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CHARACTERISTICS OF SCHOOL ORGANIZATIONS

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Robert H. Richardson

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A COMPARATIVE ANALYSIS OF THE STRUCTURAL
CHARACTERISTICS OF SCHOOL ORGANIZATIONS

By

Robert H. Richardson

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ABSTRACT

A COMPARATIVE ANALYSIS OF THE STRUCTURAL CHARACTERISTICS OF SCHOOL ORGANIZATIONS

By

Robert H. Richardson

Proceeding from Weber's classic analysis of bureaucratic structure and from the findings of recent empirical research, this investigation examined the inter-relationships among and between thirty-one environmental-contextual characteristics, fifteen structural characteristics and six performance characteristics of Michigan K-12 school district organizations. Assuming a causal sequence among the variables utilized, the following question was posed with respect to each structural and performance characteristic: What antecedent conditions influence it and what are the relationships among and between those conditions? Data for 508 school district organizations were collected from official documents and records and from a survey conducted by the investigator. Multiple regression procedures were used to analyze the data. It was found that organizational size has a predominant influence upon all of the structural characteristics examined. In many instances, however, the influence of organizational size is mediated by the complexity of the division of operational labor and the division of administrative labor. With one minor exception, none of the structural characteristics were found

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to have any significant influence upon any of the performance characteristics examined. The implications of these findings are discussed and recommendations are made for future research.

To Barbara, Elisabeth, Robert and Katherine

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It is no exaggeration to say that this study would not have been possible without the help of Michigan's 530 K-12 school district superintendents. Their cooperation in responding to a complex questionnaire is gratefully acknowledged. Michigan Superintendent of Public Instruction John A. Porter and Department of Education staff members too numerous to mention by name deserve special thanks for their help in locating the documentary information used in the study. Professor Wilbur Brookover very generously provided access to his tape of the Michigan Assessment Test data. Finally, Jacqueline Grossman provided expert, patient and invariably

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CHAPTER I

CONCEPTUAL FRAMEWORK AND
STATEMENT OF PROBLEM

Introduction

Our society has been characterized as an "organizational society" (Presthus, 1962) comprised of "organizational men" (Whyte, 1956). Although complex bureaucracies were not unknown in earlier periods of human history--as is attested by the accounts of the ancient Egyptian system of waterways and the military expeditions of Alexander the Great and the Ceasars--never before have formal organizations played such a decisive and pervasive role in the structuring of human affairs as in our own era. As Etzioni (1964, p. 1) has noted:

We are born in organizations, educated in organizations, and spend most of our lives working in organizations. We spend most of our leisure time paying, playing and praying in organizations. Most of us will die in an organization, and when the time comes for burial, the largest organization of all--the state--must grant official permission.

In addition to the sheer ubiquity of formal organizations in modern societies, several observers have speculated about the impact of this distinctively modern phenomenon upon the qualitative aspects of contemporary life. Blau and Schoenherr (1971, p. 3) have noted that "the greatest accomplishments of modern society--technological progress, superior standard of living, high level of education--

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would not be possible without formal organizations in which the coordinated efforts of men achieve results beyond the capacity of their separate endeavors. At the same time, organizations are also instrumental in perpetuating the worst horrors of modern times, whether they be genocide or nuclear war." Observing that organizations are at the "roots of power" in modern societies, Blau and Meyer (1971, pp. 147-168) have discussed the internal and external consequences of organizations for the preservation of democratic values and the survival of democratic institutions. Victor Thompson (1961, p. 154 ff.) has written extensively about "bureaupathology" and Merton's (1968, pp. 249-60) discussion of "the bureaucratic personality" has become a classic among numerous analyses of the destinies of little cogs in big machines. Commenting upon the consequences of bureaucratization for education, Goodman (1962, p. 74) has noted that "the community of scholars is replaced by a community of administrators and scholars with administrative mentalities, company men and time-servers among the teachers, grade-seekers and time-servers among the students."

