THE RELATIONSHIP BETWEEN COMMUNICATION AND COHESIVENESS: A MULTIDIMENSIONAL APPROACH

Thesis for the Degree of M. A.

MICHIGAN STATE UNIVERSITY

JOHN ROBERT OGILVIE

1976

ABSTRACT

THE RELATIONSHIP BETWEEN COMMUNICATION AND COHESIVENESS: A MULTIDIMENSIONAL APPROACH

By

John Robert Ogilvie

Previous investigations have demonstrated a positive relationship between the quantity of communication and the degree of group cohesiveness, but have approached these concepts in a simplistic manner. Both communication and cohesiveness have been operationalized unidimensionally and tested predominantly in non-task settings. Hence, the applicability of these previous results to organizational settings is limited.

This thesis conceptualized communication and cohesiveness as multidimensional, consistent with their characteristics as found in organizations. The definition of cohesiveness is based on the Lewinian force field construct and is conceptualized as having two forces attracting members to the group: task-oriented (TASK) and social-oriented (SOC) forces. Communication is differentiated into production frequency (PFQ), innovation frequency (IFQ), maintenance frequency (MFQ), challenge frequency (CHL), production initiation (PIN), innovation initiation (INOIN), maintenance initiation (MIN), communication satisfaction (SAT), and communication importance (IMP). Based on relationships among these dimensions, it was hypothesized that the type of attraction force was related to the quantity and content of communication. Also, for task forces, it was hypothesized that production initiation would be related to cohesiveness.

Cohesiveness was operationalized as the individual's perception of the task and social forces attracting him/her to the group. Communication was operationalized by having subjects respond to each communication dimension for several group members. The responses from a subset of group members were then averaged as the communication measures. All of the variables were indexed as a composite of several questionnaire items.

The data were gathered in a medium sized Scanlon Plan company. Ninety-five non-exempt line and staff members completed the questionnaire items. Seventeen were in two groups in roles analogous to Likert's "linking pin" function. To avoid violation of the statistical assumption of independence, their responses in the roles of supervisors were deleted. Relationships were tested by multivariate regression procedures with TASK, SOC, IMP, and SAT as dependent measures and PFQ, IFQ, MFQ, PIN, MIN, and INOIN as independent variables.

The multivariate test was only marginally significant. Univariate results indicated that TASK was related to PFQ while SOC was related to MFQ. The relationships were weak, with 4.5 and 11.6 percent of the variance accounted for, respectively. These results imply that cohesive task groups focused their communication predominantly on task-related topics. Socially attracted cohesive work groups spent the most time discussing non-work topics. In this organizational setting, members' attraction to each other did not serve to exclude production discussions. Methodological shortcomings were cited to account for non-significant initiation predictors. Also, additional analyses were presented and discussed with the communication attitudes as criteria, and the inclusion of CHL as a predictor. CHL was a suppressor for TASK and SAT and a positive predictor of IMP.

John Robert Ogilvie

Approved by Thesis Committee:

Dr. Eugene Jacobson, Chairman Eugene Jacobson Aug 13, 1976

Dr. Neal Schmitt _____

Dr. Carl Frost _____

THE RELATIONSHIP BETWEEN COMMUNICATION AND COHESIVENESS: A MULTIDIMENSIONAL APPROACH

By

John Robert Ogilvie

A THESIS

Submitted to

Michigan State University

in partial fulfillment of the requirements

for the degree of

MASTER OF ARTS

Department of Psychology

1976

ACKNOWLEDGEMENTS

The author wishes to gratefully acknowledge the contributions of the following persons,

Dr. Eugene Jacobson,

Dr. Neal Schmitt,

Dr. Carl Frost,

William Greenwood, III,

Anna Toth,

Mark Turbin,

Judy Mardigian,

Kathy Best,

and all the other friends and relatives, especially my parents, who supported me and gave me encouragement throughout the long course of this academic endeavor.

TABLE OF CONTENTS

LIST OF TABLES

INTRODUCTION

Any area of scientific inquiry and research is concerned with finding explanations of and relationships among phenomena in the world around us. A theoretical synthesis of various phenomena must concern itself with some of the common basic components in that area. In social science, especially psychology and sociology, one basic element is social behavior. Yet all too often, as Homans (1950) has pointed out, research and theory building has glossed over social behavior and instead studied some of its second order derivatives, such as birth rates, prostitution, etc. Homans was referring largely to the field of sociology but his comments apply equally well to other disciplines.

Industrial and organizational psychologists have been studying behavior in organizations for quite some time, examining work flows, personnel practices, leadership, team-building, etc., but only recently have they begun to study interaction. The role of social behavior in organizations was noted and given empirical recognition by the Hawthorne Studies (Roethlisberger & Dickson, 1939) but not incorporated into a comprehensive theory. Few scholars have systematically described and studied the elements of communication in organizations. Many have written about communication problems and the vital role of an effective communication system for organizational growth and survival. Even the early writers noted the importance of management conferring with the workers (Follett, 1942), and cooperating and working together to achieve integrated objectives (Barnard, 1938). These statements have continued

over the years (Bavelas & Barret, 1951; Cook, 1951; Davis, 1953; Likert, 1961; Gardner, 1964; Katz & Kahn, 1966; Leavitt, 1972; and Smith & Wakeley, 1972) with a conspicuous absence of empirical research and support. Thayer (1967, p. 80) appropriately characterized the situation by saying, "perhaps more has been 'communicated' about communication problems in organizations than in any other single topic in the field."

Besides a theoretical need, there is also a practical need for more empirical knowledge about social behavior in organizations. The influence of organizations on people is a most pervasive one. The majority of people spend one-third of their adult existence within organizations and have frequent contact with other social, civic, religious and political groups. If organizational members and consultants working with them are to improve their effectiveness, they too must have more knowledge about the nature of social behavior in organizations.

Social behavior most frequently occurs within the context of a small group. In fact, Homans' (1950, p. 1) definition of a group, "a number of persons who communicate with one another often over a span of time, and who are few enough so that each person is able to communicate with all others...," emphasizes the role of social interaction. The basis of organizations, according to Weick (1969), is the interlocking behaviors of individuals in a collective endeavor. Groups thus become the building blocks of organizations. Furthermore, in modern organizations with their ever-increasing specialization and segmentation, the most logical and valid way of studying organizations is through a group unit of analysis (Golembiewski, 1968). Thus the group and the social interaction revolving around it are fundamental concepts for the study of organizational behavior.

Given the importance of communication and small group functioning for organizations, some characteristic of small group behavior must be chosen to represent that area in a theoretical study. One variable which reflects both the interrelationships among all persons within the group and the value of group task activities is cohesiveness. Commonly referred to as the tendency for the group to "hang together" or how "tightly knit" the group is, this construct is one of the best representations of overall small group activity.

In reviewing the literature on cohesiveness, Shaw (1976) concluded that, both theoretically and empirically, cohesiveness was related to a number of process variables, interaction being one of the major ones. He further cited evidence indicating that cohesiveness was related to both the "quantity and quality of group interaction" (Shaw, 1976, p. 201). Highly cohesive groups engaged in more communication and the content of those interactions was more positive than the content of communication in low cohesive groups.

Despite the apparent conclusiveness of empirical evidence, several questions remain. Most of the research reviewed by Shaw (1976) was laboratory based, manipulating the levels of cohesiveness via instructions. In these somewhat artificial settings the full flavor of the activity of ongoing groups cannot be manifested. Furthermore, the nature of cohesiveness in work organizations may be different from that in laboratory or social groups. Cohesiveness may be multidimensional and not as unitary as most researchers have treated it. The study of group communication has also been too often restricted to the laboratory and subject to simplistic operationalizations. A truly representative study of communication must be done in ongoing work organizations. Its

operationalization must be complex, including more than just the frequency of interaction. Different content areas, directional flows and attitudes about communication must be examined.

Therefore, the purpose of the present research is to study the relationship between cohesiveness and communication in an extant organization. Research in this setting is important for theoretical and practical reasons. Both variables will be presented as complex, multidimensional constructs and examined via correlational design. More specifically, each construct will be examined theoretically to arrive at appropriate dimensions. Empirical evidence will be reported to support the use of these dimensions, especially in organizational settings. Then research focusing on the relationship between the variables will be discussed to arrive at testable hypotheses. Due to the scarcity of research using a multidimensional approach, some of the hypotheses will be speculative. This scarcity only highlights the need for the generation of empirical data in these areas. To achieve these purposes the next section will focus on a categorization of organizational communication and research on each category or dimension. The cohesiveness section will follow.

Literature Review

Communication Variables

In reviewing the organizational communication literature, a number of approaches could be taken. Social scientists have done both laboratory and field studies, shedding light on new variables. A number of different subject populations have been studied ranging from managers to factory workers to service-oriented employees. The data collection

procedures have varied. Most use self-recordings and time sampling, some questionnaires and occasionally direct observation. Each of the above approaches has added to the understanding of organizational communication in bits and pieces. One approach to a literature review could be based on the variety of methodologies employed in this area of research.

However, such an approach does not provide an overall view that will generate integrated theories in the field. If this goal is to be accomplished, primary attention must be focused on the nature of communication within organizations and not on methodological distinctions. Several individuals have looked at communication this way. Thayer (1967) viewed organizational communication as a complex phenomena composed of four interrelated systems: technological, sociological, psychological, and physiological. Each system focuses on a different unit of analysis and thus gives the theory depth. This approach was rather abstract and still ignored much of the process and content. More recently, Farace and MacDonald (1974) have grouped the recent literature into three dimensions: structure, function, and system level. Their categorization is quite broad, covering a variety of research, and yet their presentation of the material is elemental enough so as to be readily comprehensible by a wide range of scholars. Furthermore, they come from communications backgrounds and maintain an information theory perspective.

The situation viewed from a psychological perspective, especially that of an applied psychologist in industry, appears somewhat different. The structural variables are important but so are individuals' attitudes toward and reaction to communication. The present author proposes the

trichotomy of structural, content and attitudinal variables. Structural variables focus on how the relative positions among organizational members relate to their interactions with each other. This largest category includes communication networks, sociometry, hierarchy and directional flow of communication. Content variables concentrate on the various topics and functions of communication within organizations. Attitudinal variables reflect an individual's psychological evaluations of communication and include satisfaction, cohesiveness and the perceived importance of contacts. This categorization system does not purport to be all-inclusive but it is hoped that it organizes the literature in such a manner as to facilitate theory building and systematic research.

Structural Variables

Communication Networks. Historically one of the first areas in communication systematically studied and researched was the structural relationships among group members. The Hawthorne Studies (Roethlisberger & Dickson, 1939) brought out the importance of informal relations among members. The group's informal activities lead to subgroup formation, informal leaders and status differences (Homans, 1950). Together the formal and informal relations had a profound impact on the interaction patterns within the group. Researchers then began to examine and describe these structural properties. The methodological framework for analyzing communication structure stems largely from the early sociometric techniques of Moreno (1934). The use of structural analysis of communication patterns was developed by Bavelas (1948, 1950) and his colleague Harold Leavitt (1951). Their work was based on the assumption that organizations impose restrictions on communication. These restrictions manifest themselves in the structural relationships among

group members which result in a patterning of information exchange along structural lines. Bavelas and his followers were concerned with describing these patterns, examining them experimentally in the laboratory, and studying how various patterns affected the group process.

To study these patterns Bavelas and Leavitt devised an apparatus where five people could exchange messages across specific channels to solve the problem of which one pictorial symbol, out of a total of five symbols, all members had in common. By restricting the channels, they varied the amount of information exchanged. The communication networks studied were the circle, chain, Y and wheel. Leavitt (1951) found that the patterns produced differences in accuracy, total activity, satisfaction of group members, emergence of leadership and the organization of the group. He concluded that a member's position in the structure directly affected his behavior. The centrality of patterns, defined as the number of links crossed to communicate with the entire group, correlated with most of the behavioral differences.

The above research posed some questions, provided a few explanations, but left much unanswered. Further investigations examined a variety of variables under elaborated procedures to supplement and enhance the work of Bavelas and Leavitt. Guetzkow and Simon (1955) argued that the communication nets do not directly affect behavior as was previously stated. They showed that the restriction of communication influences the ability of the members to organize themselves and thus affects performance. By allowing time for efficient organization, the groups (all-channel, wheel, and circle) performed the task at the same approximate speeds.

Much of the additional research has been summarized in reviews by Collins and Raven (1969) and Shaw (1964, 1976). Collins and Raven (1969)

reviewed studies investigating a multitude of variables: size, the nature of the task, noise, information distribution, reinforcement, stress and the personality of group members. All were shown to have some effect in certain circumstances. Some of the general conclusions arrived at by the reviewers were that differences occurred between the centralized networks (wheel, chain and Y) and the decentralized nets (circle and comcon). The centralized nets performed better on simple tasks while the decentralized nets performed best on complex tasks. Satisfaction was found to be higher in the decentralized patterns, regardless of task complexity. Shaw (1964) accounted for these differences by the combined influence of two explanatory concepts, previously used in separate studies (Leavitt, 1951; Gilchrist, Shaw, & Walker, 1954), namely, independence and saturation. Independence refers to the amount of freedom members have to function in the group. Those in central positions in the wheel have autonomy and control but those on the periphery do not, and are hence dissatisfied. In decentralized nets all members are relatively autonomous and satisfied. As independence explains satisfaction differences, the term saturation accounts for most of the variation in performance. Saturation refers to an overload of information. Gilchrist, et al. (1954) differentiated overload into the number of channels a position engaged and the number of messages a position encountered. On a complex problem the central position in a wheel maintains contact with many positions and must relay a great number of messages. The total amount of saturation is high and performance is proportionately low.

These findings obtained from laboratory research indicated to managers and communication experts in the field that communication

structure and changes in it can affect performance depending on the situational circumstances (Guetzkow & Simon, 1955). However, additional study in field settings was needed to test these findings under the full complexities of extant organizations.

To study communication structures in large extant organizations, new sophisticated methodologies had to be developed to reduce the enormous bulk of data generated by sociometric procedures. Forsyth and Katz (1946) developed such a methodology using a matrix to represent the sociometric choices. The matrix is manipulated by arranging the rows and columns in systematic manner to produce a new matrix which describes the group structure in a standard graphic form. The rearrangement yielded clusters of individuals who indicated reciprocated attractions. Once this process was computerized, large quantities of data could be reduced into meaningful structural units.

Having the tools to reduce the data, meaning and interpretation must be given to it. Jacobson, Charters and Lieberman (1951) discussed the relevance and potential heuristic value in applying role theory to the study of hierarchical organizations. Applying this to communication analysis, Jacobson and Seashore (1951) used a sociometric instrument to differentiate the communication structure of a federal agency into role relationships. They also presented a number of important theoretical and methodological points. The communication structure "can be conceptualized in terms of communication events which connect pairs of individuals, and thus establish patterns of contact among individuals and groups" (Jacobson & Seashore, 1951, p. 33). Furthermore, when the events are repeated, they take on a characteristic pattern which is reflected in such communication variables as structure,

function and content. The data were structured on the basis of the ratio of internal to external reciprocated contacts. In this way they identified three communication roles: (1) group members, (2) isolates, and (3) liaisons. Using this method on a large expanded scale, Weiss and Jacobson (1955) analyzed the social structure of a complex governmental agency. Here, the matrix rearrangement method of Forsyth and Katz (1946) was employed to reduce the data. They also introduced the additional role of a bridge, a member who serves as a contact between groups but has many contacts within his own group. Thus, in these two studies, the basic framework has been laid for a structural analysis of communication networks in complex organizations.

More recent research in this area has involved a two-step procedure. First, the extant communication structure is mapped, ignoring formally designated distinctions, to locate the individual and assign him/her a role. Then this role is evaluated in terms of a variety of communication variables. Most studies have concentrated on the liaison role which is analogous to Likert's (1961, 1967) "linking pin" function. Schwartz (1968) compared liaison with non-liaison roles and found that the contacts of liaisons were greater in number, and more diverse and important in nature. Amend (1971) treated the linking function as a continuous attribute and did not dichotomize it into two roles as had previous research. He found a positive relationship between liaisonness and opinion leadership, frequency of contact, role commitment and several other information variables. MacDonald (1971) further extended the research by looking at the role activities across several functional categories of communication: production, maintenance and innovation. After generating separate networks for each function, he found the

greatest number of liaisons in the production function. These individuals were also more satisfied and perceived to have more influence than non-liaisons. This finding is also consistent with laboratory results indicating that those in more central positions, i.e., having more contacts, had more independence and were the most satisfied.

