contacts of 10.96 per individual member, presenting no difference between the departments.

While Department Deerfield presented the highest percentage of communication contacts occurring weekly, 80%, this finding could be explained by the small size of the department, thus affording the greater need and ability to communicate. Hypothesis 4.0 was not supported by the data generated.

TABLE 24.--Comparison of Uncertainty and Communication Flow.

Department	N of Contacts	N of Group	% Contact Occurring Weekly	Mean	Mean Uncer-tainty	Mean Fre-quency
Exter	252	23	66.3	10.96	4.13	5.1
Bentley	281	35	67.3	10.89	3.49	5.02
Deerfield	237	26	80.0	9.12	3.63	5.36

H 4.1: The more uncertainty of departmental members in autocratic departments, the greater the number of formal (upward) communication contacts will occur.

H 4.2: The more uncertainty of departmental members in participatory departments, the greater the number of informal (horizontal) contacts will occur.

Another interpretation of Hypotheses 4.1 and 4.2 would be that decreased levels of uncertainty would produce greater satisfaction will all three communication patterns in the organization. An analysis of least uncertainty with most satisfaction with communications horizontally and vertically (upward and downward) provided another mode of analysis.

Department Bentley expressed more uncertainty (mean = 3.49), yet reported the highest satisfaction level for upward communication (mean = 3.18). Department Bentley also indicated the least degree of satisfaction with horizontal communication (mean = 2.54). Department Exter, showing the least organizational uncertainty, reported the highest positive level of satisfaction with downward communication (mean = 4.09). Department Bentley and Deerfield

produced similar levels of uncertainty with means of 3.49 and 3.63 respectively with correspondingly similar satisfaction levels for downward communication (mean = 3.50 and 3.53). The highest mean of satisfaction for horizontal communication was generated by Departments Exter and Deerfield (3.39 and 3.45 respectively). Since all horizontal communications are not as likely to concentrate solely on messages pertaining to organizationally sanctioned information, as is normally the case for downward communication, other factors could influence horizontal communication satisfaction. Downward communication coming from the supervision and management ranks would more likely contain official organizational messages. Thus, Hypotheses H 4.1 and 4.2 are supported by this analysis.

TABLE 25.--Pearson Product Moment Correlation Uncertainty and Communication Satisfaction.

Department	Horizontal	Downward	Upward
Deerfield	.67	.94	.65
Exter	.40	.92	.66
Bentley	.12	.90	.11

Participatory Organization and Job Satisfaction

H 5.0: The more participatory the department, the greater the level of job satisfaction will exist in the department.

The police department whose members indicated the highest level of participation in the decision processes of their department was that of Department Exter which reported a mean of 2.99 with a corresponding least Job Satisfaction mean of 3.22. An analysis of the Pearson product-moment correlation coefficients which produced a coefficient of .28 for Department Deerfield and .09 for Department Bentley also provides partial support for H 5.0.

H 5.1: The more satisfaction of departmental members with horizontal communications, the more job satisfaction will exist.

H 5.2: The more satisfaction of departmental members with downward communications, the more job satisfaction will exist.

H 5.3: The more satisfaction of departmental members with upward communication, the more job satisfaction will exist.

The produced means for level of job satisfaction for members by degree of satisfaction with horizontal communication where Department Deerfield reported the highest satisfaction of horizontal communication mean (3.45) and the second highest level of job satisfaction (mean = 3.35) tends to partially support Hypothesis 5.1. A corresponding analysis of the Pearson product moment coefficient correlations also provides partial support for Hypothesis 5.1 with Department Bentley generating the least coefficient at .51 when compared to their reported level of job satisfaction.

A comparison of the means relating to satisfaction with downward communication for each of the departments revealed a

TABLE 26.--Pearson Product Moment Correlation Job Satisfaction and Participation.

Department	Participation in Agency Activities	Direct Communication Patterns	Faith in Supervisory Channels	Individual Level of Control
Exter	.29	.51	.19	.60
Bentley	.09	.37	.17	.35
Deerfield	.28	.30	.46	.63

TABLE 27.--Comparison of Job Satisfaction and Communication Satisfaction.

Department	Job Satisfaction	Horizontal Communication Satisfaction	Downward Communication Satisfaction	Upward Communication Satisfaction
	Mean	Mean	Mean	Mean
Exter	3.67	3.39	4.09	3.01
Bentley	3.22	2.54	3.50	3.18
Deerfield	3.35	3.45	3.53	2.96

corresponding rating for level of job satisfaction for all three agencies. Hypothesis 5.2 is supported by comparison of means as well as the Pearson correlations reported below.

The department reporting the highest level of satisfaction for upward communication as indicated by the generated mean, Department Bentley, had the lowest level of job satisfaction for all departments. Department Exter, with less satisfaction for upward communication, reported the highest level of job satisfaction with a mean of 3.67. Hypothesis 5.3 was not supported by the data.

TABLE 28.--Pearson Product Moment Correlation Job Satisfaction and Communication Satisfaction.

Department	Horizontal Communication	Downward Communication	Upward Communication
Exter	.45	.72	.61
Bentley	.06	.31	.33
Deerfield	.36	.57	.37

Participatory Organization and Innovativeness

H 6.0: The more participatory departments will be perceived as more innovative by departmental members at both command and staff levels.

The sixth hypothesis established the expectation that the more participatory the department was in allowing decision and control by its members, the more likely that department members would perceive

the organization to be innovative. The more autocratic organization would thus have departmental members with less perception of innovativeness. The comparisons generated by perception of innovativeness with the various facets of participatory measurement where Department Exter (mean = 3.93) was perceived by its members to be the most innovative, ranks second in reported level of participation in the control functions of the organization with a mean of 2.87. The most participatory department, Bentley, reported the second highest level of perception of innovation with a mean of 3.25. The correlations presented through the Pearson product moment correlation coefficient are presented below:

TABLE 29.--Pearson Product Moment Correlation Coefficient Innovativeness and Levels of Participation.

Department	Participation in Agency Activities	Direct Communication Patterns	Faith in Supervisory Channels	Individual Level of Control
Exter	.37	.47	.11	.59
Bentley	.38	.31	-.21	.46
Deerfield	.46	.62	.62	.76

Hypothesis 6.0 was supported in an analysis of the participation facet of the participatory measure with a coefficient of .38 for the most participatory department, Bentley, and .46 for the most

autocratic, Department Deerfield. This pattern was also consistent for the Level of Control comparisons generated, but was not for the other two facets of participatory measurement used in generating the participatory index. Thus, Hypothesis 6.0 is partially supported along two dimensions of measurement of level of participation. Faith in Supervisory Channels showed a strong negative correlation for Innovativeness.

Innovativeness

H 7.0: The more innovative the department is perceived to be by its members, the more likely ideas will be suggested by departmental members to improve the department.

Hypothesis 7.0 states that as participation in the decision-making processes is perceived to be open to departmental members, those members will suggest more ideas about improving or changing the department than members of an agency where participation is perceived as being limited to members. Besides suggesting more ideas voluntarily to peers, the participatory department members would also utilize the upward communication system to suggest new ways of doing things or new ideas to the supervisory ranks of the department. An administration that encourages participation of all members of the organization would maximize the upward-downward communication flow through requests for new ideas.

Hypothesis 7.0 was tested by surveying departmental members concerning the number of new ideas or procedures tendered to peers, to supervisors, and as a result of official departmental requests during the previous year. The hypothesis was not supported in that

the mean number of ideas transmitted outside official departmental channels (not to the immediate supervisor) occurred in the least innovative agency, Department Deerfield, with a mean of 15.83 ideas being reported as transmitted to persons other than the immediate supervisor. Ideas presented to supervisors were not significantly different across departments.

Significant requests for ideas from the departmental administration itself were not found. Indeed, only one member of each department reported such a request.

TABLE 30.--Idea Flow in Police Departments.

	Ideas to Immediate Supervisor		Ideas to Others (Informal)		Departmental Requests for Ideas	
Department	Mean	SD	Mean	SD	Mean	SD
Exter	6.73	(6.0)	7.63	(7.7)	1.0	(0)
Bentley	9.0	(5.8)	9.25	(7.9)	1.0	(0)
Deerfield	8.0	(10.)	15.83	(17.)	1.0	(0)

Identification of Organizational Leadership

H 8.0: The more participatory department will be more likely to designate monomorphic opinion leaders.

H 9.0: The more participatory department will be more likely to designate influence leaders outside of the boundaries of work groups or along status (rank) lines.

Hypothesis 8.0 dealt with opinion leadership within the three police departments. The respondents were asked to name three members of the police department to whom the departmental member would ask an opinion about a new idea that member had developed. All persons so designated were listed with each nominee receiving a score based upon number of times mentioned. Rank of respondents vs. rank of nominee were analyzed to indicate the relationship of rank (status) to designation. Each nomination was given equal weight. The operationalization of opinion leadership was nomination to the status of perceived opinion leader. An analysis of monomorphic vs. polymorphic designation was based upon in-rank nomination for opinion leadership. Those departments indicating opinion leaders with higher rank than the reporting group were seen to be concerned with status considerations in selecting opinion leaders. Selection by status relationship denoted polymorphic leaders which was hypothesized as being likely in autocratic organizations. In addition, it was posited that the more autocratic departments would tend to select opinion leaders for their perceived ability to influence the organization. Nomination to the level of leader required at least a sum of votes totalling 10% of the N of the department (Jacob, 1971).

Those who qualified as opinion leaders were listed in the categories-opinion leader and influence leader. For Department Exter, the required votes necessary for designation as a leader was 8; for Department Bentley, 6; and Department Deerfield, 4. The number of persons qualifying were added and this number

divided by the total number of respondents in the specific department.

The findings following the procedure described above were:

TABLE 31.--Selection of Opinion Leaders.