With respect to the socializing influence of modern organizations, Presthus (1962, pp. 15-16) has stated that organizations:

. . . have critical normative consequences. They provide the environment in which most of us spend most of our lives. In their efforts to rationalize human energy they become sensitive and versatile agencies for the control of man's behavior, employing subtle psychological sanctions that evoke desired responses and inculcate consistent patterns of action. In this sense, big organizations are a major disciplinary force in our society. Their influence spills over the boundaries of economic interests or activities into spiritual and intellectual sectors; the accepted values of the organization shape the individual's

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personality and influence his behavior in extra-vocational affairs . . . Big organizations therefore become instruments of socialization providing physical and moral sustenance and shaping their thought and behavior in countless ways.

Furthermore, Dewey (1972, pp. 17-23) has suggested that there are three educative factors in the schooling process--factors that are so highly intertwined in terms of their consequences for the formation of habits that it is difficult to establish an order of precedence among them: (1) the formal subject matter or curriculum; (2) the standards and rules of conduct; and (3) the general pattern of school organization. If it is true that rules and regulations and patterns of organization (which constitute the primary domain of the school administrator) are as equally educative as the subject matter content of schooling, it would seem that these purely structural attributes deserve an equal amount of attention in the education and practice of educators, and may even provide additional substance to the frequently ambiguous descriptions of the school administrator as "educational leader."

Approaches to the Study of Organizations

Given the ubiquity, pervasiveness and potency of organizations in modern societies, it is not surprising that numerous investigators representing a host of theoretical and practical disciplines have devoted their energies to the formal study of organizations and organizational phenomena. Some of these investigators (e.g., Parsons, 1959, 1960; and Etzioni, 1968), proceeding from a macro-sociological perspective, located the conditions and

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consequences of formal organizations in the operations of social systems, others (e.g., Fayol, 1949; Gulick and Urwick, 1937; Mooney and Reilly, 1931; Taylor, 1911; Spaulding, 1955; and Bobbitt, 1913) focused upon the more practical aspects of organizational development--i.e., how to build the best vehicle for the most efficient attainment of specific objectives. Between these polar extremes, some investigators have been primarily concerned with the psychological and social-psychological processes which occur within organizations, while others have been more interested in the purely structural attributes of organizations and their conditions and consequences within various types and classes of organizations.

In an attempt to introduce some degree of order into the diversity of organizational studies, Blau (1965, pp. 233-38; see also Blau and Meyer, 1971, pp. 79-97; and, for an alternative strategy, Hall, 1972, pp. 14-38) identified three fundamental approaches to the study of formal organizations: the individual approach, the group approach and the organizational approach.

The individual dimension of organizational analysis is primarily concerned with individuals and their characteristics and behavior in the roles they occupy as members of organizations. The work of Barnard (1938), Argyris (1960a, 1960b, and 1964), Maslow (1956), Simon (1957), March and Simon (1958), Herzberg, Mausner and Snyderman (1959), Boyan (1967), Corwin (1965), MacKay (1966), Moeller and Charters (1966), Sergiovani (1967) are characteristic of

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studies utilizing the individual or role dimension of organizational analysis.

The group dimension of organizational analysis focuses upon the structure of social relations and the patterns of informal relationships which inevitably emerge in organizations (the so-called "informal organization"). The work of Mayo (1933), Lewin (1943), Roethlisberger and Dickson (1939), McGregor (1960), Likert (1961), Blau (1963, 1967) are characteristic of this approach to the study of organizations.

The organizational dimension of organizational analysis is concerned with the system of interrelated structural elements or attributes which characterize the organization as a whole (e.g., its division of labor, hierarchy of authority, administrative apparatus, etc.). Weber's classical analysis of bureaucracy (Weber, 1946, pp. 196-244; 1947, pp. 329-336), the pioneering empirical work of Terrien and Mills (1955), Anderson and Warkov (1961), Rushing (1967); the comprehensive investigations of Pugh and his associates (Pugh, Hickson, Hinings and Turner, 1968, 1969) and Blau and his associates (Blau, 1968b, 1973; Blau, Heydebrand and Stauffer, 1966; Blau and Orum, 1968; and Blau and Schoenherr, 1971) are characteristic of this approach to the study of organizations.