Hierarchy, Direction, and Initiation. Another body of research exists which deals with formal structural relationships in a different manner. Instead of deriving the structure of the entire system from sociometric data, communication is examined in terms of existing patterns defined by the organizational charts. Most of these studies are descriptive, employing self-recording techniques or questionnaires and then analyzing interactions on the basis of the relative hierarchical positions of the participants. When viewed dyadically, hierarchical communication can be categorized into downward communication from a supervisor to a subordinate, lateral communication among members at the same level, upward from subordinate to superior, and diagonal across both levels and departments. One of the earlier studies to examine communication in this manner was done in an engineering factory by Burns (1954). He found a strong tendency for the flow of communication to be downward. However, the role of lateral communication was quite important in that it served as a displacement for frustration in the vertical line.

Lawler, Porter, and Tannenbaum (1968) replicated this finding using a self-recording technique with a sample of middle and lower managers, and specifying the nature of the communication more explicitly. Instead of merely indicating the predominant directional flow, they first computed the frequency of interaction within and across levels, and then determined who initiated the contact. The majority of the

contacts (approximately 60%) were with subordinates, followed by peers, and lastly superiors. An examination of overall initiation revealed a fairly even balance between self- and other-initiated contacts with few contacts perceived as being jointly initiated. However, the authors did not report initiation data for each hierarchical level separately.

Likert (1961) and Maier, Hoffman, Hooven, and Read (1961) have also found the predominant directional flow to be downward. They have hypothesized some causes and enumerated some consequences of this phenomena. Classical theories of management and supervisory training programs focus on downward communication as part of the job of supervision (Likert, 1961). Thus, in carrying out their daily functions a supervisor is most concerned with downward communication. Furthermore, when managers were asked what their major problem was, Likert (1961) found that four out of five reported downward communication. With such a preoccupation with downward flow, upward communication suffers.

This unilateral flow reduces accuracy. Haney (1964), replicating an earlier study by Leavitt and Mueller (1951) with a more heterogeneous sample, found that two-way communication improved accuracy and influenced other psychological variables as well. Maier, et al. (1961) looked at the agreement between superior-subordinate pairs on issues such as job duties, job requirements, anticipated job changes and obstacles to performance. Overall, low agreement was found, due in part of an absence of two-way communication.

Wickesburg's (1968) data on the directional flow of communication indicated a somewhat different conclusion. He had managers and non-managers record their written and oral communication exchanges on five different days over a five week period. Comparing percentages, he

concluded that very little difference existed between managers and non-managers except for one content area, non-work communication. In general, respondents reported that about one-third of their total communication was vertical in direction, one-third was horizontal, and one-third was diagonal across hierarchical levels and organizational units. Wickesburg emphasized the practical significance of the latter finding. In the performance of their daily tasks, both managers and non-managers have considerable contact with individuals in different departments at different levels. Rather than clarifying directional issues in communication, this study has emphasized the importance of another factor, out-group communication.

Using a different approach in his doctoral dissertation, Siegel (1975) examined differences in face-to-face communication patterns between two types of management systems, a traditional form and the Scanlon Plan (see Frost, Wakeley, & Ruh, 1974; and Siegel, 1975 for the description of the companies that served as the sample for this thesis). For the purposes of analysis, he split his sample into a supervisory and non-supervisory segment. The data from the non-supervisory group will not be reported here since communication contacts for them were restricted to peer and superior directions. Because they were at the bottom of the hierarchy, they could not communicate downward. Any comparisons of this data with the less restricted supervisory sample would be misleading.

Siegel (1975) did find several differences in communication between Scanlon and non-Scanlon companies, but they were in terms of several types of communication content. To examine the effect of direction of communication he collapsed across management forms to obtain general findings for the entire sample. Direction was measured and analyzed in

terms of specific content areas. Direction effects were significant for all content variables, and the ordering of the four directions was identical for each of the different content areas. Diagonal and lateral directions were most frequent, differing very little from each other. The upward direction was at an intermediate frequency level, and the frequency of the downward direction was lowest. Pairwise contrasts of the different direction levels revealed that downward communication was significantly less frequent than all of the other three directions. Communication to subordinates occupied the least amount of conversation time for this sample. Siegel did not report overall initiation data nor initiation differences among hierarchical levels.

Berkowitz and Bennis (1961) measured organizational communication by means of a personal contact checklist, similar to one developed by Jacobson and Seashore (1950). Respondents were asked to list contacts in three different hierarchical levels with reference to themselves: higher, equal and lower levels. Respondents then indicated certain characteristics of their communication activities, such as frequency and initiation. The checklist data were transformed to percentages for analysis. Frequency of communication was highest for subordinates, i.e., subordinates were named by respondents as being the hierarchical group they had the most daily contact with. Subordinate frequencies were significantly higher than peer and superior frequencies. Peer communication was also significantly more frequent than superior communication.

Thus, Berkowitz and Bennis' (1961) data support Lawler et al.'s finding that the predominant directional flow was down, followed by lateral and upward directions of communication. As Lawler et al. had indicated, this result was not especially unusual since greater numbers

of subordinates were available as potential contacts in these typical branching hierarchical structures. A bit more surprising is the fact that similar results were obtained from different methodologies. Lawler et al. used a self-recording instrument and included oral and written communication. Berkowitz and Bennis employed a checklist method of indicating frequency based on recall of past conversations, including only face-to-face communication. Each of these methodologies might be expected to result in different findings, yet they were similar.

Furthermore, the studies by Wickesburg (1968) and Siegel (1975) also have methodological contrasts. Wickesburg used a daily log and both written and oral communication as did Lawler et al. Siegel employed the same type of response items as Berkowitz and Bennis and also included only face-to-face contacts. Yet, both Wickesburg and Siegel found the frequency of peer communication to be as high or higher than superior or subordinate communication. The latter two researchers also included an additional category, a diagonal direction, representing contacts in other groups at other hierarchical levels, which was as frequent as peer communication. This type of contact was not studied by Berkowitz and Bennis and Lawler et al. Thus, explanations based on methodologies are paradoxical. Contrasting methodological techniques yield compatible results while similar approaches generated different conclusions.

The real problem seems to be that each researcher has operationalized his constructs in a different manner. The data are really not comparable. Wickesburg collapsed superior and subordinate directions into a vertical category. Several researchers used the percentage of total contacts in that hierarchical level as the basic datum while others employed the percentage of respondents having daily contact with the

subject or a summed frequency index. This basic incompatibility renders comparability of data less meaningful and muddles interpretation.

A further problem with research on the direction of communication should be noted. Direction is specified with reference to position in a hierarchy. If a sample consists of subjects at the bottom of the hierarchy, their communication in the downward direction is constrained by that fact. Siegel's (1975) results were much different when a larger sample of low level non-supervisory respondents were included in the analysis. It was difficult to determine from the descriptions given by the other researchers whether there were hierarchical limits operating at the top or bottom of their samples.

In addition to frequency data, Berkowitz and Bennis (1961) also reported initiation data. They compared self- versus other-initiated contacts across hierarchical levels. Results indicated that the percentage of self-initiation decreased as the hierarchical level of the contact increased. There was significantly less self-initiation with superior contacts (42%) than with peers (57%), but peer and subordinate (61%) contacts did not differ significantly. The authors reasoned that the organization imposed constraints against upward self-initiation but no such restrictions existed for initiation with peer and subordinate contacts.

The authors further noted their results were consistent with Homans' (1950) hypotheses about social rank and interaction. In mixed rank interactions, individuals of higher rank were observed to originate more interactions than lower rank group members. Lawler et al.'s finding of equal initiation may be consistent with Berkowitz and Bennis' data as well. Averaging across hierarchical levels in the latter data

would yield a figure near 50 percent. It is lamentable that Lawler et al. did not report their data in a manner more amenable for comparison.

The previous structural variables have been demonstrated to have an effect on organizational communication whether the extant network is generated or formally defined hierarchical relationships are examined. Analysis of the frequency and initiation of contact can shed light on an organization's communication patterns, which influence effectiveness and productivity. Likert (1961) has shown that in groups with frequent, two-way interactions, perceptions are more accurate and productivity is higher. Having focused solely on the structural positions of individuals in an interaction, attention should now move to the nature of the message.

Content Variables

Another set of variables which has received relatively less attention deal with the message itself and not the participants involved. Communication messages can deal with a variety of topics and serve many functions. The communication messages within organizations differ from those in society in general in that they are more specific in content (March & Simon, 1958). This specific nature facilitates the development of systems for classifying the content of interactions.

Several different communication content categorization schemes have been proposed by various researchers and authors. Burns (1954) had executives note their communications in production activities, new development and research, personnel, sales, factory matters and others. Taking a somewhat different approach Wickesburg (1968) examined the daily communication logs of individuals in 35 different organizations

and found the data could be classified into five content areas: (1) information received or distributed, (2) instructions given or received, (3) approval given or received, (4) problem-solving activities, and (5) non-business activities or "scuttle-butt." Thayer (1967) approached content from the organizational level, describing three systems of information. The operational system transmits information relevant to daily work and basic tasks. The regulatory system deals with goal setting and the conscious exercise of control over the environment. Thayer's (1967) third system of maintenance and development handles the non-task, human aspects which function to support and give identity to organization members. Berkowitz and Bennis (1961) used the three categories of task, organizational and interpersonal content in studying communication in an outpatient treatment center. The first and third categories are self-descriptive while the second refers to messages regarding administrative policy, working conditions, and the organization of the department.

The four schemes are all different and yet have some communality. All of the researchers studied communication messages concerned with task activities and interpersonal relationships. A few were concerned with new ideas and adapting to the larger environment.

Analysis of message content should be thorough and systematic. If a survey of communication activities is conducted, omitting a vital area, the feedback which the organization subsequently receives will be inadequate. Failure to detect an important deficiency area may eventually lead to severe problems or even collapse of the organization. A comprehensive categorization system should then conform to the basic functions an organization must perform if it is to survive and grow.

Using an open systems approach, Katz and Kahn (1966) describe the nature of organizational functioning with five subsystems. The production or technical subsystem focuses on the line operations directly related to the major task activity of the organization. The supportive subsystem provides inputs (procurement) for the production structure and disposes of the output product (e.g., sales). The third subsystem, maintenance, functions to insure the availability of human resources necessary to sustain the entire system and its parts. The adaptive subsystem contributes to survival by focusing on external conditions, employing planning and research to exploit environmental change rather than be exploited by it. The managerial subsystem interacts with the other four, coordinating, directing and making decisions across all functions. This system and its dynamics work to insure growth and survival. If the concept of a production function is expanded to include the accomplishment of daily task requirements, whatever their nature, the supportive and managerial activities can also be designated as production. Thus, the simplified trichotomy of production, maintenance, and adaptation provides a comprehensive framework for analyzing vital organizational functions.

Berlo (1970) developed such a typology to analyze the content of communication into production, innovation and maintenance. Messages of a production nature concern the direction and coordination of activities toward the production goals of the organization. Innovation communication is directed towards the generation and implementation of change from within to facilitate adaptation to environmental alterations. Maintenance messages function to preserve the organizational structure and its human components over time. More specifically this message

maintains the individual's self-concept, interpersonal relationships, and the production and innovation structures (Berlo, 1970). The Berlo typology is based on the systematic analysis of Katz and Kahn (1968) and is relatively comprehensive. Furthermore, it systematically conforms well to other existing systems, especially Burns' (1954) and Thayer's (1967).

The three content functions are closely interrelated to one another. Maintenance can serve as a groundwork for the others. Small talk, giving encouragement, and discussing personal problems helps develop a good working relationship, making production and innovation communication easier. This type of interaction is important for generating a supportive climate necessary for high productivity and satisfaction (Likert, 1961). Maintenance is necessary but excessive amounts are counterproductive, limiting the potential for production and innovation. Innovation is closely tied to production. In a rapidly changing society innovations in production manufacturing and management are vital. An ideal situation would be one in which innovation is part of the normal production activities.

The interdependent nature of the content areas is further illustrated by Homans' (1950) theoretical scheme of an external and internal system in human groups. The external system develops to insure the group's continued survival in the environment. The external system elements of activity, interaction, and sentiment work together, adapting to and modifying the environment. Production and innovation content areas of communication are similarly concerned with the survival and growth of the organization in its environment. Homans also describes how in the process of adapting to external conditions, additional

internal processes develop that go beyond external system functioning. The interdependent elements of the internal system are an expression of the sentiments which develop in the process of group life. In work organizations maintenance topics are manifestations of internal system functioning. Furthermore, the two systems do not operate independently. Their relationship is a dynamic one in which each system feeds back to and modifies the other. Thus, communication content areas can also be expected to possess a degree of interrelationship.

To date, the research on different message contents has been restricted largely to establishing the relative amount and importance of each. Wickesburg (1968) found the largest communication networks for information, instructions and problem-solving, i.e., task or production messages. Information networks contained over twice as many individuals as the next nearest network, instruction. Approval and scuttle butt networks were the smallest, containing on the average only four members. Ignoring hierarchical levels, Berkowitz and Bennis (1961) found that task messages are most frequently communicated, then organizational and lastly a very low frequency of interpersonal messages. They attributed the low interpersonal levels to the high task demands of the workers in the sample. Of the three content areas of interest here, Burns (1954) also found production was most often the subject of conversation, then considerably less often new development and research, closely followed by personnel. MacDonald (1970) derived the communication networks for each content area and found the greatest number of liaison roles for the production-message network.

As previously reported, Siegel (1975) looked for differences in communication practices of supervisory personnel in Scanlon and

non-Scanlon companies. In addition to studying direction, he broke communication down into Berlo's (1970) three categories, finding non-Scanlon supervisors communicated production and maintenance topics significantly more often than Scanlon supervisors. Collapsing across companies and direction, significant differences among content types were also found. Production communication was significantly more frequent than maintenance and innovation. Although maintenance was more frequent than innovation, the difference was non-significant.

Message content has also been examined in relation to hierarchy and the directional flow of communication. A greater proportion of production messages tend to flow in an upward or lateral direction rather than downward (Berkowitz & Bennis, 1961). A greater proportion of maintenance messages tend to flow predominantly in a lateral direction. Content specific filters appeared to influence the flow of certain content topics to different hierarchical levels. Another study (Davis, 1968) also found that production-oriented messages moved faster through the hierarchy than non-production messages when orally transmitted.

The clear dominance of production type messages, especially with contacts of a higher level, has been demonstrated in all of the research reviewed. Innovation and maintenance are at considerably lower levels and do not differ much.

In this section the theoretical importance and practical relevance of studying various types of message content has been considered, and the empirical findings presented. This section together with the previous one on structural variables provide a framework for objectively describing the nature of communication within an organization. This

objective, one point in time description does not fully characterize the communication system. People interacting and conversing develop various subjective attitudes about their communication which relate to the other variables. Analysis of the subjective component, presented in the following section, completes the review of organizational communication.

Attitudinal Variables

The internal psychological component of communication is reflected in attitudes toward communication activities. Katz and Stotland (1959) define an attitude as a predisposition or tendency to evaluate something in a certain way. They go on to add that in the process of arriving at an evaluation three types of inputs are employed: affect, cognitions, and behavior. The feelings and thoughts individuals have about the people they communicate with as well as the nature and content of the conversation determine attitudes. The process had dynamic quality in that the behavior influences attitudes, which can then modify behavior in the future. Changing behavior will lead to a change in attitude, or changing one or more components of the attitude may lead to a behavioral modification. Thus, attitudes can function in two pivotal ways. They represent a subjective evaluation of past communication behavior, and in turn have an impact on future behavior. Attitudes become even more important and meaningful, both practically and theoretically, when related to other more objective communication variables.