	Opinion Leadership	
Department	N	Per Cent
Exter	3	.19
Bentley	6	.46
Deerfield	4	.50

There is a larger percentage of polymorphic leaders in Department Deerfield than in the other two police departments. This finding is further supported in that the rank (status) of leaders designated by Department Deerfield included the greater number of nominees in the upper ranks of the department. Only in Department Exter did the Chief qualify as an opinion/leader (receiving the most votes in the department). In this department, the Chief was perceived as being readily accessible by departmental members.

There is a larger percentage of polymorphic opinion leaders in Department Bentley than in Department Exter which is consistent with the direction predicted in H 8.0. Department Deerfield also follows the pattern predicted as a higher percentage of its membership

TABLE 32.--Rank of Opinion Leaders.

Department	N	Sergeant	"Brass"*	Chief
Exter	3	--	2	1
Bentley	4	--	3	--
Deerfield	3	2	1	--

*The designation of "Brass" includes the highest strata of rank directly below that of Chief. For Department Deerfield only one officer above Sergeant is found in the organizational structure. All other designations include the ranks of Captain and Lieutenant.

were considered polymorphic opinion leaders than was found in Department Exter and Bentley.

An analysis of those members designated as influence leaders in the departments surveyed supplied a pattern consistent with that shown by Influence Leadership. Hypothesis 8.0 is supported by the data.

The anticipated designation of opinion and influence leaders was that autocratic departments were expected to rely more on status characteristics of formal hierarchy (seniority, rank, etc.) for selection of leaders. To a degree, all departments scored at the autocratic range of the scale to measure participation. The department scoring as most participatory, Department Bentley with a mean of 2.99, still placed to the negative side (autocratic) of the participation continuum (a mean of 5.0 indicating the highest perceived level of participation). If hypothesis 8.0 and 9.0 were to hold true, all departments would select leaders based upon some status consideration.

TABLE 33.--Selection of Influence Leadership.

Department	Influence Leadership	
	N	Per Cent
Exter	3	.19
Bentley	4	.31
Deerfield	3	.38

A compilation of responses to the opinion/influence questions on the survey indicated that 25% of patrol officers in Department Bentley responding selection peers as leaders. This response compares with 14% of members of Department Exter and 17% for Department Deerfield. This finding is consistent with the direction predicted in Hypothesis 9.0. The patrol level was the only rank studied as it provided the best analysis of the weight of status upon selection of opinion/influence leaders.

Summary of Hypotheses

A summary of the support of the hypotheses presented in the research are listed in Figure 3.

TABLE 34.--Nominations for Opinion/Influence Leadership.

Department	Exter		Bentley		Deerfield	
Designee / Nomination	Opinion	Influ.	Opinion	Influ.	Opinion	Influ.
Police Officers						
Line peers	-	3	3	3	2	1
Sergeant	4	1	3	5	6	5
Detective	1	1	-	-	1	-
"Brass"*	4	5	6	2	1	1
Chief	2	-	-	-	-	-
Sergeants						
Line officers	-	-	-	-	-	-
Peers	2	-	1	1	-	-
Detective	-	-	-	-	-	-
"Brass"	1	1	2	-	2	-
Chief	1	1	-	-	-	-
Detectives						
Line officers	-	-	-	-	-	-
Sergeants	-	-	5	2	-	-
Peers	1	1	4	-	-	-
"Brass"	1	1	4	2	-	-
Chief	2	2	1	1	-	-
"Brass"*						
Line officers	-	-	-	-	-	-
Sergeants	-	-	1	1	-	-
Detectives	1	-	-	-	-	-
Peers	4	4	7	3	-	-
Chief	2	2	1	-	-	-
Chief						
Line Officers	-	-	-	-	-	-
Sergeant	-	3	-	-	3	3
Detective	1	-	-	-	-	-
"Brass"	2	1	2	-	2	2
Office						
Peers	1	1	1	1	-	-
Patrol	-	1	-	-	1	-
Sergeant	-	-	-	-	1	1
Detective	-	-	-	-	-	-
"Brass"	2	4	1	-	-	-
Chief	1	-	1	1	-	-

*The category "Brass" includes the highest ranks directly below Chief in each of the departments including Captain and Lieutenant.

Hypothesis	Result
H 1.0	Supported
H 1.1	Supported
H 1.2	Not Supported
H 1.3	Not Supported
H 1.4	Supported
H 2.0	Supported
H 2.1	Not Testable
H 2.2	Not Testable
H 3.0	Not Supported
H 4.0	Not Supported
H 4.1	Supported
H 4.2	Supported
H 5.0	Partially Supported
H 5.1	Partially Supported
H 5.2	Supported
H 5.3	Not Supported
H 6.0	Partially Supported
H 7.0	Not Supported
H 8.0	Supported
H 9.0	Supported

Figure 3. Summary of Hypotheses Tested.

CHAPTER V

SUMMARY AND DISCUSSION

The research effort undertaken was a comparative analysis of the structure of the internal communication system of three police departments. The goal of the thesis was to define the impact of various perceptions about the department held by its members upon the direction and frequency of communication contacts.

A police organization exhibits characteristics in its normal operation which past researchers have found to impede the quality, quantity, and direction of communication flow in other types of organizations. These variables which were selected for study include: Integration, Propinquity, Job Satisfaction, Uncertainty, Innovativeness, Communication Satisfaction, and Level of Participation in Decision-Making. Further variables under consideration included Status, Opinion Leadership, and Influence Leadership.

The research design used in the study was a mailed questionnaire given to three police departments of an average representative size with populations not to exceed 50. All three police departments were in the Midwest with each department being located in a different state. Departments were selected based upon acceptance to an entry inquiry made to the chief of each department at the outset of the research. The request for participation was only

refused in one agency contacted and two participating agencies withdrew during the course of the research at their request.

The problem of entry into any organization has proven to be a common problem in social research. Manning (1972) presents the problems associated with entry into police organizations as involving monitoring elements for the control, sanctioning, and observation of intrusion into the organization, with frequent demands for reciprocity. While the research reported did not experience monitoring difficulties, other than the insistence upon the part of the researcher that the police chief review the questionnaire before consenting to participate, each chief did broach the topic of "what's in it for me." In each case, a bargain was struck on the extent of feedback to be provided to the organization which would not jeopardize the privacy and integrity of those members participating in the research. Access to each of the departments necessitated the development of a mailed questionnaire format so as to conform to and appease union and departmental needs for minimizing intrusion. An observational and/or interview approach was rejected by each of the departments as being potentially disruptive for organizational activities.

The method of initial access used in the research in consistent with that described by Manning (1972) as being the most common mode adopted successfully by researchers attempting to study the police organization. Secondary access, allowing entry by police administrators to those perceived to be police professionals, also had bearing upon the acceptance to entry based

upon the knowledge held by the participating police chiefs about the researcher's intentions and capabilities. The more autocratic administrator would tend to perpetuate the closed, secret atmosphere of the police agency and would not be as likely to agree to participate. The acceptance itself thus characterizes the administration of the participating department as being more open and professional.

Sponsorship by the police chief was selected as the mode of introduction best likely to produce the highest questionnaire return (Manning, 1972). Contract, policy, and union arrangements required participation be voluntary on the part of the departmental members. Questions presented on the instrument would be perceived to be sensitive in any organization where an assessment of supervision is requested. This sensitivity seems to be compounded in a police organization where the value of secrecy is already part of the cultural system (Niederhoffer and Blumberg, 1976). Manning (1972, p. 114) suggests that:

> All these aspects of police organizations-secrecy, threat, paramilitary organization, morale and self-esteem problems and internal schisms, and extended relations have created a research milieu in which the researcher often avoids contact and interaction with certain persons, and constantly renegotiates roles.

Indeed, problems of access, research style, sponsorship, location, and perspective on action as reported by Manning (1972) were met by this researcher.

Data Analysis

Data for the study were gathered by a 63-item questionnaire and a Personal Contact "Communication Map" Checklist. A list of members of the department was given each respondent asking for an indication of the average frequency of communication with that member. Departmental lists were prepared by each police chief from seniority lists. The population of the departments selected for study were consistent with the configuration of the majority of police departments in the Midwest area with the highest percentage of departments having less than 25 members.

The items on the questionnaire were developed from many sources depending upon the variable under consideration and were modified for relevancy for a police force. The items were pretested on a group of police officers from a large metropolitan police force and two suburban departments. The "Communication Map" was developed with the assistance of Rolf Wigand, Michigan State University, based upon format requirements of the NEGOPY program.

Data was evaluated utilizing the range-free statistics for cumulative indices generated by question groupings for each of the variables. Index reliability was tested through a comparison of the Pearson Product Moment Correlation Coefficients for each question to the index. The cumulative indices were then compared utilizing the Pearson Product Moment Correlation to determine if a relationship existed.

The data generated by the "Communications Map" Checklist was analyzed using the NEGOPY program to determine the frequency of communication, density of communication, integrativeness, and connectiveness for each department. An attempt was made to visualize distinct communications groupings based upon communication behavior of individual members but only one group emerged for each department. The statement, "hypothesis is supported" was used if the differences of the analyses were in the direction predicted.

Main Findings

Sixteen hypotheses were tested dealing with the variables of communication structure (flow) and communications satisfaction in relation to seven other variables: job satisfaction, uncertainty, propinquity, innovativeness, opinion leadership, influence leadership, and level of participation in decision-making and control in the organization.

Communication Structure Flow

Six hypotheses dealt with the communication structure (flow) of the police department:

H 1.0: The degree of lack of propinquity between departmental members will result in less integration of the department.

H 1.2: The degree of lack of propinquity between departmental members will increase vertical (upward/downward) communication patterns in the department.

