

A COMPARISON OF COMMUNICATION
BEHAVIORS IN INNOVATIVE AND
NON - INNOVATIVE SECONDARY SCHOOLS

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This is to certify that the

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SECONDARY SCHOOLS

presented by

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has been accepted towards fulfillment
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ABSTRACT

A COMPARISON OF COMMUNICATION BEHAVIORS IN INNOVATIVE AND NON-INNOVATIVE SECONDARY SCHOOLS

By

Richard K. Allen

The present study sought to assess the relationship between selected communication behaviors and the innovativeness of organizations. The study was a comparative evaluation of these communication behaviors in innovative and non-innovative secondary schools.

Four secondary schools in the Northwest quadrant of Michigan were selected as the research settings. Two of the schools were predesignated as innovative and two as non-innovative. Each teacher in the four schools was asked to respond to a two part questionnaire. Part I asked for the name, sociometric data and factors of sex, age, teaching experience, etc. Part II contained anonymously answered attitudinal questions concerning the school system and its administration. The returned questionnaires were coded and computer analyzed.

The communication behaviors were divided into two classes on the basis of general behavioral concepts. These



concepts were system openness, the system's ability to exchange information with its outside environment, and communication integration, the system's ability to transmit information internally. System openness deals with how information gets into an organizational system and communication integration deals with what happens to the information once it is in the system.

The system openness hypotheses predicted that the opinion leaders, as well as the entire teaching staff, in the innovative schools would read more professional journals, attend more extra-system education meetings, and involve themselves in more extra-system interpersonal communication than the opinion leaders and teachers in the non-innovative schools. The communication integration hypotheses predicted that the innovative schools would have more downward communication, have a higher degree of sociometric integration, and be more participative in school decisions than the non-innovative schools. The communication integration hypotheses further predicted (1) more highly concentrated opinion leadership in innovative schools, and (2) more vertical communication in innovative schools, with more horizontal communication in the non-innovative schools.

We found support for the predicted differences between the innovative and non-innovative schools concerning attendance of teachers and opinion leaders at extra-system meetings and the degree of participation in decision-making by members



of the system. The present study also supported the predictions concerning sociometric integration and the direction of communication in the system.

Data for hypotheses concerning readership of professional journals, opinion leader reliance on extra-system interpersonal sources for educational information, and the concentration of opinion leadership indicated results in the opposite direction of that which was predicted. These hypotheses were not supported.

Research results also failed to support the predictions that the teachers in innovative schools relied more heavily upon extra-system interpersonal information sources, and received more downward communication from administrators than teachers in non-innovative school, although the results were in the predicted direction.



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SECONDARY SCHOOLS

By

Richard K. Allen

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DEDICATION

**To
Jean**

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CHAPTER I

THE PROBLEM

A frequently encountered view of the American educational system is that it is not a system at all, but a vast, sprawling, complex semi-chaos. Another view sees it as a connected network of subsystems of various size, operating in a more or less coherent way (Miles, 1964, p. 29).

Chapter I will set the scene for the comparative analysis of innovative and non-innovative systems by examining the objectives, research traditions, and justifications pertaining to the subject.

Objectives

The innovativeness¹ of social systems² has long been a concern of researchers. However, there seems to be limited empirical evidence available from past diffusion research with regard to the basic problem of how communication behavior affects innovativeness in a system. The present study was

¹Innovativeness is the degree to which one unit is relatively earlier than another unit in adopting ideas, practices and/or inventions which are new to that unit.

²A social system is defined as a bounded collection of interdependent parts, devoted to the accomplishment of some goal or goals.

designed to analyze the effects of communication structure on the innovativeness of comparative social systems.

The principal research questions here are generally concerned with system openness and communication integration as organizational communication behaviors and their relationship to the innovativeness of an educational organization.

System openness¹ is the degree to which a system is receptive to all types of inputs, and makes outputs to, the environment.

Communication integration¹ is the interconnectedness of the organizational communication structure. Such integration is produced by an uninterrupted flow of information² and the openness of communication channels within the organization.

The specific objective is to examine innovativeness as it relates to communication behaviors in a field setting by:

1. Observing the differences in communication behaviors between innovative and non-innovative school systems, viewing these school systems as formal organizations.³

¹System openness and communication integration will be further defined in Chapter II.

²Information is defined as the combination of intelligence, learned experiences and observations necessary for the maintenance and advancement of a system. It is the energetic input, the life-blood, if you will, of a system. Without a steady flow of information in and out of an organization, that organization is not likely to survive.

³Katz and Kahn (1966) define a formal organization as an ensemble of individuals who perform distinct but interrelated and coordinated functions, in order that one or more tasks may be completed. Such functionary groups as industrial firms, the army and, of course, the public schools, fit this definition.

2. Observing how an organization gives and receives information and how it internally processes that information.
3. Collecting and analyzing comparative empirical evidence from the "real world."

Before expanding the structure of the present study it will be helpful to make a closer examination of organizational structures and their ability to change.

Change and Organizational Structure

Change is a noticeable alteration which takes place in the goals, structure, or processes of a system over time. The observer of formal organizations is forced to the conclusion that most organizations are not characterized by rapid change.

Indeed, when organizations are observed over a long period of time, they appear to be characterized by stability, rather than change. Since (1) a formal organization is a structural mechanism employed by society to achieve one or more of its commonly-accepted goals, (2) the goals do not change noticeably, and (3) each organization's activities are rather clearly demarcated, any particular organization comes into existence with a great deal of built-in stability. This stability is so great as to constitute a powerful resistance to change.

On the other hand, it is clear that organizations do change. In many organizations, the increments of change are small, but in others, change is so radical as to cause

the disappearance of the original organization and the appearance of a new one. As an organization changes, the members of that organization also must change, must acquire an unaccustomed facility for change, if they are to live in a modern world. Such organizational change means that the achievement and maintenance of our mutual well-being becomes progressively more important and more difficult to accomplish because change has to affect the stability of an organization and its members. It further means, however, that if we are to maintain our health and a creative relationship with the world around us, we must be actively engaged in change efforts directed toward ourselves and toward our material, social, and spiritual environments.

One way to examine the problems of organizational change is to place ourselves in the role of communication consultant for a moment. According to Lippitt and others (1958, p. 3), "The increased need to modify or invent our patterns of behavior and organization has led naturally to a demand for professional help." Based upon past research, what sort of help or advice could a professional offer an organization?

First, resistance to change can be expected if the nature of the change is not made clear to the people who are going to be influenced by the change. Theories of decision-making sometimes ignore communication effects. Prima facie, this exclusion seems implausible. If, for example, educational decisions are assumed to be based on expectations

concerning student needs, costs, and effectiveness of programs, it is "hard to see how we can ignore the process through which such information is communicated in the organization" (Cyert and March, 1963, p. 67). In spite of these facts, it seems that the dissemination of recommended changes in education has not been dealt with adequately, and one of the major problems inhibiting change in our present educational programs and processes is the lack of sound communication between teachers, administrators, school boards and the public. We might do well in this situation to apply a question and answer posed by Simon (1957, p. 108), although it does not speak directly to education problems.

He says:

The question to be asked of any administrative process is: How does it influence the decisions of the individual? Without communication, the answer must always be: It does not influence them at all.

In order to study formal organizations, it is first imperative that we understand the relationship between the hierarchical structure, both stated and perceived, and existing communication patterns. Communication is the exchange of information and the transmission of meaning. It is "the very essence of a social system or an organization" (Katz and Kahn, 1966, p. 223).

All organizations need information in their communication channels. As an organization grows, it is to be expected



that its information needs will increase. But the parallel growth of an organization and its ability to gather and use information do not exist in a one-to-one-ratio. The disparity is caused by the necessary accelerated growth so common in organizations today and their comparative lack of interest and/or ability to exchange information with their environment and utilize that information at a similar rate. Every organization thus must solve the problem of how it will obtain its information and what patterns of communication shall be followed.

A part of the chaos that may exist in an organization is the failure to see any dimensions of organizational communication other than those implied by the formal organization chart on the executive office wall. The formal organization chart is, of course, an important structural factor simply because organizations are traditionally described by organization charts. An organization chart specifies the authority or reportorial structure of the system. The organization chart communicates some of the most important formal attributes of the system. Cyert and March (1963, p. 289) point out that "The organization chart still provides a lot of information conveniently--partly because the organization usually has come to consider relationships in terms of the dimensions of the chart."



When one studies the diagram of the structure of an institution, he learns something about its operation and about the communication patterns which accompany its function. Yet when we place human beings into the slots on that organizational chart, we find ourselves with a second, but equally important, structural pattern, the informal organizational¹ chart.

The high structure and rigidity of the formal structure may account for the frequently-reported existence of informal, and sometimes unknown, communication channels in such organizations. The problem stems from the fact that the informal structure is changing, fluctuating, and dynamic, whereas the formal structure has a tendency to be more static. Too often the formal structure no longer describes what is, in fact, going on in the dynamics of an organization. And even more importantly, if the formal organization always matched the informal organization, most organizations would be highly productive, highly cohesive, and enjoy considerably

¹Formality is defined as a conventional methodical structure, a set of rules. Informality, on the other hand, is a non-conventional method with little structure. The formal aspect of an organization then, is the hierarchical structure which the organization itself recognizes as its structure, i.e., who reports to whom. The informal organization, is the less obvious structure within each formal organization which, although it is not always recognized, is nonetheless present and must be dealt with; i.e., "the grapevine." Because of its obscurity and lack of recognizable structure, the informal organization is extremely difficult to deal with.



more communication efficiency than they do. Since the informal and formal do not match, the recognition and understanding of the informal organization hierarchy within a formal organization is an absolute necessity if one is to examine the total organization.

Communication in a hierarchical structure must proceed both up and down the hierarchy. On the surface, the consideration of upward and downward seems to imply a complete communication system in a formal organization according to the formal organizational chart. However, if the informal organizational structure is considered, we add an horizontal, or lateral, dimension to the communication system.¹ Organizations face one of their most difficult problems in procedures and practices concerned with lateral communication, i.e., communication between people at the same hierarchical level. The model of a tightly run organization would be one which attempts to understand and control, but not necessarily restrict, lateral communication. A role incumbent would receive almost all his instructions from the man above him, and would deal with his associates only for task coordination specified by rules. Such a plan, however, neglects the need

¹Katz and Kahn (1966, p. 235) define downward communication as information which follows down through the pattern of hierarchical positions and upward communication as information which ascends the hierarchical ladder. They define horizontal communication as information which moves among peers at the same organizational level.



for socioemotional support among peers, and although it is still true that uncontrolled communication of a horizontal character can detract from maximum efficiency, it will continue to exist and must be understood and managed, not destroyed.

Communication among peers, in addition to providing emotional and social support to the individual, also provides task coordination. The mutual understanding of colleagues is one reason for the power of the peer group. Psychological forces push people toward communication with peers; people "in the same boat" share the same problems. Hence, if there are no problems of task coordination left to a group of peers, the content of their communication can take forms which are irrelevant to or destructive of organizational functioning (Katz and Kahn, 1966, p. 244).

The importance of a lateral dimension should not diminish the importance of the upward and downward dimensions. All three dimensions are important. Downward communication has implications for organizational morale and effectiveness. In general, the rank-and-file member gets his task instructions from those immediately above him. As Katz and Kahn (1966, p. 239) point out, messages from superior to subordinate basically concern job instructions, job rationale, procedures and practices, feedback to the subordinate about his performance, and indoctrination of goals.



Supervisors are relatively quick to perceive the problems of downward communication. The growth and complexity of modern systems place pressure upon supervisors at all levels to develop effective means of transmitting information to lower echelons that is vital to the continuing, efficient operation of the organization. The passing on of orders, policies, and plans necessary to modern life is the backbone of efficient management.

There are many values, however, that accrue to those supervisors who listen willingly and who urge their subordinate to talk freely and honestly. Communication "up the line" takes many forms. It can be reduced, however, to what the person says (1) about himself, his performance, and his problems, (2) about others and their problems, (3) about organizational practices and policies, and (4) about what needs to be done and how it can be done. Thus the subordinate can report to his supervisor about what he has done, what those under him have done, what his peers have done, what he thinks needs to be done, his problems and the problems of his unit, and about matters of organizational practice and policy. He can seek clarification about general goals and specific directives. The more oppressive the organizational structure is at the top, however, and the more control is exercised through pressure and sanctions, the less adequate will be the flow of information "up the line."

If the functions of communication in an organization are to be achieved, we must realize that communication is dynamic. Information must flow constantly up, as well as down, if it is to stimulate mutual understanding at all levels of the organization.

The formal aspects of an organization, then, must be considered in conjunction with its own informal structure and the resulting upward, downward and horizontal communication dimensions of the organization. The structural and communication patterns within an educational organization are examples of the necessary melding of the formal and informal aspects of an organization.

While the administrative process of an organization is affected by communication, it is by no means a one-way street. An organization through its norms, values, status hierarchy, etc., also has a strong effect on communication. Open and necessary communication in an organization may be altered in important ways or thwarted altogether by the explicit and implicit rules and policies of that organization. The organization itself can seriously hamper the establishment of effective lines of communication, even though it may do so unwittingly. According to Katz and Kahn (1966, p. 246), "It is not a matter of changing the communication habits of individuals, but of changing the organizational conditions responsible for them." These effects or conditions may be of a nature which limit the flow of communication in



and out of an organization or of a nature which limit the flow of information within an organization.

Let us now turn to the specifics of the communication of change in an educational setting.

Communication of Change in Educational Organizations

As mentioned earlier, the communication patterns of an organization seem to be interrelated with, and inextricable from, the ability of the organization to adapt to change. Support for this contention is indicated by research findings from all types of organizational systems.

Of course, we are primarily concerned here with the body of knowledge resulting from research on the communication of change in educational systems. Many of the research findings from industry may be applied to educational systems, particularly if both industrial and educational systems are looked at as organizations.

Of about 1,700 diffusion studies content-analyzed and included in the bibliography of the Diffusion Document Center

¹The Diffusion Document Center is located in the Department of Communication at Michigan State University. The Center contains articles pertaining to the communication of new ideas among members of a social system over time. Each empirical study catalogued in the Center has been content-analyzed, and information pertaining to both the independent and dependent variables and the relationship between them has been placed on IBM cards.



at Michigan State University, slightly more than six percent were classified as educational. The comparative paucity of research findings in the field of education may be partly due to a lack of interest or a lack of useful methodologies.

It is also possible that certain ideological beliefs in the educational profession serve to block educational innovation and the study of educational innovation by effectively insulating educational practitioners from reality. For example, beliefs that North American schools are locally controlled, that the school teacher is an independent, autonomous professional, and that teaching and learning cannot be effectively measured or specified in other than intuitive terms, all appear to serve the function of protective myths.

As Miles (1964, p. 634) further pointed out:

. . . the teacher's ideological commitment to professional autonomy appears to be belied by heavy classroom reliance on texts and materials. Confused role expectations for the teacher may be at work; for example, reading experts do not accord full professional status to teachers, yet expect them to act autonomously and rely less on texts. Thus it seems likely that local innovative efforts are restricted by the fact that the teacher's role is actually that of a bureaucratic functionary who has little power to initiate systemwide change, but--because of the ideology concerning professionalism alluded to above--tends to resist innovative demands, like most professionals in bureaucratic organizations.

Other aspects like vulnerability to outside influence, the use of persons rather than physical technology as primary instruments of change, lay control, and the communication behaviors found in the individual organizations, may serve to lower innovation rates in educational organizations, when seen comparatively with other types of organizations.



Another basic reason why educational systems have difficulty in managing change is because their administrators have been trained instead to manage stability. Perhaps no type of system has been subjected to more rapid and sudden change since "Sputnik" than education, a condition which accounts for the difficulty educational organizations have found in keeping up with change.

Such authors as March (1965), Lippitt and others (1958), and Katz and Kahn (1966) point out that the difficulty of experiencing and implementing change in a stable organization should not be minimized. Clearly, successful educational systems, like any organization, must be stable if they are to provide the continuity necessary in a formally structured organization. It is therefore unreasonable to expect such organizations to evolve structures which maximize flexibility. A highly flexible organization is poorly adapted to stable conditions, just as a highly inflexible and formal organization is poorly adapted to an unstable set of problems.

The pain and disorganization that arise from finding that our familiar ways of behavior no longer work in a new environment, or in one that has been altered, are frequently an unavoidable stimulus toward change. It is not pleasant to feel threatened and that pain can become a force toward change. The system experiencing a threat will try first and most urgently to return to old and secure patterns of behavior because members of the system naturally feel more



sure of these traditional patterns than of other untried and untested patterns.

What appears to be painfully "new" to our educational systems is not "new" because it has never been there before, but because it has changed in quality. One factor that is new is the prevalence of newness; the changing scale and scope of change itself, so that the world alters as we walk in it, so that the years of man's life measure not some small rearrangement or moderation of what he learned in childhood, but a great upheaval. The Angel Gabriel in Green Pastures put it still more succinctly: "Everything nailed down is coming loose."

When a change process occurs, the system can react in one of four ways. These ways are:

1. Ignore the change; pretend things are just as they always have been and will be. Think that the usual is eternal.
2. Resist the change; prefer conditions not as good as they could be for fear they might be worse than they are.
3. Adapt and accept with an easy, false enthusiasm under the delusion of action: "We did this." Dedicated to ourselves, our goals are simply adaptation to the past as we knew and loved it.
4. Design and create the future. Mistakes may occur but not by individuals who do nothing. A leader is always exposed to risk. But he takes the risk in the hope of real gain, where inaction can only court certain disaster.



The first three reactions are forms of resistance to change. A change force has its origin in any aspect of the situation which increases the willingness of the system to make a proposed change. A resistance force has its origin in any aspect of the situation which reduces the willingness of the system to make a change.

One of the most discouraging moments in many a process of change comes when resistance to change suddenly appears in an important subpart of the system. Usually the change-initiating subpart responds by being intensely angry or painfully disheartened. Often it seems incomprehensible to the proponents of change that resistance should occur. "Why are they resisting something that will benefit them as much as it does us?" "Can't they see that this will be an advantage to the whole community, even if they have to give up a little?"