The first variable to be discussed is importance. Given that people communicate, how important or valuable do they regard their conversations? As one would expect, most individuals feel their conversations are important. Greater insights are gained by looking at

relative differences in importance across hierarchical levels. Several studies (Berkowitz & Bennis, 1961; Lawler et al., 1968) have established that there is a positive relationship between importance and hierarchy. Berkowitz and Bennis found superior contacts were viewed as more important than peer which in turn were viewed as more important than subordinate contacts. The difference between superior and subordinate was statistically significant. Lawler, et al. added another dimension by looking at initiation in terms of importance. Self-initiated communications were found to be regarded as significantly more important than other initiated contacts.

Importance is one attitudinal dimension of communication that reflects the necessity of a communication contact. A broader, more complex attitudinal variable is satisfaction. This variable can reflect many aspects of communication including access, interpersonal characteristics and some indication of the quality of the interaction. As with importance, research (Berkowitz & Bennis, 1961; Lawler, et al., 1968) has indicated that most individuals feel their communication activities are fairly satisfying.

In relation to hierarchy, Berkowitz and Bennis (1961) discovered that subordinate communications are least satisfying while peer and superior are significantly more satisfying at about the same level. The measure used was percent responding "very satisfying" in each hierarchical level. The researchers noted that this finding of approximately equal percentages for peer and superior might be due to the peculiar nature of the population, an outpatient treatment center, and that in another sample superior contacts might be more satisfying than peer. Assuming the atypical population hypothesis is true, Berkowitz and Bennis (1961) arrived at some interesting conclusions:

> (1) Superior interactions are the most important and the most satisfying but are the ones an individual is least likely to engage in, and especially most difficult to initiate. (2) In contrast, interactions with subordinates are most frequent, most easily initiated but least satisfying and important. (3) Peer communication then appears to play a key role in maximizing satisfaction. Peer communication is less important than superior but it is more frequent, equally satisfying and more easily initiated.

Lawler, Porter, and Tannenbaum (1968) measured managerial attitudes toward communication on five dimensions: valuable-worthless, satisfying-dissatisfying, interesting-boring, precise-vague, and challenging-not challenging. They also compared attitudes toward self- versus other-initiated contacts and found self-initiated contacts were consistently evaluated more positively. Differences for the composite, the valuable-worthless, satisfying-dissatisfying, and precise-vague dimensions were significant. To account for the positive attitudes toward superior contacts, the authors offer several explanations:

> (1) He has more control if he initiates. (2) He would not begin the interaction if he thought it was trivial, and (3) Being the initiator gives a great feeling of responsibility.

Lawler, et al. (1968) explained that a superior contact was more unusual, i.e., less frequent, and therefore more highly evaluated. Supervisors also have reward power over their subordinates. Berkowitz and Bennis (1961) also added that communication with an individual who has a higher hierarchical rank serves as a substitute for actual locomotion or upward mobility. Kelley (1951) in a laboratory study also found that communication with higher status individuals functioned as a substitute for upward locomotion with no actual possibilities for such movement existed. All of these explanations are consistent and help account for the overwhelmingly positive evaluation of self-initiated supervisor contacts.

Thus far, attitudinal variables have been shown to be related to several hierarchical variables. What about the content variables? Few studies have examined which content area is most important for satisfying communication. Connelly (1970) studied communication behavior in terms of Herzberg's (Herzberg, Mausner & Snyderman, 1959) two-factor theory of satisfaction. He looked at direction and Berlo's (1970) three functional content areas of communication. Results indicated that vertical communication was related to dissatisfaction, i.e., vertical communication functioned as a hygiene factor. Lack of participation led to dissatisfaction, but high levels of vertical communication did not lead to satisfaction. Maintenance type communication was most highly related to satisfaction of all content areas.

Cohesiveness: Conceptual Issues

The hypothetical construct cohesiveness has long been used as a primary index of small group dynamics. In fact, Golembiewski (1962, p. 150) stated "the study of cohesiveness is small group analysis at its best." Cohesiveness or cohesion is a term also frequently used by laymen to describe groups in which the members "hang" or "stick together." One of the early definitions and one most frequently cited is Festinger's (1950, p. 274), "the resultant of all forces acting on members to remain in the group."

Early operationalizations of the total field of forces were based largely on in-out group friendship ratios and sociometric choice. Back (1951), Berkowitz (1954), Schachter (1951), and Schachter, Ellertson, McBride and Gregory (1951) all manipulated member attractiveness through instructions to achieve desired levels of cohesiveness. Lott and Lott (1961) measured the average magnitude of mutually positive attitudes

for ongoing groups and used this measure as an index of cohesiveness.

Gross and Martin (1952) criticized these operationalizations because they utilized only one of a multitude of possible attraction forces. Back (1951) recognized that this attraction may be for (1) other members or the group itself, or (2) for goals which the group mediates for its members. Anderson (1972) and Gross and Martin (1952) also noted this dichotomy. In discussing meanings of cohesiveness, Golembiewski (1962) and Shaw (1971) both presented three definitions: attraction to the group or its members, coordination of efforts among members, and the morale or motivation to do tasks. Other measures used have been the number of reasons given by members for belonging to a group and value similarity (Eisman, 1959), verbal expressions of satisfaction with the group, participation in group activities, and willingness to remain in the group (Hagstrom & Selvin, 1965). Gruen (1965) developed a different type of measure based on cognitive structures, and found that two cognitive indices correlated with behavioral measures, such as group consensus and effort spent on projects.

Consistent with Gross and Martin's (1952) argument, the many operationalizations given above utilize only one attraction force. However, the multitude and diversity of the measures only makes the concept more nebulous. Several investigators have studied interrelationships among cohesiveness measures. Seashore (1954) used questionnaire measures of group identification, preference to remain, and comparisons with other groups on several dimensions. With an industrial sample he concluded there was sufficient intercorrelation to justify combination into a unidimensional index. No internal consistency reliability estimates were presented. Eisman (1959)

measured attractiveness, sociometric friendship, value concordance, and reasons for belonging to several student social groups. She found low positive and negative intercorrelations, leading her to conclude that cohesiveness had no construct validity and was not unitary. With a sample of community groups Gruen (1965) found that most of his measures did not intercorrelate well.

In an attempt to resolve some of the uncertainty surrounding the concept cohesiveness, Hagstrom and Selvin (1965) measured 20 large social groups on 19 different variables. Their factor analysis of the data yielded two orthogonal factors which they labelled social satisfaction and sociometric cohesion. This study was the first and only attempt to statistically examine the dimensionality issue of cohesiveness. They compared their factors of satisfaction and sociometry to Festinger and colleagues' intrinsic group attraction and extent of goal mediation, to Homans' (1950) internal and external systems and to Parsons' (1951) and Bales' (1950) expressive and instrumental activities. While these factors appear to add to the understanding of group cohesiveness, Hagstrom and Selvin's (1965) results are questionable on methodological grounds. Their sample size (20) was the smallest possible to arrive at a factor solution with 19 variables. The factor loadings are therefore very unstable. Secondly, the content of the items in each factor have some similarity. The lack of clear content distinctions may be a further indication of the instability of the factors.

An issue further clouding a precise understanding of the construct is the samples on which the data were generated. Some investigators studied sorority/fraternity and volunteer groups whose activities were

largely affiliative while others analyzed more task-oriented work groups. As noted by Bales (1950), groups can have socio-emotional or task-oriented purposes. These purposes can overlap and duplicate each other's function. To avoid confounding overlap, Back (1951) manipulated source and level of cohesiveness by using deceptive instructions. Two-person task-, attractiveness- and prestige-based groups spent different amounts of time in discussion. When task activity was the source of high cohesiveness, discussion time was minimized. The most time was spent on discussion in high cohesive groups based on attractiveness. These differences disappear at low levels of cohesiveness. This study has given some indication that the origin of the forces on an individual to remain in a group have an impact on at least one type of activity, namely communication.

The final issue in a conceptual discussion of cohesiveness is a basic one. At what level should the measure be operationized? The Festinger (1950) definition cited earlier focused on "...forces which act on individuals to remain in the group." The concept is approached from an individual viewpoint here while most of the research used a group unit of analysis. The concept is usually operationalized by measuring the resultant of the total forces operating on the individual and then averaging among members to obtain a group index. While the most available source of data is the individual interacting with other group members, Golembiewski (1962) cautioned that the original operational definition was an individual measure whose precise relation to a cohesiveness measure treated as a group concept was unclear. Cohesiveness is a type of individual attitude toward the group and should be operationalized as such.

Maintaining an individual level of operationalization is especially relevant in a correlational paradigm. When one variable is correlated with another, it is desirable to retain a maximal amount of the variability in the data, as originally measured. Variability is necessary for significant correlations. An individual unit of analysis retains more variability. Each individual perceives, interprets, and reacts to the forces on him/her to remain in the group on an individual basis. He/she may perceive different forces or at least differing magnitudes of forces, producing distinct resultant forces. This resultant force affects other behaviors within the group. Cohesiveness is an attitude (Lott & Lott, 1961) and, as stated in the communication review, attitudes influence behavior and vice versa. Thus, an individual's personal attitude about the group will affect his communication behavior with other group members. Furthermore, communication with a small subset of the group can effect an individual's attitude towards the larger group as well. The best way to detect the nature of that relationship would be to retain individual perceptions of cohesiveness and compare them to an individual's report of his/her communication behavior. Averaging across group members to obtain a group cohesiveness index reduces some of the variability in the data and may mask some of the theoretical relationships. An operationalization based on each individual's perceptions of the forces exerted on him/her is thus a more relevant way of conceptualizing cohesiveness.

A similar argument was made by Aronson (1968) in interpreting the cognitive dissonance literature. He asserted that the quality of prediction was reduced when a nomothetic approach was used with this type of research. An individualistic treatment of the data allowed for a

more detailed differentiation of responses, and explained some conclusions that were previously viewed as contradictory in the literature.

A final argument for an individual unit of analysis is based solely on methodological grounds. Complex, sophisticated correlational designs, such as factor analysis and multiple regression, require large sample sizes. Averaging individual's responses within a group drastically reduces the size of the sample. By retaining an individual unit, the sample allows the researcher to employ more sophisticated analyses which can describe more precisely the nature of the relationships between several variables, especially multidimensional variables.

Cohesiveness and Communication

In addition to establishing a conceptual basis for understanding cohesiveness, Festinger was also one of the first to propose a theoretical relationship between cohesiveness and communication. In his paper on informal communication, Festinger (1950) hypothesized that the pressure on group members to communicate increases monotonically with increases in cohesiveness. Festinger, Schachter, and Back (1950) partially tested this hypothesis in a field study of housing units at Massachusetts Institute of Technology. Using an ingroup/outgroup sociometric choice ratio as their operationalization, they found that cohesiveness was negatively related to opinion deviations from the group norm. They reported that communication was one major factor which influences this relationship. Further testing the hypothesis in a laboratory study, Schachter (1951) manipulated cohesiveness by varying the attractiveness of a group's activities, and found greater amounts of communication were associated with high levels of cohesiveness. He was quick to caution, however, that the

relationship held only for communication which arose as a result of pressure to uniformity.

Seashore (1954) was one of the few researchers to study cohesiveness in an actual work organization. As previously mentioned, he obtained only one unitary dimension with few relatively homogeneous items. He compared cohesiveness with a number of other organizational variables. He found cohesiveness was associated with less feeling of tension at work and less variability in productivity. To account for the latter relationship, Seashore explained, that, above minimal levels of cohesiveness, the group exerted a force or uniformity pressure on individuals. Communication was the vehicle by which the group modified an individual's perception of reality. Productivity was influenced toward the group standard as a function of group cohesiveness. The more cohesiveness, the more pressure, and less variability in productivity. In work groups, as in the housing groups and laboratory task groups, the degree of cohesiveness was related to the amount of interaction among members. Seashore also demonstrated that cohesiveness was associated with several situational factors: tenure or the length of time worked on the job, and group size. These factors determined the opportunities for interaction which affected the development of cohesiveness. These results further point out the strong relationship between communication and cohesiveness.

Lott and Lott (1961) proposed a general model to explain the relationship between the two variables of interest. They noted that cohesiveness was a type of positive attitude held by an individual for other members of the group. One of the characteristics of such an attitude was a drive property. Thus, they proposed that groups with

strong positive attitudes (high cohesiveness) would be characterized by a high drive level. This high activity level would be reflected in the amount of communication among group members. As predicted, Lott and Lott found a positive relationship ($r = .43$, $p < .02$) between the quantity of communication among group members and the degree of cohesiveness in their sample of university groups. They asserted that they were the first to demonstrate a direct relationship between quantitative levels of communication and a sociometric attraction measure of cohesiveness.

Using a different approach, Moran (1966) obtained the same general results with a sample of Dutch training groups. Group members were given the names of all possible dyadic pairings of group members and were asked to rate them in terms of the attractiveness of the pair working together. Ratings of those dyads not including the subject were discarded. Then, pairings in which both members had evaluated the dyad as very attractive were assigned to the high attractiveness condition. Similiarly, pairings receiving low attractiveness ratings by both members were assigned to the low attractiveness condition. If either member used a less extreme category to evaluate the dyad, the pair was also eliminated from the study. This procedure resulted in the retention of 233 mutually attractive pairs of a possible 719.

Subjects also rated how often they were communicated to by every other member. Moran found that the combined amount of communication perceived by both members of the dyad was significantly higher in high attractiveness groups. Besides reporting higher amounts of total perceived communication, the high attractiveness groups were also more likely to report they received a similar amount of communication. This

latter finding implies that the amount of communication was more balanced in high attractiveness groups. Although this study did not purport to investigate cohesiveness, the rating of how attractive it would be to work with other members was very similar to some of Seashore's (1954) cohesiveness measures. Thus, this study supported the finds of Lott and Lott (1961), and extended the relationship between communication and cohesiveness to a cohesiveness based more on task than social attractiveness.

Although the above investigations indicated a definite association between the amount of interaction and the degree of group cohesiveness, they have approached both constructs in a rather limited manner. All operationalizations can be criticized on Gross and Martin's (1952) grounds of measuring only one force acting on members to remain in the group. Most studies have only utilized sociometric attraction with groups whose purposes were largely social in nature. All have treated communication as the frequency of total interaction. Treating both constructs in such a simplistic, unidimensional manner limits the understanding of these complex multidimensional concepts. Research examining both variables as multidimensional constructs has been nonexistent.

Given the absence of research investigating these variables in a manner representative of their complexities, some guidelines will be proposed for such a study. Cohesiveness can be conceptualized as having two distinct forces, one relating to the task activity of the group and the other to the social relationships among members. As discussed in this literature review, organizational communication can be measured in terms of the frequency and initiation of communication in several

content areas. Attitudes about communication contacts have also been used to describe the nature of an organization's communication activities. Using this differentiated approach will yield further understanding of how communication relates to group cohesiveness.

To develop hypotheses about probable relationships between these variables, extrapolations must be made from the few previous studies done. Back (1951) looked at the effects of different bases of cohesiveness. He examined the amount of time spent in discussion in two-person groups, which varied in level and bases of cohesiveness. Using manipulative instructions, the bases identified were the attractiveness of members, the nature of the task engaged in, or the prestige that group membership carried. In low cohesiveness groups members withdrew and acted independently. High cohesiveness groups more actively participated as a group in completing the task. The group spending the most time on discussion was that based on attractiveness while the least time was spent by the task-based groups. The former spent more time on non-work, maintenance topics, prolonging the discussion time while the latter were effective in restricting interactions to a briefer task-oriented content. Prestige based groups spent an intermediate amount of time on discussion. Their interactions were attempts to maintain their status. Back demonstrated that the source of the forces on an individual to remain in the group affected both the amount and content of interaction.

A study by Shaw and Shaw (1962) lends some support to these results. Over four test periods they studied second graders in high or low cohesive groups, based on attraction. They found initially that the high cohesive groups were more task-oriented and efficient, but by the

third period these same groups were spending more time on non-task maintenance activities. This situation is comparable to work organizations where people spend a great deal of time together in groups. If these results hold in organizations, work groups who have been together long enough to develop moderate to high levels of cohesiveness should engage in maintenance, non-work topics most often.