H 2.0: The structure of communication flow consistent with the formal hierarchical structure will occur in

departments having less perception of participation in organizational decision-making.

H 2.1: The more autocratic department will have greater formal communication channel contacts based upon the formal hierarchical (upward/downward) and in-group communication channel contacts.

H 2.2: The more participatory department will have greater informal (horizontal) and inter-group communication channel contacts.

H 4.0: The more uncertainty that exists by departmental members about organizational goals and objectives, the greater the number of communication contacts will occur.

The communication structure of each department was generated from communication contacts reported by members weighted by frequency as analyzed by the NEGOPY program. Responses indicated that less than 2% of the membership of each department had no contact with a colleague. Due to the less than complete return on the checklist, it was necessary to analyze unreciprocated links of communication contact in order to "map" non-respondents in the departmental communication structure. The high level of contacts named resulted in the failure of the program to discern distinct communication groups with identified liaisons, bridges, and isolates. The smallness of the departments themselves could account for the high degree of integrativeness in each of the departments where it is possible to know and have contact much more easily with all members of the organization. Each department was presented as one distinct communication grouping. Density data was available, as were frequency distributions that allowed an analysis of the flow of communication between ranks and work units. The data generated allowed an analysis of certain characteristics of communication structure

with the variables presented for comparison. Hypotheses that were supported were 1.0 and 2.0. Hypotheses not supported were 1.2 and 4.0. The inability to program communication groups and roles caused Hypotheses 2.1 and 2.2 to be untestable.

Communication Satisfaction

Communication satisfaction of members was analyzed in three directions: horizontal, downward, and upward. Five hypotheses were tested through a comparison of cumulative indices developed from perceptual data reported by departmental members as to their satisfaction with communication in three directions. Hypotheses that concerned communication satisfaction were:

H 5.1: The more satisfaction of departmental members with horizontal communications, the more job satisfaction will exist.

H 5.2: The more satisfaction of departmental members with downward communication, the more job satisfaction will exist.

H 5.3: The more satisfaction of departmental members with upward communication, the more job satisfaction will exist.

Additional hypotheses tested under communication satisfaction measures due to partial program failure included:

H 4.1: The more uncertainty of departmental members in autocratic departments, the greater the number of formal (upward) communication contacts will occur.

H 4.2: The more uncertainty of departmental members in participatory departments, the greater the number of informal (horizontal) contacts will occur.

A Pearson product moment correlation of the cumulative indices for the three directions of communication flow satisfaction

with indices of the compared variables produced support for Hypotheses 5.2, 4.1, and 4.2. Certainty correlated most positively with Downward Communication Satisfaction when compared with its Pearson's γ. (Producing a Pearson correlation of .9244 for Department Exter .9038 for Department Bentley and .9434 for Department Deerfield.) Partial support was given for Hypothesis 5.1 and Hypothesis 5.3 proved not to be supported.

The data defining communication structure (flow) and communication satisfaction proved to be significantly effected by various perceptions of departmental members about the department. The lack of support for Hypothesis 4.0 suggested that uncertainty exists due to the failure of members in communicating among those of the same rank and work assignment. In Department Bentley, which exhibited high uncertainty, the lack of communication could be construed to be the cause. The members reported being satisfied with downward communication, an inconsistent situation. Further analysis suggests that the greater extent of participatory behavior perceived by Department Bentley could conceivably result in uncertainty due to the situation where the member's capacity to participate in decision-making caused decisions to take longer and be more open-ended. Uncertainty also seemed to effect job satisfaction as is indicated in the data analysis for Hypothesis 5.3. If participatory behavior produces uncertainty, then its responsibilities and ambiguities could produce job dissatisfaction. Further affecting H 5.3 could be the reluctance of those having job dissatisfaction to using upward communication channels to relay criticisms to higher status

positions due to fear of reprisal (Read, 1962, p. 383). The participation level of Department Bentley also seemed to cause the partial failure of support for Hypothesis 5.1.

Autocratic vs. Participatory Decision-Making

The decision to measure the level of participation of departmental members in the decision-making and control processes of the organization through the perceptions of the members afforded a better indication of the relationship with communication structure and satisfaction than if the departments were independently evaluated along observational and/or incidence criteria. The definition of participatory over autocratic management produced four indices of perceived level of control. All three departments scored toward the autocratic end of the continuum with the members of Department Bentley reporting the greater perception of participation. This finding is consistent with previous research into the autocratism found in the administration of police organizations. It could be assumed that the openness of the participating departments would place them to the middle of the continuum while police administrators who might refuse participation due to the secrecy and protectiveness norm previously reported would be more autocratic.

Hypotheses dealing with the effects of control over the department by its members in relation to their perceptions of the department produced the following hypotheses:

H 3.0: The more participatory the department is perceived to be by its members, the less uncertainty will exist.

H 5.0: The more participatory the department, the greater the level of job satisfaction will exist in the department.

H 6.0: The more participatory departments will be perceived as more innovative by departmental members at both command and staff levels.

An analysis of the relationship between the level of perceived participation of the responding agencies with the variables under analysis through the use of comparisons of range-free means and Pearson Product Moment Correlations provided partial support for Hypotheses 5.0 and 6.0. The confounding factor seems to be the unrest expressed by members of Department Bentley for the operation of the department, although they perceive themselves to have greater latitude to providing input. It seems that members of the department do not avail themselves of this opportunity. Hypothesis 3.0 was not supported. Possible explanations include the ambiguity that surrounds opportunity to participate as well as the present economic situation of the department that has disrupted the normal activities of that police agency. Further, Department Bentley is headed by a relatively new chief who is highly educated, thus introducing a possible discrepancy in interpretation of goals and expectations between the chief and departmental members possessing high seniority and low educational attainment.

The respondents were also asked to designate up to three members of the department to whom that member would seek an opinion or support (influence) for an idea or procedure the member might wish to see implemented in the department. The operationalization of both opinion and influence leadership was nomination by at least 10% of the respondents as suggested by Jacob (1971). Hypotheses presented are:

H 8.0: The more participatory department will be more likely to designate monomorphic opinion leaders.

H 9.0: The more participatory department will be more likely to designate influence leaders outside of the boundaries of work groups or along status (rank) lines.

Both Hypotheses 8.0 and 9.0 were supported by the choices of the members. Even though the more participatory department selected the larger percentage of in-rank leaders, the majority of those chosen still were of a high rank. This became more apparent as the analysis focused upon those members having rank above that of line officer. Leaders of higher rank were more likely to be selected than peers with no department having members of rank selecting a leader of lesser rank.

Other

The lack of propinquity necessitated by police work was hypothesized to be a factor in producing uncertainty in a department. This was tested in the following hypothesis:

H 1.1: The degree of lack of propinquity between departmental members will increase the level of uncertainty of the department.

The analysis of reported propinquity by departmental members based on self-report of physical contact with other departmental colleagues to the range-free mean generated for the uncertainty index supported Hypothesis 1.1.

H 7.0: The more innovative the department is perceived to be by its members, the more likely ideas will be suggested by departmental members to improve the department.

Respondents were also asked to list the number of times they tendered suggestions for procedures or policy to their immediate

supervisor or to others in the department. The mean number of suggestions was compared to the index of perceived innovativeness of the department. Hypothesis 7.0 was supported.

It proved impossible to test the following hypothises from the available data:

H 1.3: The degree of lack of propinquity between departmental members will decrease the level of horizontal (peer) communication contacts in the department.

The failure of the analysis based upon NEGOPY to generate the necessary data for comparison led to the use of the Density Histogram and the perceived horizontal communication satisfaction scale for study. The analysis from both sets of data did not provide inferred support for Hypothesis H 1.3.

H 1.4: The degree of lack of propinquity between departmental members will decrease the perceived level of participation of members in the organizational decision-making process.

A comparison of the perceived level of participation held by department members in relation to their reported degree of propinquity showed support for Hypothesis 1.4.

Suggestions for Future Research

Police departments as organizations for research are a relatively new phenomena in social research (Manning, 1972) and are non-existent in research directed at communication structure and function. Indeed, Etzioni (1961, p. 137) suggested that "There are very few functional-structural studies of communication, in particular communication in organizations." The failure of the research to map the extant communication structure of the departments

studied needs additional research. The information generated could have an important impact upon the information processing and decision centers in the police organization. For the professional, the identification of vital information linkages and opinion/influence leadership could conceivably aid in the introduction of innovation into the department.

Additional attention also needs to be given to police departments in order to discover and isolate factors and relationships that influence the variables examined and to test the validity and reliability of the methodology of the present study. Further analysis is also needed to identify the types of communication systems operant in the department, defined by the type and direction of messages and information carried.

The problems of lack of propinquity need to be explored for larger police departments than those studied who seemed to find some way to overcome the handicap of physical distance. As departments consolidate and municipalities grow, the need to maximize member input increases for the police organization which depends on the line officer to provide the necessary information that ultimately directs and evaluates the performance of the police department.

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APPENDICES

APPENDIX 1

QUESTIONNAIRE

Dear Respondent:

I am conducting research in the area of communications in police organizations for my doctoral dissertation in Criminal Justice-Police Administration at Michigan State University. Of special concern is the communication of policy and directives in your department but I am also interested in information flow patterns. The aim of this study is to obtain an idea of how to improve the flow of information to the police officer so as to provide the officer with a more knowledgeable and satisfying work environment.

While answers to all questions on the attached questionnaire are voluntary, I would appreciate your complete cooperation. I am asking that you identify yourself through use of a code number so that I might be able to match communication contacts. These questionnaires will be seen by no one but myself. You have my assurance that the answers will not be shared with your department.

Thank you for your cooperation. I am grateful for your assistance. The questionnaire can be returned by using the enclosed envelope. I would appreciate receiving your responses as quickly as possible.