The specific criterion for differentiating among these approaches is whether the particular variables being analyzed describe individuals and the roles they occupy in an organization, groups of interrelated individuals or systems of interrelated groups. "Thus seniority, professional expertness, socioeconomic status,

commitment to an organization and political preference are attributes of individual human beings. But the strength of the cohesive bonds that unite group members and the extent of differentiation of status that emerges among them are variables that refer to groups as such and not to their individual members. Correspondingly, the division of labor among various groups, the degree of centralization of control in an organization, the age of the organization and its size are characteristics of the organization as a whole that cannot be attributed either to its subgroups or to its individual members" (Blau, 1965, p. 330)--although the operational measures for some (but not all) of these variables may be derived from characteristics of individuals (see Lazarsfeld and Menzel, 1961 for their helpful distinction between "global" and "analytical" properties of collectivities).

Although these three dimensions of organizational analysis are not necessarily mutually exclusive, they are concerned with quite different substantive issues. Furthermore, each dimension presents unique methodological problems which normally preclude the simultaneous investigation of all three dimensions in a single study. For example, investigations of the attitudes and behavior of individual members of one or more organizations--e.g., their beliefs about minorities or their satisfaction with the leadership style of first line supervisors--generally employ more or less sophisticated survey techniques which must, of necessity, ignore, take for granted and/or make assumptions about the dynamics of organizational subgroups and the nature and impact of the structural

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attributes of the larger organizational environment. By the same token, the intensive study of organizational subgroups--e.g., the impact of informal relationships upon the promotion or restriction of cooperation or competition--usually requires a case study of a single organization based upon a sociometric design which is constrained to ignore or simply assume both the individual characteristics of organizational members and the structural attributes of the particular type of organization under investigation. Finally, investigations of the conditions, consequences and interrelationships of the structural attributes of organizations--e.g., the influence of increasing organizational size upon the degree of centralized decision making--requires the comparison of a large number of organizations within or across functional types and precludes attention to or requires assumptions about both the characteristics of organizational members and the dynamics of organizational subgroups.

Blau illustrates the conflicting implications of these three dimensions of organizational analysis as follows:

Let us assume that a comparative study of welfare organizations found that professionalization, that is, the proportion of case workers who have graduate training in social work, is associated with more extensive service to clients. Three interpretations of this finding are possible, depending on whether the focus is on roles, on group structures, or on the organization of the agencies. First, professionally trained individuals may provide more service to clients than untrained case workers. Second, the structure of work groups with a high proportion of professionals, perhaps by making informal status dependent on the way clients are treated, may encourage case workers, regardless of their own training, to extend more service to clients. Third, agencies with a high proportion of professionals on

their staff may be better organized to serve clients, which would be reflected in improved service by individual case workers independent of these individuals' own training or the work groups to which they belong. To determine which of these three interpretations is correct, or whether more than one or all three are, it is necessary to separate three distinct influences on treatment of clients, that of the individual's own training, that of the professional composition of his work group, and that of the professionalization of the agency in which he works (Blau, 1965, p. 330).

Ideally, of course, the investigation of the professionalization-service syndrome--or any other of a host of similar issues of interest to students of organizations--should utilize all three dimensions of analysis simultaneously. Hopefully, as the state of the art of organizational investigation and analysis advances and as economic resources become available, such gargantuan tasks will become commonplace. For the time being, however, students of organizations must be content to pursue these three dimensions independently, perfecting the methodological and statistical techniques employed in each, and seek to synthesize their findings as opportunities become available.