Homans' (1950) theoretical formulation would support a similar conclusion. Homans proposes that cohesiveness is a sentiment that arises from internal system functioning. Due to the mutually dependent nature of sentiments, activities, and interaction, the positive sentiment of cohesiveness is likely to be manifested in the frequency and content of group interactions. The content is likely to be social and non-work in nature, supporting and bolstering the sentiment. However, if the activity is very task-oriented, one would predict within Homans' framework that the content of interaction would be more production-oriented. Thus, his theory could account for high levels of production or maintenance communication depending on the group's activities. However, he did not specify the prior conditions which lead to either of these situations.

Cohen, Whitmyre, and Funk (1960) studied the effect of cohesiveness on creativity in problem-solving groups of hospital personnel. The experimenters formed two-person groups to find solutions for ego-involving and non-ego-involving problems. Groups were formed on the basis of high sociometric ratings, low ratings and chance pairings. For the ego-involving problem, the benefits and difficulties ensuing from hospital discharge, the cohesive (high attraction) groups generated significantly more unique ideas than the other groups. Although the

focus of the task in this situation was brainstorming for creative solutions, the study does provide some evidence that cohesiveness may be associated with the amount of innovation communication. The association would be especially strong in those organizations where creative change is part of the task demands. In those situations the communication content would center on innovation. This effect would be strongest when the bases of cohesiveness are founded more on task-related forces than on attraction.

However, group decision-making research came to a different conclusion. In a laboratory study Dion, Miller and Magnan (1971) formed four-person groups, half who were told they would get along well and half who were told they probably would not. Contrary to predictions, they found the high cohesive groups less likely to make risky decisions. This finding appears to contradict that of the Cohen, et al. (1960) study, and yet it must be noted that group risk taking is not identical to the number of unique solutions developed. Neither of the measures is synonymous with the frequency of innovation communication. The type of innovation in the Cohen, et al. (1960) study was more applicable to the focus of this thesis, but it was also a laboratory study. Even in field settings, the frequency of innovation communication was low relative to other content areas. Low frequency implies little variability which limits the size of correlation coefficients, so the reported relationship of innovation communication to cohesiveness is weak at best.

Some theoretical and empirical basis has been presented to link cohesiveness with the various content areas of communication. The research on initiation of communication is more tangential. From his analysis of Whyte's study of the Norton Street Gang, Homans (1950)

concluded that higher status individuals initiate interactions more than anyone else in the group. In a sample of outpatient clinic workers, Berkowitz and Bennis (1961) found that with non-peer contacts the higher the status of the persons, the more likely they were to initiate the interaction.

Although these studies seem to indicate that in work and social groups individuals of higher status were more likely to initiate interaction, neither measured any group variables. The study previously cited by Moran (1966) did examine the relationship between a group variable, dyadic attractiveness, and communication. He found that high attractive groups perceived more balance or agreement on the amount of interaction. This balance can be interpreted in terms of initiation. Since both members of the dyad reported receiving approximately the same amount of communication, the initiation of those interactions can be assumed to be equal. Thus, Moran's (1966) study suggested that cohesiveness may be associated with a balanced or equal amount of initiation of communication.

Moran's (1966) findings do not support those of Homans (1950) and Berkowitz and Bennis (1961). However, the commonalities among studies were few. Although he measured group attraction, Moran utilized two-person groups which never actually worked together as a single entity, but were part of a larger group. His groups were therefore not very representative of extant work groups which usually have membership greater than two. The small size also limited the possibilities of hierarchies forming. From the description given, Whyte's Norton Street Gang appeared to be fairly cohesive although specific measures were never taken. Intragroup rivalries and subgroup formation may have

reduced the levels of cohesiveness in this social group. The data are not very comparable so it is difficult to arrive at general conclusions. The existing research provides only a vague indication of how the variables relate. The literature on the association of cohesiveness and communication initiation is scarce and inconclusive. Studies actually measuring both variables are sorely needed before clear conclusions can be drawn.

The findings of an additional study serve as a general note of caution. Heinen (1971) studied stages in the development of task groups in an organizational setting. He described group activity as involving four processes. Over four stages of development, a different process dominates group activity at each stage, and the group must master a specific process during each critical period before it can move on to the next stage. To test the model, he used three dependent measures, one of which was cohesiveness. Heinen found that the dependent variables only correlated with identification, the critical process of the first stage. On this basis, he concluded that the groups were at a basic level of development. For communication to be the primary focus, the task groups needed to ascend two additional stages. His findings imply that cohesiveness and communication are strongly related only in highly developed task groups.

Model

Thus far, a strong relationship between communication and cohesiveness has been demonstrated, and potential relationships among the various multiple dimensions of both variables have been examined. However, no indication of the direction of the relationship or causal implications have yet been made. Even in correlational designs, especially multiple

regression, some causal directions are at least implicit even though the designs do not allow such conclusions to be made from them.

Several models describing the relationship between cohesiveness and communication have been proposed. Lott and Lott (1961) proposed that cohesiveness as an attitude has drive properties which manifest themselves in the level of communication of small groups. Indik (1965) has delineated a model for organizations in which communication and cohesiveness are variables mediating between the independent variable of organizational size and the dependent variable of member participation. Size affects organizational processes, such as communication, which in turn affects psychological variables, such as cohesiveness and other attitudes. All these variables impact on member behavior, i.e., participation. Since it was based on an organizational setting, this model seems well suited for the analysis of communication and cohesiveness in organizations. Seashore (1954) also proposed a model for organizations in which cohesiveness influenced communication. An argument can be made for either approach.

Since the literature has not conclusively dictated one correct causal model, the situational and pragmatic determinants of the present investigation should influence a decision. Communication as a multidimensional construct has been described in terms of six dimensions, three frequency content variables and three initiation variables. Cohesiveness has been conceptualized in terms of two dimensions, task and social cohesiveness. Thus for ease of analysis in a correlational design, the communication dimensions have been designated as independent, and the cohesiveness dimensions as dependent variables. In addition, the communication attitude variables seem to fit logically into the

current model as dependent variables. They are attitudes which are affected by communication behavior, and hence have been designated dependent variables. The communication literature, previously cited, has shown that the perceived importance of and satisfaction with communication contacts are related to behavioral indices of organizational communication, such as frequency and initiation.

Hypotheses

In summary, empirical studies have clearly demonstrated that a positive relationship exists between the level of communication and the degree of cohesiveness in groups. Much of the research cited has employed simplistic operationalizations of both variables and has studied them in somewhat artificial settings. Therefore, multidimensional conceptualizations of both constructs were described and evidence presented to support the validity of these dimensions. A model was then proposed in which the six communication variables were designated as independent and the two cohesiveness variables as dependent.

Such a model readily lends itself to multiple regression analysis. A linear combination of the independent variables will be used to predict or account for the variability in the dependent measures. Since multiple dependent measures have been proposed, the regression analysis will use multivariate techniques to test the following hypotheses.

1. Task and Social (SOC) bases of cohesiveness as a unit are positively related to the set of communication variables: Production Frequency (PFQ), Innovation Frequency (IFQ), Maintenance Frequency (MFQ), Production Initiation (PIN), Innovation Initiation (INOIN), and Maintenance Initiation (MIN).

This initial hypothesis is based on previous investigations of the relationship between the variables, treating them as unidimensional constructs. It will attempt to add further support to those conclusions.

Research of a multidimensional nature has indicated that social topics prevail in groups where members are highly attracted to one another. Task related topics have a lower frequency in highly attractive groups, but do have some relationship to cohesiveness when the basis of group attraction is more task-oriented. Also, evidence has shown that groups beginning with a task focus become more socially oriented. This empirical conclusion also supports Homans' (1950) theoretical propositions of external and internal system development. From this data the following hypotheses are derived.

2. MFQ is positively related to SOC

3. PFQ is positively related to TASK.

4. MFQ is also positively related to TASK.

Since some evidence indicated that groups evolve towards more socially oriented types of communication, a task-oriented group can have high frequencies of both MFQ and PFQ. Groups based on member attraction may never develop a task orientation. No hypothesis is proposed for both MFQ and PFQ, and SOC.

Communication focusing on new ideas and creativity has only been shown to be related to cohesiveness in a limited setting where the activity is focused on task and not social functions.

5. IFQ is positively related to TASK.

No clear relationship between initiation of various communication content areas and the dependent variables has been demonstrated. High attraction was associated with equal initiation. In the present study equal initiation is a midpoint value. Thus, in socially based cohesive groups, the relationship between cohesiveness and initiation may be curvilinear, and linear methods may not detect the relationship. When

groups are attracted by task activities, expertise differences and the formal structure may lead to initiation differences, and result in a significant correlation between initiation of communication and cohesiveness. Due to the paucity of research and absence of firm conclusions, the following hypotheses are very speculative.

6. PIN, MIN, and INOIN are unrelated to SOC.

7. PIN is positively related to TASK.

These are the hypotheses of the study. Before describing the methods, some comments will be made. The multiple regression analysis testing these hypotheses best detects multiple relationships when the variables are uncorrelated. If highly correlated predictor variables result, an assessment of the importance of each to the dependent variable becomes difficult (Darlington, 1968). Thus, relationships among the independent variables are important as well as their relationship to the criteria. Some extra data will be analyzed and presented in addition to the tests of the present hypotheses and reported in a special section of the results. Communication satisfaction and communication importance will be added as dependent variables for the previous set of predictors. Also, the frequency of challenge communication will be added as predictor. The two cohesiveness variables and the two communication attitude measures will then be regressed on this enlarged set of predictors. These extra measures were included in the questionnaire as part of the organizational intervention, but were not integral to the present theoretical presentation.

METHODOLOGY

Description of the Research Site

The present study was conducted in a medium-sized (employing about 600 people during peak economic periods) corporation engaged in the manufacturing of a high quality, imaginative style of institutional furniture. Through the years, the company has demonstrated a willingness to experiment with innovative management styles and an interest in applying behavioral research. The most evident manifestation of this interest was the adoption of the Scanlon Plan (Lesieur, 1958; and Frost, Wakeley, & Ruh, 1974) in 1950. Since that time, it has experienced considerable financial success and growth, aided by an external consultant, who was instrumental in the implementation of the Scanlon Plan and continues to facilitate the development of the organization.

The research site was the primary manufacturing center for the corporation. Another plant on the west coast and two more in other countries were not involved in the study. This particular plant is located in a semirural area of the Midwest inhabited largely by people of Dutch origin, holding largely traditional conservative values, maintaining strong family ties and reflecting a strong Protestant work ethic. The physical structure of the plant is relatively new and is quite pleasant and esthetic with large open break areas complemented by living plants and expansive windows looking out to the grounds, scattered de-centralized staff areas, and a clean well-kept interior.

Subjects

The subjects for the study were 95 non-exempt line and staff personnel from first-line foremen up to the Vice-President of Manufacturing who were responsible for the functions of engineering, logistics, purchasing, and production. The sample consisted of all non-exempt personnel at the manufacturing center.

Description of Measurement Instruments

The data for the study were obtained by means of paper-and-pencil questionnaires. All measures plus instructions were contained in one booklet and included communication measures, cohesiveness measures and the biographical data of sex and tenure.

The communication measures were modified[1] version of the items developed by Siegel (1975) based on Berlo's (1970) typology. The items measure frequency, initiation and attitude towards communication along several dimensions:

A. Content frequency
   1. Production (7, 14, 22)
   2. Maintenance (3, 10, 18)
   3. Innovation (2, 8, 16)
   4. Challenge (5, 12, 21)

B. Initiation
   1. Production (1, 15)
   2. Maintenance (4, 19)
   3. Innovation (9, 17)

C. Attitude
   1. Satisfaction (6, 13)
   2. Importance (11, 20)

The frequency items consist of six-point Likert-type response items ranging from "more than once a day" to "never" with three items for each

---

[1]Credit must be given to William H. Greenwood, III, a fellow graduate student and colleague, who was instrumental in the modification of items and who made valuable contributions throughout the study.

content area. The initiation data were obtained for the three content areas by means of five-point response items ("I always do" to "he always does" with "we do equally" as midpoint), having two items per category. No initiation items were developed for challenge content since a challenging communication implies "I initiated." The attitudinal scales each consisted of two items per variable. All of these items were on a five-point scale ranging from "always" to "never," or "strongly agree" to "strongly disagree." Thus, these 22 items in haphazard order (i.e., not precisely random) constitute the initial communication measures for each individual contact. See Appendix A.

Each subject completed the 22 item questionnaire for a number of communication contacts. The selection of actual contact persons was made by the subject within certain constraints. They were to respond regarding the nature of their communication activities with 1) their supervisor, 2) two people who report to the same supervisor (peers), 3) two people who report to them (subordinates) or if none, then two additional peers, 4) one person, reporting to another supervisor with whom they have <u>good</u> communication, and 5) one person, reporting to another supervisor with whom they have <u>poor</u> communication. The first three categories were designed to insure a representative description of communication among members at different levels in the work group. The latter two categories were designed in part for practical purposes to provide helpful feedback data for organizational and personal development, and in part for the theoretical interest of examining perceived differences between good and poor communication contacts. The actual questionnaire (Appendix A) contained only one set of the 22 items, but included an answer sheet on which space was provided for subjects to

write the name of each contact and then immediately below circle their response to each question. Instructions also asked subjects to answer a question for all contacts before going on to the next (to minimize halo effects).

An important operational distinction must be made. The communication data used to test the hypotheses were the first three categories of contacts, plus category three if peers were listed. Communication with these individuals summarized a respondent's communication activities within the group. For most respondents these contacts constituted only a subset of the group members. Furthermore, the questionnaire was not designed to restrict responses solely to a within group focus. The measures reflect communication with group members, but the content could include out-group topics. For instance, person A could talk to fellow group member B about production topics, but those production topics would involve another group and not exclusively his/her own. This operational distinction is an important one theoretically.

The cohesiveness measures are based in part on Seashore's (1954) dependent measures, specifically his item numbers 50a, 50b, 50c, and 51. Due to the absence of any well-established or standard measure for cohesiveness, the author wrote several additional items in an attempt to better measure the concept and measure it so as to be congruent with Festinger's definition. These items are all five-point Likert-type response items similar to Seashore's with the exception of one item (#6) which included only four response categories.

The literature review indicated that more than one type of force attracted members to the group. Two of these forces, task and social, were shown to have an influence on member behavior, especially

communication. Therefore, based on content, the items were designated as either task (items 4, 9, and 10) or social (items 1, 3, 5, 6, 7, 8, and 11). These items represented the strength of task and social attraction forces for each respondent. Those individuals who were members of two groups answered two sets of cohesiveness items, one for each group. Each set resulted in two cohesiveness values, one for task and one for social attraction. These measures resulted in two sets of cohesiveness values for each respondent who was a member of two groups. Only the task and social scores were used for later analyses. Other measures found in Appendix A in the cohesiveness section were not used.

The groups were identified on the basis of an organizational chart and consultation with company officials. The name of the group that the respondent was to consider in completing each set of items was written at the top of the first page of the two page set of items concerned with cohesiveness.

Data Gathering

A preliminary form of the instrument was given to an administrative unit within the same company but located in a different building a few miles away. This preliminary form was modified, based in part on a cluster analysis, deleting certain items, adding others, and changing the format as well. Since the final form was markedly different from earlier ones, pilot data will not be presented.

The involvement of the organization in the study occurred over a protracted period of time and should receive some documentation. Some ten months prior to administration of the final form, a meeting was held with the chief executive officer of that division (Vice-President of Manufacturing) and his immediate group of subordinates (all at the

managerial level). From this initial contact and subsequent meetings, inputs were solicited from this group of company personnel and were included in the development and design of the study. Decisions jointly arrived at included a) use of the pilot study in a small administrative site, b) modification of certain items, c) the administration of the final form to only a segment of the people at the manufacturing site, so the data would be fed back in an intensive and thorough manner. The segment chosen was nonexempt personnel at the formen level and above, including management support staff. A more detailed description of the steps involved as part of a larger organizational development program can be found elsewhere (Greenwood, 1975).