Such frustration need not exist, as Lippitt and others (1958, p. 86) point out:

It is of interest that many resistance forces can be converted into change forces. Resistance forces come into being originally in response to certain needs of the client system. If the client is saying, in effect, that the status quo must be maintained because it is the best way to meet these needs, the change agent may be able to show that the same needs would be met even more satisfactorily in a changed set of conditions. Then the very energy which the client system once used to maintain the status quo may shift direction and become an impetus toward change.



What an organization really needs is an effective, solid management of the system in question through the development of adequate communication channels and behaviors. This type of management is the process of converting information into action, and managerial success is determined by what information is chosen and how the conversion is executed. The manager's environment is information about his enterprise and its environment; his function is that of searching and selecting relevant data from that environment for conversion into behavior--in the form of inputs to those who do the work of the organization (Dance, 1967, p. 93).

We can now see a strong case for an improved system of communication which will allow educational systems to keep up with their own needs. These needs must be met because innovation in education, whether it involves the use of new curriculum materials or new educational technology, has become essential if the schools are to be genuinely effective in achieving their aims and goals. Continuing assessment of the product of the schools also is necessary in order to properly evaluate and update the school programs. Hence, the development of principles and techniques for critically judging the worth of whatever the schools teach and the effectiveness and efficiency of their methods of instruction is essential. Thus, the formal educational system may feel dissatisfaction or pain associated with the present situation. Then the change force is a desire for relief. Just



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as the sick individual wants to be cured of his symptoms, the unproductive group or organization wants to find a way to function more efficiently.

One of the best and most reliable ways to locate the most efficient, productive methods in organizations is through conceptualizing and empirical measurement, which the present study will seek to provide.

Justification

Most educators can see the need for a study of innovation and change methods in today's educational organizations. But research and attention to the organizational aspects and the communication behaviors necessary for change have often been ignored.

In the main, past research has taken the school systems as the study unit with very limited attention being paid to concepts related to organizational theory. School systems have been seen as adopting units; but school systems are complex organizations. The fact that school systems are organizations has been generally over-looked, according to Carlson (1968, p. 16).

One must, of course, recognize some exceptions to the overall dearth of research attention to school system as organizations. Davis (1965) made some use of what could be called organizational theory in examining the adoption of innovations in two liberal arts colleges. And Eibler

(1965) explored some organizational variables related to the adoption of innovations among high schools. Such studies provide an excellent research beginning but far from enough conclusive results to begin to build any body of theory.

Communication has been neglected in diffusion studies of educational innovations. Attempts to understand how various modes of communication are related to innovativeness have been few. According to Carlson (1968, p. 22), research has shown that the extent to which one seeks information outside his immediate geographical area is related to the rate of adoption. Studies have pursued the notion of opinion leadership and its bearing on rates of adoption. But overall, the neglect of communication in educational organizations is awesome. As Guetzkow (1965, p. 569) pointed out, ". . . research in communication has lagged behind studies concerning other features of organizational life such as authority, division of work, and status."

It is desirable to know how communication behaviors are related to innovativeness, since communication is necessary for innovativeness to take place. Without communication, innovations will not even be introduced into a system. Additionally, if one wants to know how an innovation spreads, one is inescapably involved in the study of communication processes.

Greater knowledge of the effects of communication behaviors on the innovativeness of an educational system



is needed. An organization can be viewed as an information-processing and decision-rendering system. We need more reliable data on where and how organizations secure new information, how that information is communicated through the organization, how decisions are reached, and finally, how such decisions are implemented in the organization. Without such research and information, educational organizations will continue to find it difficult, if not impossible, to modernize. In this regard, Gouldner (1961, pp. 396-397) state that:

The very rationality of the modern organization has made it increasingly dependent upon the kinds of information that can be supplied by operations or market researchers, opinion pollsters, industrial sociologists, morale surveyors, and group dynamics.

A problem with past diffusion research in the educational setting has been its heavy concern with the entire system as a unit for study. Strictly speaking, until one is concerned with individual system members, the questions pertaining to various uses of channels of communication are meaningful. "School systems do not send, receive, nor fall under the influence of communications; only people do" (Carlson, 1968, p. 22). As long as the school system is taken as the adopting unit and until attention is given to who plays what part within a school system in the adoption decision, the neglect of the part played by communication will continue, and a large gap in knowledge will continue to exist.

For instance, if more data were available concerning teachers in the schools, perhaps methods could be suggested by which being innovative could be made more attractive to the average teacher in the classroom. Research must be focused toward the classroom if it is ever to interest teachers in the adoption of innovations. The present study focuses on classroom teachers and their subsequent collective communication behaviors. As Miles (1964, p. 47) put it, "In the development of theoretical understanding, there is no substitute for the close examination of concrete particular situations."

Now a very fundamental question from a theoretical and practical viewpoint can be raised as to why some social systems have a higher rate of innovativeness than other social systems. It is evident that the comparative analysis of communication integration is important both theoretically and empirically in terms of bringing into focus the effect of communication structure on innovation diffusions.

There is a rationale for exploring the linkage between the communication behaviors of the classroom teacher and the innovativeness of a particular educational system on a comparative basis. Such a comparative research approach, which attempts to systematically compare educational organizations, is "probably the best heuristic solution" (Blau and Scott, 1962, p. 223) to the study of a formal organization. Further need for such study is cited by Blau and Scott (1962, p. 111):

It has long been asserted that work groups should not be studied in isolation but in the context of the larger organization of which they are a part. However, few studies have used a comparative approach to show how specific differences between formal organizations influence work group structure.

The progress of schools over the last few years has exhibited the worth of educational research and development. Much has been learned about relating subject matter to instructional goals, refining the techniques of explanation, cultivating the capacity for discovery, and defining other aspects of the learning process. But much more needs to be known if schools are to continue to move ahead. Better techniques must be developed for disseminating new technical knowledge and applying it in actual instruction. Both basic and applied research are necessary if false starts, blind alleys, and wasted time are to be avoided in the school systems.

Theorists and philosophers of science tell us that it will never be possible to lay claim to a solid body of theory until research testing all possible variable linkages has been conducted and all pertinent research questions have been asked. While we cannot cover such a broad territory as all variable linkages in the present study, we are asking some research questions which link major variables.

A suggested method of theory-building is to ask similar research questions in slightly different ways, replications of a sort, thus testing and re-testing, validating and re-validating. Such is the nature of the study herein presented.

Given the foregoing research inadequacies and research needs in the field of organizational communication, the stage is set for raising the fundamental problem of this thesis: Are there comparative differences between educational organizations with regard to their communication behaviors which differentially affect their innovativeness?

CHAPTER II

HYPOTHESES

The present study was not designed to investigate in depth the total structure of the communication system itself. The focus was rather on innovativeness and how a few selected structural communication variables affect innovativeness. Chapter II will develop the relationship between communication behaviors and innovativeness further and state the hypotheses postulated in the present study.

According to Kerlinger (1964), an independent variable is the presumed cause of the dependent variable, which is the presumed effect. The independent variable is the antecedent; the dependent variables is the consequence of one or more independent variables.

In the present study the dependent variable is the innovativeness of the system and the independent variables are the communication behaviors of members of the system. The present study tests a series of comparative hypotheses in which the innovativeness of the systems is always the dependent variable and the various communication behaviors posited in the hypotheses are the independent variables.

The Diffusion Document Center located in the Department of Communication, Michigan State University, contains over 1,700 such studies, of which approximately 1,020 seek to explain innovativeness as their main dependent variable. Rogers (1969, p. 56) stated that "adopting new ideas is the heart of the modernization process, hence, innovativeness is utilized as a consequent."

Before pursuing the hypotheses further, it seems advisable to expand the conceptual definitions of system and innovativeness found in Chapter I and to consider them in the context of the present study.

We define a system as a bounded collection of inter-dependent parts, devoted to the accomplishment of some goal or goals. Operationally, what are these boundaries in the present study? We arbitrarily define the system¹ boundaries as follows:

1. Each system includes only the teachers and administrator or administrators in a certain building within each of the four school districts under study. Exception: One school district being studied includes two buildings (located about ten miles apart) in its system. Both Buildings were included since the two constitute one total secondary school with one common principal.

¹The systems in the present study are four secondary schools in Northern Michigan. These systems will be described in more detail in Chapter III.

2. The system boundaries includes the teachers and administrators found in the secondary schools of each of the four school districts being studied. These teachers and administrators were considered "within" the system while parents, school board, local citizens and all those outside the school district were considered to be "outside" the system.
3. The principal justification for setting these system boundaries was to facilitate the study of communication behaviors. In an educational setting, the communication system boundaries seem to naturally fall rather tightly around a small educational unit and its own internal membership.

Our definition of innovativeness is the degree to which one unit is relatively earlier than another unit in adopting ideas of practices which are new to them. Operationally, we further define innovativeness as the general tendency and willingness of a school to try educational innovations which are new to them and which may require changes in their structure. When attempting a workable definition of innovativeness, one must consider the time element, cognitive or attitudinal innovativeness versus behavioral innovativeness, and needed innovativeness, rather than innovation for innovation's sake.

Let us further explain these terms. The present study considers an innovative school to be one willing to take overt innovative action and not just talk about, or profess an attitude toward, such action. It is also important to examine a school and its innovation attempts together to determine whether the innovation is an important and necessary change rather than simply an attempt to appear fashionable.

An innovative school is considered to be one which is attempting to change the stability of its organization at the time. At any certain point, time is clearly an important consideration since once a change is established in an organization and has been fully implemented into that organization, the change becomes part of the organizational patterns at some point, rather than organizational change. Since change is a process, and when the process stops, the organization becomes static and unchanging. When today's innovative educational organizations become satisfied and complacent with their specific changes and cease to remain flexible to further change, they become non-innovative.

We are, therefore, dealing with a comparison of presently innovative and non-innovative systems. The basis for these designations will be further explicated in Chapter III.

General Hypotheses

As pointed out by Rogers (1962), a postulated relationship between two conceptual variables is called a general hypothesis, which is tested by means of testing one or more empirical hypotheses. An empirical hypothesis, according to Rogers, is the postulated relationship between two operational measures of conceptual variables. The present study was designed within such a framework.

For convenience in research, analysis, and understanding, the general hypotheses are operationalizations of two separate but interrelated major behavioral concepts. The total communication structure of a social system is herein defined, in terms of these two main concepts, system openness and communication integration. The two concepts are interrelated since system openness speaks to the way in which information gets in and out of an organization, and communication integration deals with what becomes of the information while it is within the organizational system.

Both system openness and communication integration and their related empirical hypotheses will be examined in greater detail in a moment. But first, we must take a closer look at the interdependence of the two concepts. For example, if we are to predict the effects of the downward communication of a school administrator on his teachers, we cannot ignore the openness of the administrator to exogenous information channels. Actually we are dealing with a form of one of the most common communication research orientations, the two-step flow hypothesis¹. The two-step flow hypothesis calls attention to channels of communication and to the various personal relations among those who receive communication messages.

¹The two-step flow hypothesis suggests that innovations spread from sources of new ideas via relevant channels to opinion leaders and from them by way of interpersonal communication channels to their followers (Lazarsfeld and others, 1944, p. 151).

The two general concepts in the present study are so mutually exclusive and still so undeniably interdependent, that they seem to provide an excellent package for studying the communication behaviors of a system and its members. In short, it seems highly possible that system openness plus communication integration may well determine innovativeness.

System Openness

In Chapter I we provided a limited conceptual definition of system openness which will now be expanded.

System openness is the degree to which a system exchanges information with sources outside the system. System openness includes open and closed systems and the various degrees found along a continuum stretching between the two. "An open system is related to and makes exchanges with its environment, while a closed system is not related to and does not make exchanges with its environment" (Miles, 1964, p. 429).

Yadav (1967, p. 199) pointed out that the nature and extent of innovation diffusion in a social system depends upon an effective linkage of interpersonal communication structure with the information environment external to a social system. Rao (1966) in his research in communication and development in peasant villages asserted that if

communication is mainly within the group, little that is new comes into the system and the old information and methods must be relied upon. To survive, then, a system needs to continuously exchange energies and materials with its environment.

Two factors, entropy and organization, are constantly at work against one another in a system and should be considered here, since they directly affect the openness of the system. Entropy¹ is a "measure of disorder in the universe, and its characteristic tendency is to increase" (Ascroft, 1969, p. 63). According to Ascroft, organization² is the measure of opposition to the entropic process and the presence of structure in the system.

Closed systems are static, incapable of exchanging energy with their environments, and are characterized by

¹The entropic process, according to Katz and Kahn (1966, p. 21), is a universal law of nature in which all forms of organization move toward disorganization or death. Complex physical systems move toward simple random distribution of their elements and biological organisms also run down and perish. The open system, however, by importing more energy from its environment than it expends, can store energy and can acquire negative entropy. There is a general trend in an open system to maximize its ratio of imported to expended energy, to survive and even during periods of crisis, to live on borrowed time. To survive, systems must move to arrest the entropic process; they must acquire negative entropy (organization).

²Organization, as it is used here, is synonymous with negentropy, which Katzman (1970) defined as the degree to which there is structure in a system. In a thermodynamic system, for instance, it is the degree of patterned, non-random distribution of matter and energy.

a tendency for entropy to increase. Open systems are dynamic, maintain a continuous interchange of energy and component materials with their environments and are characterized by a limited and temporary tendency for organization to increase.

One might find a steady state at any given point in time within either an open or closed system. A steady state is defined as the composition of the system remaining constant, a state of equilibrium. According to Rölöing (1970, p. 29), a steady state can be a "dynamic equilibrium (open system) or a static equilibrium (closed system)." In other words, an open system may have boundaries, however, they are at least partially permeable.

Open-system theory, with its entropy assumption, emphasizes the close relationship between a structure and its supporting environment, in that without continued inputs the structure soon runs down. Thus, one critical basis for identifying social systems is through their relationships with energetic sources for their maintenance. The substance of open-system theory is pointed out by Griffiths (1964, p. 430):

. . . any open system has supra-systems and sub-systems. Let an organization be considered as an open system, comprised of human interactions, that maintains a definite boundary. Further, consider administration as an open sub-system, and the environment as a supra-system. The administration sub-system is located at the point of tangency of the three systems (as in Figure II-1).

When we consider the openness of a system to its surrounding environment in the present study, we are taking

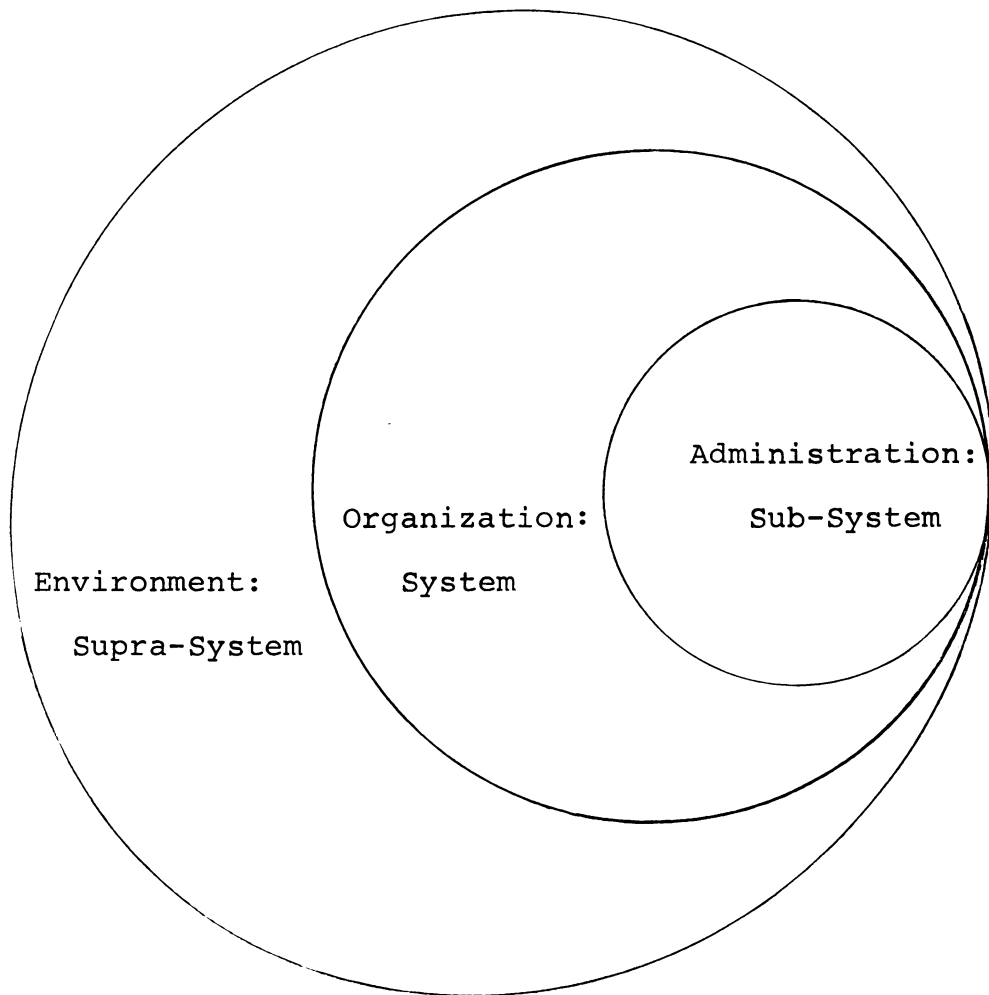


Figure II-1. Griffith's open system theory.

into consideration the relationship of the system itself to its own sub-systems and supra-system.

Katz and Kahn (1966), Miles (1964), and others provide controversy about the effects of an open system on change and innovation. Some authors state that an open system produces stability and infrequent change because of the stable, mechanical system necessary to keep information flowing in and out of an organization. Others conversely feel that the major impetus for change in an organization comes from outside the organization because of the fresh approaches that exogenous information brings with it. As pointed out by Rao (1966), it appears that most energetic inputs such as new ideas must start outside a given system, and continue to flow into it if that system is to survive. Although we pointed out in Chapter I of the present study that innovations often enter a system at the top of the system hierarchy, it is possible for information to enter a system at lower levels. The system openness hypotheses assume the possibility of innovations entering a system at these lower levels, through the teachers rather than from the school administrators.