Sincerely,

Chris Dunning

Dear Police Officer:

A few weeks ago your chief distributed a copy of a questionnaire on communications in police departments to members of your force. In agreeing to allow his officer to fill out these forms, your chief agreed to total anonymity for members of the department. Your chief agreed not to seek to know your answers to these questions nor would I agree to reveal them. Many of the questions could be seen as being sensitive. Realizing that, I allowed for a neutral or "no response" option for use at the discretion of the officer. These questions deal with variables such as job satisfaction, communication satisfaction, and perceived openness that frequently cause communication distortion or blockages in organizations.

If you have already responded to the questionnaire, I want to thank you for your assistance. If you have elected not to respond, I respect your decision. If, however, you would respond if complete anonymity were insured, I am asking that you would consider filling out the questions, omitting your name, respondent number, or any other data that you might feel would identify you. The communications map need not be completed, or it could be sent in a separate envelope so as not to identify you with the questionnaire. I am asking that you identify your department as several are participating in the study.

If you need an additional copy of the questionnaire, I have asked the chief to make such copies available. Again, I would appreciate your assistance in completing the questionnaire before July 1, 1975.

Thank you.

Sincerely,

Chris Dunning

COMMUNICATIONS QUESTIONNAIRE

Respondent (#)_____

Agency_____

Please place a check (✓) next to the appropriate category that best describes your status.

1. Age

_____ a. 21-25	_____ f. 46-50
_____ b. 26-30	_____ g. 51-55
_____ c. 31-35	_____ h. 56-60
_____ d. 36-40	_____ i. 61-65
_____ e. 41-45	_____ j. over 65

2. Sex

_____ a. Male
_____ b. Female

3. How long have you worked for your present department?

_____Years _____Months

4. What is your present rank?

_____(01) New Recruit	_____(06) Sergeant
_____(02) Probationary Officer	_____(07) Lieutenant
_____(03) Patrol/Police Officer	_____(08) Investigator
_____(04) Corporal	_____(09) Captain
_____(05) Detective	_____(10) Inspector
	_____(11) Chief
	_____(12) Other (Specify)_____

5. Which of the following describes your present regular duty assignment? Check one.

_____(01) Patrol	____(12) Records
_____(02) Tactical Unit	____(13) Personnel
_____(03) Crimes Against Persons	____(14) Narcotics
_____(04) Crimes Against Property	____(15) Jail
_____(05) Traffic	____(16) Planning
_____(06) Vice	____(17) Accident Investigation
_____(07) Internal Affairs	
_____(08) Juvenile	____(18) Other (Specify)_____
_____(09) Property	
_____(10) Communications	
_____(11) Training or Education	

6. Which of the following duties have you had in the past? (Check more than one if applicable)

_____(01) Patrol
_____(02) Tactical Unit
_____(03) Crimes Against Persons
_____(04) Crimes Against Property
_____(05) Traffic
_____(06) Vice
_____(07) Internal Affairs
_____(08) Juvenile
_____(09) Property
_____(10) Communications
_____(11) Training or Education
____(12) Records
____(13) Personnel
____(14) Narcotics
____(15) Jail
____(16) Planning
____(17) Accident Investigation
____(18) Other(Specify)_____

7. What shift or watch do you currently work?_____

8. Does your assignment entail a shift rotation? ____Yes ____No

9. If you rotate, how often?_____

10. Does your whole unit rotate together? ____Yes ____No

11. How long have you been on your present assignment? ____Years ____Months

12. In an average week, how many hours do you usually work on the following types of assignments?

a. On foot patrol _____Hours
b. In a one-man car_____Hours
c. In a two-man car_____Hours
d. On a motorcycle_____Hours
e. In a police station or office _____Hours

13. In an average week, how many hours do you usually work:

a. Alone _____Hours
b. With an assigned partner _____Hours
c. With more than one person _____Hours

14. In your job, do you usually have direct supervisory responsiblity over other officers or civilian employees? ____Yes ____No

15. If yes, How many people do you usually supervise? (Fill in the number of people) _____People

16. Do the members of your department belong to a union or professional association? ____Yes ____No

17. Are you a shift representative for your department? ____Yes ____No

COMMUNICATIONS QUESTIONNAIRE (Cont.)

Answer the following items by checking the category which most nearly matches your feeling or opinion on that item.

Use this code on Items 18 to 22.

1. Very dissatisfied
2. Dissatisfied
3. Neutral
4. Satisfied
5. Very Satisfied

___18. How satisfied are you with the sort of work you are doing?

___19. How satisfied are you with the type of leadership you receive from your supervisor?

___20. How satisfied are you with your possibilities of being promoted to a better position in your department?

___21. How satisfied are you with your present salary?

___22. In general, how satisfied are you with efforts made by your department to modernize and keep up with the field of law enforcement?

Use this code on Items 23 to 29.

1. None
2. Little
3. No Opinion
4. Some
5. A Lot

___23. What value does your supervisor show for a job well done?

___24. To what extent do you get to participate in the supervisory decisions that affect your job?

___25. Do you receive a feeling of accomplishment from the work you are doing?

___26. In your daily work how much freedom do you have to make decisions and act on them?

___27. How much pressure do you feel in meeting the work demands of your job?

___28. How much does your supervisor observe your work?

___29. How much confidence do you feel that your supervisor keeps you fully informed about things that might concern you?

COMMUNICATIONS QUESTIONNAIRE (Cont.)

Use this code on Items 30 to 45.

1. Strongly disagree
2. Moderately disagree
3. Neutral or No Opinion
4. Moderately agree
5. Strongly agree

___30. My work is interesting to do.

___31. I often have to 'bend' department policies and procedures in order to get my job done.

___32. There's pretty good sharing of information among the various units on my shift.

___33. There's pretty good sharing of information among the officers on all the shifts.

___34. The officers who work the same shift with me are the ones I talk to socially the most.

___35. My department doesn't like us to talk to anyone outside of channels.

___36. My supervisor(s) doesn't care who I go to with information as long as the work gets done.

___37. My supervisor is usually quick to respond to my requests to talk to him.

___38. I feel I usually know what is expected of me by my fellow departmental members in doing my job.

___39. I feel I usually know what is expected of me by my superiors in doing my job.

___40. My supervisor does not like me to go over his head to talk to anyone in a higher rank.

___41. The department encourages discussion among its members to come up with new ways of doing things.

___42. My immediate supervisor keeps me well informed.

___43. My fellow officers talk about new and different ways for the department to do things frequently.

___44. My supervisor is easy to talk to.

___45. It is relatively easy to get an opportunity to talk to my supervisor alone.

COMMUNICATIONS QUESTIONNAIRE (Cont.)

Use this code on Items 46 to 53.

1. Strongly disagree
2. Moderately disagree
3. Neutral or No Opinion
4. Moderatley agree
5. Strongly agree

____46. The officers I work with don't get much chance to talk to each other.

____47. My immediate supervisor is willing to listen to suggestions.

____48. If I have an idea about a way to improve the department, I take that idea to my immediate supervisor.

____49. I don't feel there is enough communication among the officers on different shifts or watches.

____50. Officers in this department are quickly informed about policy changes.

____51. Department policies are communicated clearly to all members of the department.

____52. The role of a police officer has changed for the better over the last few years.

____53. The duties of a police officer have expanded for the better over the last few years.

On the next items, Use this code.

1. Very little
2. Little
3. A moderate amount
4. Much
5. Very much

In your job as a police officer, how much:

____54. Responsibility do you have for the functioning of your unit?

____55. Do you participate with others in determining the way things are done on your job?

____56. Freedom do you have in arranging your work hours and days off?

____57. Do you decide with others what part of a task you will do?

____58. Do you participate with others in making decisions that affect you?

59. Check the one phrase which most clearly describes the way you receive messages from the department.

_____a. All or nearly all written

_____b. More written than oral

_____c. About one-half written and one-half oral

_____d. More oral than written

_____e. All or nearly all oral

60. Within the last year, how often have you volunteered ideas to change the department's practices: (Number of times approximately)

_____a. To others in the department

_____b. To your superior

61. Within the last year, how often has the department requested ideas from the members of the department through formal channels?_____

Give examples if possible._____

_____

_____

_____

62. If you want an opinion about a new idea you have for the department (investigatory technique, theory on a crime, equipment change, etc.) which members of the department would you ask? (Write names in blanks)

a._____

b._____

c._____

63. If you want someone to go to bat for you (sponsor) or to go to bat for one of your ideas who would you contact in your department?

a._____

b._____

c._____

PERSONAL CONTACT CHECKLIST

_____
(Write your name here)

The attached checklist asks for certain information about your communication with other members of your department. This information is needed to complete the mapping of the communication structure of the department necessary for my dissertation.

Please place a check in the category beside each officers' name which most closely indicates the frequency of communication between you two. "Communications" include face-to-face conversations, telephone conversations, radio conversations, formal or informal meetings, memos, etc.

Neither the following pages nor the code sheet containing the names and the final assigned numbers will be seen by anyone but myself. NO ONE in your department will see this information.

THANK YOU FOR YOUR COOPERATION.

Chris Dunning

Police Department #_____

COMMUNICATIONS MAP

Respondent #_____

Please put a check in the box which most closely indicates the frequency of your communication with each person in your department.