During the week before data gathering, preparatory meetings were held with each functional group. During these meetings 1) the areas the questionnaire sought to measure were presented in general terms, 2) the confidential nature of the results was stressed, 3) the role of the research team and group members in feedback interpretation and problem identification was delineated, 4) procedural steps were covered, and 5) any questions or misunderstandings were cleared up. The specific variables to be measured were intentionally not described in detail to prevent any response bias. Also, one person in each group was delegated the responsibility of distributing the questionnaires to members of his group.

Immediately prior to data gathering, a letter, signed by the Vice-President of Manufacturing, was distributed to all respondents, explaining the need for self-examination, the importance of communication and team development, the positive use of the data, and the commitment to feedback. This letter was intended to serve as an indication of

top-management support, and to focus attention on communication.

Actual administration was accomplished by delivering questionnaires and envelopes to contact persons in each group with instructions to distribute them near the end of the work day. Subjects were told by the research team to complete the questionnaires at home away from the influences and distractions of work and to return them in sealed envelopes the following morning. Individuals not returning questionnaires at that time were asked to mail them as soon as possible. Those persons who returned questionnaires were sent a letter thanking them for their involvement and participation.

Before proceeding to an examination of the results of the analyses, a final comment must be made. The data were gathered, and fed back to groups in the company some time in advance of the preparation of this report. The organization wanted the survey conducted and the data presented to groups as soon as possible. Theoretical formulation and testing came latter. Most of the hypotheses were derived after the author had conducted feedback sessions in which frequency tabulations were presented. However, no predictor-criterion correlations were examined until after the proposal was completed.

RESULTS

Within two weeks of administration, 100% of the questionnaires were returned. Questionnaire data were then coded and punched onto computer cards for analysis.

Communication Variables. Before individual items were evaluated, the communication data were modified. Each respondent completed questionnaire items for several communication contacts. The number of contacts each individual responded to varied, depending on the size of the group. The 95 respondents listed a total of 359 within group communication contacts. To make the communication responses comparable across respondents, the data were reduced. Each individual's responses were averaged across his/her contacts for all of the 22 communication items. The result of this procedure was a single value for the 95 respondents for each of the 22 communication items. These values represented a summary of each individual's communication activity with a subset of group members. These item group scores were used to evaluate the questionnaire measures.

A small subset of the sample (17 respondents) were peer group members in one group and supervisors in another. These individuals represented Likert's (1961, 1967) "linking pins." The focus of this investigation was with communication among group members. Since only within group communication contacts could be averaged, the peer and subordinate contacts could not be averaged together. Nonetheless, two sets of within group communication data were available for this

subset of 17 respondents. Including both sets of group contacts would have violated the assumption of independence across observations for later analyses. Since the majority of the sample only responded to peer and supervisory contacts, retention of these contacts for "linking pins" would make their responses more comparable with the rest of the sample. Thus, the communication contacts that "linking pins" reported in their role as supervisors were not included in the analysis. Similarly, cohesiveness data of the "linking pins" in groups where they were supervisors were excluded and peer data were used in the following analyses.

To evaluate the measurement instruments, a priori cluster analyses were separately performed on the communication and cohesiveness items. These analyses yielded internal consistency reliability estimates, i.e., coefficient alphas, for designated clusters of items. They also generated intercorrelations corrected and uncorrected for attenuation. Corrections for attenuation provide an estimate of how the variables would intercorrelate if they were perfectly reliable. Thus, they represent true score correlations of the variables unaffected by measurement error. The statistics for the communication variables are presented in Table 1.

The coefficient alphas for the set of communication variables, found in the diagonal of Table 1, had a wide range of values. The frequency clusters were reasonably reliable measures (alphas from .62 to .86 of each frequency content variable). The initiation items, especially Maintenance (MIN) and Innovation Initiation (INOIN), were less reliable (alphas were .49 and .44 respectively). However, the frequency cluster contained one more item than the remainder of the

TABLE 1. Communication Intercorrelations and Coefficient Alphas

	Frequency				Initiation			Attitude	
	Production (PFQ)	Innovation (IFQ)	Maintenance (MFQ)	Challenge (CHL)	Production (PIN)	Maintenance (MIN)	Innovation (INOIN)	Satisfaction (SAT)	Importance (IMP)
PFQ	76*								
IFQ	63 (78)**	88							
MFQ	64 (93)	62 (85)	62						
CHL	64 (81)	68 (81)	47 (65)	81					
PIN	-09 (-11)	-04 (-05)	-14 (-20)	0 (1)	73				
MIN	9 (14)	9 (14)	1 (1)	7 (10)	12 (19)	49			
INOIN	-10 (-17)	9 (15)	-13 (-24)	13 (21)	49 (82)	27 (55)	44		

TABLE 1 (cont'd.)

	Production (PFQ)	Innovation (IFQ)	Maintenance (MFQ)	Challenge (CHL)	Production (PIN)	Maintenance (MIN)	Innovation (INOIN)	Satisfaction (SAT)	Importance (IMP)
SAT	13 (18)	12 (15)	29 (43)	-15 (-19)	-9 (-5)	-09 (-14)	-17 (-28)	74	
IMP	24 (35)	23 (32)	14 (23)	26 (37)	-23 (-34)	-03 (-5)	-08 (-12)	20 (30)	59

N = 95

* coefficient alphas in the matrix diagonal

** values in parentheses corrected for attenuation

clusters, so those clusters would be expected to have higher internal consistency reliabilities solely on the basis of cluster size. Nunnally (1967) noted that low alphas can be due to a lack of common item content or too few items per cluster. The reliability estimates for the two-item attitudinal clusters were moderately high (.74 and .59). Thus, there was some evidence to indicate that the size of the low alphas for MIN and INOIN were due to the content of the items, and not solely the number of items in the clusters. Furthermore, these low reliabilities will limit the correlations of these variables with other variables.

Task and Social Cohesiveness. The coefficient alphas for Task Cohesiveness (.79) and for Social Cohesiveness (.75) demonstrated that the items were fairly reliable measures of each variable. One cohesiveness item, number 12, proved to be an unreliable measure and was eliminated from the social cluster. This procedure resulted in a three-item Task Cohesiveness (TASK) cluster and a seven-item Social Cohesiveness (SOC) cluster.

Examination of the cluster intercorrelations indicated some degree of measurement overlap. The two cohesiveness variables were highly correlated (.69 uncorrected and .88 corrected for attenuation) as were the communication frequency clusters, Production (PFQ), Innovation (IFQ), Maintenance (MFQ), and Challenge (CHL).

Having determined that the items measured the variables of interest with a moderate to good degree of reliability, individual items were further averaged to produce a group cluster score to be used for later analyses. Averaging several items to produce a cluster score was intended to provide a highly reliable index of each variable. The

result of these modifications was a single group cluster score for each of the nine communication and two cohesiveness variables for each respondent. The nine communication indices represented a summary of each respondent's communication activities with, and communication attitudes, toward a subset of the group. The two cohesiveness indices represented the respondent's perceptions of the group's cohesiveness on a task and a social dimension.

The means and standard deviations of these transformed scores are presented in Table 2. Subjects responded similarly to two of the frequency variables, CHL and MFQ. The approximate mean of 4.0 corresponds to a subject response once or twice a month. The frequencies for PFQ and IFQ were higher with mean responses between once or twice a week and once or twice a month. There was similar agreement among initiation items with the mean response interpreted as slightly to the "I usually" side of equal initiation. The means of the cohesiveness dimensions were very close. In general, groups reported that their group was better than most others when compared on several dimensions.

The intercorrelations among all the variables, both predictors and criteria, are presented in Table 3. As with the item group scores in Table 1, the communication frequency measures, after averaging into clusters, were highly related. Many of the correlations between individual predictors and criteria were significant. Most of these significant correlations were between communication frequency variables and the criteria measures, especially IMP. The intercorrelations among the dependent variables were high also. The correlation between the two cohesiveness measures and that between SOC and communication

TABLE 2. Means and Standard Deviations Communication and Cohesiveness Group Scores

Variables	Means	Standard Deviations
Predictors		
PFQ	3.73	.764
IFQ	3.56	.715
MFQ	3.97	.744
CHL	4.12	.714
PIN	2.86	.386
MIN	2.98	.274
INOIN	2.77	.374
Criteria		
SAT	1.95	.577
IMP	2.25	.536
SOC	2.16	.533
TASK	2.16	.675

N = 95

TABLE 3. Communication and Cohesiveness Zero-order Correlations

	Frequency				Initiation			Attitudes			
								Com.		Group	
	PFQ	IFQ	MFQ	CHL	PIN	MIN	INOIN	SAT	IMP	SOC	TASK
Predictors											
PFQ	100										
IFQ	62**	100									
MFQ	63**	60**	100								
CHL	64**	68**	45**	100							
PIN	-09	-04	-14	00	100						
MIN	09	10	1	07	13	100					
INOIN	-11	08	-13	11	48**	28**	100				
Criteria											
SAT	13	12	28**	-14	-03	-9	-17	100			
IMP	25*	24*	16	28**	-24*	-2	-12	19	100		
SOC	26*	22*	31**	11	01	01	-4	52**	39**	100	
TASK	17	18	13	-05	-6	08	-4	48**	40**	70**	100

N = 95

* $p < .05$

** $p < .01$

satisfaction were rather high (.70 and .52 respectively).

Regression Analyses. These transformed values were submitted to a multivariate multiple regression analysis. The dependent variables, TASK, SOC, Communication Satisfaction (SAT), and Communication Importance (IMP) were regressed on the independent variables, PFQ, IFQ, MFQ, MIN, INOIN, and Production Initiation (PIN). The multivariate procedure was used because it simultaneously tests the significance of the independent variables in predicting the overall set of multiple dependent measures. This simultaneous testing controls for alpha-levels which would otherwise be highly inflated if only the individual univariate regressions were performed.

The multivariate multiple regression analysis performed on the four dependent and six independent variables resulted in a marginally significant value ($F(24,297.7396) = 1.4717$, $p < .0748$). This statistic tested the null hypothesis that no relationship existed between the set of predictors and the set of criterion measures. Failure to reject this statistical hypothesis at the .05 level rendered further examination of the univariate regression equations somewhat tenuous. Nonetheless, the multidimensional analysis used here to study communication and cohesiveness was a new approach, and many of the hypotheses were speculative. Therefore, the univariate equations will be examined for their heuristic value even though a conservative researcher might find the procedure inappropriate.

To examine specific relationships among variables and to test additional hypotheses, univariate regression equations were calculated for each criterion. The correlations among predictors and criteria on which the equations were based are presented in Table 3.

Two different procedures were used to calculate the regression values: forced inclusion and stepwise inclusion. The forced inclusion procedure places all predictors into the equation at one time and then calculates regression statistics for all of them, even if they make no contribution to prediction. The stepwise inclusion procedure selects those variables which contribute most to prediction. First, the stepwise technique chooses the best single predictor of the criterion. Thereafter, the variables with the next highest partial correlations are chosen until further variables cease to make significant additions to the model. However, at each inclusion stage partial-F values are re-computed for all predictors currently included. This approach differs from forward inclusion techniques in that predictors are re-evaluated at each step to estimate the contribution of each as though it had been the most recent one entered, regardless of its initial entry point (Draper & Smith, 1966). A variable included at an earlier stage could be eliminated later. By selecting only significant predictors, the stepwise procedure may exclude some highly correlated predictors from the equation. Exclusion of these non-significant variables would improve the overall test of the model.

Although the procedures employed were different, they arrived at very similar results. Overall regression values for the forced and stepwise inclusion procedures are presented in Table 4. None of the forced regression equations were significant at the .05 level. The equations for IMP and SOC were significant at the .054 and .087 levels, respectively. All equations in the stepwise inclusion were highly significant, with the exception of TASK which was marginally significant at the .079 level.

TABLE 4. Prediction of Criteria with Communication Variables: Summary of Forced and Stepwise Regression

Criterion	R	R^2	F	Significance Level
Forced Inclusion				
TASK	.212	.045	.6898	.660
SOC	.340	.116	1.918	.087
IMP	.358	.128	2.160	.054
SAT	.333	.111	1.833	.102
Stepwise Inclusion				
TASK	.181	.033	3.155	.079
SOC	.307	.094	9.688	.002
IMP	.330	.109	5.615	.005
SAT	.285	.081	8.209	.005

N = 95

The individual predictor statistics are presented for each dependent variable, based on forced inclusion (Table 5) and stepwise inclusion (Table 6). Both procedures identified approximately the same variables for each dependent measure as being the best predictor. The only difference was in predicting IMP. The stepwise procedure identified PFQ and PIN as both being significant predictors while the forced technique including all variables indicated that PIN and IFQ were the best two predictors. PFQ closely followed by IFQ as the third best predictor, so these differences were slight. Also, two importance indices (Nunnally, 1968), beta weights and usefulness, ordered the variables similarly.

The stepwise regression equation for TASK indicated that IFQ was the only significant predictor at the very marginal level of .079. PFQ was not a significant predictor for TASK. From Table 3 both PFQ and IFQ have approximately the same zero-order correlations with TASK, but PFQ was slightly less correlated with TASK and therefore made no additional contribution to the prediction of TASK over and above that of IFQ. PIN was not a significant predictor for TASK, and with one exception none of the initiation variables were significant predictors for any dependent measures.

The stepwise regression equation for SOC indicated that MFQ was significantly related to SOC. None of the other behavioral communication variables were significantly related to SOC.

Several significant predictor-criterion relationships were observed. However, the quality of prediction was questionable. PFQ accounted for slightly more than three percent of the variance in TASK (see Table 4). The vast majority of the variability was unaccounted for. The prediction

TABLE 5. Relationship of All Communication Predictors with Criteria: Summary of Forced Inclusion Regression

Criterion	Predictor	Beta	Standard Error of Beta	F of Beta	Significance of F	Usefulness
TASK						
	PFQ	.071	.148	.231	.632	.0025
	IFQ*	.136	.146	.872	.353	.0095
	MFQ	-.008	.145	.003	.958	.0000
	PIN	-.037	.120	.095	.758	.0010
	MIN	.074	.109	.456	.501	.0049
	INOIN	-.041	.127	.103	.744	.0011
SOC						
	PFQ	.089	.142	.391	.534	.0039
	IFQ	.037	.140	.071	.790	.0007
	MFQ*	.227	.139	2.639	.108	.0265
	PIN	.109	.116	.890	.348	.0089
	MIN	.014	.105	.017	.896	.0002
	INOIN	-.128	.122	1.097	.298	.0010
IMP						
	PFQ	.165	.141	1.365	.246	.0135
	IFQ	.190	.139	1.852	.177	.0184
	MFQ	-.089	.138	.411	.523	.0041
	PIN*	-.225	.115	3.848	.053	.0381
	MIN	-.027	.105	.065	.799	.0006
	INOIN	-.006	.122	.002	.964	.0000
SAT						
	PFQ	-.065	.142	.207	.650	.0021
	IFQ	-.023	.141	.028	.868	.0003
	MFQ*	.331	-.140	5.617	.020	.0567
	PIN	.090	.116	.602	.440	.0061
	MIN	-.054	.106	.261	.611	.0026
	INOIN	-.157	.123	1.628	.205	.0164

N = 95

* Best predictor based on beta weight, F of Beta and Usefulness Index

TABLE 6. Significant Relationships of Communication Predictors with Criteria: Stepwise Regression to Test Hypotheses 2 to 7

Criterion	Predictor	Beta	Standard Error of Beta	F of Beta	Significance Level	Usefulness
TASK	IFQ	.181	.102	3.155	.079	.0328
SOC	MFQ	.307	.099	9.688	.002	.0944
IMP	PFQ	.225	.099	5.181	.025	.0502
	PIN	-.221	.099	4.990	.028	.0483
SAT	MFQ	.285	.099	8.209	.005	.0811

N = 95

was somewhat better for SOC, as MFQ accounted for over 11% of the variance.