The evidence presented thus far points out that:

1. The nature and extent of innovativeness in an organization depends upon an effective linkage between that organization and the external information environment.

2. It is necessary for an organization to be open to extra-system communication channels in order to successfully acquire the negentropy necessary for organizational survival.
3. An organization must remain open to extra-system communication channels if it is to achieve a dynamic equilibrium, a steady state in an organization which is still partially permeable and viable.

Given such evidence, the following empirical hypotheses relating to the general hypothesis concerning system openness will help operationalize system openness and attempt to prove its relationship to the more innovative systems.

General Hypothesis: Innovative schools depend more heavily on extra-system communication exchange than non-innovative schools.

Hypothesis 1: Teachers in innovative schools read more professional journals than those in non-innovative schools.

Hypothesis 1 is intended to test the relationship between innovativeness and a high degree of system openness through the examination of the number of professional journals read by the teachers in the system. Professional journals are regarded here as an important source of education information from outside the system.

Rogers (1962, p. 102) states that there have been direct relationships found by several researchers between a high degree of openness in a system toward outside information sources, and innovativeness.

The spontaneous self-improvement which is involved in reading professional journals should be an indicator of the openness of the system members to extra-system information.

Hypothesis 2: Teachers in innovative schools attend more extra-system professional meetings than teachers in non-innovative schools.

Extra-system professional meetings, as herein used, are meetings of an educational information nature, such as regional or state educational association meetings, which involve people from more than one school district. These meetings clearly are extra-system information sources by our earlier definition of system boundaries. Such meetings disseminate information stemming from their own level or often from levels even further removed from a particular school or school district, such as national and international levels. Professional meetings are considered to definitely be sources of extra-system information and should prove to be direct indicators of system openness.

According to Fox and Lippitt (1967), teachers participating in summer workshops became more innovative than teachers who did not attend the workshops and were more successful in bringing about change in their own systems.

Rogers (1963, p. 256) stated that, "It has been found that teachers who attend out-of-town educational meetings are more innovative. This suggests that sending teachers to workshops, conferences, and lectures, where they may be exposed to new educational methods, may be a wise investment."

Hypothesis 3: Teachers in innovative schools engage in extra-system interpersonal communication more than teachers in non-innovative schools.

Some researchers have found that messages emanating from outside the social system, cosmopolite sources, are often more technically accurate than localite sources.

Cosmopoliteness is "the degree to which an individual's orientation is external to a particular social system" (Rogers, 1962, p. 19). Researchers suggest that cosmopolite communications are more important for the members of a social system to learn of a new idea. Information about innovations usually emanates from sources external to the system.

Researchers found that opinion leaders¹ are more apt to engage in extra-system communication than their followers. From this notion, it is the contention in Hypothesis 3 that the entire teaching staff of an innovative school would enter into more outside communication than would the teaching staff of a non-innovative educational system.

Hypothesis 4: Opinion leaders in innovative schools read more professional journals than those in non-innovative schools.

¹An opinion leader is defined as an individual from whom others seek information and advice (Rogers, 1962, p. 16). While Rogers points out that an opinion is not usually an "innovator" (Roger's designation for the first in a system to adopt an innovation), he does state an opinion leader is usually an early adopter and a highly innovative person.

Hypothesis 5: Opinion leaders in innovative schools attend more extra-system professional meetings than opinion leaders in non-innovative schools.

Hypothesis 6: Opinion leaders in innovative schools engage in extra-system interpersonal communication more than opinion leaders in non-innovative schools.

As previously pointed out, researchers indicate that opinion leaders are more apt to engage in extra-system communication than their followers. Hypotheses 4, 5 and 6 test whether or not opinion leaders in an innovative system are more apt to engage in extra-system communication than those in a non-innovative system.

The narrative section under Hypotheses 1, 2, and 3 explicated that relationship between system openness and three variables. The same explanations apply to Hypotheses 4, 5, and 6, except that we now approach the three tests of system openness and its relationship to innovativeness through an examination of the opinion leaders and their information sources, rather than the entire teaching staff of each school.

There is some basis for the postulations in Hypotheses 4, 5, and 6 concerning opinion leader behavior. Lionberger (1962, p. 238) findings indicate that former opinion leaders subscribed to and read a comparatively higher number of magazines and newspapers, and belonged to more organizations than the non-opinion leaders. Menzel and Katz (1962, p. 238)

found that more influential medical doctors were most likely to receive information about drugs from professional journals. It is further reported by Rogers (1962, p. 238) that opinion leaders relied heavily upon extra-system, or cosmopolite, sources of information.

In his study of modernization processes in peasant villages, Rogers (1969, p. 229) pointed out that, "In the traditional villages where to be cosmopolite is to be deviant from localistic norms, the opinion leaders are less cosmopolite." Rogers further stated that an opinion leader is highly conformist to the system norms.

Hence, Hypotheses 4, 5, and 6 test if findings concerning the opinion leader's propensity to exchange information with outside sources is more likely to be applicable to innovative systems than to non-innovative systems.

Communication Integration

Communication integration, the second of the two concepts in the study, is concerned with an open, uninterrupted communication flow within a system. Communication integration is the interconnectedness of the units within an organization.

Guimaraes (1970, p. 10) defined communication integration as "the degree to which the sub-systems or individuals in a communication system are structurally interlinked." Communication integration, or the lack of it, is a process variable which ranges on a continuum and is measured as the degree to

which all members of an organization or system relate to each other through the exchange of symbolic content. It is evident from the foregoing definition that the concept of communication integration includes not only the interpersonal relationships between individuals at the dyadic level, but also between individuals and subgroups and between subgroups themselves. These subgroups constitute the total communication structure of an entire social system.

Guimaraes (1970) carried out an analysis to examine the relationship between external and internal communication integration¹ and innovativeness. Two relatively modern Brazilian villages, in the Guimaraes study, show considerably higher levels of communication integration than do two relatively traditional social systems. A tentative conclusion was that "modern social systems seem to exhibit relatively higher degrees of both internal and external communication integration" (Guimaraes, 1970, p. 18).

We selected the following general hypothesis and empirical hypotheses concerning the relationship between communication integration and innovativeness.

General Hypothesis: Innovative schools have a higher degree of communication integration than non-innovative schools.

¹Guimaraes' "internal integration" concept corresponds with our concept of communication integration. His "external communication integration" is the same as what we have labeled "system openness."

Hypothesis 7: Teachers in innovative schools receive more frequent downward communication from administrators concerning the adequacy of their work than is received by teachers in non-innovative schools.

The type of downward communication in question here is really a form of feedback. We define feedback as return communication providing the initial source with information concerning his success in accomplishing his objective. Such feedback is vital to communication integration within a system because of its loosening effect on the internal flow of communication and its strengthening effect on organizational morale.

Experienced personnel directors and successful managers feel that subordinates are better able to function and will be more apt to operate successfully in a free communicative manner when they receive frequent and meaningful downward communication from their superiors. Such a notion concerning downward communication seems to be true even if the nature of the communication is corrective concerning the performances of subordinates. In short, as long as superiors control the rewards in the system, their subordinates need to know where they stand at all times from an evaluative point of view.

In the present study the more innovative school systems were expected to have a comparatively higher rate of downward communication because of the perceived effect of downward communication upon the free flow of communication in the internal system.

Hypothesis 8: Innovative schools have more vertical communication flows, while non-innovative schools have more horizontal communication flows.

An examination of the direction of communication flows within an organization should tell us a great deal about the communication integration of the systems, since the direction of communication deals with the flow of communication within the organization. The direction of the flow may suggest the degree of freedom in the internal communication channels and whether it is possible for information to pass vertically or if it can move only horizontally.

The information requirements of superior and subordinate are not symmetrical. What the superior wants to know is often not what the subordinate wants to tell him; what the subordinate wants to know is not necessarily the message the superior wants to send. The difference exists because their social status, goals, needs, and expectations are not the same and in some cases they are not even similar. The greater the conflict between the communication needs of these two hierarchically situated senders and recipients of information, the more likely lateral communication is to increase. Among peers, there is greater complementarity of information needs. When a foreman finds little reception from his superior, he will turn to fellow foreman to talk about his problems.



Most innovations enter the system at the top and if the system is well integrated, they flow downward. The basic assumption here is that when change occurs in an organization, it occurs from the top down while change coming up from the lower echelons is less frequent. As it is noted by Miles (1964, p. 435), "A hierarchical order would enable change to occur from the top down, but the relative independence of the sub-systems would tend to slow down the rate of change." The structure makes change from the bottom very difficult; one would expect little, if any change, to be introduced in such a way. Such a statement seems even more true when one considers that in most organizations the organizational power resides at the top.

There has been little empirical research concerning the direction of communication flows and their effect upon the organization. Katz and Kahn (1966, p. 247) point out that there are no studies of the distinctive types of communication which characteristically flow horizontally, upward, or downward in organizations, although such research is much needed.

Hypothesis 8 is an attempt to link vertical communication with a higher degree of innovativeness and horizontal communication with a lower degree of innovativeness. Such a linkage is important in better establishing the relationship between innovativeness and the direction of the flow of communication within an organization.



Hypothesis 9: Innovative-schools have a higher degree of sociometric communication integration than non-innovative schools.

The sociometric patterns and links in an organization are probably the best single indicator of the degree to which an organization is integrated. The foregoing is true primarily because group cohesiveness¹ is, in fact, another way to measure communication integration.

The major thrust of Hypothesis 9 is that innovative schools will have a more closely integrated communication system than non-innovative schools. Such a sociometrically-integrated system has more individuals linked to each other in communication and fewer isolates² and segregated cliques³.

¹Group cohesiveness is a combination of all the factors which draw individuals to a group and keep them there such as attractiveness, friendship choices, common goals, etc.

²According to Lin (1966), an isolate is defined as an individual who has no apparent relationships with other members of the system and neither nominates nor is nominated by any other individual in the organization.

³Cliques are sub-groups within a larger group who do not connect or communicate with other major groups in the organization. A clique is a set of individuals who interact more frequently with members of that set than they do with other social system members outside the set. Cliques can be effectively cohesive internally, however, they tend to have a divisive effect upon the larger group unless there are contacts between the cliques.

Research, though not extensive, has shown that innovativeness is related to an integrated sociometric pattern. Lin (1966) found that, on a comparative basis, the most innovative school systems had highly integrated communication patterns, while the less innovative systems configured into several small cliques and some isolates.

Hypothesis 9 is an attempt to substantiate the Lin (1966) and Guimaraes (1970) findings concerning the relationship between innovativeness and an integrated communication pattern.

Hypothesis 10: Innovative schools have a higher degree of participation than non-innovative schools.

Participation is the engagement of the individual in the system so that he is involved in decisions which affect him as a system member. In a participative system the individual has both a voice and a vote in the sub-system in which he functions and in the representation of that sub-system in the larger structure. Such participation also guarantees him an opportunity to share through his own involvement in the rewards of the group cooperation that constitutes the system. Coch and French (1948) point out that research shows that industrial workers who were given such opportunities for discussion accepted innovations in work procedures much more readily than did workers in situations where no discussions were allowed. It seems clear that the more participative a system is, the more integrated the communication will be.



Since reaching a group decision is normally a frustrating and time-consuming process, the rate of adoption of innovations is usually faster by the authoritative approach¹ than by the participative approach. Changes brought about by the authoritative approach, however, are more likely to be discontinued than those brought about by the participative approach due to the lack of individual involvement and commitment to the final decision which is missing in the authoritative approach.

"A belief by the membership that they have a reasonable control over group decisions seems to generate an interest on their part in the goals" (Cartwright and Zander, 1968, p. 407). Therefore, through the perceived commonality of goals, the members should be more apt to turn the system into an innovative one.

Hypothesis 10 attempts to explore and test for the foregoing relationship. According to Katz and Kahn (1966, p. 380), "The involvement of the individual in a system so that he regards its goals as his own personal objectives has seen little study."

¹The authoritative approach to decision-making is the opposite of the participative approach in that the group is not involved in the decision. Decisions are made unilaterally and flow down from the top of the hierarchy in the form of rules and policies.



Hypothesis 11: Opinion leadership is more concentrated in innovative schools than in non-innovative schools.

Opinion leadership concentration is the degree to which influence and power is concentrated in one or more units in a social system. Opinion leadership in a social system can be either widely distributed over the entire communication structure or concentrated in the hands of a few individuals. It is felt that the highly innovative system is produced by a system with greater unanimity in the designation of opinion leadership choices. The ability of the members of a system to accept and designate their opinion leaders should indicate an integration in the organizational communication system rather than a disjointed system with no universally accepted opinion leadership.

It seems that if individuals in a social system can readily identify opinion leadership, the social system in question is highly integrated with clearly structured internal communication lines. High opinion leader concentration should help provide a more clearly defined internal information source for system members and, hence, indicate a more effective communication integration structure.

While formal research in the area of opinion leadership concentration is limited, there has been a great deal of speculation concerning the relationship of leader concentration to innovativeness.



Summary

The present study is designed to examine the relationships of certain communication behaviors on the innovativeness of selected secondary schools. The format of the study is to examine these relationships through two general concepts; system openness and communication integration, which are operationalized through 11 hypotheses (Figure II-2).

In general support of our hypothetical construct, Carlson (1965, p. 6A) provided findings which speak to the relationship between the degree of innovativeness and certain communication behaviors contained in some of our hypotheses.



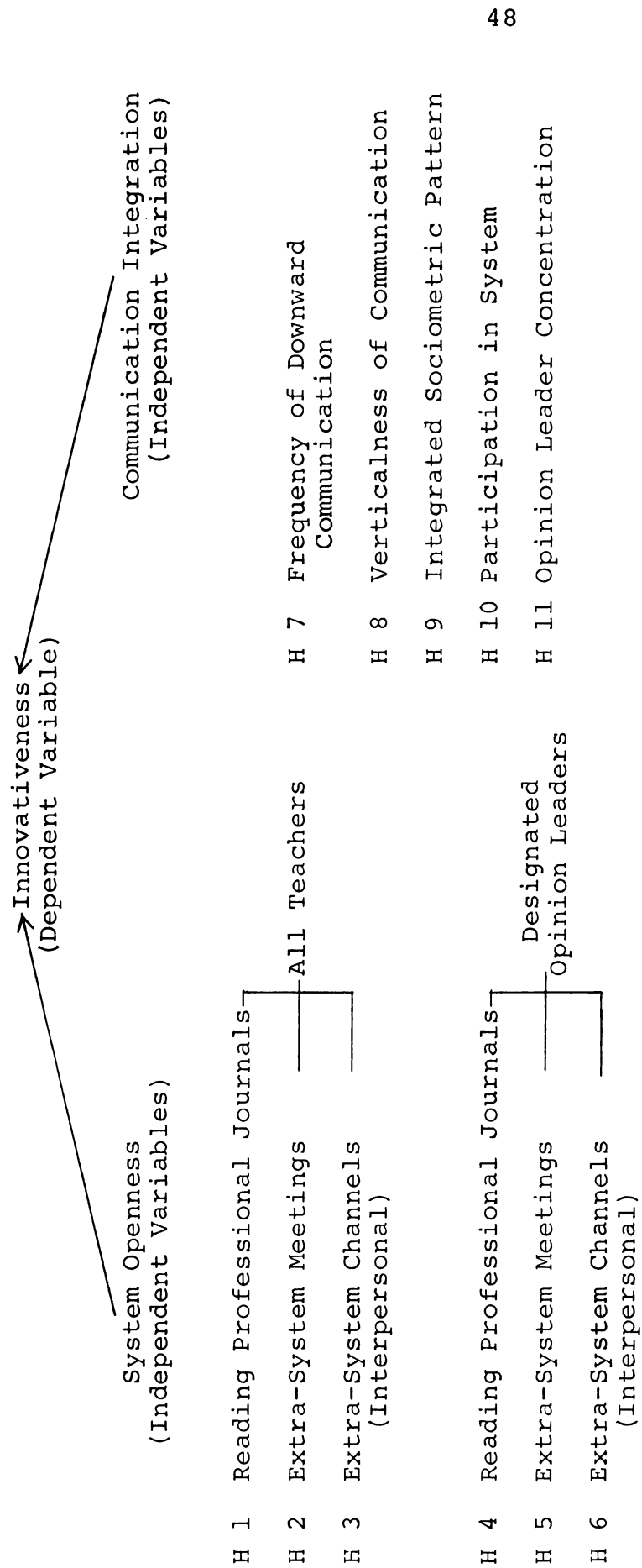


Figure II-2.--Paradigm of hypotheses



CHAPTER III

METHODOLOGY

Chapter III will describe the physical settings for the research, the method of data-gathering, the operationalization of hypothetical terms, and the various methods of data-analysis used.

The Settings

The settings for the present study were four secondary school systems in Northern Michigan. These schools are relatively small, employing 8 to 29 teachers each. Two systems were predesignated as "innovative" and two as relatively "non-innovative".

The main reason for choosing only secondary schools is that many educators agree that in any given system or size level, elementary schools and teachers have a tendency to be more innovative than similar secondary schools. Therefore, it might cause a loss of control in the study to mix elementary with secondary systems. Additionally, since innovativeness is our dependent variable, it is important to hold the characteristics of the predesignated cells as constant as possible in every aspect except innovativeness while observing the independent variables.



Comparatively small schools were chosen because of their apparent tendency toward greater comparative disparity between the innovative and non-innovative. Rogers (1963, p. 255) asserts that:

A high relationship has been found between the financial resources of a school system and its innovativeness. In fact, outstandingly innovative school systems are usually located in particularly wealthy communities. At the same time, however, it is important to remember that not all rich schools are innovators and that not all schools that innovate are rich. The community's attitude about providing support for the school's costs is obviously an important intervening variable between community wealth and school innovativeness.