Department Members #	Several Times a Day	Once a Day	3 to 4 Times a Week	1 to 2 Times A Week	1 to 2 Times a Month	Less Than Once a Month	Other(Indicate Amount)	Not at All

APPENDIX 2

PEARSON PRODUCT MOMENT CORRELATIONS FOR VARIABLES UNDER STUDY

PEARSON PRODUCT MOMENT CORRELATION COEFFICIENTS

DEPARTMENT EXTER

	Job Satis-faction	Work Assoc. Satis-faction	Uncer-tainty	Innova-tiveness	Hori-zontal Communi-cation Satis.	Down-ward Communi-cation Satis.	Upward Communi-cation Satis.
Job Satis-faction	1.0000	.2169	.5311	.7869	.4493	.7196	.6143
Work Assoc. Satis-faction		1.0000	.4674	.1370	.1784	.4252	.5673
Uncer-tainty			1.0000	.4559	.3951	.9244	.6612
Innova-tiveness				1.0000	.3840	.5913	.3823
Horizon-tal Commu-nication Satis.					1.0000	.5253	.4220
Downward Communi-cation Satis.						1.0000	.7891
Upward Communi-cation Satis.							1.0000

PEARSON PRODUCT MOMENT CORRELATION COEFFICIENTS

DEPARTMENT BENTLEY

	Job Satis-faction	Work Assoc. Satis-faction	Uncer-tainty	Innova-tiveness	Hori-zontal Communi-cation Satis.	Down-ward Communi-cation Satis.	Upward Communi-cation Satis.
Job Satis-faction	1.0000	.4899	.2386	.2254	.0578	.3110	.3267
Work Assoc. Satis-faction		1.0000	.4161	.3556	.3820	.4078	.3167
Uncer-tainty			1.0000	.4651	-.1155	.9038	.1072
Innova-tiveness				1.0000	.4558	.4714	-.2256
Horizon-tal Commu-nication Satis.					1.0000	.0027	.2182
Downward Communi-cation Satis.						1.0000	.1393
Upward Communi-cation Satis.							1.0000

PEARSON PRODUCT MOMENT CORRELATION COEFFICIENTS

DEPARTMENT DEERFIELD

	Job Satis-faction	Work Assoc. Satis-faction	Uncer-tainty	Innova-tiveness	Hori-zontal Communi-cation Satis.	Down-ward Communi-cation Satis.	Upward Communi-cation Satis.
Job Satis-faction	1.0000	.1083	.5106	.6969	.3633	.5657	.3705
Work Assoc. Satis-faction		1.0000	.6482	.6920	.1905	.6479	.4035
Uncer-tainty			1.0000	.6711	.6679	.9434	.6491
Innova-tiveness				1.0000	.3177	.7637	.6106
Horizon-tal Commu-nication Satis.					1.0000	.6959	.6386
Downward Communi-cation Satis.						1.0000	.8128
Upward Communi-cation Satis.							1.0000

PEARSON PRODUCT MOMENT CORRELATION COEFFICIENTS

DEPARTMENT EXTER

	Partici-pation in Agency Activities	Direct Communi-cation Patterns	Faith in Supervi-sory Channels	Individual Level of Control
Job Satis-faction	.2898	.5055	.1864	.6030
Work Assoc. Satis-faction	-.0177	.3091	.5168	-.1693
Uncer-tainty	.3875	.5800	.6406	.3697
Innova-tiveness	.3743	.4702	.1081	.5892
Horizon-tal Commu-nication Satis.	.6107	.2695	.0395	.5398
Downward Communica-tion Satis.	.3750	.7014	.5850	.4717
Upward Communi-cation Satis.	.2883	.8670	.7024	.3626

PEARSON PRODUCT MOMENT CORRELATION COEFFICIENTS

DEPARTMENT BENTLEY

	Partici-pation in Agency Activities	Direct Communi-cation Patterns	Faith in Supervi-sory Channels	Individual Level of Control
Job Satis-faction	.0940	.3697	.1742	.3480
Work Assoc. Satis-faction	.5604	.2882	.2605	.3021
Uncer-tainty	.0911	.3024	.0544	.3410
Innova-tiveness	.3755	.3140	-.2068	.4565
Horizon-tal Commu-nication Satis.	.4008	-.0646	.2167	.0091
Downward Communi-cation Satis.	.0502	.2611	.1505	.3587
Upward Communi-cation Satis.	.0719	.4727	.7388	-.1212

PEARSON PRODUCT MOMENT CORRELATION COEFFICIENTS

DEPARTMENT DEERFIELD

	Partici-pation in Agency Activities	Direct Communi-cation Patterns	Faith in Supervi-sory Channels	Individual Level of Control
Job Satis-faction	.2816	.3036	.4596	.6271
Work Assoc. Satis-faction	.3161	.5224	.4105	.3801
Uncer-tainty	-.1269	.8065	.3837	.3282
Innova-tiveness	.4614	.6234	.6198	.7596
Horizon-tal Commu-nication Satis.	-.3422	.6794	.3826	.2745
Downward Communi-cation Satis.	.0692	.8990	.5861	.4156
Upward Communi-cation Satis.	-.0544	.9387	.8129	.1630

APPENDIX 3

COMMUNIMATRICES

Dept. Exter

THERE ARE 23MEMBERS IN THIS GROUP

GROUP LINK ANALYSIS MATRIX

LINK ANALYSIS MATRIX

	NUMBER OF LINKS						STRENGTHS OF LINKS				
	TWO-WAY	OUTGOING	INCOMING	TOTAL	PERCENT		TWO-WAY	OUTGOING	INCOMING	TOTAL	PERCENT
WITHIN GROUP	122.	129.	129.	380.	100.00	WITHIN GROUP	626.	656.	656.	1938.	100.00
BETWEEN GROUP	0.	0.	0.	0.	0.00	BETWEEN GROUP	0.	0.	0.	0.	0.00
LIAISON	0.	0.	0.	0.	0.00	LIAISON	0.	0.	0.	0.	0.00
OTHER	0.	0.	0.	0.	0.00	OTHER	0.	0.	0.	0.	0.00
TOTAL	122.	129.	129.	380.		TOTAL	626.	656.	656.	1938.	
PERCENT	32.11	33.95	33.95			PERCENT	32.30	33.85	33.85		

	AVERAGE WEIGHTING FACTOR					AVERAGE STRENGTH			
	TWOWAY	OUTGOING	INCOMING	TOTAL		TWOWAY	OUTGOING	INCOMING	TOTAL
WITHIN GROUP	19.672	12.519	12.519	14.816	WITHIN GROUP	5.131	5.085	5.085	5.100
BETWEEN GROUP	0.000	0.000	0.000	0.000	BETWEEN GROUP	0.000	0.000	0.000	0.000
LIAISON	0.000	0.000	0.000	0.000	LIAISON	0.000	0.000	0.000	0.000
OTHER	0.000	0.000	0.000	0.000	OTHER	0.000	0.000	0.000	0.000
TOTAL	19.672	12.519	12.519	14.816	TOTAL	5.131	5.085	5.085	5.100

YOU HAVE CHOSEN THE SYMMETRICAL RELATION OPION.
ALL LINKS (INCOMING,OUTGOING, AND TWO-WAY) ARE USED IN CONNECTIVITY CALCULATIONS

GROUP N IS 23 MAXIMUM POSSIBLE NO OF DIRECTED LINKS IS 506.
THERE ARE 380. DIRECTED W/G LINKS, CONNECTIVENESS (DENSITY) IS .75098814

DISTANCE MATRIX FOR GROUP 1,USING NON-DIRECTED LINKS
THE ENTRY IS THE SHORTEST PATH FROM ROW TO COLUMN

	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50
31	0	1	1	1	1	1	1	1	1	1	1	0	1	1	1	1	1	1	1	1
32	1	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
33	1	1	0	1	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
34	1	1	1	0	2	1	1	2	2	2	2	2	2	1	1	1	1	1	2	2
35	1	1	1	2	0	1	1	2	2	2	2	2	2	1	1	1	1	1	2	2
36	1	1	1	1	1	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1
37	1	1	1	1	1	1	0	1	1	1	1	1	1	1	1	1	1	1	1	1
38	1	1	1	2	2	1	1	0	1	1	1	1	1	1	1	1	1	1	2	2
39	1	1	1	2	2	1	1	1	0	2	2	2	2	1	1	1	1	1	2	2
40	1	1	1	2	2	1	1	1	2	0	2	2	2	1	1	1	1	1	2	2
41	1	1	1	2	2	1	1	1	2	2	0	2	2	2	1	2	1	2	2	2
42	1	1	1	2	2	1	1	1	2	2	2	0	2	1	1	1	1	1	2	2
43	1	1	1	2	2	1	1	1	2	2	2	2	0	1	1	1	1	1	2	2
44	1	1	1	1	1	1	1	1	1	1	2	1	1	0	1	1	1	1	2	2
45	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	1	1	1	2	2
46	1	1	1	1	1	1	1	1	1	1	2	1	1	1	1	0	1	1	1	1
47	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	1	1	1
48	1	1	1	1	1	1	1	1	1	1	2	1	1	1	1	1	1	0	2	2
49	1	1	1	2	2	1	1	2	2	2	2	2	2	2	2	1	1	2	0	2
50	1	1	1	2	2	1	1	2	2	2	2	2	2	2	2	1	1	2	2	0
51	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
52	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
53	1	1	1	2	2	1	1	2	2	2	2	2	2	2	2	2	1	2	2	2

Dept. Exter

	51	52	53
31	1	1	1
32	1	1	1
33	1	1	1
34	1	1	2
35	1	1	2
36	1	1	1
37	1	1	1
38	1	1	2
39	1	1	2
40	1	1	2
41	1	1	2
42	1	1	2
43	1	1	2
44	1	1	2
45	1	1	2
46	1	1	2
47	1	1	1
48	1	1	2
49	1	1	2
50	1	1	2
51	1	1	1
52	1	1	1
53	1	1	0