Analysis of Communication Attitudes. In addition to testing the hypotheses of this thesis, further analyses were performed to test the existence of additional relationships. The relationship of the communication attitudes to the communication behavioral measures was tested. The overall stepwise regression values in Table 4 indicated that the behavioral communication measures significantly (.005) predicted both SAT and IMP. From Table 6, both PFQ and PIN significantly ($p < .05$) predicted IMP. PIN received a negative beta weight, making it a suppressor variable. PIN also had a significant negative zero-order correlation with IMP. MFQ predicted SAT at a highly significant level (.005).

Challenge Frequency as a Predictor. The variable frequency of Challenge Communication (CHL) was included as part of the organization intervention, but not in the theoretical formulations because its relationship to any of the other variables had not been documented in the literature. A multivariate test of the relationship between the four dependent variables and the six original predictors plus CHL was significant ($F(28,304.2885) = 2.1470$, $p < .001$). Univariate stepwise equations were then computed for all four criteria with the previously used communication variables and CHL as predictors (see Table 7). A comparison of the overall stepwise regression values in Table 4 with those in Table 7 revealed that overall prediction was improved with the inclusion of CHL for three dependent measures, and had no impact on SOC.

Individual predictors were chosen by stepwise inclusion, and these results are presented in Table 8. Examination of these results

TABLE 7. Degree of Prediction with the Addition of CHL: Summary of Overall Stepwise Regression

Criterion	R	R^2	F	Significance Level
TASK	.371	.118	4.043	.010
SOC	.307	.094	9.688	.002
IMP	.371	.137	7.323	.001
SAT	.417	.174	9.676	<.0005

N = 95

indicated that CHL was a significant predictor for TASK, IMP and SAT at the .005 level. CHL became the best of three predictors for TASK and IMP and significantly predicted SAT. Thus although not part of the theoretical hypotheses, CHL does make a significant contribution to prediction.

Examination of the beta weights in Table 8 revealed that CHL received a negative weight for two criteria measures: TASK and SAT. By definition (Darlington, 1968) CHL was a suppressor variable for those dependent variables. CHL did not correlate significantly with any of those criterion measures either. As a suppressor CHL correlated with the variance in the other predictors which was not related to the criterion. Thus, by subtracting out of the equation that variability unrelated to the criterion by means of a negative weight, it improved overall prediction. CHL was positively related to IMP, entering the regression equation with a significance level of .005.

TABLE 8. Relationship of Communication Predictors with CHL to Criteria: Summary of Stepwise Inclusion Regression

Criterion	Predictor	Beta Weight	Standard Error of Beta	F of Beta	Significance of F	Usefulness
TASK						
	IFQ	.319	.142	5.043	.027	.0489
	CHL	-.415	.144	8.266	.005	.0801
	PFQ	.232	.135	2.946	.090	.0286
SOC						
	MFQ	.307	.099	9.688	.002	.0944
IMP						
	CHL	.281	.097	8.397	.005	.0788
	PIN	-.243	.097	6.311	.014	.0592
SAT						
	MFQ	.437	.106	17.011	< .0005	.1527
	CHL	-.340	.106	10.320	.002	.0927

N = 95

Including the suppressor, CHL, resulted in the inclusion of an additional predictor, PFQ, for TASK at a marginal level of significance. Previously, PFQ was too highly correlated with IFQ to enter as a predictor. The inclusion of CHL for IMP did not allow PFQ to become a predictor as in Table 6. CHL had a higher zero-order correlation with IMP than did PFQ. Adding CHL to SAT did not result in any other changes in the predictors used.

DISCUSSION

This thesis proposed that both organizational communication and group cohesiveness were multidimensional constructs. The hypotheses predicted relationships between specific dimensions of each construct. To some extent, the results confirmed the general hypothesis that the six dimensions of communication were positively related to the two cohesiveness dimensions and the two communication attitudinal measures. The data also indicated that certain communication dimensions were positively related to each of the cohesiveness dimensions. Specifically, the frequency of maintenance communication was positively related to social cohesiveness forces, and the frequency of production communication was positively related to task cohesiveness forces. No initiation variables were related to any of the cohesiveness measures. The implication of these results for the interpretation of previous research will be discussed here. Explanations for the failure to confirm certain hypotheses will be offered. Some methodological reservations and limitations will be presented, practical applications will be discussed, and possibilities for future research explored.

Overall Relationship

Failure to reject the multivariate F at the .05 level can be interpreted to mean the set of behavioral communication measures were unrelated to the cohesiveness measures and attitude measures. However,

the F statistic could be rejected at the .075 level. Levels of statistical significance are somewhat arbitrary and nothing is sacred about the .05 level. Less rigorous statistical levels can be accepted, in circumstances, like the present study, where new approaches have been utilized. The heuristic value of the results may outweigh the increased probability of a type I error with the higher statistical level of rejection. Thus, one of the conclusions of this investigation is that the set of predictors were related to the criteria, but that the association was weak. Further interpretations will be based on this conclusion, but the reader should consider these interpretations in light of the weak overall relationship that was found.

Several explanations can be offered to explain the low multivariate F value. Four dependent variables were used of which only two were cohesiveness measures. The communication attitudes of satisfaction and importance were not part of the hypotheses and yet were included in this omnibus test. Satisfaction with communication was not strongly related to all of the frequency and initiation variables. This weak relationship contributed to the low overall association. Another factor which could explain the nonsignificant multivariate F is that this overall test is based on the inclusion of all predictors into the equation. Hypotheses for many of the predictors, especially the communication initiation variables, were not based directly on the literature and were very speculative. The stepwise inclusion regression equations indicated that most of these variables were not good predictors of either cohesiveness or communication attitudes. This large amount of noise in the entire predictor set may have masked the few positive relationships that occurred and resulted in the low overall test value.

Thus, several arguments, can be made that the cohesiveness variables were related to the communication variables. The following section discusses how this finding relates to the conclusions of previous studies.

Confirmations and Extensions

The results of the present study lend support to the findings of Lott and Lott (1961) that the quantity of communication was positively related to the degree of cohesiveness among group members. Prior to Lott and Lott, Schachter (1951) and Back (1951), using an experimental design, had reported that cohesiveness, as an independent variable, affected communication. Lott and Lott measured cohesiveness as a dependent variable and found it was related to communication in a correlational design. This investigation also treated cohesiveness as a dependent variable. Thus, in both experimental and correlational designs, communication and cohesiveness were positively related.

The present study rendered the Lott and Lott findings more generalizable in another way. The three previous studies employed groups observed in non-task-oriented contexts. In this study, similar findings were reported in organizational work groups. This interrelationship among communication and cohesiveness was pervasive enough to hold for several types of groups in several settings, both task and non-task.

The focus of this study was on the multidimensional nature of cohesiveness and communication, and that is its intended contribution. First of all, it was shown that multiple dimensions of cohesiveness and communication could be measured with some degree of reliability with the exception of two communication initiation variables. Then two of the communication dimensions, maintenance frequency and production frequency,

were shown to be differentially related to the two cohesiveness dimensions, task and social.

These findings reflect upon the research of Back (1951), Shaw and Shaw (1962), Moran (1966), and Cohen, Whitmyre and Funk (1960). Back found that the source of attraction forces affected the amount of communication that groups engaged in. He found, as did Shaw and Shaw, that task based cohesive groups spent less time in discussion than social based groups. Moran had found that task-oriented dyadic attraction was related to communication. The present study differentiated discussion in terms of content and found that the source of the attraction force was related to the content as well as the quantity of communication.

The quantity of innovation topics were found to relate to task attraction, but that association was rather weak. This result gives some support to the findings of Cohen, Whitmyre and Funk (1960) that creativity was related to group cohesiveness. Despite the number of operational contrasts, this study and the Cohen et al. study arrived at similar outcomes, indicating the conclusions may be fairly general. Cohen et al. measured creativity as the number of unique ideas generated, and measured cohesiveness as the evaluated attractiveness of working with another person. His dyadic ratings were also with extreme high and low nominal groups. The present study operationalized creativity as the frequency with which innovative topics were discussed, and cohesiveness as the perceived attraction to the task-related features of on-going work groups. Thus, these two studies indicated that cohesiveness did not limit creativity. Furthermore, assuming that innovation involves some risk taking, these studies question the

conclusions of Dion, Miller and Magnan (1971) that four-person cohesive groups made less risky decisions. The methodology of the Dion et al. study may be sufficiently different to render comparisons inappropriate. The low level of the association found here between innovation and cohesiveness further limits the generalizability of the conclusions discussed.

The quantity of innovation communication was related to cohesiveness but not the quantity of production discussions. Several factors account for this outcome. The content distinctions between production and innovation are subtle. Production topics are current while innovation topics are more future-oriented. Highly related content could fall in to the same categories with the only difference being the time-frame. Furthermore, innovation and production frequency were also highly correlated statistically ($r = .62$). However, this association was not greater than those with any of the other communication frequency variables. Besides content, the statistical procedures of stepwise regression may have presented a misleading outcome. Stepwise inclusion chooses the first predictor based on zero-order correlations. Innovation frequency was most strongly related to task cohesiveness ($r = .18$), but production frequency was virtually as strong ($r = .17$). That insignificant difference resulted in innovation frequency being chosen first. Since the two predictors were so highly related, production frequency did not contribute a significantly unique increment to the prediction of task-related cohesiveness. The higher correlation of the quantity of innovation communication with task cohesiveness may also be due to the psychometric fact that innovation cluster of items was more reliable than the cluster of production

frequency items. Practically, both frequency content variables were equally good predictors.

Thus, some support has been given to the findings of Back, Shaw and Shaw, and Moran. Task-related communication topics, whether production or innovation, are related to task-based group attraction forces.

Social attraction forces were shown to be related to the quantity of maintenance communication. The frequency of giving recognition and discussing non-work matters was the best predictor of social cohesiveness. The relationship was fairly strong. This outcome supported the findings of Back and Shaw and Shaw that social based group cohesiveness was associated with high levels of non-work discussion time. The present study measured cohesiveness on a relatively continuous scale and did not manipulate several levels of social attraction as did Back (1951) and Shaw and Shaw (1962). Thus, the present study extended the findings of previous investigations from a qualitative relationship to a quantitative one, i.e., the stronger the attraction force reported, the larger the quantity of maintenance communication engaged in.

No other variables contributed unique increments to prediction although the frequency of production and innovation communication had significant zero-order correlations with social cohesiveness. The co-linearity among the frequency predictors probably prevented the two additional variables form making significant additions to the regression equation. Nonetheless, it is interesting to note that social cohesiveness had significant zero-order correlations with three frequency content areas while task cohesiveness was only marginally related to two of those frequency areas.

Thus, in the work groups studied, the type of group attraction force was differentially related to the quantity of different communication content areas. Three of the first five hypotheses were confirmed, and to some extent a fourth as well.

Hypotheses Not Confirmed

Other hypotheses were not confirmed. Production frequency was not a predictor of task cohesiveness. This result was previously accounted for by the colinearity among the frequency predictors. With such a high degree of intercorrelation, the frequency and initiation variables may not have measured specific dimensions, but one general factor, frequency of communication. Yet, real world intercorrelations are usually high, and conceptually distinct factors can be highly related. Furthermore, the propositions of George Homans (1950) were cited in the literature review as evidence of conceptual interelationship among content areas. In organizations with well developed communication systems, uniformly high levels of each content area would not be extraordinary.

The frequency of maintenance communication was not found to be associated with task cohesiveness. Evidence presented by Shaw and Shaw (1961) indicated that high attraction groups, working on a project, were task-oriented at first but spent more time in non-task discussions over succeeding periods. This relationship was not demonstrated in the present study. The work groups sampled in this study had been together for some time. The degree of task cohesiveness was related to innovation communication, and the degree of social cohesiveness was related to non-work, "scuttle-butt." Non-work discussions were

not found to be prepotent for both task and non-task attraction. The predominance of maintenance communication was limited to situations of high personal attraction, such as that employed by Shaw and Shaw.

None of the initiation content variables had significant zero-order correlations with or were significant predictors of the cohesiveness variables. The initiation of production messages was a predictor for communication importance and will be discussed in a later section. Other than this one exception, communication initiation was not related to any of the criteria meaaures. This absence of relationship between communication initiation and other variables leads the author to question the operationalizations employed. The reliability estimates of the time measuring the initiation variables were low for the initiation of maintenance and innovation topics. This unreliability prevented these from having significant correlations with any of the other variables. The one initiation variable that was a significant predictor for communication importance was a much more reliable cluster of questionnaire items. The significance of this more reliable predictor lends support to the explanation given that unreliability restricted the correlation of the initiation of maintenance and innovation communication with the criteria measures. Perhaps with improved measurement of these variables, significant relationships between communication initiation and cohesiveness can be found in the future.

Limitations of the Present Study

In addition to item reliability difficulties, additional problems were encountered in this research investigation. Cohesiveness was conceptualized as the individual's perception of the task and the social forces the group exerts on him/her to remain in the group. Thus,

although viewed from an individual perspective, cohesiveness focused on the group as a whole. Communication was measured by having subjects respond to items about specific individuals. Most individuals were responding to communication contacts with only a subset of the group. The group and individual units did not match. In order to examine relationships between the single, two dimensional cohesiveness perceptions and responses to multiple communication contacts, the data had to be modified. The communication variables were averaged across contacts to obtain single indices of each communication variable for respondents. These means could then be compared with the respondents' perceptions of the group's cohesiveness. The data were at a comparable group level for statistical analyses.

However, these transformations created some definitional problems. This kind of problem is illustrated most directly by the communication initiation data. Instead of summarizing each respondent's initiation communication behavior within the group, the means may have presented misleading or inaccurate information. The meaning of the initiation items may have been altered. For example, a respondent may have always initiated conversations about production operations with some group members and reported that other individuals always initiated production discussions with him/her. After averaging, the resultant score is interpreted as equivalent initiation for each group member. The data were averaged even though the response categories did not have interval scale properties. This problem is not assumed to be as great in the more quantitative frequency data. The communication frequency responses have more interval scale properties. They have higher reliabilities, as well.

The way the variables were operationalized differs from many of the other studies. Lott and Lott (1961) used a sociometric attraction measure summarizing the entire group's attraction to each other as their cohesiveness measure, and observations of how often members interacted within a 30 minute discussion period as their communication measure. Communication and cohesiveness measures both reflected the activity of the entire group. Those operationalizations are very different from those of this investigation. Most of the other studies have measured the variables based on the entire group, as well. All have resulted in similar findings nonetheless. The communality of the findings, despite varying methodologies, indicates the variable relationships are strong and the limitations of the present study are not too severe. In fact, the methods employed to operationalize the constructs were dictated, in part, by practical limitations. Work groups could not be observed to measure communication. The techniques used here, though different, may be more appropriate for organizational settings. To be effective, an organizational member may only need to interact with a subset of group members, and may feel cohesive about the whole group based on those limited contacts.

An additional aspect of this investigation should also be kept in mind when interpreting the results of this study. The sample on which the data were based may be rather unique. The company has had a Scanlon Plan (Frost, Wakeley, & Ruh, 1974) for over twenty-five years. The Scanlon Plan provides formal mechanisms for communication which is focused primarily on production and innovation contents. Although a small percentage of the sample were members of the formal committee structure, those who were may have been extreme enough to affect the

overall findings, especially for production and innovation frequency. The community also has a reputation for conservative values, especially placing a high value on work. These situational factors may limit the generalizability of these findings. More research must be done in many different types of organizations.

A final model consideration involves the deletion of part of the data for individuals in "linking pin" functions. In those groups where "linking pins" were supervisors, their communication and cohesiveness responses were deleted prior to data analysis. For the sake of statistical independence across subjects, this particular set of responses was excluded. All respondents were answering the items from the viewpoint of a group member. The data were quite comparable. However, the supervisor is an integral part of the group, whose behavior affects both the communication and cohesiveness of the group. Including their responses as supervisors might have injected a greater degree of task and/or production orientation into the results. The assumption of independence is important for statistical analyses, but theoretical relationships are dependent on the type of data included. This problem could be avoided by studying lower level hourly work groups and their first line supervisor. With this lower level sample, all responses would be meaningful and no statistical assumptions of independence would be violated.