From the Rogers statement we assume that larger communities have a larger school budget with which they work and perhaps a greater tendency toward modern goals. These larger budgets may quite possibly be a major reasons for innovativeness in larger school systems. It was felt that in choosing both the innovative and non-innovative school systems from small, traditional type areas with limited financial support, we would be dealing with systems which were innovative or non-innovative mainly because of a desire, or lack of it, for more effective learning by their children. In other words, we wanted to deal with innovative schools that apparently are innovative because of a desire to be so and not due to a "surplus of money, so why not give it a try" attitude. Such a wide disparity in innovativeness, which does not seem as if it would be as pronounced in larger school systems, makes identification of polarized innovativeness in the selected schools easier and more justifiable.



The predesignated degree of innovativeness of each system was established by one outside source and verified by another. The source establishing the original innovativeness is a special project, Impact 7, operating out of Title III of the Elementary and Secondary Education Act¹.

Impact 7² is headquartered in Reed City, Michigan and is involved in assisting certain school systems in the

¹The divisions of the Elementary and Secondary Education Act passed by Congress in 1965 are all designed for different educational purposes. Impact 7 is a program which comes under Title III of the ESEA. Title III, for the purpose of developing innovative ideas in education, is formally established as Projects to Advance Creativity in Education, abbreviated as PACE.

²The stated philosophy of Impact 7 is as follows:

We believe there is a need for greater and continuous exposure to the expanding world of education, therefore we perceive our task as providing opportunities to explore and develop educational trends both inside and outside the Impact 7 area, recognizing that school districts and individuals must ultimately decide their own course of action.

The activities of the Project over the past three years have been varied. One such activity is the Voyager magazine, a publication developed within the Impact 7 area, concerning the Impact 7 area. It is designed to strengthen and promote an awareness of the cultural, social, economic and educational heritage of the area.

Other Project programs are a series of workshops, conferences and seminars designed to expose educators to the latest trends in education. They are planned according to the needs and desires of area educators and "sabbaticals", which are live-in, work-in experiences in innovative schools outside the Impact 7 area, have been provided to a limited number of educators upon application approval. These sabbaticals have not been approved on any quota-per-school basis and have ranged from several days to two weeks in length.



Northwestern quadrant of the State (see Appendix A) with the development of innovative educational programs. The seven counties of the Impact 7 area include five intermediate school districts. These intermediate school districts are combinations of local school districts which often cross county lines and are brought together for the purposes of better planning and improved programs. The five intermediate school superintendents decided that ESEA Title III could serve some of the educational needs which exist in the area. In order to qualify for Title III funds, it was necessary to design and submit a plan. A planning project was submitted to the Federal government and approved to survey the needs of the local schools and to compile a proposal to meet these needs. The planning project resulted in a proposal which was submitted to the U. S. Office of Education. The proposal was approved and Impact 7 began operation on June 28, 1967 for a three year period.

The primary Impact 7 Project was an invitation which was extended to all school systems in the seven counties to submit proposals for funds to operate "Lighthouse Projects." These "lighthouses" were to be innovative educational programs which could serve as demonstration centers for the enrichment of the entire field of education. Of the proposals submitted (many school districts did not submit), seven were selected. The selected projects were concerned with the following:



1. Elementary School Guidance and Perceptual Development
2. School Community Relations
3. Extended School Year
4. K-12 Scheduling Revision
5. Flexible Scheduling-Ungraded Elementary
6. Individualized Instruction and Non-Graded Elementary
7. K-12 Comprehensive Health Program

After nearly three years of working with all of the schools in the seven county area, particularly those in the seven selected projects above, the Impact 7 staff named schools in their total Project area who have adapted or tried their suggested programs as "innovative" and those schools who were reluctant or refused to accept the ideas as "non-innovative". It is possible that Impact 7 looked favorably toward their programs. However, the variety of innovative programs offered by Impact 7, and whether a school would accept or reject such programs, appear to be valid indicators of innovativeness.

These predesignated innovative and non-innovative schools were verified further by Dr. William Force, a professor in the School of Education at Central Michigan University. In his research, Force attempted to determine the effects of innovative and non-innovative schools on the attitudes and teaching effectiveness of first year teachers.



Force presented the schools designated to him by the Impact 7 staff with a curricular practices poll listing 25 recent educational innovations (Appendix B) and asked the teachers and administrators to check the practices which they had tried or were presently practicing. The resulting scores were computed by totaling the number of innovative practices adopted by each school system. The range of scores were from 0 to 13 and those schools with scores from 7 to 13 were considered by Force to be innovative and those with scores from 0 to 3 were the non-innovative schools. The innovative schools selected for the present study had scores of 13 and 12 on the Force instrument and the scores for the non-innovative schools selected were 1 and 0.

In the present study we selected schools in the Impact 7 area which were designated by the Project staff as innovative or non-innovative, and verified by the Force research as our subject systems. Schools on extreme ends of the innovativeness continuum were chosen rather than schools with varying degrees of innovativeness located all along the continuum. While an "extreme group" approach leaves out a sizable amount of data concerning innovative systems located between the extremes, it does provide excellent comparative data in an exploratory study such as the present study. Future studies with more prior research from which to draw should include selected systems from along an innovativeness continuum rather than only the extremes.

The schools predesignated to the present study as innovative or non-innovative varied in size. However, since we wanted to study the designated schools as they existed from a field study point of view, the size differential had to be a secondary consideration. All schools, however, are in the Northwestern quadrant of Michigan, all are in the seven county Impact 7 area, and all are consolidated¹ school districts.

In order to maintain the necessary anonymity promised to the schools under study, we shall hereafter refer to the two innovative systems as I-1 and I-2 and the non-innovative systems as N-1 and N-2.

School I-1

School I-1 has been a consolidated school district for about four years and is still a small school by most standards. They have eight teachers and approximately 170 students in grades 7 through 12. This school, although it is very small,

¹In these rural areas it became necessary several years ago to consolidate, to combine several smaller school district in order to maximize the resources available to each system and offer the best possible program to the students.

is operating a modular scheduling¹ program. All of the teachers in I-1 have visited other innovative schools within the last two years. By the judgement of the Impact 7 staff and by their own self-perceptions school I-1 is a highly innovative, modern system. School I-1 had a score of 13 on the curricular practices poll administered by Force.

During the Spring of 1968 the staff of school I-1 began to put many of the ideas they had gathered from Impact 7 and extra-system visitations into operation. The teachers experimented with different teaching methods and worked with such activities as large and small group instruction, open labs, independent study, self-pacing and non-grading (no marks). All such experimentation was done within the confines of the existing high school schedule.

The experimentation led to the development of a modular flexible scheduling program, which was put in operation with the opening of school in September, 1969. The schedule

¹Modular scheduling is a teaching method which divides the school day into equal time segments and usually is operated daily on a demand basis so that each class may not meet for the same amount of time each day. For instance, the school day might be broken into 24 fifteen minute modules. Each teacher establishes the amount of time he needs on each day in order to handle whatever unit the class is studying. It might be one module today and three modules tomorrow. Some types of programs which can be run with modular scheduling are expanded field trips, open labs, seminars and activity packages, which enable students to learn almost independently of formal classes and at their own speed.

operates on an eight day cycle and consists of twenty-one, 20 minute modules or class periods. Staff members have also added new courses to the curriculum and are working with learning activity packages for independent study. In addition, formal study halls have been eliminated and the students are provided with a quiet area and an informal area for use during their unscheduled time.

School I-2

School I-2, a consolidation of several school districts, has been in existence about 19 years. The present school has 15 teachers and approximately 300 students in grades 7 through 12. Every teacher in School I-2 has visited at least one innovative school outside their own system through an Impact 7 visitation program within the last two years and the school is also presently operating an Impact 7 program in modular scheduling. I-2 achieved a score of 12 on the curricular practices poll.

In the Spring of 1968, the school I-2 staff decided to give a flexible or modular program a trial. Staff members built the schedule and made the decision as to the amount of formal classroom time they would use for the program. The program consisted of a hand-generated daily demand schedule of thirteen, 30 minute class periods or modules. Formal study halls were discontinued and the student was given the responsibility for handling his unscheduled time.

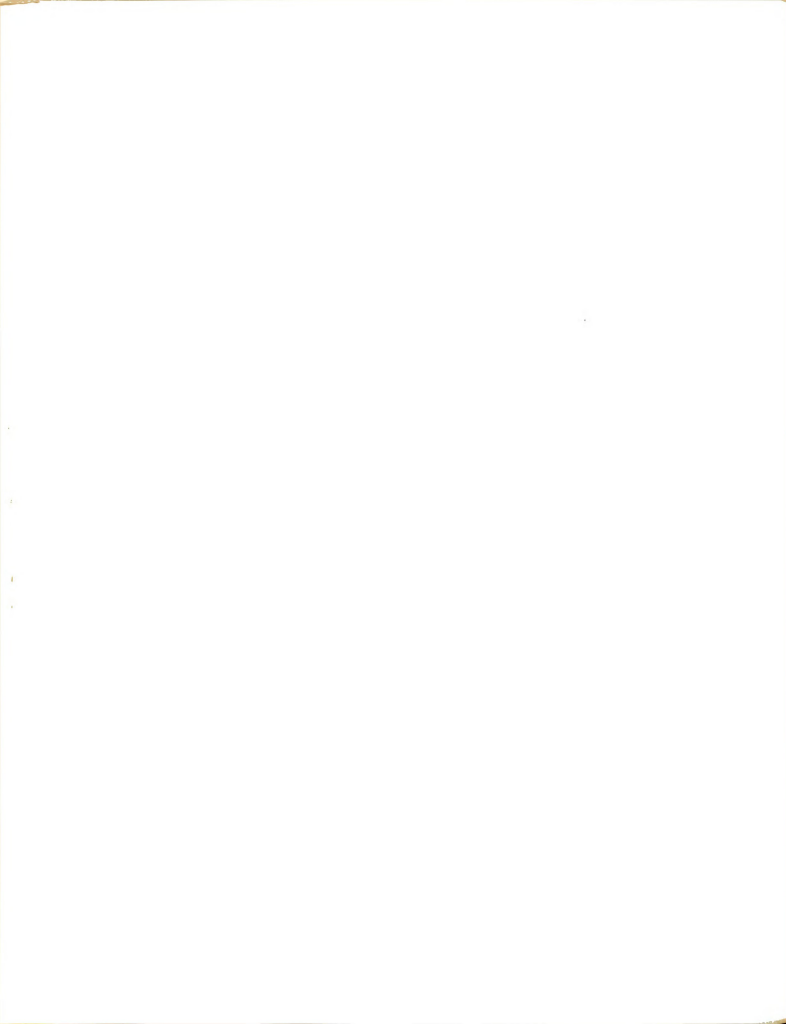


Drawing upon this previous experience, a six day cycled flexible scheduling program was put into operation in the Fall of 1969. The schedule consisted of 19 class periods or modules of 20 minutes in length. Under the current program many new activities are being tried by the staff such as independent study, open lab, large and small group instruction, learning activity packages, seminars, combined studies programs, and the introduction of new class offerings.

School N-1

School N-1 is a five-year-old consolidation of three school districts. The school has 23 teachers and approximately 475 students in grades 7 through 12. The school has a fairly new junior and senior high school building and a new principal in 1969-70. An interview with the principal indicated that he had occasionally attended Impact 7 conferences, some of his teachers had used some of the Impact 7 services, but that no attempt had been made to try a lighthouse project or take part in Impact 7 in any major way. School N-1 had a score of 1 on Force's curricular practices poll.

School N-1, although it has 23 teachers, only consists of 21 respondents since the principal explained that two individuals simply did not wish to answer the questionnaire and he would not pressure them to do so. One can only speculate what the reasons for the two refusals might be. The reasons the two respondents refused to answer and return their



questionnaires will be a subject for further discussion in Chapter V.

School N-2

School N-2 is a three-year-old consolidation which temporarily operates grades 11 and 12 in one building and grades 9 and 10 in another building, approximately 10 miles away. The school has 29 teachers and approximately 670 students in grades 9 through 12. The seventh and eighth grades were not included here because they were located in several different elementary buildings. The principal, who has been in the system for two years, stated that a few of his teachers had used Impact 7 services on a strictly voluntary basis, but that no major programs of Impact 7 had been used or applied for. N-2 had a score of 0 on the curricular practices poll administered by Force.

Interestinly, school N-2 had difficulty at the beginning of the 1969-70 year with a teacher concerning his beard and long hair. The school finally was forced to allow this teacher to teach his classes without removing his beard by court order. The court order came only after the involvement of such organizations as the American Civil Liberties Union.

Neither school systems N-1 nor N-2 are presently involved in innovative educational projects by their own admission.



Data-Gathering

The data were obtained via a field survey in which the unit of analysis was the individual teacher in the selected schools. The survey data were collected from all teachers in each system via a questionnaire (Appendix D) which was mailed to the administrators, distributed, and answered in writing by the respondents.

The field survey seemed to lend itself very well to the testing of the particular set of comparative hypotheses which were described in Chapter II. The survey approach also makes possible the inexpensive collection of comparable material so that the results may be expressed in quantitative terms and statistical methods may be employed in the analysis. Survey research has, however, been criticized for its lack of control over extraneous variables. The findings from survey research, it is said, lack the validity in determining relationships between the dependent and independent variables.

On the other hand, the laboratory experiment has been criticized for its narrow definition of the population and for its use of an unnaturalistic environment. A field survey, such as the present one, may avoid such a narrowness of definition through the gathering of the data as it exists in its natural environment.

In order to gather firsthand data on a social organization, the researcher must get within seeing and hearing distance of that organization. To come close to an organization, however, is to be exposed to the very social forces the researcher wishes to investigate, for no organization is apt to be willing to be treated solely as an impersonal means to the ends of some outsider--even if those ends are the advancement of knowledge. No investigator is capable of behaving in a completely neutral and detached manner when in the process of interacting with other human beings. Such a bias effect from interaction is eliminated when the main source of data is a written questionnaire.

To be allowed to remain close to the subject organization, a researcher must not only abide by the general norms regulating his conduct as a social scientist, he must also respect the norms of the particular group he wishes to study. With this thought in mind, the decision was made to honor the request from the four school principals that they be allowed to administer the instrument to their teachers. It must, at the same time, be realized that one must carefully draw up the directions, purposes, cover letters, etc. due to the potential difficulty of someone not as familiar with the study as the researcher administering the research.

The questionnaires were administered in two parts. Part I asked for the name of the respondent and some personal data.

Part I included questions such as the sociometric questions, which require identification of the respondent in order to identify who talks to whom. Part II was anonymously answered and contained system evaluation questions which probe the opinions of the individual. Hopefully, the anonymity put the respondent at ease and gained a maximum accuracy of response. The instrument also included control questions such as age, education level, years in the school system, radio listening and television viewing habits, and newspapers reading habits of the respondents.

Carlson (1968, p. 19) pointed out that in his own studies of school staff characteristics he has sometimes produced inconclusive results which may be the result of asking the wrong questions. With the danger of asking the wrong questions or too many questions in mind, we tried to ask only the questions necessary to gain the desired information to test the hypotheses and to word the questions as directly and completely as possible.

The questionnaires were mailed to each of the four school principals with explicit instructions for administering them and an instructional cover letter (Appendix C) to the respondents was attached to each questionnaire.

The completed questionnaires were picked up by the researcher approximately one week after mailing them. During the visit to the schools, the week of May 25, 1970, each school was observed in operation and the principals were interviewed by the researcher.

Operationalization of Concepts
and Techniques of Measurement

A degree of clarity has already been established through the operational definitions for innovativeness, system openness, and communication integration in Chapter I and II, however, we must now make clear how the instrument operationalized the concepts in the empirical hypotheses, (Appendix D). The operational definitions will include references to the appropriate questions in the instrument, which may be examined further in Appendix D.¹

A list of professional journals read, extra-system education publications regardless of their academic area, was requested of each respondent. The respondents were asked to list the journals which they read regularly and those which they read occasionally, in Part I B-5 of the instrument. Those journals listed as read occasionally were assigned a score of one and those read regularly were assigned a score of two. The total of these two responses was the individual score for journals read by the respondent. The score of two for those journals read regularly was intended to give stronger weight to more regular reading habits.

In the operationalization of professional meeting attendance, the respondents were asked in Part I B-4 to

¹Part II A of the questionnaire was included for use in another paper by this author and is not a part of the present study.



record the number of professional educational meetings attended in the past two years involving educators from "more than one school district". Such professional meetings might be educational association meetings or institutes. It was felt that the "more than one school district" stipulation indicates that only meetings involving extra-system communication and information sources are to be listed. The total number of meetings attended by each individual was their meeting attendance score.

To determine the use of interpersonal extra-system communication channels, the subjects were asked in Part I B-6 of the instrument if they received most of their "insights and new ideas regarding education" from discussions with educators within their own school district or from educators outside of their own district. The subjects had to choose one of these two answers which determined whether they relied more heavily upon interpersonal information sources inside or outside of the system. The results were scored according to which of the two choices were selected by each respondent.

We examined these measures of journals read, meetings attended, and interpersonal sources of information both in relation to all of the teachers in each system and then in relation to the opinion leaders designated by their peers.

Opinion leaders in the present study are members of the system who were selected by their peers in Part I C-1 of the questionnaire as the persons "whose opinions on educational changes" were most valuable to them. The 30 per cent of the teachers receiving the most nominations in each school system were designated as the opinion leaders. The selection of 30 per cent was an arbitrary one designed to include the several top choices from each school and, at the same time, provide at least five choices in the innovative and non-innovative cells to allow the use of certain statistical measures.

The frequency of downward communication was operationalized as a type of feedback from the principal. The subjects were asked two questions, Part II B-3 and B-4, regarding downward communication from administrators. The subjects were asked if the principal "offers suggestions" to help improve their teaching performance, and whether or not the principal let them know when he "heard any criticism" of their teaching performance. Each of the two questions offered the following answers:

(Scores)

- (4) Very frequently
- (3) Quite frequently
- (2) Once in a while
- (1) Quite infrequently
- (0) Never

Summing these assigned values for the two questions, scores could range from 0 to 8.