Purpose of the Investigation

The research reported in this paper consists of a comparative analysis of the structural characteristics of Michigan K-12 school districts. Employing the organizational dimension of analysis with an individual school district defined as a case, the study explores several questions derived from Weber's classic analysis of bureaucracies and from more recent empirical research concerning the relationships among various aspects of the division of labor, hierarchy

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of authority and administrative apparatus of K-12 school districts in Michigan. In addition, since school districts do not exist in a vacuum, the investigation examines the relationships between the structural characteristics of school district organizations and selected outcome or effect criteria in order to determine the impact of organizational structure upon school district performance. The specific questions to be answered in this investigation are spelled out in detail in Chapter III following the literature review reported in Chapter II.

Since this investigation is conducted from the organizational dimension of analysis, it intentionally omits any consideration of the characteristics of individual school district employees and clients and their informal interactions in organizational subgroups. This omission does not imply that the structural attributes of school district organizations do not affect, are not affected by or are more important than the psychological and social-psychological dimensions of these organizations. However, an understanding of organizational structure is as important (and may be logically prerequisite for) an understanding of the behavior and interactions of individuals and groups in organizational contexts.

Contributions of the Investigation

The research reported in this paper contributes to two distinct but theoretically overlapping disciplines: the field of organizational research and theory and the field of school administration. Since there is frequently--and regrettably--little intercourse

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between the practitioners of these disciplines, it is hoped that this investigation will make some contribution to bridging this unfortunate gap.

Organizational researchers have traced the relationships among the structural characteristics of several different types of organizations. This investigation represents the first known attempt to examine these relationships in public K-12 school district organizations. Thus, in addition to its substantive contributions, this research contributes empirical evidence from yet another type of organization to the small but expanding body of literature concerning the structural characteristics of formal organizations generally, and provides an additional opportunity for making those post hoc comparisons which are so important for determining the presence of structural homologies between organizations of different functional types.

Most studies of formal organizations conducted from the organizational dimension of analysis have been limited to an exploration of the internal relationships between their structural characteristics. This investigation on the other hand examines selected environmental and contextual conditions of those relationships in school district organizations and, further, explores the consequences of those relationships in terms of selected criteria of school district performance. Thus, in addition to documenting the internal relationships between the structural characteristics of school district organizations, this investigation breaks new ground by exploring the following questions: To what extent are the

structural attributes of school district organizations determined by variations in the environmental and contextual characteristics of those school districts? To what extent are different configurations of organizational structure responsible for various dimensions of school district performance? Although these questions are largely exploratory, their implications are equally significant for both organizational researchers and practicing administrators.

The questions posed in this investigation depend ultimately upon the ability to measure various dimensions of organizational environment, structure and performance. Consequently this investigation makes several contributions to the state of the art of organizational research as such. First, although most of the structural variables utilized are similar to those employed in other studies, this investigation advances the state of the art in this area by (1) employing multiple indicators of a single structural dimension (division of labor); (2) introducing a new indicator (administrative differentiation) to measure an additional aspect of another structural characteristic (hierarchy of authority); and (3) differentiating between specific functions in yet another aspect of school district structure (administrative apparatus). Secondly, although previous investigations have established the importance of organizational size and the availability of financial resources for various aspects of organizational structure, this investigation considers the contribution of several other environmental and contextual conditions. Although most of these conditions are included because of their relevance to school district operations, demonstrated relationships

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will have a bearing upon future research in other kinds of organizations. Finally, whereas most investigations have been primarily concerned with the internal consequences of the structural characteristics of formal organizations (i.e., the interrelationships between various structural characteristics), this investigation raises the larger question of external (i.e., performance) consequences of various configurations of school district structure. Although the performance criteria selected for investigation in this study are definitely peculiar to school district organizations, and although the studies reviewed in Chapter II provide little evidence to suggest any relationships between organizational structure and performance, findings concerning the presence or absence of such relationships will make a significant substantive contribution to the field of organizational research.