Before discussing practical applications of these findings, a comment should be made about the design of the study. Regression analysis is a correlational technique which specifies the degree of association among variables, but does not provide data about causal inferences. If two variables are found to covary, one is not necessarily

causing the effect in the other. This limitation should be kept in mind by the reader in examining the following applications.

Applications

The results of this investigation have implications for individuals interested in group process. It was demonstrated that work groups were different from other types of groups. Based on examination of the means, the individuals in organizational groups, studied here, exhibited fairly strong attraction to their groups on both task and social dimensions. Although no previous investigators had studied individuals' attraction to the group simultaneously on several dimensions, this study indicated that high attraction on one dimension did not limit attraction on another. This simultaneous multidimensional attraction may only be a property of work groups.

A related implication pertains to communication in groups. Managers have often been concerned that if groups become very cohesive, they will "degenerate" into social activity clubs. This apprehension seems unfounded. A groups' cohesiveness can have different bases. High task cohesive groups discuss innovation-oriented topics most often. This type of cohesiveness was not related to high levels of non-task socializing. Task attraction had virtually the same magnitude of association with production communication although production was not chosen as a predictor for reasons previously indicated. In general, groups with high task attraction communicate most often about current or future task activities. Social cohesive groups engage primarily in personal discussions. The type of attraction force affects the predominant type of communication. It is tempting to say the results imply that managers, desiring higher levels of task communication, can obtain

it by developing more task cohesiveness with the group. However, the correlational design used in this investigation does not permit causal inferences. Nonetheless, if group members are attracted to the group because of its task activities, there will be a high level of task-related communication.

In support of a causal interpretation, Back's (1951) results indicated that different types of cohesiveness affected different levels of overall communication. Future research may provide the manager with more precise information on how to develop higher levels of production communication. Managers may want their groups to have moderate levels of maintenance communication as well. However, research has not yet indicated that high levels of either type of communication are related to performance measures. Many factors influence performance and productivity in organizations. In a similar way, Seashore (1954) demonstrated that cohesiveness was not directly related to productivity. The groups' perceived supportiveness of the company intervened to moderate that relationship. Strong statements of application are difficult to make without knowledge of their impact on job performance.

For Future Study

Since this investigation was somewhat of a pioneer in multidimensional research on communication and cohesiveness, many possibilities exist for future endeavors. A next logical step would be to employ an experimental design, controlling other factors and examining causal effects. In separate studies, both communication and cohesiveness could be manipulated with one as the independent variable and the other as the dependent measure. A design based on Back's (1950) research could be developed in which different sources of cohesiveness are induced in

subjects and resulting communication measured on several dimensions, at least on several content areas. Such an experimental design would allow for causal interpretations of the effects of bases of cohesiveness on communication. The problem with such a study done in the laboratory is that groups need time to grow and develop to engage in the types of interaction that begins to approximate that which occurs in organizations. Manipulating newly formed groups in an organization would be a more desirable approach.

Since no one causal model seems to prevail, communication or opportunities for certain types of communication could be varied and the resulting cohesiveness forces measured. This type of study might be more suitable for laboratory investigation. Restrictions could be made on the content and degree of interaction allowed. Communication could then be solely focused on within group matters and not left uncontrolled as in this study. Using nominal groups in a controlled setting would allow the use of more behavioral indices of cohesiveness.

Perhaps before moving on to causal designs, research should carefully and systematically study cohesiveness itself. No standard measures exist, due in large part to the variety of operationalizations. As such, it is rather difficult to measure cohesiveness as a dependent variable. The measures used in this investigation were not optimal. Although the two dimensions were measured reliably, they were also highly interrelated. One could legitimately question whether two distinct dimensions had been tapped. The only piece of research to study the dimensionality issue (Hagstrom & Selvin, 1965) can not be accepted because of methodological shortcomings. Thorough scale construction procedures should be undertaken to develop reliable measures and to

identify how many distinctly different types of forces attract and hold members to the group. In doing so, the operational definition employed will be important. The individual perception measure used here may be valuable in that it allows for larger sample sizes. Such a measure should be tested in several settings as well, since the type of group studied was found to make a difference. Most of the prior research was done on cohesiveness in the early 1950's. Organizational groups may have changed in 25 years. The concept is becoming more important again, especially in organizations with the growing emphasis on team building. Better understanding of the concept through improved measurement can provide valuable information for the manager.

Additional analyses performed, tangential to the theoretical hypotheses, did discover some interesting relationships. Communication attitudes were presented in the literature as an important part of organizational communication. The analyses indicated that the frequency of maintenance communication was positively related to satisfaction with group communication. This finding was somewhat similar to that obtained by Connelly (1970) who found job satisfaction was related to maintenance communication. Respondents indicated that they were most satisfied with those individuals with whom they spent much time discussing personal problems and non-work items. Task factors were not vital in predicting satisfaction. Although it can not be demonstrated, based on this design, the results imply a personal touch in communicating makes people feel good about those interactions.

The predictor most strongly related to communication importance was production initiation. The initiation of production messages received a negative regression weight, making it a suppressor by Darlington's

(1968) definition. This same predictor also had a significant negative zero-order correlation with importance. The latter finding makes interpretation somewhat easier than when the zero-order correlation is zero. The initiation response categories are ordered so that a higher response category reflects more initiation by the other individual in the discussion. The negative relationship found in this study indicates that discussions initiated by another person were viewed as less important and self-initiated communications were viewed as more important. This finding supports Lawler, Porter and Tannenbaum's (1968) similar conclusion that self-initiated communication episodes are evaluated more positively.

The two communication attitudes - satisfaction and importance - together with the cohesiveness variables were the dependent measures in this study. These measures were interrelated. The two types of cohesiveness were most closely related. The close relationship was not too surprising, given they were both attitudes toward the group. An individual's task based attraction is related to his/her social attraction to the group. The two measures of attitudes toward communication were not related. Feelings of how important or necessary it is to talk with group members has little to do with how satisfied one is with those contacts. This finding contradicts the conclusions Berkowitz and Bennis (1961) made in regard to superior interactions. They found the most satisfying interactions were those with the most important contacts, who were shown to be superiors. Superior contacts were part of the data for each respondent in this study. The research on communication networks found satisfaction was negatively related to importance or dependence on others for information. Shaw (1964)

concluded in his review of the literature that those individuals who were dependent on others for information, i.e., in non-central positions in a centralized network, were less satisfied. Since an organization with its hierarchical patterns is a centralized system much like an extended wheel network, the network results might be more comparable. However, neither of the studies cited account for the present findings. The network research found a negative relationship while organizational research found a positive relationship. The present non-significant finding supports neither. Further research in ongoing organizations is needed.

The communication attitudes were significantly related to both cohesiveness measures. Part of this communality may be due to the fact that they are all affective responses to one's activity within the group, or to common methods used to measure the attitudes. The association could also be based on conceptual similarities. The strongest relationship was between satisfaction and social cohesiveness. Attraction to group members is related to positive evaluations of communication with some of those members. Homans' (1950) mutual dependence of sentiment and interaction within the internal system would predict the same relationship. Similarly, task attraction is comparable to Homans' activity which is the third element in his mutually dependent system. Thus, the interrelationships among the dependent measures lend some support to previous findings.

In yet another analysis, an additional variable, the frequency of challenge communication was added to the existing predictor set. Although challenge frequency had no impact on social cohesiveness, the inclusion of this variable improved the prediction of the other criteria.

Its role in prediction was much different than the previous other predictors for two of the criterion measures. For task cohesiveness and communication satisfaction, challenge was negatively weighted and yet was nonsignificantly correlated with the criteria. Statistically, it was removing variance from the other predictors which was not related to the criterion, thereby enhancing prediction.

The conceptual content of this variable may help explain these results. A challenging verbal exchange involves questioning and some mild confrontation. This confrontation must somehow influence other behavioral communication measures in some way. Explanations could be offered that limits the development of cohesiveness and satisfaction. Since challenge was not significantly correlated, positively or negatively, with any of these criteria, such a statement may not be completely justified.

Challenge affected one dependent measure in another way. By accounting for some variance not correlated with the criterion in the regression for task cohesiveness an additional predictor was added. The regression procedure identified both the frequency of production communication and the frequency of innovation communication to be related to task cohesiveness. This finding was one of the hypotheses of this study. Since both production and innovation topics were predictors, more empirical evidence has been given to support statements, made earlier in the discussion, that task cohesiveness was related to task-oriented communication in general. How often individuals discuss current task practices and new ways of doing those activities is related to their attraction to the group's task. Any challenge or questioning of those task activities appears to create enough turmoil so as to

limit task attraction.

Challenge also functioned as a positive predictor for importance. The level of significance at which challenge entered the equation was greater than .05, indicating a weak relationship with the criterion. The earlier equation for importance without challenge included only production initiation. Adding challenge improved prediction, even though the relationship was rather weak.

Challenge was also a highly significant suppressor of a communication satisfaction. Including this new predictor improved overall prediction. Apparently frequently challenging a communication contact about work matters limits the overall evaluation of that interaction. Unlike task cohesiveness, including challenge did not result in the inclusion of other predictors. It did not alter the relationship of satisfaction and maintenance communication either. Maintenance was included in the equation at the same level of significance with or without challenge as a predictor. This constant inclusion level implies that challenge is subtracting out uncorrelated criterion variance associated with some of the other predictor variables. The initiation of production messages remained a strong predictor with or without challenge. This conclusion indicates that self-initiation of daily task activities is most strongly related to perceptions of how important it is to talk with that person.

The fact that challenge was a suppressor and increased the number of significant predictors provided additional information about the psychometric properties of the measurement instruments. Prior to its use, several variables did not enter the regression equations together because they were too highly correlated. Challenge subtracted out variance

in the predictors which was not correlated with the criterion. The item phrasing, item format, or use of an answer sheet may have generated some common method variance. If this was the case, the relationships described in this thesis are fairly accurate, but a need for better communication measures, as well as cohesiveness measures, has been demonstrated.

Summary

The results indicated that multidimensional measures of organizational communication and group cohesiveness were related, quantitatively and qualitatively. The relationships extended the findings of previous research to a multidimensional context. These results obtained with work groups were shown to differ from those of non-task groups. Model considerations were discussed, and the methodological problems with modification of the communication data and the deletion of some data for the sake of independence were examined. Future research in scale construction and in more varied settings were suggested, and the potential use of additional variables for future study noted.

APPENDIX

APPENDIX

COMMUNICATIONS QUESTIONNAIRE

Department of Psychology

Organizational Research Division

Michigan State University

East Lansing, MI 48824

INTRODUCTION

A phrase that we hear often nowadays is "communication problem." People are constantly talking about the problems that they have in communicating with others in both work and home life.

Scanlon Plan companies generally are very interested in finding out about communications that take place in their work settings. With this information they may be able to learn how to understand and overcome many of these problems. Your cooperation in this study will help greatly in trying to find some solutions.

All of the enclosed questionnaires are strictly confidential. NO ONE but the research team at Michigan State University will see them. As soon as you have completed the questionnaires you can seal them in the envelope provided. You will hand them tomorrow directly to a University staff person who will come around to collect them. No one in the company will ever see the individual information that you have provided. General results of the study will be made available to you at a later date.

Thank you very much for your cooperation.

Before starting to answer the questionnaire it is necessary that we get some information about you. This will only be used to help us code and analyze the information in the questionnaire.

YOUR NAME: _____

JOB TITLE: _____

SEX: MALE _____ FEMALE _____

NUMBER OF MONTHS AT PRESENT POSITION: _____

INSTRUCTIONS FOR COMMUNICATION LIST

Please go back over the last few months and think of people you talk to frequently. In the spaces below list seven of these people according to the following instructions:

A. Write the name of your supervisor:

1. _____

B. Write the names of two people who report to your supervisor and with whom you communicate:

2. _____

3. _____

C. Write the names of two people who report to you and with whom you communicate. If no one reports to you, include two additional people who report to your supervisor as in #2 and #3 above:

4. _____

5. _____

D. Write the name of one person in the plant who reports to another supervisor and with whom you have GOOD communications.

6. _____

E. Write the name of one person in the plant who reports to another supervisor and with whom you have POOR communications.

7. _____

INSTRUCTIONS

On the pages that follow you will find 22 questions to answer about each of the people you listed on page 3. The questions concern the way you communicate with others in the company.

Please pull out the answer sheet included in your envelope and place it alongside the questionnaire. Print your name in the space provided at the top. You will see that there are seven blanks labelled COMMUNICATION CONTACT. Print the names of the individuals you listed on page 3 in these blanks, placing only one person's name in each space.

Beginning with the first question on page 5, record your choice of answer by circling the appropriate letter next to Question 1 for the first communication contact. Now answer Question 1 for all the other contacts before going on to Question 2. Then read Question 2, answering for all communication contacts before proceeding to Question 3. Follow this procedure until all questions are answered for all communication contacts. You may find it helpful to slide the edge of a piece of paper down from one question to the next on the answer sheet as you go along.

REMINDER: Never go on to the next question until you have answered the question you are working on for all communication contacts.

(1) When you talk with this person about work activites, who decides what will be discussed?

A	B	C	D	E
I always do	I usually do	We do equally	He usually does	He always does

(2) How often do you talk with this person about any new ideas or suggestions that you or others have about how to improve work performance?

A	B	C	D	E	F
more than once a day	once a day	once or twice a week	once or twice a month	less than once a month	never

(3) How often in your talks with this person do you give or get encouragement or recognition about work or non-work matters?

A	B	C	D	E	F
more than once a day	once a day	once or twice a week	once or twice a month	less than once a month	never

(4) When you talk with this person about non-work, off the job matters, who starts the conversation?

A	B	C	D	E
I always do	I usually do	We do equally	He usually does	He always does

(5) How often do you disagree with this person about work-related matters for which you are responsible?

A	B	C	D	E	F
more than once a day	once a day	once or twice a week	once or twice a month	less than once a month	never

(6) I usually get the information I need from this person at the time I need it.

A	B	C	D	E
I agree strongly	I agree somewhat	I am undecided	I disagree somewhat	I disagree strongly

REMINDER: Never go on to the next question until you have answered the question you are working on for all communication contacts.

(7) How often do you talk with this person about work deadlines--getting the work done?

A	B	C	D	E	F
more than once a day	once a day	once or twice a week	once or twice a month	less than once a month	never

(8) How often do you talk with this person about new things to do in connection with your work or the work of others?

A	B	C	D	E	F
more than once a day	once a day	once or twice a week	once or twice a month	less than once a month	never

(9) When you talk with this person about new ways of doing things, who starts the conversation?

A	B	C	D	E
I always do	I usually do	We do equally	He usually does	He always does

(10) How often do you talk about non-work problems with this person?

A	B	C	D	E	F
more than once a day	once a day	once or twice a week	once or twice a month	less than once a month	never

(11) In general, how important are your talks with this person?

A	B	C	D	E
always important	usually important	sometimes important	rarely important	never important

(12) How often do you question or challenge what this person has to say about work problems or work activities?

A	B	C	D	E	F
more than once a day	once a day	once or twice a week	once or twice a month	less than once a month	never

REMINDER: Never go on to the next question until you have answered the question you are working on for all communication contacts.

(13) I am satisfied with my communications in general with this person.

A	B	C	D	E
I agree strongly	I agree somewhat	I am undecided	I disagree somewhat	I disagree strongly

(14) When talking with this person how often do you give or take instructions about work performance?

A	B	C	D	E	F
more than once a day	once a day	once or twice a week	once or twice a month	less than once a month	never

(15) When you talk with this person about things related to your work, who starts the conversation?

A	B	C	D	E
I always do	I usually do	We do equally	He usually does	He always does

(16) How often do you talk with this person about actually putting new ideas or suggestions into effect--carrying them out?

A	B	C	D	E	F
more than once a day	once a day	once or twice a week	once or twice a month	less than once a month	never

(17) When you talk with this person about any changes that take place or should take place in connection with your work, who starts the conversation?

A	B	C	D	E
I always do	I usually do	We do equally	He usually does	He always does

(18) How often do you talk about "people-problems" - such as trying to solve personal problems with this person?

A	B	C	D	E	F
more than once a day	once a day	once or twice a week	once or twice a month	less than once a month	never

REMINDER: Never do on to the next question until you have answered the question you are working on for all communication contacts.