THERE ARE 35MEMBERS IN THIS GROUP

GROUP LINK ANALYSIS MATRIX

LINK ANALYSIS MATRIX

NUMBER OF LINKS

	TWO-WAY	OUTGOING	INCOMING	TOTAL	PERCENT
WITHIN GROUP	90.	238.	238.	566.	100.00
BETWEEN GROUP	0.	0.	0.	0.	0.00
LIAISON	0.	0.	0.	0.	0.00
OTHER	0.	0.	0.	0.	0.00
TOTAL	90.	238.	238.	566.	
PERCENT	15.90	42.05	42.05		

STRENGTHS OF LINKS

	TWO-WAY	OUTGOING	INCOMING	TOTAL	PERCENT
WITHIN GROUP	473.	1185.	1185.	2843.	100.00
BETWEEN GROUP	0.	0.	0.	0.	0.00
LIAISON	0.	0.	0.	0.	0.00
OTHER	0.	0.	0.	0.	0.00
TOTAL	473.	1185.	1185.	2843.	
PERCENT	16.64	41.68	41.68		

AVERAGE WEIGHTING FACTOR

	TWOWAY	OUTGOING	INCOMING	TOTAL
WITHIN GROUP	30.689	10.311	10.311	13.551
BETWEEN GROUP	0.000	0.000	0.000	0.000
LIAISON	0.000	0.000	0.000	0.000
OTHER	0.000	0.000	0.000	0.000
TOTAL	30.689	10.311	10.311	13.551

AVERAGE STRENGTH

	TWOWAY	OUTGOING	INCOMING	TOTAL
WITHIN GROUP	5.256	4.979	4.979	5.023
BETWEEN GROUP	0.000	0.000	0.000	0.000
LIAISON	0.000	0.000	0.000	0.000
OTHER	0.000	0.000	0.000	0.000
TOTAL	5.256	4.979	4.979	5.023

YOU HAVE CHOSEN THE SYMMETRICAL RELATION OPION.
ALL LINKS (INCOMING,OUTGOING, AND TWO-WAY) ARE USED IN CONNECTIVITY CALCULATIONS

GROUP N IS 35 MAXIMUM POSSIBLE NO OF DIRECTED LINKS IS 1190.
THERE ARE 566. DIRECTED W/G LINKS. CONNECTIVENESS (DENSITY) IS .47563025

DISTANCE MATRIX FOR GROUP 1,USING NON-DIRECTED LINKS
THE ENTRY IS THE SHORTEST PATH FROM ROW TO COLUMN

	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29
10	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
11	1	0	1	2	2	2	1	2	2	2	1	2	2	1	2	1	2	2	1	2
12	1	1	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
13	1	2	1	0	2	2	1	2	2	1	1	2	2	1	2	1	2	1	1	2
14	1	2	1	2	0	2	1	2	2	1	1	2	2	1	2	1	2	2	1	2
15	1	2	1	2	2	0	1	2	2	1	1	2	2	1	2	1	2	1	1	2
16	1	1	1	1	1	1	0	1	1	1	1	1	1	1	1	1	1	1	1	1
17	1	2	1	2	2	2	1	0	2	1	1	2	2	1	2	1	2	2	1	2
18	1	2	1	2	2	2	1	2	0	1	1	2	2	1	2	1	2	2	1	2
19	1	2	1	1	1	1	1	1	1	0	1	1	1	1	1	1	1	1	1	1
20	1	1	1	1	1	1	1	1	1	1	0	1	1	1	1	1	1	1	1	1
21	1	2	1	2	2	2	1	2	2	1	1	0	2	1	2	1	2	2	1	2
22	1	2	1	2	2	2	1	2	2	1	1	2	0	1	2	1	2	1	1	2
23	1	1	1	1	1	1	1	1	1	1	1	1	1	0	1	1	1	1	1	1
24	1	2	1	2	2	2	1	2	2	1	1	2	2	1	0	1	2	1	1	2
25	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	1	1	1	1
26	1	2	1	2	2	2	1	2	2	1	1	2	2	1	2	1	0	2	1	2
27	1	2	1	1	2	1	1	2	2	1	1	2	1	1	1	1	2	0	1	2
28	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	1
29	1	2	1	2	2	2	1	2	2	1	1	2	2	1	2	1	2	2	1	0
30	1	2	1	2	2	2	1	2	2	1	1	2	2	1	2	1	2	2	1	2
31	1	2	1	2	2	2	1	2	2	1	1	2	2	1	2	1	2	1	1	2
32	1	2	1	2	2	2	1	2	2	1	1	2	2	1	2	1	2	2	1	2
33	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
34	1	2	1	2	2	2	1	2	2	1	1	2	2	1	2	1	2	2	1	2
35	1	2	1	2	2	2	1	2	2	1	1	2	2	1	2	1	2	2	1	2
36	1	2	1	2	2	2	1	2	2	1	1	2	2	1	2	1	2	2	1	2
37	1	2	1	2	2	2	1	2	2	1	1	2	2	1	2	1	2	2	1	2
38	1	2	1	2	2	2	1	2	2	1	2	2	2	1	2	1	2	2	1	2

Dept. Bentley

39	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
40	1	2	1	2	2	2	1	2	2	1	1	2	2	1	2	1	2	2	1	2
41	1	2	1	2	2	2	1	2	2	1	1	2	2	1	2	1	2	2	1	2
42	1	2	1	2	2	2	1	2	2	1	1	2	2	1	2	1	2	2	1	2
43	1	2	1	2	2	2	2	1	2	2	2	2	2	2	2	2	2	2	2	2
44	2	2	1	2	2	2	2	1	2	2	2	2	2	2	2	2	2	2	2	2

Dept. Bentley

	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44
10	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2
11	2	2	2	1	2	2	2	2	2	1	2	2	2	2	2
12	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
13	2	2	2	1	2	2	2	2	2	1	2	2	2	2	2
14	2	2	2	1	2	2	2	2	2	1	2	2	2	2	2
15	2	2	2	1	2	2	2	2	2	1	2	2	2	2	2
16	1	1	1	1	1	1	1	1	1	1	1	1	1	2	2
17	2	2	2	1	2	2	2	2	2	1	2	2	2	1	1
18	2	2	2	1	2	2	2	2	2	1	2	2	2	2	2
19	1	1	1	1	1	1	1	1	1	1	1	1	1	2	2
20	1	1	1	1	1	1	1	1	2	1	1	1	1	2	2
21	2	2	2	1	2	2	2	2	2	1	2	2	2	2	2
22	2	2	2	1	2	2	2	2	2	1	2	2	2	2	2
23	1	1	1	1	1	1	1	1	1	1	1	1	1	2	2
24	2	2	2	1	2	2	2	2	2	1	2	2	2	2	2
25	1	1	1	1	1	1	1	1	1	1	1	1	1	2	2
26	2	2	2	1	2	2	2	2	2	1	2	2	2	2	2
27	2	1	2	1	2	2	2	2	2	1	2	2	2	2	2
28	1	1	1	1	1	1	1	1	1	1	1	1	1	2	2
29	2	2	2	1	2	2	2	2	2	1	2	2	2	2	2
30	0	2	2	1	2	2	2	2	2	1	2	2	2	2	2
31	2	0	2	1	2	2	2	2	2	1	2	2	2	2	2
32	2	2	0	1	2	2	2	2	2	1	2	2	2	2	2
33	1	1	1	0	1	1	1	2	1	1	1	1	1	2	2
34	2	2	2	1	0	2	2	2	2	1	2	2	2	2	2
35	2	2	2	1	2	0	2	2	2	1	2	2	2	2	2
36	2	2	2	1	2	2	0	2	2	1	2	2	2	2	2
37	2	2	2	2	2	2	2	0	2	1	2	2	2	2	2
38	2	2	2	1	2	2	2	2	0	1	2	2	2	2	2

39	1	1	1	1	1	1	1	1	1	0	1	1	1	2	2
40	2	2	2	1	2	2	2	2	2	1	0	2	2	2	2
41	2	2	2	1	2	2	2	2	2	1	2	0	2	2	2
42	2	2	2	1	2	2	2	2	2	1	2	2	0	2	2
43	2	2	2	2	2	2	2	2	2	2	2	2	2	0	1
44	2	2	2	2	2	2	2	2	2	2	2	2	2	1	0

ANALYSIS OF DISTANCE MATRIX

NODE	COL TOTAL	COL AVE	ROW TOTAL	ROW AVE
10	35	1.029	35	1.029
11	59	1.735	59	1.735
12	34	1.000	34	1.000
13	57	1.676	57	1.676
14	58	1.706	58	1.706
15	57	1.676	57	1.676
16	36	1.059	36	1.059
17	56	1.647	56	1.647
18	58	1.706	58	1.706
19	37	1.088	37	1.088
20	37	1.088	37	1.088
21	58	1.706	58	1.706
22	57	1.676	57	1.676
23	36	1.059	36	1.059
24	57	1.676	57	1.676
25	36	1.059	36	1.059
26	58	1.706	58	1.706
27	53	1.559	53	1.559
28	36	1.059	36	1.059
29	58	1.706	58	1.706
30	58	1.706	58	1.706
31	57	1.676	57	1.676
32	58	1.706	58	1.706
33	37	1.088	37	1.088
34	58	1.706	58	1.706
35	58	1.706	58	1.706
36	58	1.706	58	1.706
37	59	1.735	59	1.735
38	59	1.735	59	1.735

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THERE ARE 26 MEMBERS IN THIS GROUP

GROUP LINK ANALYSIS MATRIX

LINK ANALYSIS MATRIX

NUMBER OF LINKS

	TWO-WAY	OUTGOING	INCOMING	TOTAL	PERCENT
WITHIN GROUP	42.	133.	133.	308.	100.00
BETWEEN GROUP	0.	0.	0.	0.	0.00
LIAISON	0.	0.	0.	0.	0.00
OTHER	0.	0.	0.	0.	0.00
TOTAL	42.	133.	133.	308.	
PERCENT	13.64	43.18	43.18		