In measuring the direction of communication flow within the school systems, we asked each subject to tell us whether they discussed their teaching problems with the school administrators (vertical communication), or with their fellow teachers (horizontal communication). The subjects had to choose between these two responses and the results were scored according to which of the two available choices were made by each subject in Part II B-5 of the instrument.

The degree of sociometric integration was determined by asking each respondent to name the teachers in their school with whom they talked most frequently, Part I C-2, to determine to whom they were linked and consequently if the system was configured in a multi-linked sociometric pattern or if it had several small cliques and one or more isolates. The instrument provided three spaces for nominations, however, there were a few respondents who nominated more or less than three people. Most respondents, however, listed three choices. The scoring here was how many nominations were received by each member of the system. The nominations were the key to the method of analysis used here which will be discussed further in the next section of the present chapter.

Participation was defined as the role in decision-making played by the members of the system.

The instrument asked two questions concerning participation, Part II B-1 and B-2. One asked if the principal usually asks the "teacher's opinion when making a school decision" involving their work. The second question asked if it is unusual for the teacher "to take part in discussions which results in decisions regarding school problems and activities". The scaled choices offered to the respondent were as follows:

Agree very much
Agree on the whole
Agree a little
Don't know
Disagree a little
Disagree on the whole
Disagree very much

These scales were assigned values from "0" to "6"; however, the scores ran in the opposite order in the two scales, since one question was worded positively and one negatively. Summing the two scores provided a potential total range from 0 to 12.

Opinion leadership concentration is the degree to which more units (individuals in the present study) in a social system are perceived to have a relatively greater concentration of interpersonal influence or power as opposed equal power among all system members. The present study is concerned with opinions on educational change. The related item, contained in Part I C-1, asked each respondent to name the three teachers

in their school "whose opinions on educational changes are most valuable" to them. The responses were scored by summing the nominations received by each member of the system.

Data-Analysis

The collected data were analyzed by a variety of appropriate procedures. Bearing in mind that the study is a comparative study, we used several methods of analysis where they seemed feasible, including statistical methods in some instances. We compared the communication behaviors (the independent variables) in relation to pre-designated innovativeness or non-innovativeness (the dependent variable) of the schools.

The tests used with each hypothesis are shown in Table III-1.

Analysis of Variance

One-way analysis of variance is a parametric statistical method. There are certain assumptions of parametric statistics which must be met: A normal distribution, homogeneity of variance, and equality of intervals¹. It is advisable, wherever

¹Normal distribution assumes that the sample is drawn from a population that is normally distributed. Homogeneity of variance assumes the variance within group's homogeneous from group to group within the bounds of random variation. Equality of intervals assumes that the interval between each score is equal and continuous.

TABLE III-1.--Basis for Testing the Independent Variables.

Hypothesis	Unit	Independent Variable	Basis for Testing Hypothesis
H 1	All Teachers	Reading Professional Journals	Analysis of Variance
H 2	All Teachers	Extra-System Meetings	Analysis of Variance
H 3	All Teachers	Extra-System Channels (Interpersonal)	Chi Square
H 4	Opinion Leaders	Reading Professional Journals	Analysis of Variance
H 5	Opinion Leaders	Extra-System Meetings	Analysis of Variance
H 6	Opinion Leaders	Extra-System Channels (Interpersonal)	Chi Square
H 7	All Teachers	Frequency of Downward Communication	Analysis of Variance
H 8	All Teachers	Direction of Communication Flows	Chi Square
H 9	All Teachers	Integrated Sociometric Pattern	Visual (Matrix Multiplication)
H 10	All Teachers	Participation	Analysis of Variance
H 11	All Teachers	Opinion Leadership Concentration	Visual (Gini Ratio)

possible, to use parametric statistics because of their greater accuracy and validity than non-parametric statistics.

Kerlinger (1964, p. 260) points out:

Use parametric statistics, as well as the analysis of variance, routinely, but keep a sharp eye on data for gross departures from normality, homogeneity of variance, and equality of intervals.

Although some of the data were interval data, some of it only approached interval data. In some of the latter cases, we assumed interval data for the sake of the more accurate and definitive parametric measures. The total subjects in the present study constituted entire populations of the systems studied rather than random samples. We, however, assumed that these schools were representative of similar schools.

The data obtained concerning Hypotheses 7 and 10 concerning the frequency of downward communication and participation provided equal interval data meeting the assumptions necessary for parametric statistics and allowing us to employ a one-way analysis of variance.

In testing Hypotheses 1 and 4 dealing with journals read, and Hypotheses 2 and 5 dealing with extra-system meetings, we assumed we had interval data in order to use the one-way analysis of variance. The type of data yielded by the instrument for these hypotheses were probably not actually interval data since the intervals were not necessarily equal.

Chi Square

Chi square is a non-parametric binomial statistical test. A binomial test is associated with two class, dichotomous variables such as yes-no, male-female, intra-system--extra-system, vertical-horizontal, etc. The data concerning Hypothesis 3 and 6 dealing with extra-system channels and 8 dealing with the direction of communication flows were binomial choices which were well suited to a chi square test of significance.

Sociometric Integration

The sociometric data obtained in relation to Hypothesis 9 were analyzed by visual observation of sociograms and the computerized matrix multiplication program. The main advantage of the sociogram is its visual utility in observing the system under study. The main disadvantage, however, is that its analytic utility is limited because it is limited to descriptive statements. In other words, where the researcher gains in visual, descriptive utility with sociograms he loses the mathematical accuracy of statistical tests such as matrix multiplication.

The matrix multiplication approach allows the identification of formally-defined structures within a communication network, including both direct and indirect relationships. According to Guimaraes (1970, p. 39), the matrix multiplication computer program, consists of raising the original



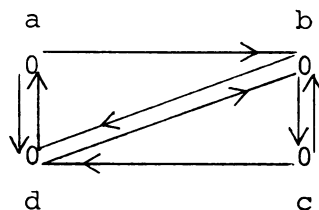
binary (0-1) matrix to n-powers in order to determine n-chains among network members, as well as the tendency toward and identification of clique groups.

As an illustration, consider a simple hypothetical network of four persons (a, b, c, d), whose relations are shown both in the sociogram and in the binary matrix, A, in Figure III-1. Assuming that the sociogram and its corresponding binary matrix, A, represent the communication patterns in the network, one can see who communicates to whom (in matrix A, by reading across the rows, i.e., row 1 shows that person a communicates with person b and d, etc.). By inspection we can, therefore, observe in matrix A, direct, one-step connections among the network members.

The squared matrix, A^2 , shows indirect, two-step connections among the network members. For example, in the squared matrix, A^2 , we see that cell ac has a value of 1 (in the original binary matrix, A, this cell has a value of 0). In fact, the following relationships can be seen both in the sociogram and in matrix A: a b c. In cell ca of matrix A^2 we also find a value of 1, indicating the relationship: c d a.

Opinion Leader Concentration

Hypothesis 11 was tested by visual observation of the opinion leadership Gini ratios. When using the Gini ratio to examine opinion leadership concentration, the concentration is measured from the Lorenz curve by plotting the cumulative



A:

	a	b	c	d
a	0	1	0	1
b	0	0	1	1
c	0	1	0	1
d	1	1	0	0

A^2 :

	a	b	c	d
a	1	1	1	1
b	1	2	0	1
c	1	1	1	1
d	0	1	1	2

Figure III-1.--Example of a communication network as represented by a sociogram, a binary matrix, (A), and its corresponding squared matrix, A^2 .

percentage distribution of sociometric choices on the ordinate against the cumulative percentage distribution of individuals on the abscissa (Figure III-2). The Lorenz curve is drawn by rank-ordering all individuals according to the percentage of sociometric choices that each individual has. Since both axes of the Lorenz curve are expressed in terms of cumulative percentage distribution ranging from 0 to 100, the straight line rising from the origin indicates the line of perfect equality of distribution of sociometric choices among all members. The area between the Lorenz curve and the line of perfect equality represents the degree of opinion leadership concentration in a social system. The ratio of the area between the Lorenz curve and the line of perfect equality, to the total area of the triangle formed by the two axes and the line of perfect equality, is called the Gini ratio of concentration or Gini index of concentration.

According to Yadav (1967, p. 101), the Gini index sums for each individual in the population the difference between where he is on the Lorenz curve and where he would be expected to be in the case of equal distribution of sociometric choices among all the members. This sum is divided by its maximum possible value so that the Gini coefficient ranges between 0 and 1. The greater the Lorenz curve deviates from the line of equality, the greater is the concentration.

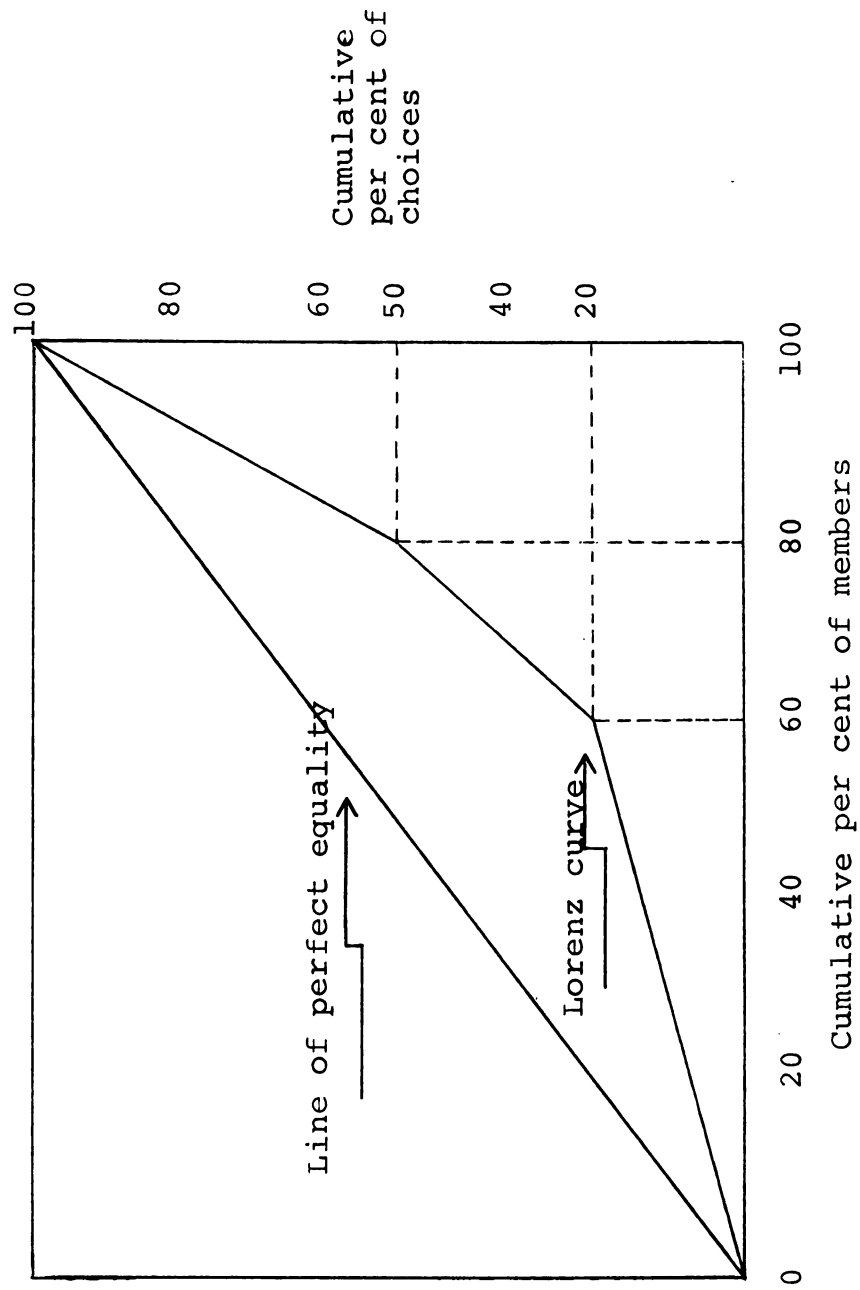


Figure III-2. An illustration of the Lorenz curve indicating concentration of sociometric opinion leadership.

Statistical Significance

All hypotheses were tested for significance at the .05 level. Since the selection of a significance level is an arbitrary decision, the .05 level has been chosen because of its widespread acceptance.

CHAPTER IV

RESULTS

This chapter presents the results of the research. Following the established format in the study, we shall approach the results from the standpoint of the system openness hypotheses first, and then the communication integration hypotheses.

System Openness

Hypothesis 1

The first hypothesis predicts a relationship between the innovativeness of a school system and the number of professional journals read by the teachers in that system. Specifically the hypothesis states:

Teachers in innovative schools read more professional journals than those in non-innovative schools.

Table IV-1 indicates the mean scores for professional journals read by the teachers in the innovative and non-innovative school systems. The results of the analysis of variance indicate no significant difference between the means; F is 2.43, which is less than the 3.98 required for significance at the 5 per cent level. In fact, the trend

is in the opposite direction from the one predicted in the hypothesis, and the hypothesis is not supported.

TABLE IV-1.--Professional Journals Read by Teachers in Innovative and Non-Innovative Schools.

Teachers	Mean Score
Innovative Schools	3.65
Non-Innovative Schools	4.76

Hypothesis 2

The second hypothesis deals with the relationship between school system innovativeness and the number of extra-system meetings attended by the teachers in each system.

The hypothesis states:

Teachers in innovative schools attend more extra-system professional meetings than teachers in non-innovative schools.

Table IV-2 indicates the mean number of meetings attended by the teachers in innovative and non-innovative schools. An analysis of variance shows a significant difference in the predicted direction between the means; F is 9.25, which is greater than the 3.98 required for significance at the 5 per cent level. Thus, Hypothesis 2 is supported.

TABLE IV-2.--Number of Extra-System Meetings Attended by Teachers in Innovative and Non-Innovative Schools.

Teachers	Mean Number
Innovative Schools	11.26
Non-Innovative Schools	5.06

Hypothesis 3

Hypothesis 3 predicts a relationship between innovativeness of the systems and the teacher's preference for interpersonal sources which were outside the system. The hypothesis predicts:

Teachers in innovative schools engage in extra-system interpersonal communication more than teachers in non-innovative schools.

Table IV-3 shows the number of teachers indicating a preference for information sources inside or outside their own school. Chi square reveals no significant difference in source choices; χ^2 is .11, which is less than the 3.89 required for significance at the 5 per cent level. Therefore, although the data trended in the predicted direction, the hypothesis is not supported.

TABLE IV-3.--Interpersonal Sources of Educational Information for Teachers in Innovative and Non-Innovative Schools.

Teachers	Within System	Outside System	Total Subjects
Innovative Schools	11	12	23
Non-Innovative Schools	26	24	50



Hypothesis 4

The fourth hypothesis draws a relationship between innovativeness of a system and the number of professional journals read by the opinion leaders in that system. The hypothesis specifically states:

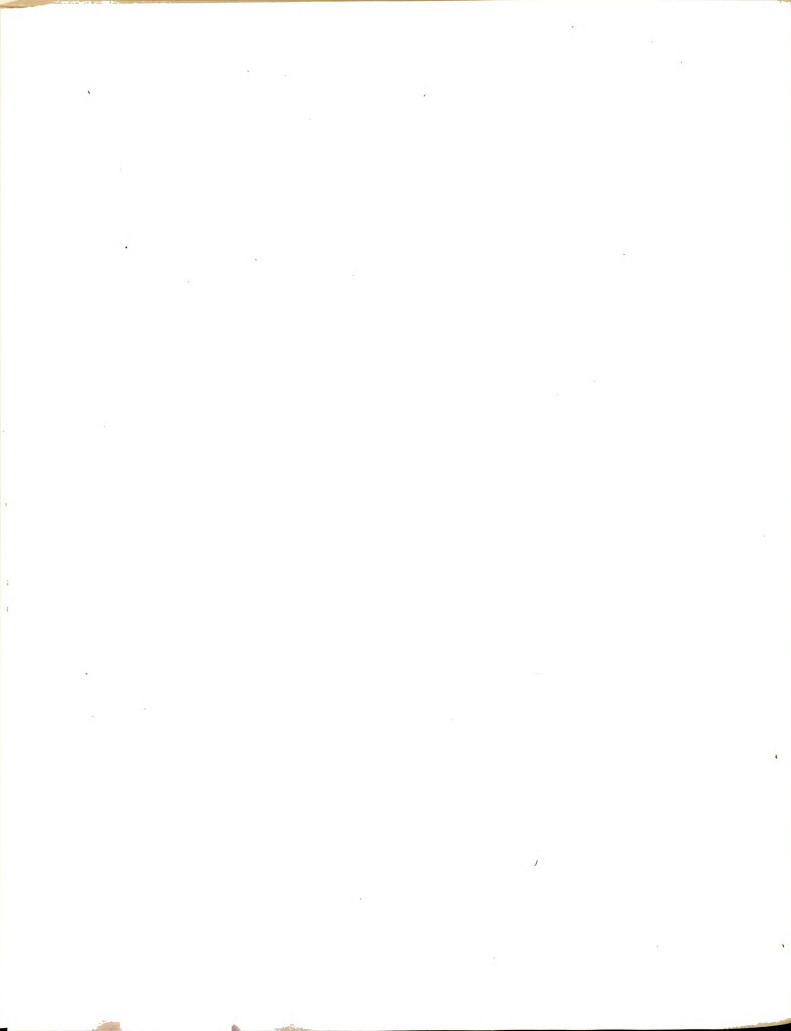
Opinion leaders in innovative schools read more professional journals than those in non-innovative schools.

As pointed out in Chapter III, we designated the 30 per cent of the teachers in each school receiving the most opinion leader nominations as opinion leaders.

Table IV-4 indicates the mean journal reading scores obtained from the opinion leaders. An analysis of variance indicates no significant difference between the mean scores; F is .76, which is less than the 4.28 required for significance at the 5 per cent level. As in Hypothesis 1, the data trended in the opposite direction from that which was predicted in the hypothesis. Hypothesis 4 is not supported.

TABLE IV-4.--Professional Journals Read by Opinion Leaders in Innovative and Non-Innovative Schools.