(19) When you talk with this person about non-work matters, which one of you is more likely to encourage or give recognition to the other?

A	B	C	D	E
I always do	I usually do	We do equally	He usually does	He always does

(20) Compared to other people in the company you talk to, how necessary is it that you talk to this person in order to get your job done?

A	B	C	D	E
always necessary	usually necessary	sometimes necessary	rarely necessary	never necessary

(21) How often do you find yourself defending your point of view with this person about how the work should be done?

A	B	C	D	E	F
more than once a day	once a day	once or twice a week	once or twice a month	less than once a month	never

(22) How often do you talk with this person about your personal work methods and habits?

A	B	C	D	E	F
more than once a day	once a day	once or twice a week	once or twice a month	less than once a month	never

Please check your answer sheet now to see if you have left any questions unanswered. You should be sure to circle an answer for every question.

Once you are sure all questions are answered, please proceed to the next page and follow instructions given there.

INSTRUCTIONS: On this page and the next you will find a series of questions that deal with you and your work group. This section has no separate answer sheet like the communication items. Read each of the questions carefully and circle the number of the answer that you want to give. Please answer all items leaving none blank.

In answering the following questions, consider your work group to be

_____.

(1) In some groups most of the people like each other quite a bit. In other groups, the people are neutral toward or do not like each other as well. How is it in your group?

1. Everyone in my group likes one another.
2. The majority of the members in my group like one another.
3. Most of the members of my group are neutral toward one another.
4. The majority of the people in my group do not like one another.
5. Everyone in my group dislikes one another.

(2) What percent (%) of the people in your group do you feel:

positive about?	_____	%
mildly positive about?	_____	%
neutral about?	_____	%
mildly negative about?	_____	%
negative about?	_____	%
TOTAL	100	%

(3) How do you think your group compares with others in the plant in the way you get along together?

1	2	3	4	5
one of the best	better than most	same as most	not as good as most	one of the worst

(4) How do you think your ~~group~~ compares with others in the ~~plant~~ in the way you work together and help one another?

1	2	3	4	5
one of the best	better than most	same as most	not as good as most	one of the worst

(5) How do you think your ~~group~~ compares with others in the plant in the way the people stick together?

1	2	3	4	5
one of the best	better than most	same as most	not as good as most	one of the worst

(6) Do you feel that you are really a part of your work group?

1	2	3	4
definitely a part	included in most ways	included less than half the time	don't feel I belong

(7) How much influence does the group as a whole have on your attitudes (political, social, etc.) in general?

1	2	3	4	5
very strong influence	fairly strong influence	moderate influence	weak influence	no influence

(8) How often does your group give you support or stand behind you when something does not go just right?

1	2	3	4	5
always	usually	some of the time	rarely	never

(9) How often does your group agree on work goals?

1	2	3	4	5
always	usually	some of the time	rarely	never

(10) How often does your group agree on a specific course of action to achieve these work goals?

1	2	3	4	5
always	usually	some of the time	rarely	never

(11) How many members of your group socialize off the job (evenings, weekends)?

1	2	3	4	5
all members	many members	some do	only a few	none

(12) The following are some possible reasons why <u>YOU</u> may be attracted to your work group. Please rank them in the order of their importance to you. (1 = most important, 6 = least important).

_____ I like the people.
_____ It helps me to attain my personal goals.
_____ It helps me accomplish company goals.
_____ It has a prestigious reputation.
_____ The members support me when things go wrong.
_____ I agree with the group on work objectives and the best way to get them accomplished.

(13) Now please rank in order the reasons why you think the OTHER MEMBERS OF THE GROUP in general are attracted to the group. (1 = most important, 6 = least important).

_____ We like each other.
_____ Our personal goals are attained through membership.
_____ Company goals are accomplished.
_____ We enjoy being part of a group with an excellent reputation.
_____ We support each other when things go wrong.
_____ We agree on work objectives and the best way to get them accomplished.

ANSWER SHEET (EXAMPLE)

NAME: _____

	Communication Contact	Communication Contact	Communication Contact	Communication Contact	Communication Contact
1.	A B C D E	A B C D E	A B C D E	A B C D E	A B C D E
2.	A B C D E F	A B C D E F	A B C D E F	A B C D E F	A B C D E F
3.	A B C D E F	A B C D E F	A B C D E F	A B C D E F	A B C D E F
4.	A B C D E	A B C D E	A B C D E	A B C D E	A B C D E
5.	A B C D E F	A B C D E F	A B C D E F	A B C D E F	A B C D E F
6.	A B C D E	A B C D E	A B C D E	A B C D E	A B C D E
7.	A B C D E F	A B C D E F	A B C D E F	A B C D E F	A B C D E F
8.	A B C D E F	A B C D E F	A B C D E F	A B C D E F	A B C D E F
9.	A B C D E	A B C D E	A B C D E	A B C D E	A B C D E
10.	A B C D E F	A B C D E F	A B C D E F	A B C D E F	A B C D E F
11.	A B C D E	A B C D E	A B C D E	A B C D E	A B C D E
12.	A B C D E F	A B C D E F	A B C D E F	A B C D E F	A B C D E F
13.	A B C D E	A B C D E	A B C D E	A B C D E	A B C D E
14.	A B C D E F	A B C D E F	A B C D E F	A B C D E F	A B C D E F
15.	A B C D E	A B C D E	A B C D E	A B C D E	A B C D E
16.	A B C D E F	A B C D E F	A B C D E F	A B C D E F	A B C D E F
17.	A B C D E	A B C D E	A B C D E	A B C D E	A B C D E
18.	A B C D E F	A B C D E F	A B C D E F	A B C D E F	A B C D E F
19.	A B C D E	A B C D E	A B C D E	A B C D E	A B C D E
20.	A B C D E	A B C D E	A B C D E	A B C D E	A B C D E
21.	A B C D E F	A B C D E F	A B C D E F	A B C D E F	A B C D E F
22.	A B C D E F	A B C D E F	A B C D E F	A B C D E F	A B C D E F

LIST OF REFERENCES

LIST OF REFERENCES

Amend, E. H. Liaison communication roles of professionals in a research dissemination organization. Unpublished doctoral dissertation, Michigan State University, 1971.

Anderson, A. B. Combined effects of interpersonal attraction and goal-path clarity on the cohesiveness of task-oriented groups. Unpublished masters thesis, Michigan State University, 1972.

Aronson, E. Dissonance theory: Progress and problems. In R. Abelson, E. Aronson, W. McGuire, T. Newcomb, M. Rosenberg & P. Tannenbaum (Eds.), Theories of cognitive consistency: A sourcebook, Chicago: Rand-McNally, 1968.

Back, K. W. Influence through social communication. Journal of Abnormal and Social Psychology, 1951, 46, 9-23.

Bales, R. F. Interaction process analysis: A method for the study of small groups. Cambridge, Mass.: Addison-Wesley, 1970.

Barnard, C. Functions of the executive. Cambridge, Mass.: Harvard University Press, 1938.

Bavelas, A. A mathematical model for group structures. Applied Anthropology, 1948, 7, 16-30.

Bavelas, A. Communication patterns in task-oriented groups. Journal of the Acoustical Society of America, 1950, 22, 725-730. In D. Cartwright & A. Zander (Eds.), Group dynamics. New York: Harper & Row, 1960.

Bavelas, A. & Barret, D. Experimental approach to organizational communication. Personnel, 1951, 27, 366-371.

Berkowitz, L. Group standards, cohesiveness, and productivity. Human Relations, 1954, 7, 509-519.

Berkowitz, N. H., & Bennis, W. G. Interaction patterns in formal service-oriented organizations. Administrative Science Quarterly, 1961, 6, 25-50.

Berlo, D. K. Essays on communication. Unpublished manuscript, Michigan State University, 1970.

Burns, T. Directions of activity and communications in a departmental executive group. Human Relations, 1954, 7, 73-97.

Cohen, D., Whitmyre, J. W., & Funk, W. H. Effect of group cohesiveness and training upon creative thinking. Journal of Applied Psychology, 1960, 44, 319-322.

Collins, B. E., & Raven, B. H. Group structure: Attraction, coalitions, communication and power. In G. Lindzey and E. Aronson (Eds.), The handbook of social psychology, 1969, 4, 102-204.

Connelly, R. A. Monitoring communication behavior of organizational employees as a predictor of work satisfaction. Unpublished masters thesis, Michigan State University, 1970.

Cook, P. H. Examination of the notion of communication in industry. Occupational Psychology, 1951, 25, 1-14.

Darlington, R. B. Multiple regression in psychological research and practice. Psychological Bulletin, 1969, 69, 161-182.

Davis, K. A method of studying communication patterns in organizations. Personnel Psychology, 1953, 6, 301-312.

Davis, K. Success of chain-of-command oral communication in a manufacturing management group. Academy of Management Journal, 1968, 11, 379-387.

Dion, K. L., Miller, N., & Magnan, J. A. Cohesiveness and social responsibility as determinants of group risk taking. Journal of Personality and Social Psychology, 1971, 20, 400-406.

Draper, N. R. & Smith, A. Applied regression analysis. New York: Wiley, 1966.

Eisman, B. Some operational measures of cohesiveness and their interrelations. Human Relations, 1959, 12, 183-189.

Farace, R. V., & MacDonald, D. New directions in the study of organizational communication. Personnel Psychology, 1974, 27, 1-15.

Festinger, L. Informal social communication. Psychological Review, 1950, 57, 271-282.

Festinger, L., Schachter, S., & Back, K. Social pressures in informal groups. New York: Harper, 1950.

Follett, M. P. Dynamic administration. New York: Harper & Brothers, 1942.

Forsyth, E., & Katz, L. Matrix approach to the analysis of sociometric data. Sociometry, 1946, 9, 340-347.

Frost, C. F., Wakeley, J. H. & Ruh, R. A. The scanlon plan for organization development: Identity, participation, and equity. East Lansing: Michigan State University Press, 1974.

Gardner, J. Self-renewal. New York: Harper & Row, 1964.

Gilchrist, J. C., Shaw, M. E., & Walker, L. C. Some effects of unequal distribution of information in a wheel group structure. Journal of Abnormal and Social Psychology, 1954, 49, 554-556.

Golembiewski, R. T. The small group: An analysis of research concepts and operations. Chicago, IL: University of Chicago Press, 1962.

Golembiewski, R. T. Integrating small behavioral units into large formal organizations. In B. P. Indik & F. K. Berrien (Eds.), People, groups, and organizations. New York: Teachers College Press, Columbia University, 1968.

Greenwood, W. H., III. A process analysis of an O.D. intervention in a field setting. Unpublished manuscript, Michigan State University, 1975.

Gross, N., & Martin, W. E. On group cohesiveness. American Journal of Sociology, 1952, 57, 546-554.

Gruen, W. A contribution toward understanding of cohesiveness in small groups. Psychological Reports, 1965, 17, 311-322.

Guetzkow, H., & Simon, H. A. Impact of certain communication nets upon organization and performance in task-oriented groups. Management Science, 1955, 1, 233-250. In A. H. Rubenstein & C. J. Haberstrok (Eds.), Some theories of organization. Homewood, IL: Richard C. Irwin, Inc., 1960.

Hagstrom, W. O., & Selvin, H. C. Two dimensions of cohesiveness in small groups. Sociometry, 1965, 28, 30-35.

Haney, W. V. Comparative study of unilateral and bilateral communication. Academy of Management Journal, 1964, 7, 128-136.

Heinen, J. S. Development of work teams in a complex organization. Unpublished doctoral dissertation, Michigan State University, 1971.

Herzberg, F., Mausner, B., & Snyderman, B. The motivation to work. New York: Wiley, 1959.

Homans, G. C. The human group. New York: Harcourt, Brace & World, 1950.

Indik, B. P. Organizational size and member participation. Human Relations, 1965, 18, 339-350.

Jacobson, E., Charters, W. W. Jr., & Lieberman, S. Use of the role concept in the study of complex organizations. Journal of Social Issues, 1951, 7, 18-27.

Jacobson, E., & Seashore, S. E. Communication practices in complex organizations. Journal of Social Issues, 1951, 7, 28-40.

Katz, D., & Kahn, R. The social psychology of organizations. New York: Wiley, 1966.

Katz, D., & Stotland, E. Preliminary statement to a theory of attitude structure and change. In S. Koch (Ed.), Psychology: A study of science. Formulations of the person and the social context. New York: McGraw-Hill, 1959, 3, 71.

Kelley, H. H. Communication in experimentally created hierarchies. Human Relations, 1951, 4, 39-56.

Lawler, E. E., III, Porter, L. W., & Tannenbaum, A. Manager's attitudes toward interaction episodes. Journal of Applied Psychology, 1968 52 (6), 432-439.

Leavitt, H. J. Some effects of certain communication patterns on group performance. Journal of Abnormal and Social Psychology, 1951, 46, 38-50.

Leavitt, H. J. Managerial psychology (3rd ed.). Chicago: University of Chicago Press, 1972.

Leavitt, H. J., & Meuller, R. H. H. Some effects of feedback on communication. Human Relations, 1951, 11, 401-410.

Lesieur, F. G. The scanlon plan: A frontier in management-labor cooperation. Cambridge, Mass.: Massachusetts Institute of Technology Press, 1958.

Likert, R. New patterns of management. New York: McGraw-Hill, 1961.

Likert, R. The human organization: Its management and values. New York: McGraw-Hill, 1967.

Lott, A. J., & Lott, B. E. Group cohesiveness, communication level and conformity. Journal of Abnormal and Social Psychology, 1961, 62, 408-412.

MacDonald, D. Communication roles and communication content in a bureaucratic setting. Unpublished doctoral dissertation, Michigan State University, 1970.

Maier, N., Hoffman, L., Hooven, J., & Read, W. Supervisor-subordinate communication in management. New York: American Management Association, 1961.

Moran, G. Dyadic attraction and orientational consensus. Journal of Personality and Social Psychology, 1966, 4, 94-99.

Moreno, J. L. Who shall survive? Washington, D.C.: Nervous and Mental Disease Publishing Co., 1934, No. 58.

Nunnally, J. C. Psychometric Theory. New York: McGraw-Hill, 1967.

Parsons, T. The social system. Glencoe: The Free Press, 1951.

Roethlisberger, F. J., & Dickson, W. J. Management and the worker. Cambridge, Mass.: Harvard Press, 1939.

Schachter, S. Deviation, rejection and communication. Journal of Abnormal and Social Psychology, 1951, 46, 190-207.

Schachter, S., Ellertson, N., McBride, D., & Gregory, D. Experimental study of cohesiveness and productivity. Human Relations, 1951 4, 229-238.

Schwartz, D. Liaison communication roles in a formal organization. Unpublished doctoral dissertation, Michigan State University, 1970.

Seashore, S. E. Group cohesiveness in the industrial work group. Ann Arbor: University of Michigan Press, 1954.

Shaw, M. E. Communication networks. In L. Berkowitz (Ed.), Advances in experimental social psychology. New York: Academic Press, 1964, 1, 111-147.

Shaw, M. E. Group dynamics: Psychology of small group behavior (2nd ed.). New York: McGraw-Hill, 1976.

Shaw, M. E., & Shaw, L. M. Some effects of sociometric grouping upon learning in a second grade classroom. Journal of Social Psychology, 1962, 57, 453-458.

Siegel, A. L. A comparative investigation of organization communication practices. Unpublished doctoral dissertation, Michigan State University, 1975.

Smith, H. C., & Wakeley, J. H. Psychology of industrial behavior (3rd ed.). New York: McGraw-Hill, 1972.

Thayer, L. Communication and organization theory. In F. E. X. Dance (Ed.), Human communication theory: Original essays. New York: Holt, Rinehart, & Winston, Inc., 1967, pp. 70-115.

Weick. K. E. Social psychology of organizing. Reading Mass.: Addison-Wesley, 1969.

Weiss, R. S., & Jacobson, E. Method for the analysis of the structure of complex organizations. American Sociological Review, 1955, 20, 661-668.

Wickesberg, A. K. Communication networks in the business organization structure. Academy of Management Journal, 1968, 11, 253-262.