STRENGTHS OF LINKS

	TWO-WAY	OUTGOING	INCOMING	TOTAL	PERCENT
WITHIN GROUP	225.	713.	713.	1651.	100.00
BETWEEN GROUP	0.	0.	0.	0.	0.00
LIAISON	0.	0.	0.	0.	0.00
OTHER	0.	0.	0.	0.	0.00
TOTAL	225.	713.	713.	1651.	
PERCENT	13.63	43.19	43.19		

AVERAGE WEIGHTING FACTOR

	TWOWAY	OUTGOING	INCOMING	TOTAL
WITHIN GROUP	25.000	7.000	7.000	9.455
BETWEEN GROUP	0.000	0.000	0.000	0.000
LIAISON	0.000	0.000	0.000	0.000
OTHER	0.000	0.000	0.000	0.000
TOTAL	25.000	7.000	7.000	9.455

AVERAGE STRENGTH

	TWOWAY	OUTGOING	INCOMING	TOTAL
WITHIN GROUP	5.357	5.361	5.361	5.360
BETWEEN GROUP	0.000	0.000	0.000	0.000
LIAISON	0.000	0.000	0.000	0.000
OTHER	0.000	0.000	0.000	0.000
TOTAL	5.357	5.361	5.361	5.360

YOU HAVE CHOSEN THE SYMMETRICAL RELATION OPION.
ALL LINKS (INCOMING, OUTGOING, AND TWO-WAY) ARE USED IN CONNECTIVITY CALCULATIONS

GROUP N IS 26 MAXIMUM POSSIBLE NO OF DIRECTED LINKS IS 650.
THERE ARE 308. DIRECTED W/O LINKS. CONNECTIVENESS (DENSITY) IS .47384615

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DISTANCE MATRIX FOR GROUP 1,USING NON-DIRECTED LINKS
THE ENTRY IS THE SHORTEST PATH FROM ROW TO COLUMN

	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29
10	.	1	2	2	2	2	2	2	1	1	1	2	2	2	1	1	1	1	1	1
11	1	0	2	2	2	2	2	2	2	2	1	2	2	2	2	1	1	1	2	2
12	1	2	0	2	2	2	2	2	2	2	1	2	2	2	2	1	1	1	2	2
13	1	2	2	0	2	2	2	2	2	2	1	2	2	2	2	1	1	1	2	2
14	1	2	2	2	0	2	2	2	2	2	1	2	2	2	2	1	1	1	2	2
15	1	2	2	2	2	0	2	2	2	2	1	2	2	2	2	1	1	1	2	2
16	1	2	2	2	2	2	0	2	2	2	1	2	2	2	2	1	1	1	2	2
17	1	2	2	2	2	2	2	0	2	2	1	2	2	2	2	1	1	1	2	2
18	1	2	2	2	2	2	2	2	0	2	1	2	2	2	2	1	1	1	2	2
19	1	2	2	2	2	2	2	2	2	0	1	2	2	2	2	1	1	1	2	2
20	1	1	1	1	1	1	1	1	1	1	0	1	1	1	1	1	1	1	1	1
21	1	2	2	2	2	2	2	2	2	2	1	0	2	2	2	1	1	1	2	2
22	1	2	2	2	2	2	2	2	2	2	1	2	0	2	2	1	1	1	2	2
23	1	2	2	2	2	2	2	2	2	2	1	2	2	0	2	1	1	1	2	2
24	1	2	2	2	2	2	2	2	2	2	1	2	2	2	0	1	1	1	2	2
25	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	1	1	1	1
26	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	1	1	1
27	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	1	1
28	1	2	2	2	2	2	2	2	2	2	1	2	2	2	2	1	1	1	0	2
29	1	2	2	2	2	2	2	2	2	2	1	2	2	2	2	1	1	1	2	0
30	1	2	2	2	2	2	2	2	2	2	1	2	2	2	2	1	1	1	2	2
31	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
32	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
33	1	2	2	2	2	2	2	2	2	2	1	2	2	2	2	1	1	1	2	2
34	1	2	2	2	2	2	2	2	2	2	1	2	2	2	2	1	1	1	2	2
35	1	2	2	2	2	2	2	2	2	2	1	2	2	2	2	1	1	1	2	2

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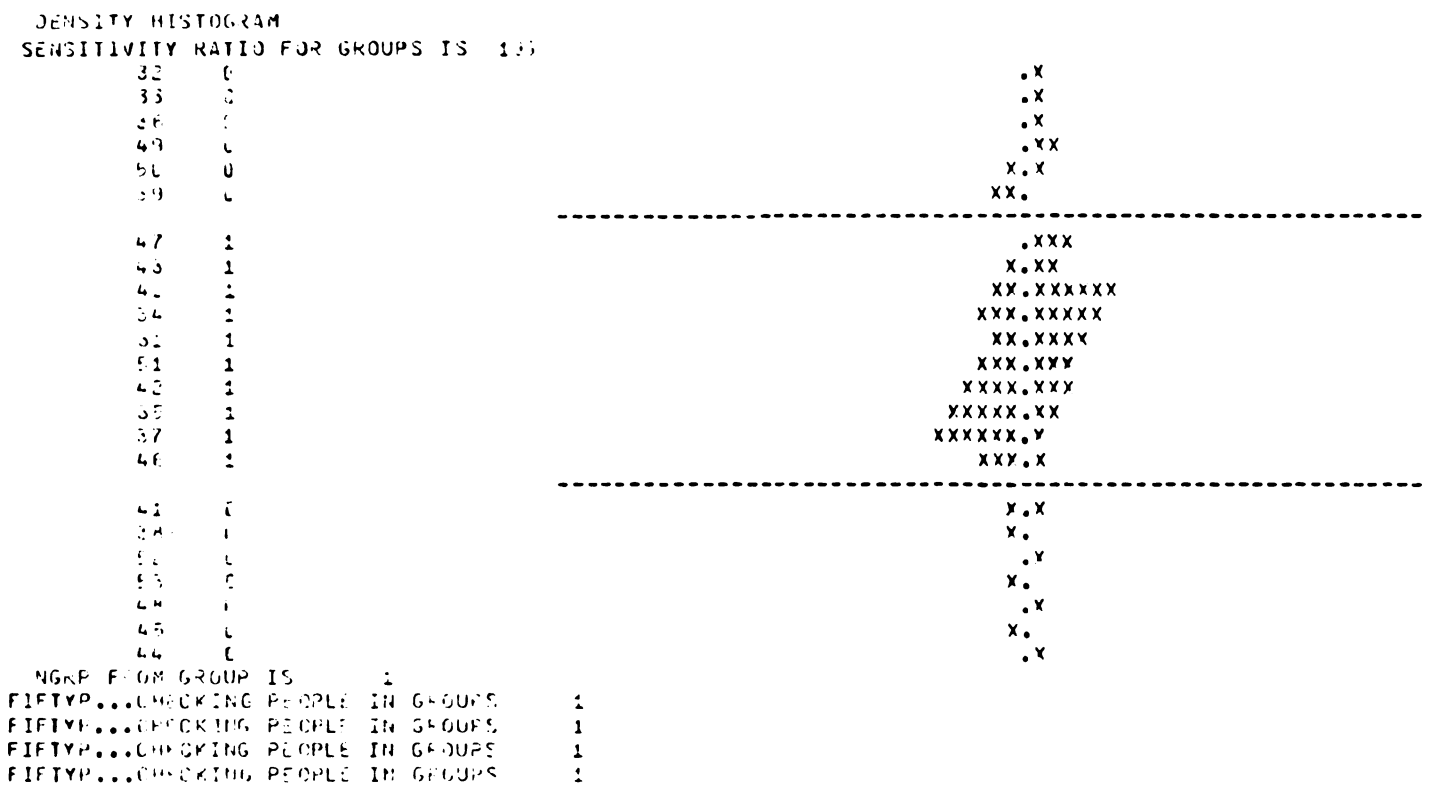
	30	31	32	33	34	35
10	1	1	1	1	1	1
11	2	1	1	2	2	2
12	2	1	1	2	2	2
13	2	1	1	2	2	2
14	2	1	1	2	2	2
15	2	1	1	2	2	2
16	2	1	1	2	2	2
17	2	1	1	2	2	2
18	2	1	1	2	2	2
19	2	1	1	2	2	2
20	1	1	1	1	1	1
21	2	1	1	2	2	2
22	2	1	1	2	2	2
23	2	1	1	2	2	2
24	2	1	1	2	2	2
25	1	1	1	1	1	1
26	1	1	1	1	1	1
27	1	1	1	1	1	1
28	2	1	1	2	2	2
29	2	1	1	2	2	2
30	2	1	1	2	2	2
31	1	1	1	1	1	1
32	1	1	1	1	1	1
33	2	1	1	2	2	2
34	2	1	1	2	2	2
35	2	1	1	2	2	2