Opinion Leaders	Mean Score
Innovative Schools	3.88
Non-Innovative Schools	5.24



Hypothesis 5

Hypothesis 5 predicts a relationship between system innovativeness and opinion leader attendance at extra-system meetings. The hypothesis specifically predicts:

Opinion leaders in innovative schools attend more extra-system professional meetings than opinion leaders in non-innovative schools.

Table IV-5 provides the mean number of extra-system meetings attended by opinion leaders. An analysis of variance indicates a significant difference between the means; F is 8.46, which is greater than the 4.28 required for significance at the 5 per cent level. Hypothesis 5 is supported.

TABLE IV-5.--Number of Extra-System Meetings Attended by Opinion Leaders in Innovative and Non-Innovative Schools.

Opinion Leaders	Mean Number
Innovative Schools	18.50
Non-Innovative Schools	5.71

Hypothesis 6

The sixth hypothesis deals with the relationship between the innovativeness of a system and the opinion leader's propensity to seek interpersonal communication sources located outside their own system. The hypothesis specifically states:

Opinion leaders in innovative schools engage in extra-system interpersonal communication more than opinion leaders in non-innovative schools.

The mean scores for interpersonal source choices by opinion leaders are indicated in Table IV-6. Chi square reveals a non-significant difference; χ^2 is .49, which is less than the 3.84 which is required for significance at the 5 per cent level. While the opinion leaders in the innovative schools were equally divided in their choices of internal and external communication sources, the choices of the opinion leaders in the non-innovative schools trended in opposition to the predicted direction. Thus, Hypothesis 6 is not supported.

TABLE IV-6.--Interpersonal Sources of Educational Information for Opinion Leaders in Innovative and Non-Innovative Schools.

Opinion Leaders	Within System	Outside System	Total Subjects
Innovative Schools	4	4	8
Non-Innovative Schools	6	11	17

Supplementary Analysis

It seems worthwhile at this point to compare some opinion leadership scores with similar scores achieved by all of the teachers. Let us compare, for instance, the scores relative to extra-system meeting attendance and extra-system interpersonal communication sources.

Table IV-7 indicates that the mean number of meetings attended by the teachers and the opinion leaders were nearly the same in the non-innovative schools. On the other hand, the opinion leaders in the innovative schools attended considerably more meetings than their colleagues on the teaching staff.

TABLE IV-7.--Mean Number of Meetings Attended for Teachers and Opinion Leaders in Innovative and Non-Innovative Schools.

System	All Teachers	Opinion Leaders
Innovative Schools	11.26	18.05
Non-Innovative Schools	5.06	5.71

Table IV-8 concerning external and internal information sources reveals very little difference between the interpersonal communication sources of teachers and opinion leaders in the innovative schools. In the non-innovative schools a high percentage of subjects gain their information from within their own system, while an equally high percentage of their own opinion leaders report a preference for extra-system information sources (an even higher percentage than opinion leaders in the innovative schools).

TABLE IV-8.--Information Sources for Teachers and Opinion Leaders in Innovative and Non-Innovative Schools.

System	Sources Within System	Sources Outside System	Total
<u>Innovative Schools</u>			
Teachers (N=23)	47.8%	52.2%	100%
Opinion Leaders (N=8)	50.0%	50.0%	100%
<u>Non-Innovative Schools</u>			
Teachers (N=50)	52.0%	48.0%	100%
Opinion Leaders (N=17)	35.3%	64.7%	100%

The data presented in Table IV-7 tend to support the theory that opinion leaders conform to the norms of their own system. Table IV-8, on the other hand, tends to support to a degree the generalizability of opinion leadership behaviors. Table IV-8 suggests that some opinion leaders may behave like other opinion leaders regardless of the system norms in their own systems. We shall discuss this further in Chapter V.

Communication Integration

Hypothesis 7

The seventh hypothesis predicts a relationship between system innovativeness and the frequency of downward communication, by stating:

Teachers in innovative schools receive more frequent downward communication from administrators concerning the adequacy of their work than is received by teachers in non-innovative schools.

The results shown in Table IV-9 indicate the mean scores for downward communication in the innovative and non-innovative schools. An analysis of variance indicates a non-significant difference in the predicted direction between the means; F is 1.24, which is less than the 3.98 required for significance at the 5 per cent level. Hypothesis 7 is, therefore, not supported.

TABLE IV-9.--Downward Communication in Innovative and Non-Innovative Schools.

Teachers	Mean Score
Innovative Schools	2.65
Non-Innovative Schools	2.18

Hypothesis 8

Hypothesis eight postulates a relationship between innovativeness and the direction of the communication flows within a system. Specifically, the hypothesis states:

Innovative schools have more verticalness in their communication flows, while non-innovative schools have more horizontal communication flows.

The results presented in Table IV-10 show the number of teachers in the innovative and non-innovative schools who responded concerning their use of either vertical or horizontal communication. Chi square reveals a significant



difference in the direction of communication flows as predicted; χ^2 is 15.91, which is greater than the 3.84 required for significance at the 5 per cent level. Thus, the hypothesis is supported.

Hypothesis 9

The ninth hypothesis predicts a relationship between system innovativeness and the degree of sociometric communication integration. The hypothesis states:

Innovative schools have a higher degree of sociometric communication integration than non-innovative schools.

The results of the matrix multiplication analysis are reported in Tables IV-11 through IV-14.

In Chapter II we defined a clique as a subgroup within a larger group. An isolate was defined as an individual who has no apparent relationships with other members of the system and neither nominates or is nominated by any other individuals in the organization. Because of the stringency of such an absolute definition of isolate, it is felt that it will be helpful here to designate semi-isolates. We define semi-isolates as those individuals who either did not choose any other individuals, or were not chosen by anyone.

The data produced by the matrix multiplication computer program designate each entire system as at least one clique. Such a designation could be confusing according to our



TABLE IV-10.--Direction of Communication Flows in Innovative and Non-Innovative Schools.

Teachers	Vertical Communication	Horizontal Communication	Total Subjects
Innovative Schools	15	8	23
Non-Innovative Schools	9	41	50

TABLE IV-11.--Cliques, Isolates, and Semi-Isolates in Innovative and Non-Innovative Schools.

	Innovative Schools		Non-Innovative Schools	
	I-1 (N=8)	I-2 (N=15)	N-1 (N=21)	N-2 (N=29)
Number of Cliques	1	1	2	6
Isolates	0	0	1	1
Semi-Isolates	0	0	2	7



definition of a clique. Using our definition of a clique, we would designate no cliques at all in a system when all members are sociometrically connected to all other members. The matrix multiplication program designates such a system (I-1 and I-2 are examples) as having one clique.

The prediction of Hypothesis 9 is supported by the matrix multiplication data. As indicated in Table IV-11, each of the innovative schools was configured into one solid group with no isolates or semi-isolates. The data concerning the non-innovative schools indicates the designation of several cliques, semi-isolates and one isolate in each school.

Table IV-12 indicates the group centrality indices achieved in each school as obtained by the matrix multiplication program. To review briefly, the matrix multiplication program takes data from responses to sociometric questions and determines the direct and indirect interconnectedness among the individuals responding. The program provides, among other indices, an index we call "the group centrality index." In essence the centrality index is the mean of the individual's relative integration scores in a system. The individual relative integration score for each nominator is the sum of the length of all links (direct and indirect) in the individual's row in a matrix, divided by $N-1$, i.e., the number of individuals in the matrix minus the individual being observed.



Higher centrality indices indicate greater integration in a system. We can see in Table IV-12 that School N-2 has a much lower centrality index than either of the innovative schools. Although School N-1 has approximately the same centrality index material presented here at least partially supports the prediction in Hypothesis 9.

TABLE IV-12.--Group Centrality Indices for Innovative and Non-Innovative Schools.

Schools	Group Centrality Index
I-1	4.82
I-2	4.46
N-1	4.93
N-2	2.66

The matrix multiplication data indicate that the teachers in both innovative schools are connected sociometrically to the maximum number of fellow teachers in their system (N minus 1). The innovative schools, therefore, are highly integrated systems. The matrix multiplication further reveals that non-innovative school N-1 configured into two cliques and did not reach their maximum degree of interconnectedness. Perhaps a much better example of the integration pattern in a non-innovative school is the results obtained for non-innovative school N-2. School N-2 configured into six cliques and also did not reach the maximum level of interconnectedness



possible for them. Thus, we must conclude that the non-innovative schools in the present study are not as highly integrated as the innovative schools.

Observation of the sociometric choices (see matrices in Appendix E) resulted in the sociograms found in Figures IV-1 through IV-4.

Figure IV-1 indicates the tight sociometric interconnectedness found in School I-1. The only individual not in the sociometric "mainstream" of the system is individual number 2. The individual is probably not in the mainstream because he only nominated one person and was only nominated by one person, whereas other system members had more than one or two direct relationships. In Figure IV-2, School I-2 appears to have an even greater interconnectedness within its system than that found in School I-1.

Figure IV-3 shows one isolate and two semi-isolates in School N-1. The sociometric pattern does not appear to be as interconnected in School N-1 as it is in the innovative schools. Such an appearance is probably due to the fact that more individuals nominated fewer than three colleagues in the non-innovative schools than in the innovative schools.



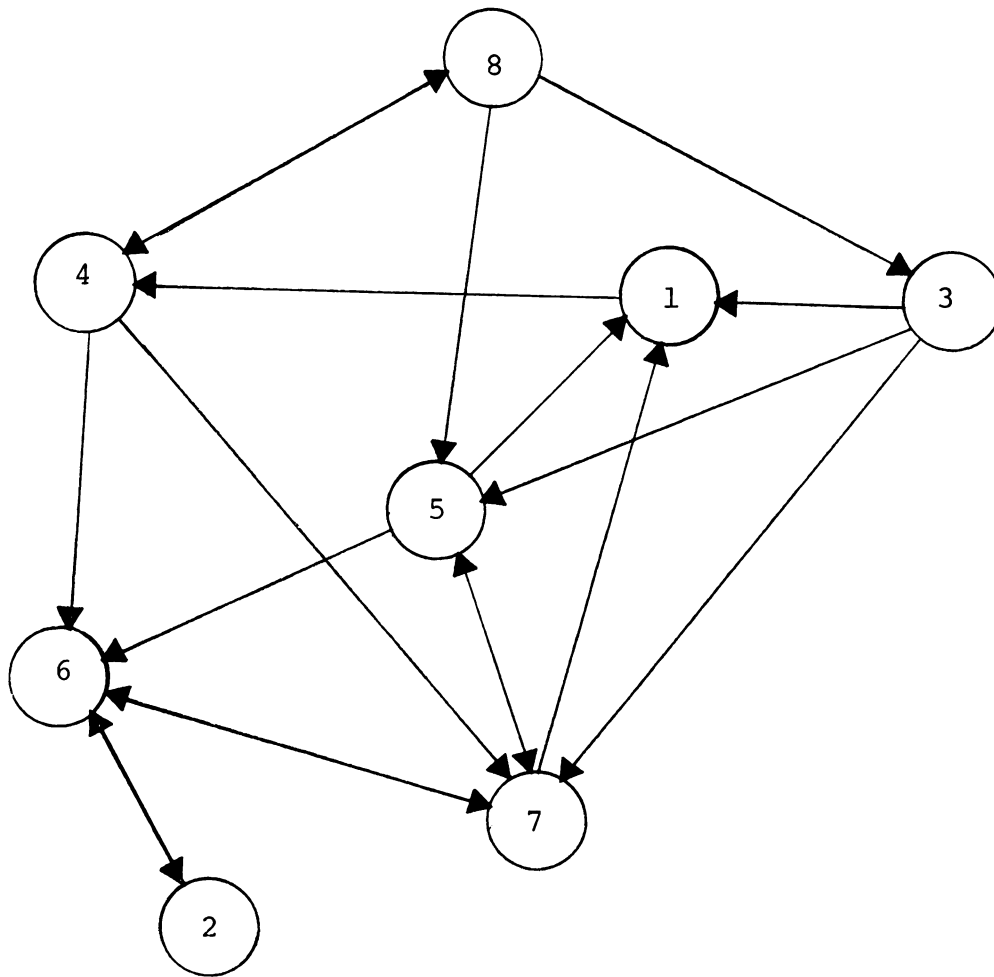


Figure IV-1. Sociogram of the sociometric choices in School I-1.







Figure IV-4 shows one isolate (Number 69) and seven semi-isolates (Numbers 45, 48, 50, 51, 53, 55 and 73) in School N-2. All of the semi-isolates are individuals who were not nominated by anyone. The system seems to divide itself into two separate groups which are connected by only four one-way relationships. Of further interest is the fact that three of these four connecting individuals (Numbers 51, 53 and 73), are semi-isolates, since they were not nominated by anyone. Individuals 51, 53 and 73 seem to be comparatively weak linkages.

Considering the configurations illustrated in these four sociograms we conclude that the innovative schools are more highly interconnected sociometrically than the non-innovative schools.

Thus the results of the matrix multiplication program and the observation of the sociograms indicate that we support Hypothesis 9.

Hypothesis 10

Hypothesis 10 predicts a positive relationship between the amount of member participation in the decisions made by a system and the innovativeness of that system. The hypothesis states:

Innovative schools have a higher degree of participation than non-innovative schools.

Table IV-13 indicates the mean participation scores in the innovative and non-innovative schools. An analysis of variance reveals a significant difference in the predicted direction; F is 19.62, which is greater than the 3.98 required for significance at the 5 per cent level. Thus, the hypothesis is supported.

TABLE IV-13.--Participation in Organization Decisions in Innovative and Non-Innovative Schools.

Teachers	Mean Scores
Innovative Schools	10.48
Non-Innovative Schools	6.82

Hypothesis 11

The eleventh hypothesis predicts a positive relationship between innovativeness and high opinion leader concentration. Specifically, the hypothesis states:

Opinion leadership is more concentrated in innovative schools than in non-innovative schools.

The relationships involved in Hypothesis 11 were tested by computing Gini ratios. As we pointed out in Chapter III, the Gini ratio sums for each individual in the system, the difference between where he is on the Lorenz curve and where he would be expected to be in the case of equal distribution of sociometric choices among all the members. The sum is divided by its maximum possible value so that the Gini



coefficient ranges between 0 and 1. Table IV-14 provides the coefficients of the Gini ratio of concentration for each of the four schools.

TABLE IV-14.--Gini Ratio Coefficients for Innovative and Non-Innovative Schools.

	Innovative Schools		Non-Innovative Schools	
	I-1	I-2	N-1	N-2
Gini Ratio	.54	.47	.56	.58

The possible range of a Gini coefficient is between 0 and 1. The coefficients in Table IV-14 do not indicate a very high level of concentration and they show very little difference from school to school. Moreover, the differences which appear are in a direction opposite to the one predicted by Hypothesis 11. For the foregoing reasons we could not accept Hypothesis 11.

Observation of the opinion leader data concerning nomination choices are shown in Table IV-15.

TABLE IV-15.--Number of Opinion Leaders Nominated by Teachers in Innovative and Non-Innovative Schools.

Number of Nominations Made	Number of Teachers			
	I-1	I-2	N-1	N-2
0	0	0	4	5
1	3	3	2	6
2	3	3	4	13
3	2	9	11	5
Total N	8	15	21	29

Bearing in mind that each teacher could nominate three opinion leader choices, the results in Table IV-15 seem to indicate an important factor: the greater percentage of teachers making less than three choices are in the non-innovative schools. Such a result is bound to cause the concentration to be higher in the Gini ratio computation, since the fewer nominations in the non-innovative schools would not be spread over nearly as many difference individuals.

Summary

Table IV-16 summarizes the results of the statistical tests in the present study.

TABLE IV-16.--Summary of Tests of Hypotheses.

Hypothesis	Unit of Analysis	Independent Variable	Statistical Test	Support of Hypothesis
H-1	All Teachers	Reading Professional Journals	$F=2.43$	Not Supported
H-2	All Teachers	Extra-System Meetings	$F=9.25$	Supported
H-3	All Teachers	Extra-System Channels (Interpersonal)	$\chi^2=.111$	Not Supported
H-4	Opinion Leaders	Reading Professional Journals	$F=.76$	Not Supported
H-5	Opinion Leaders	Extra-System Meetings	$F=8.46$	Supported
H-6	Opinion Leaders	Extra-System Channels (Interpersonal)	$\chi^2=.49$	Not Supported
H-7	All Teachers	Frequency of Downward Communication	$F=1.24$	Not Supported
H-8	All Teachers	Verticalness of Communication	$\chi^2=15.92$	Supported
H-9	All Teachers	Integrated Socio-metric Pattern		Supported
H-10	All Teachers	Participation	$F=19.62$	Supported
H-11	All Teachers	Opinion Leadership Concentration		Not Supported

CHAPTER V

CONCLUSIONS

The chapter summarizes the present study, discusses the results concerning system openness and communication integration, and discusses the relationship of these two concepts to innovativeness. This chapter will also discuss implications for future research and action.

Summary

The present study examined the relationship between the innovativeness of a school system and the system openness and communication integration in a system. System openness is defined as the degree to which information may pass in and out of a system, and communication integration is the degree of interconnectedness of the communication patterns within the system. System openness and communication integration were operationalized through eleven communication behavior variables. The general objective of the study was to examine innovativeness in an organization as it relates to communication behaviors.



All of these behaviors were examined comparatively between predesignated innovative and non-innovative schools. The willingness to cooperate and the behavior of the respondents in the innovative and non-innovative schools were as one might typically predict. For instance, the administrators and the teachers in the innovative schools went out of their way to make the research comfortable during his visit to their schools. They were very proud of their schools and insisted that the researcher see all of their facilities and programs in action. Conversely, the administrators in the non-innovative schools felt they hardly had time to speak with the researcher. In School N-1, which had 21 respondents, there were originally 23 secondary teachers. Two teachers refused to respond and, although the principal was reluctant to discuss it further, it seemed as though these two teachers did not feel free to respond.