APPENDIX 4

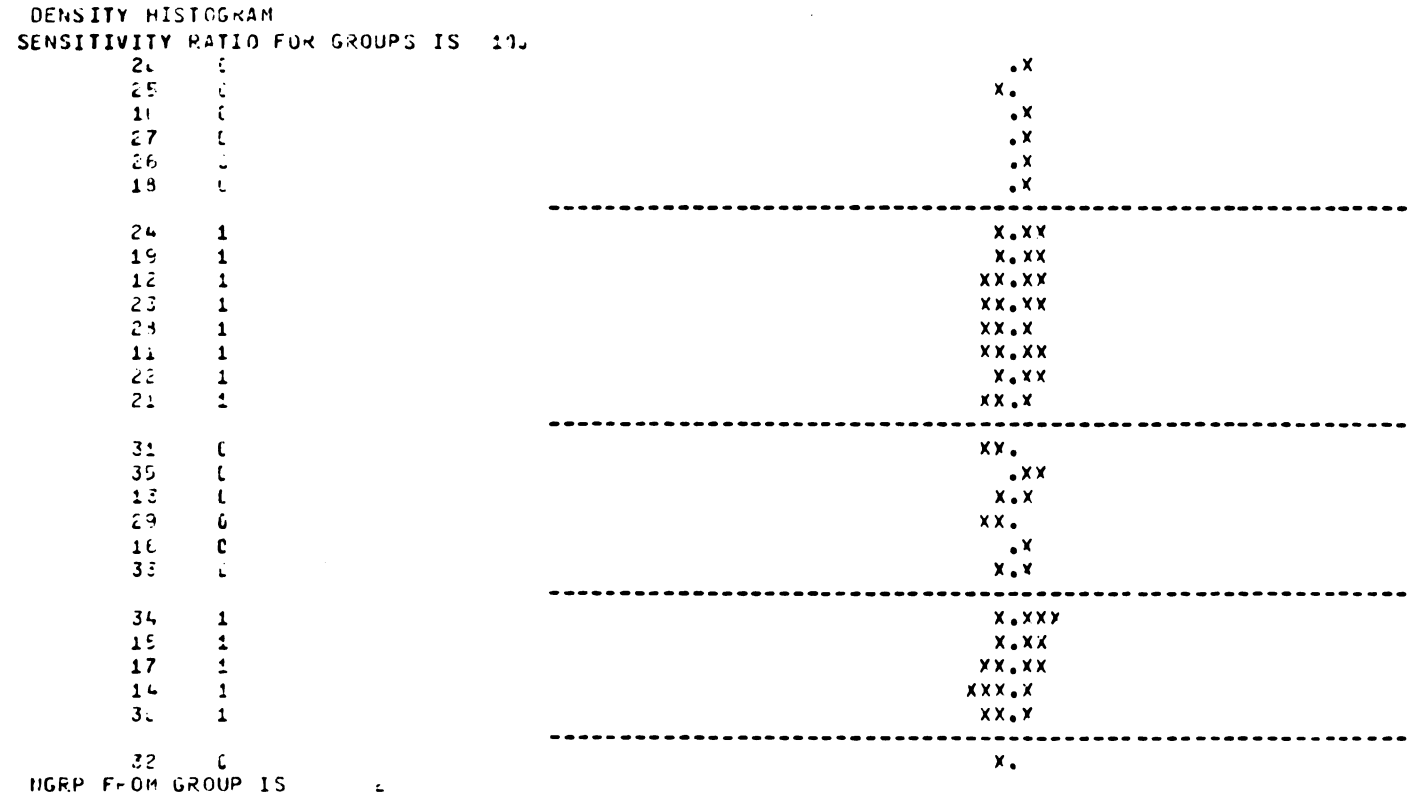
COMMUNICATION FREQUENCY AND DENSITY HISTOGRAMS

Dept. Exter


DENSITY HISTOGRAM
SENSITIVITY RATIO FOR GROUPS IS 1.5
32 0 .X
33 0 .X
34 0 .X
49 0 .XX
50 0 X.X
39 0 XX.
47 1 .XXX
43 1 X.XX
41 1 XX.XXXXXX
34 1 XXX.XXXXX
32 1 XX.XXXX
51 1 XXX.XXX
42 1 XXXX.XXX
35 1 XXXXX.XX
37 1 XXXXXX.X
46 1 XXX.X
41 0 X.X
34 1 X.
52 0 .X
53 0 X.
44 1 .X
45 0 X.
44 0 .X
NGRP FROM GROUP IS 1
FIFTYP...CHECKING PEOPLE IN GROUPS 1
FIFTYP...CHECKING PEOPLE IN GROUPS 1
FIFTYP...CHECKING PEOPLE IN GROUPS 1
FIFTYP...CHECKING PEOPLE IN GROUPS 1

```
 DENSITY HISTOGRAM
SENSITIVITY RATIO FOR GROUPS IS  100
          44     0                                                .X
          43     0                                                .X
          17     0                                                .X
-------------------------------------------------------------------------
          13     1                                                .XXX
          15     1                                               X.XXXX
          12     1                                              XX.XXXXXX
          22     1                                             XXX.XXXXX
          19     1                                             XXX.XXXXX
          28     1                                            XXXX.XXXX
          11     1                                            XXXX.XXXXX
          20     1                                           XXXXX.XXXX
          24     1                                          XXXXXX.XXX
          25     1                                           XXXXX.XXXX
          10     1                                            XXXX.XXXX
          16     1                                           XXXXX.XXX
          23     1                                              XXX.XXXXX
          31     1                                            XXXX.XXXXX
          18     1                                            XXXX.XXXXX
          39     1                                             XXX.XXXX
          27     1                                            XXXX.XXX
          29     1                                           XXXXX.XX
          33     1                                           XXXXX.X
          14     1                                           XXXXX.X
-------------------------------------------------------------------------
          40     1                                               X.XXXXXX
          21     1                                               X.XXXXXXXX
          35     1                                              XX.XXXXXXX
          36     1                                             XXX.XXXXXX
          30     1                                            XXXX.XXXXXX
          32     1                                           XXXXX.XXXXXX
          34     1                                          XXXXXX.XXXXX
          26     1                                          XXXXXX.XXXX
          42     1                                         XXXXXXX.XXX
          41     1                                        XXXXXXXX.XX
          37     1                                          XXXXXX.X
          38     1                                          XXXXXX.
  NGRP FROM GROUP IS      2
FIFTYP...CHECKING PEOPLE IN GROUPS     1
FIFTYP...CHECKING PEOPLE IN GROUPS     2
FIFTYP...CHECKING PEOPLE IN GROUPS     2
FIFTYP...CHECKING PEOPLE IN GROUPS     1
FIFTYP...CHECKING PEOPLE IN GROUPS     2
FIFTYP...CHECKING PEOPLE IN GROUPS     1
FIFTYP...CHECKING PEOPLE IN GROUPS     2
FIFTYP...CHECKING PEOPLE IN GROUPS     1
FIFTYP...CHECKING PEOPLE IN GROUPS     2
```

Dept. Deerfield



```
----------NODE NO    53
        IS CONNECTED TO
             NODE NO.    31  A          STRENGTH=    4
             NODE NO.    32  A          STRENGTH=    7
             NODE NO.    33  A          STRENGTH=    7
             NODE NO.    36  A          STRENGTH=    7
             NODE NO.    37  A          STRENGTH=    5
             NODE NO.    47  A          STRENGTH=    5
             NODE NO.    51  A          STRENGTH=    5
             NODE NO.    52  A          STRENGTH=    4

                                    STRENGTH TABLE
                          OUT                IN                  TOTAL
UNEXPECTED       S=   ..  N= 0.  M=  0.0    S=  44.  N= 8.  M= 5.5%    S=  44.  N= 8.  M= 5.5%
```

```
RECIPROCATION ANALYSYS
              TWOWAY    OUTGOING  INCOMING  TOTAL
NUMBER        122.0     129.0     129.0     380.0
PERCENT        32.11     33.95     33.95
```

```
         STRENGTH DISTRIBUTION ANALYSIS
        LOWEST LEGAL VALUE =     1
        HIGHEST LEGAL VALUE =    7
        RANGE IS    7  UNITS.

        DISTRIBUTION HISTOGRAM (FREQUENCIES IN HISTOGRAM  SCALED BY A FACTOR OF     2)
STRENGTH  NUMBER
      1       3    X
      2       8    XXXX
      3      26    XXXXXXXXXXXXX
      4      91    XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
      5     124    XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
      6      71    XXXXXXXXXXXXXXXXXXXXXXXXXXXXX
      7      43    XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX

        MEAN STRENGTH =     5.101   NUMBER OF LINKS =   341.
```

Dept. Bentley

```
          NODE NO.    43  U          STRENGTH=    7
                                                STRENGTH TABLE
                        OUT                          IN                                 TOTAL
UNRECPRCTO       S=  21.  N= 3.  M=  7.00       S=   0.  N= 0.  M=  0.00       S=  21.  N= 3.  M=  7.00

-----------------------------------------------------------------------------------------------------
-----------------------------------------------------------------------------------------------------


RECIPROCATION ANALYSYS
              TWOWAY    OUTGOING  INCOMING  TOTAL
NUMBER        90.0      238.0     238.0     566.0
PERCENT       15.90      42.05     42.05



   STRENGTH DISTRIBUTION ANALYSIS
  LOWEST LEGAL VALUE =     1
  HIGHEST LEGAL VALUE =    7
  RANGE IS    7  UNITS.

  DISTRIBUTION HISTOGRAM (FREQUENCIES ON HISTOGRAM   SCALED BY A FACTOR OF      2)
STRENGTH  NUMBER
     1       8    XXXX
     2      60    XXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
     3      31    XXXXXXXXXXXXXXX
     4      86    XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
     5     114    XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
     6     161    XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
     7     106    XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX

  MEAN STRENGTH =     5.023  NUMBER OF LINKS =   566.
```

Dept. Deerfield

```
 STRENGTH DISTRIBUTION ANALYSIS
LOWEST LEGAL VALUE =     1
HIGHEST LEGAL VALUE =     7
RANGE IS    7  UNITS.

        DISTRIBUTION HISTOGRAM (FREQUENCIES ON HISTOGRAM   SCALED BY A FACTOR OF      2)
STRENGTH  NUMBER
     1       2     X
     2       5     XX
     3      15     XXXXXXX
     4      49     XXXXXXXXXXXXXXXXXXXXXXXX
     5     104     XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
     6      53     XXXXXXXXXXXXXXXXXXXXXXXXXX
     7      80     XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX

    MEAN STRENGTH =     5.360  NUMBER OF LINKS =   308.
```