The study predicted that the teachers and the opinion leaders in the innovative schools would both attend more extra-system meetings and that the teachers in the innovative school would participate more in decisions within their school. It was further predicted that the innovative schools would have a comparatively higher degree of sociometric integration and that the innovative schools would use more vertical communication channels, while the non-innovative schools would use more horizontal channels. Each of these five hypotheses was supported.



The study predicted that teachers and opinion leaders in the innovative schools would read more professional journals than those in the non-innovative schools. The study also predicted that opinion leadership would be more highly concentrated in the innovative schools and that opinion leaders in the innovative schools would engage in more extra-system interpersonal communication than the opinion leaders in the non-innovative schools. These four hypotheses were not supported and the results were in the opposite direction of that which was predicted, although not significantly.

Finally, the study predicted that teachers in the innovative schools would receive more frequent downward communication from administrators and that teachers in the innovative schools would engage in more extra-system interpersonal communication than teachers in the non-innovative schools. Examination of these two hypotheses revealed results in the direction predicted, but not to a statistically significant degree for support.

System Openness

In light of the research by Rogers (1962), Lionberger (1962), and Menzel and Katz (1962) which was cited in Chapter III concerning the reading of professional journals and in light of the logical basis for such reading being a key source of extra-system information, it is somewhat surprising to this researcher that Hypotheses 1 ($F=2.43$) and 4 ($F=.76$) were not confirmed.



The only apparent reasonable explanation for the non-innovative teachers and opinion leaders reading more journals than the teachers and opinion leaders in the innovative schools is their need for outside information due to the probable paucity of new information within their own system. One plausible explanation for what appears to be a low number of journals read by all respondents and the lack of difference between the innovative and non-innovative schools may be the settings themselves.

The settings for the present study were small, rural secondary schools which naturally employ local, rural teachers for the most part. If one might attribute a degree of intellectual curiosity and/or sophistication to those who are stimulated to read professionally, then perhaps these hypotheses were not really highly valid indicators of system openness for these particular teachers. The foregoing possibility is based on the comparative lack of intellectual and cultural stimulation found in small rural communities and the type of people who might consequently be likely to settle and teach in such an area. Perhaps they are not the type who seek their information through professional reading whether they are innovative or non-innovative.

Hypothesis 2 ($F=9.25$) and 5 ($F=8.46$) dealing with teacher and opinion leader attendance at extra-system meetings, were supported. In the innovative schools, the opinion leaders scored higher than the teachers on their attendance at extra-

system meetings, while in the non-innovative schools, the opinion leaders and teachers scored approximately the same (Figure V-1).

	Teachers	Opinion Leaders
Innovative Schools	$\bar{X}=11.26$	$\bar{X}=18.50$
Non-Innovative Schools	$\bar{X}=5.06$	$\bar{X}=5.70$

Figure V-1.--Paradigm of meeting attendance by teachers and opinion leaders in innovative and non-innovative schools.

Extra-system educational meetings appear to be an important source of outside information, particularly for the teachers in the more innovative systems. The meetings appear to be an even more important information source to the opinion leaders in the non-innovative schools. A plausible explanation for the increased importance to these opinion leaders in non-innovative schools is that, since their system has little innovativeness within it, they must rely on outside sources for new educational information.



Examination of Hypothesis 3 concerning extra-system interpersonal communication sources showed results tending slightly in the direction predicted, although not significantly ($\chi^2=.11$). That is, a slightly larger number of teachers in the innovative schools reported gaining most of their educational insights from sources outside rather than inside their system and in the non-innovative schools the opposite was true. One respondent from a non-innovative school wrote "if any" in the margin next to the question asking where they received their educational insights.

Hypothesis 6 data revealed results in an opposite direction from those predicted by this researcher concerning interpersonal sources of educational information for opinion leaders. The opinion leaders in the non-innovative schools showed a higher propensity toward the use of outside sources than they did toward inside sources ($\chi^2=.49$). These results were not in the direction predicted. A possible explanation for these results is that those who believe that opinion leadership and its accompanying personality characteristics are generalizable to some degree, may be correct. In other words, perhaps an opinion leader will behave nearly the same, whether he is a member of an innovative or a non-innovative social system. Further, it now seems plausible that such a generalized opinion leader would naturally feel a much greater need to go outside a non-innovative system for information than would an opinion leader in an innovative

system where his fellow teachers would provide stimulation and information within the system. Actually, in the present study the opinion leaders in the non-innovative schools also read more professional journals than opinion leaders in the innovative schools (Hypothesis 4). An unexpected suggestion indicated by the present study, then, might be that opinion leadership is a variable with stronger influence than such variables as the norms of an innovative or non-innovative social system. An opinion leader may be more apt to follow opinion leader norms than the norms of the social system to which he belongs, when surrounded by non-innovative people.

Communication Integration

An examination of the Hypothesis 7 data reveals that the teachers in the innovative schools reported a slightly greater amount of downward communication from their administrators than teachers in the non-innovative schools. Although the difference was in the predicted direction, it was not confirmed as statistically significant ($F=1.24$).

It now seems possible that the questions used for Hypothesis 7 and the accompanying five item scaled responses were confusing to the respondents. Such a conclusion seems possible because of the confusion apparent from observation of the completed questionnaires. The confusion was manifested

in the high number of erasures and decision changes appearing on the completed questionnaires. Another plausible explanation for the high number of teachers in the non-innovative schools reporting corrective downward communication from their principal is the possible existence of a greater need for corrective work with that group of teachers than among the more innovative ones. Such an assumption is based on the notion that innovative teachers are usually active and creative "self-starter" types, while non-innovative teachers would no doubt require more supervision from their administrators.

The prediction in Hypothesis 8 that the communication flows in the innovative schools would be more vertical than horizontal and that the communication flows in the non-innovative schools would be the direct opposite was supported as highly significant ($\chi^2=15.92$).

In Chapter II we said that when a subordinate cannot achieve communicative satisfaction vertically, he would resort to lateral or horizontal communication. We further stated in Chapter II that, since innovations often enter a system at the top, vertical communication seems imperative to an innovative system. The implication of the above findings is that an innovative system has an open and useful set of vertical communication channels and that the members of such a system are not forced to resort to horizontal communication as often as the members in a non-innovative system.



Hypothesis 9, which predicts that innovative schools have a higher degree of sociometric communication integration than non-innovative schools, was confirmed both by the matrix multiplication computations and visual observation of the sociograms.

The innovative schools each registered the highest possible integration scores on the matrix multiplication program with no isolates and no internal cliques. On the other hand, neither of the non-innovative schools achieved the integration scores they potentially could have achieved by having a completely integrated system. Each of them had one isolate. Additionally, one non-innovative school had two semi-isolates and the other had seven. In Chapter IV, we defined a semi-isolate as an individual who either nominated no one or was nominated by no one. While isolates and semi-isolates do tend to impede the total integration of a system, we are not, making a value judgement here whether it is good or bad for an individual to be an isolate. The results of these matrix examinations indicate support for Hypothesis 9.

Some of the respondents in the non-innovative schools wrote unsolicited comments in the margin of the questionnaire next to the sociometric question, "List the teachers with whom you talk most frequently." Examples of these comments are "no preference," "no real distinction," and "I know few people." One of the isolates left answers A, B and C

unanswered, wrote in the letter "D," and placed his own name beside it. He then added the words "only D" beside the item. The respondent in answering "only D" apparently was telling us that he talks to no other colleagues.

The findings for Hypothesis 9 indicate the same positive relationship which Lin (1966) found between the degree of innovativeness in a system and the degree to which that system has a sociometrically integrated communication pattern.

Hypothesis 10 predicts that innovative schools have a higher degree of participation than non-innovative schools. The results were confirmed as highly significant ($F=19.62$). There appears to be little participation in decision-making in the non-innovative schools by the system members. A teacher in a non-innovative school answered the statement, "The principal usually asks my opinion when making a school decision which involves my work" by checking "disagree on the whole." In the margin this respondent wrote, "Can't think of a particular instance but knowing my principal as I do, I can only guess."

The relationship between participation and the innovativeness in a system takes on added importance when we consider that a great deal of research such as that cited in Chapter II by Katz and Kahn (1966), Cartwright and Zander (1968), Coch and French (1948), and many others reports that system members who participate in decisions have a greater interest in the implementation of the decision. Such

findings concerning participation and involvement seem to indicate that the diffusion, adoption, and continuance of an innovation should be much easier in a participative system.

Hypothesis 11 predicts a relationship between a high degree of innovativeness and high opinion leadership concentration but was not supported. The Gini ratio computations indicated almost identical ratios for all four schools in the study, e.g., the four schools in the present study showed very little difference in their opinion leadership concentration. The Gini ratios in the non-innovative schools were slightly higher than those in the innovative schools which is a trend in the opposite direction from the one predicted in the hypothesis.

One reason for the lack of high concentration on a small number of opinion leaders could have been partially brought about by the questionnaire item itself, which asked the respondents to, "Name the three teachers in your school whose opinion on educational changes are most valuable to you." The overt offer of three choices, when accepted by the respondents, was bound to spread the nominations over a larger total population thereby limiting the concentration on just a few nominees.

The question and response problem also offers a possible explanation for the trend in the results opposing the prediction of the hypothesis. As we pointed out in Chapter IV, Table IV-17, there was a higher percentage of

teachers in innovative schools nominating two or three individuals, while in the non-innovative schools, there were nine out of fifty respondents who nominated no one. Teachers in the non-innovative schools wrote comments such as, "no preference," "none," and "I don't believe there is much of an exchange of opinions on educational changes." On the surface, these comments and the blank questionnaires might seem to indicate that the prediction of Hypothesis 11 would be confirmed since the respondents did not always name any opinion leader and some did not even think there was any exchange of opinions. However, the structure of the question and the number of responses received actually appear to have worked against the prediction in Hypothesis 11. Such a notion is based on the fact that the non-innovative schools, having fewer separate individuals nominated, would naturally concentrate the opinion leader nominations they did make on a smaller, more highly concentrated group of individuals.

Implications for Future Research

While only part of the hypotheses in the present study were supported, several implications for future research in the areas of innovativeness and communication behaviors can be suggested.

First, methods of assuring the innovativeness of study units might be questioned. There is a great deal of difference

between an "innovative teacher" and a "teacher in an innovative school." Researchers investigating the innovativeness variable in the future might be wise to screen individual subjects on a pretest basis, rather than assuming that teachers are all innovative because the system they are part of meets valid innovativeness criteria. Such a pretest situation would provide subjects who could produce statistically significant results for the hypotheses which tended in the predicted direction, but not to a significant degree.

Of particular interest for future research is the relationship between innovativeness and the reading of professional journals. Perhaps the predictions concerning journal readership and innovativeness in the present study could be supported if the innovativeness and non-innovativeness were established through individual pretesting and the independent variable were examined more carefully in an isolated condition rather than as one of eleven hypotheses.

As pointed out in Chapter III of the present study, we have used the extreme ends of the innovativeness continuum for the pre-designation of our innovative and non-innovative schools. These extremes were chosen because of the comparative method employed in the present study and the exploratory nature necessary due to the paucity of the related research. As research becomes more prevalent in the areas of innovativeness and organizational communication, it will be necessary to examine organizations with varying degrees of innovativeness located between the two extremes of the continuum.

Another research question which definitely needs answering is whether opinion leadership is stronger in innovative or non-innovative systems. Additionally the results of the present study raise the question of whether variables such as system norms or generalized opinion leader behavioral norms are stronger. The present study seems to indicate that an opinion leader will behave positively as predicted in Hypotheses 4, 5, and 6 whether the system norms tend toward innovativeness or not. Specific research is needed to confirm or reject this notion. Rogers (1962, p. 250) suggests that research is needed concerning opinion leadership and its correlates, such as social status, cosmopoliteness, innovativeness, and social participation. Rogers suggests investigations should be directed to determine the amount of variation in leadership explained by each of these variables. The present study supports these suggestions.

It will be a valuable addition to the total body of theory to examine the variables in the present study and other similar variables on a multivariate basis. Since each of these communication behavior variables are interlinked, there is good reason for examining them in concert and analyzing the corresponding interaction effects. Such a multivariate analysis might couple factors dealing with innovativeness, sources of educational information, age, and level of education in one analysis.

The present researcher would heartily recommend the use of a comparative research design such as the one used in the present study. It is not only a highly workable design for field research, but the comparative analysis of the communication structure in modern and traditional social systems can hopefully provide information regarding the kind of structural rearrangements which might be conducive to the adoption of technologies. These structural rearrangements might include improved practices such as better recruitment, changes in personnel, and better training methods.

Hopefully, the present study sheds some light on the relationship between innovativeness and the hypothesized communication behaviors, as well as other behavioral concepts. The communication field will surely profit if future researchers concentrate their efforts on an examination of the important organizational variables.

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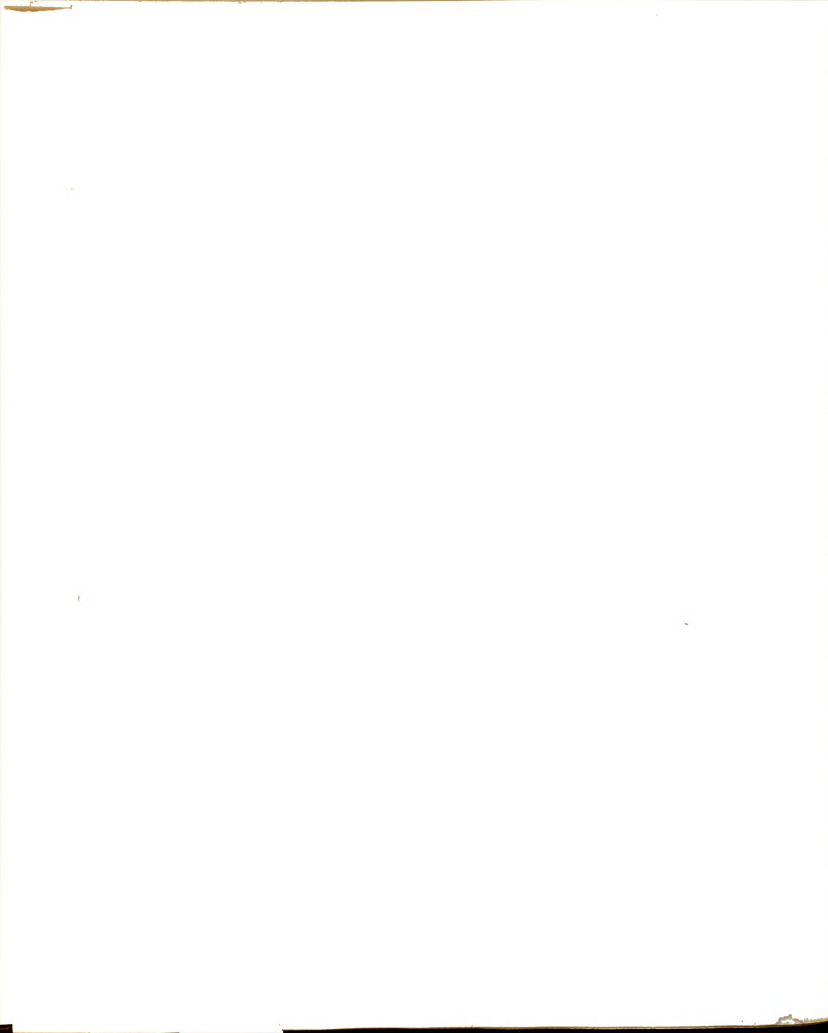
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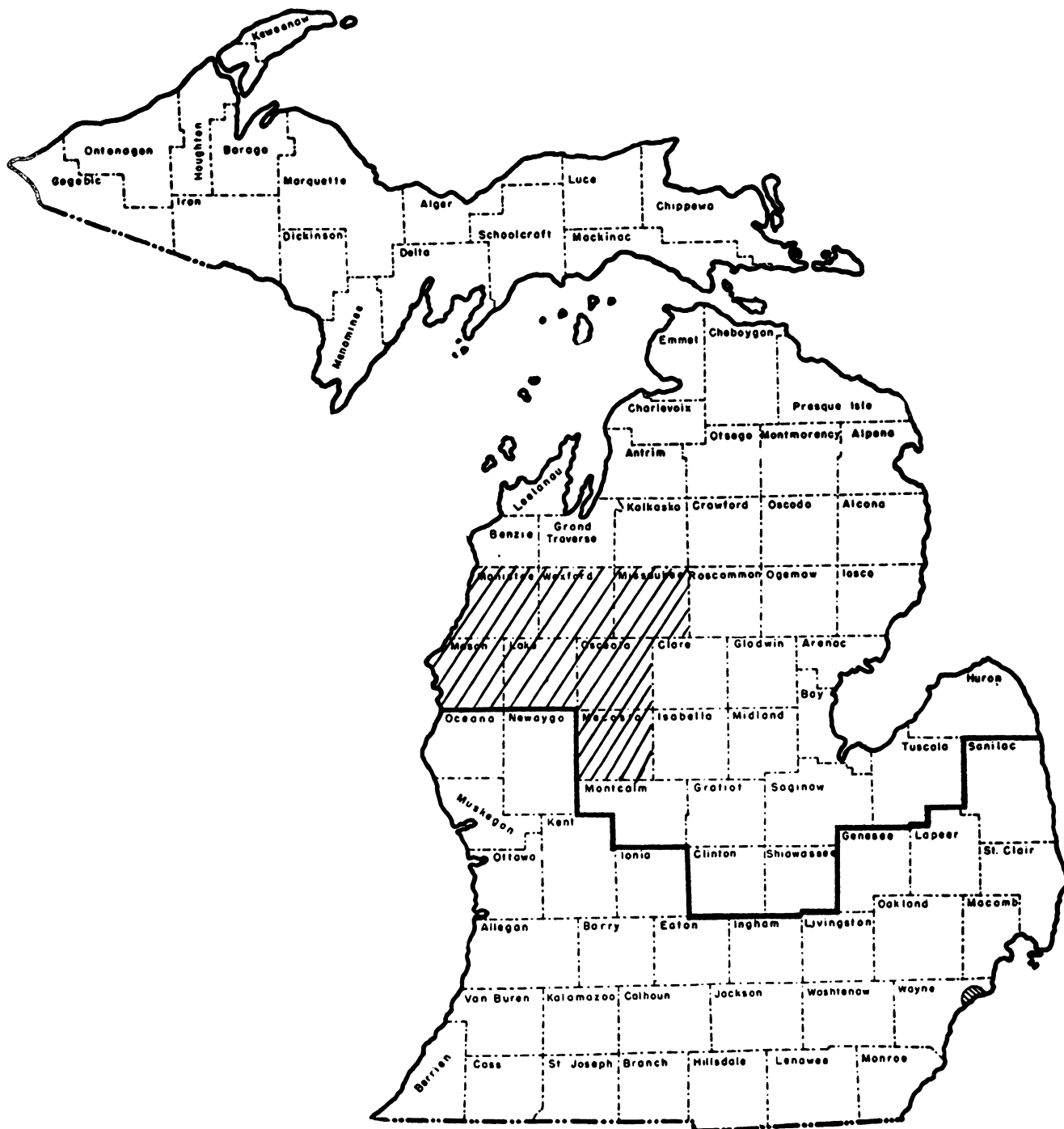
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APPENDICES



APPENDIX A
THE PROJECT 7 AREA



APPENDIX B
CURRICULAR PRACTICES POLL

CURRICULAR PRACTICES POLL

SCHOOL _____ LEVEL _____ DIST. _____

Please check the practices in use in your school

☐ independent study	☐ computer scheduling
☐ open labs	☐ programmed learning
☐ unscheduled time for pupils	☐ new math
☐ seminar groups	☐ B.S.C.S.
☐ non-graded	☐ P.S.S.C.
☐ no A,B,C, grades	☐ Project English
☐ schedule modifications	☐ year-round school
☐ team teaching	☐ lang.-exp. approach to lang. arts
☐ large group instruction	☐ outdoor education programs and facilities
☐ core or unified curr.	☐ Federal curriculum project
☐ multiage grouping	☐ (other) _____
☐ multiage tutoring	☐ (other) _____
☐ pupil-teacher planning	☐ (other) _____
☐ role playing or mock teaching	☐ (other) _____
☐ simulation	☐ (other) _____

Developed by William R. Force

APPENDIX C
LETTER OF INSTRUCTION TO SUBJECTS



Dear Respondent,

Thank you very much for your cooperation!!

The answers you give should be thoughtful and as accurate as possible. Your replies will be held completely confidential.

Part I

When you have completed Part I place it in the plain unsigned envelope attached to it, seal it, and return it to your school administrator.

Part II

Part II should be confidentially placed in the brown envelope appropriately labeled and located in your school office.

Remember: Part II is not to be signed by you.

Please try to complete these within two days after you receive them.

Again, thank you.



APPENDIX D
THE QUESTIONNAIRE

Part I

A. Name _____Sex

1. Male 2. Female

Age (Circle one)

- | | |
|----------|---------------|
| 1. 20-24 | 6. 45-49 |
| 2. 25-29 | 7. 50-54 |
| 3. 30-34 | 8. 55-59 |
| 4. 35-39 | 9. 60 or over |
| 5. 40-44 | |

Educational Level (check the highest level attained)

- | | |
|-----------------------|-------|
| 1. 1-3 years college | _____ |
| 2. Bachelors Degree | _____ |
| 3. Bachelors Degree + | _____ |
| 4. Masters Degree | _____ |
| 5. Masters Degree + | _____ |
| 6. Specialist Degree | _____ |
| 7. Doctors Degree | _____ |
| 8. Other (specify) | _____ |

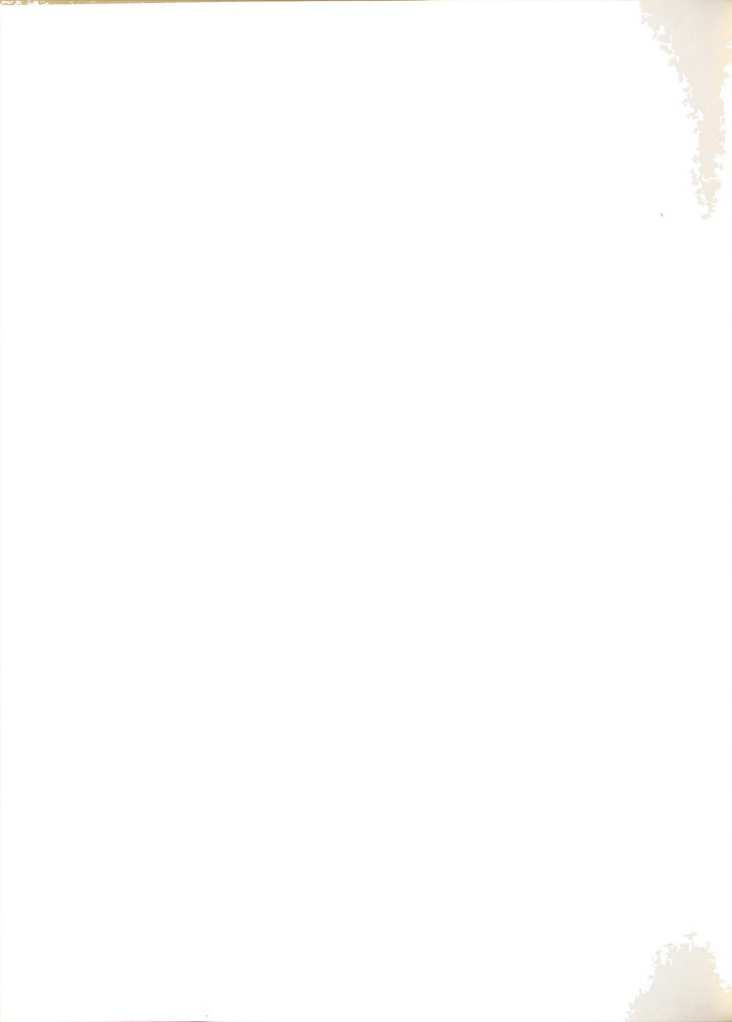
Years of Service

How many years have you taught in this school system? _____

B. 1. I read newspaper(s) yesterday.

1. No _____ 2. Yes _____

How many? _____



2. I listened to radio yesterday.

1. No ___ 2. Yes ___

If the answer is yes, the program(s) I listened to were:

___ music

___ weather

___ sports

___ educational activities

___ local news

___ national and international news

___ drama and/or comedy

3. I watched television yesterday.

1. No ___ 2. Yes ___

If the answer is yes, the program(s) I listened to were:

___ music

___ weather

___ sports

___ educational activities

___ local news

___ national and international news

___ drama and/or comedy

4. How many professional educational meetings which involved educators from more than one school district have you attended in the past two years?

(Number)

5. Please list below the professional journals (regardless of the academic area to which the journal is addressed) which you read:

a). Regularly: _____

b). Occasionally: _____

6. Most of my insights and new ideas regarding education result from:

_____ Discussion with educators in this school district.

_____ Discussion with educators outside this school district.

C.

1. Name the 3 teachers in your school whose opinions on educational changes are most valuable to you.

A. _____

B. _____

C. _____

2. List the teachers with whom you talk most frequently.

A. _____

B. _____

C. _____

Part II

Do Not Put Your Name on This Part.

Your answers to these questions will be held completely anonymous so please answer them as honestly as you possibly can.

A. Please check the one most appropriate response to each of these statements:

1. In this complicated world of ours the only way we can know what's going on is to rely on leaders or experts who can be trusted.
☐ agree very much
☐ agree on the whole
☐ agree a little
☐ don't know
☐ disagree a little
☐ disagree on the whole
☐ disagree very much
2. My blood boils whenever a person stubbornly refuses to admit he's wrong.
☐ agree very much
☐ agree on the whole
☐ agree a little
☐ don't know
☐ disagree a little
☐ disagree on the whole
☐ disagree very much



3. There are two kinds of people in this world: those who are for the truth and those who are against the truth.

☐ agree very much
☐ agree on the whole
☐ agree a little
☐ don't know
☐ disagree a little
☐ disagree on the whole
☐ disagree very much

4. Most people just don't know what's good for them.

☐ agree very much
☐ agree on the whole
☐ agree a little
☐ don't know
☐ disagree a little
☐ disagree on the whole
☐ disagree very much

5. Of all the different philosophies which exist in this world, there is probably only one which is correct.

☐ agree very much
☐ agree on the whole
☐ agree a little
☐ don't know
☐ disagree a little
☐ disagree on the whole
☐ disagree very much



6. The highest form of government is a democracy
and the highest form of democracy is a government
run by those who are most intelligent.

☐ agree very much
☐ agree on the whole
☐ agree a little
☐ don't know
☐ disagree a little
☐ disagree on the whole
☐ disagree very much

7. The main thing in life is for a person to want to
do something important.

☐ agree very much
☐ agree on the whole
☐ agree a little
☐ don't know
☐ disagree a little
☐ disagree on the whole
☐ disagree very much

8. I'd like it if I could find someone who would tell
me how to solve my personal problems.

☐ agree very much
☐ agree on the whole
☐ agree a little
☐ don't know
☐ disagree a little
☐ disagree on the whole
☐ disagree very much

9. Most of the ideas which get printed nowadays aren't worth the paper they are printed on.

☐ agree very much
☐ agree on the whole
☐ agree a little
☐ don't know
☐ disagree a little
☐ disagree on the whole
☐ disagree very much

10. Man on his own is a helpless and miserable creature.

☐ agree very much
☐ agree on the whole
☐ agree a little
☐ don't know
☐ disagree a little
☐ disagree on the whole
☐ disagree very much

11. It is only when a person devotes himself to an ideal or cause that life becomes meaningful.

☐ agree very much
☐ agree on the whole
☐ agree a little
☐ don't know
☐ disagree a little
☐ disagree on the whole
☐ disagree very much



12. Most people just don't give a "damn" for others.

☐ agree very much
☐ agree on the whole
☐ agree a little
☐ don't know
☐ disagree a little
☐ disagree on the whole
☐ disagree very much

13. To compromise with our political opponents is dangerous because it usually leads to the betrayal of our own side.

☐ agree very much
☐ agree on the whole
☐ agree a little
☐ don't know
☐ disagree a little
☐ disagree on the whole
☐ disagree very much

14. It is often desirable to reserve judgement about what's going on until one has had a chance to hear the opinions of those one respects.

☐ agree very much
☐ agree on the whole
☐ agree a little
☐ don't know
☐ disagree a little
☐ disagree on the whole
☐ disagree very much



15. The present is all too often full of unhappiness.

It is only the future that counts.

☐ agree very much
☐ agree on the whole
☐ agree a little
☐ don't know
☐ disagree a little
☐ disagree on the whole
☐ disagree very much

16. The United States and Russia have just about nothing in common.

☐ agree very much
☐ agree on the whole
☐ agree a little
☐ don't know
☐ disagree a little
☐ disagree on the whole
☐ disagree very much

17. In a discussion I often find it necessary to repeat myself several times to make sure I am being understood.

☐ agree very much
☐ agree on the whole
☐ agree a little
☐ don't know
☐ disagree a little
☐ disagree on the whole
☐ disagree very much

18. While I don't like to admit this even to myself,
my secret ambition is to become a great man, like
Eistein, Beethoven, or Shakespeare.

☐ agree very much
☐ agree on the whole
☐ agree a little
☐ don't know
☐ disagree a little
☐ disagree on the whole
☐ disagree very much

19. Even though freedom of speech for all groups is a
worthwhile goal, it is unfortunately necessary to
restrict the freedom of certain political groups.

☐ agree very much
☐ agree on the whole
☐ agree a little
☐ don't know
☐ disagree a little
☐ disagree on the whole
☐ disagree very much

20. It is better to be a dead hero than to be a live
coward.

☐ agree very much
☐ agree on the whole
☐ agree a little
☐ don't know



- ☐ disagree a little
- ☐ disagree on the whole
- ☐ disagree very much

B. Please answer the following confidential questions with the most appropriate answer.

1. The principal usually asks my opinion when making a school decision which involves my work.

- ☐ agree very much
- ☐ agree on the whole
- ☐ agree a little
- ☐ don't know
- ☐ disagree a little
- ☐ disagree on the whole
- ☐ disagree very much

2. It is unusual for me to take part in discussion which results in decisions regarding school problems and activities.

- ☐ agree very much
- ☐ agree on the whole
- ☐ agree a little
- ☐ don't know
- ☐ disagree a little
- ☐ disagree on the whole
- ☐ disagree very much



3. The principal offers suggestions to help improve my teaching performance:

☐ very frequently
☐ quite frequently
☐ once in a while
☐ quite infrequently
☐ never

4. The principal lets me know if he has heard any criticism of my teaching performance:

☐ very frequently
☐ quite frequently
☐ once in a while
☐ quite infrequently
☐ never

5. I usually discuss my teaching problems with:

☐ the school administration
☐ my fellow teachers



APPENDIX E
SOCIOMETRIC CHOICE MATRICES



Sociometric Choice Matric for School I-1.

Chooser	Chosen							
	1	2	3	4	5	6	7	8
1				X				
2						X		
3	X				X		X	
4						X	X	X
5	X					X	X	
6		X					X	
7	X				X	X		
8			X	X	X			
Totals	3	1	1	2	3	4	4	1



Sociometric Choice Matrix for School I-2.

Chooser	Chosen																						
	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23								
9		X		X	X																		
10										X				X	X								
11		X			X									X									
12					X						X		X										
13		X				X								X									
14					X						X		X										
15		X			X			X															
16							X					X											
17		X								X			X										
18		X			X									X									
19		X			X			X															
20				X				X															
21				X					X	X													
22		X	X							X													
23		X							X	X													
Totals	3	6	1	3	7	1	1	3	2	5	2	1	3	4	1								

Sociometric Choice Matrix for School N-1.

Chooser	Chosen																				
	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44
24							X								X					X	
25								X		X											
26						X												X		X	
27																					
28	X									X											
29					X				X					X							
30	X			X						X											
31		X			X																
32						X		X										X			
33				X			X									X					
34		X				X														X	
35																					
36					X				X										X		
37					X	X		X													
38	X	X														X					
39			X							X					X						
40		X								X	X										
41			X		X				X												
42			X				X							X							
43			X						X					X							
44		X										X									
Totals	3	5	4	2	5	4	3	3	4	4	3	0	2	1	1	3	0	2	1	1	2

Sociometric Choice Matrix for School N-2.

Chosen

Chooser	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73
45																													
46								X																					
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Totals	0	6	1	0	2	0	0	5	0	5	0	8	1	2	1	4	2	4	2	5	5	3	3	2	0	2	1	1	0
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APPENDIX F
FACTORS OF SEX, AGE, EDUCATION,
AND YEARS IN SCHOOL

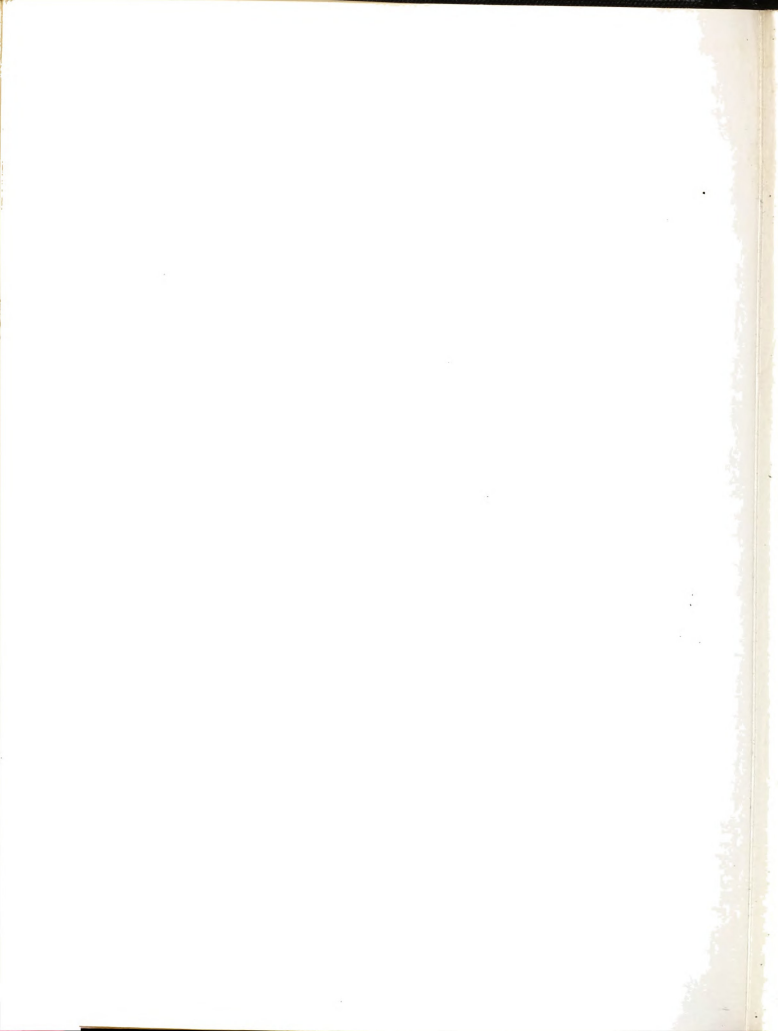


Factors of Sex and Age.

School	Sex		Age							
	Male	Female	20-24	25-29	30-34	35-39	40-44	45-49	50-Over	
I-1 (N=8)	6	2	2	2	1	1	1	1	0	
I-2 (N=15)	10	5	3	4	2	0	0	0	6	
N-1 (N=21)	14	7	3	6	8	1	1	0	2	
N-2 (N=29)	15	14	7	8	1	4	3	2	4	

Factors of Education and Years in School.

School	No Degree	Bachelors	Education		Masters	Masters+	Yrs. in School (this school)	
			Bachelors+				Range	Mean
I-1 (N=8)	0	2	3		0	3	1-20	8
I-2 (N=15)	1	1	8		3	2	1-17	4.6
N-1 (N=21)	0	4	15		1	1	1-10	3.7
N-2 (N=29)	0	2	17		7	3	1-29	4.9



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