Given the exploratory nature of this investigation, one important contribution is a set of suggestions for future research. As was indicated above, this investigation represents the first known attempt to examine the relationships between and the conditions and consequences of the structural characteristics of public school district organizations. The findings will suggest questions that either were not asked or could not be answered because of the limitations of the available data. Furthermore, this investigation, which is limited to the organizational dimension of analysis, will suggest avenues for future research which involve a multi-dimensional design including variables representing the organizational, small

group and/or individual units of analysis. Specific questions for further research are discussed in detail in Chapter VI.

Overview of the Investigation

The details of the investigation are presented in six chapters. This introductory chapter is concerned with the background, purpose, rationale and anticipated contributions of the investigation. Chapter II provides an extensive review of the research literature. Chapter III presents the questions examined and the variables utilized to measure the environmental, contextual, structural and performance characteristics of Michigan K-12 school districts. This chapter also describes the procedures employed to collect and analyze the data, and concludes with a detailed discussion of the decomposition procedures used to interpret the relationships observed in the statistical analysis. Chapter IV describes the findings with respect to the environmental and contextual conditions of the structural characteristics of Michigan K-12 school districts, and Chapter V describes the findings with respect to the performance consequences of the structural characteristics of Michigan K-12 school districts. Chapter VI summarizes the findings and conclusions of the investigation and makes several suggestions for future research.

CHAPTER II

LITERATURE REVIEW

Introduction

Max Weber was one of the first serious students of modern organizations--which he called "bureaucracies" (a neutral term referring to organizations manifesting specific structural characteristics and which should not be confused by the ambiguities of colloquial usage designating either a ruthless preoccupation with or a total disregard for administrative efficiency). Although Weber's classic analysis of bureaucracy (Weber, 1946, pp. 196-244; 1947, pp. 329-366) is embedded in his larger sociological concern for the "disenchantment" or increasing rationalization of modern life, his analysis comprises the baseline of most subsequent scientific investigations of modern organizations.

Among the several defining characteristics Weber identified as comprising the essence of bureaucratic organization, the most significant are:

1. A precise division of labor--"The regular activities required for the purposes of (the organization) are distributed in a fixed way as official duties" (Weber, 1946, p. 196)--characterized by a high degree of specialization which, by reducing the range of responsibilities associated with each task, encourages a high degree of expertness in the performance of all tasks.

2. A circumscribed hierarchy of authority--"The organization of offices follows the principle of hierarchy; that is, each lower office is under the control and supervision of a higher one" (Weber, 1947, p. 331)--which mediates the distribution of power and status in the organization in such a way as to assure adequate supervision and control by limiting and protecting the discretion exercised by each official.

3. An administrative staff--"The management of (the organization) is based upon written documents ('the files') . . . There is, therefore, a staff of subaltern officials and scribes of all sorts" (Weber, 1946, p. 197)--which is concerned primarily with matters of coordination and communication and which, unlike the "production staff," contributes to goal attainment primarily by attending to problems of organizational maintenance.

4. A system of general and impersonal rules and procedures--Operations are governed by "a consistent system of abstract rules . . . (and) consist of the application of these rules to particular cases" (Weber, 1947, p. 330)--which govern official decisions and actions, and encourage uniformity and continuity in the performance of tasks despite changes in personnel.

5. An impersonal orientation with respect to both clients and other officials--"The ideal official conducts his office . . . (in) a spirit of formalistic impersonality, 'Sine ira et studio,' without hatred or passion, and hence without affection or enthusiasm" (Weber, 1947, p. 340)--which guarantees that decisions will be made

and tasks performed without the corrupting influence of emotions or personal bias.

6. Career employment based on technical qualifications-- "Employment in the organization constitutes a career. There is a system of 'promotions' according to seniority or to achievement or both" (Weber, 1947, p. 334)--thus obviating personal or political considerations in matters of hiring or promotion and encouraging a high degree of identification with the organization, loyalty and esprit de corps.

Weber's description and analysis of bureaucracy implies a relationship of functional interdependence among these attributes, the criterion of function being rational, efficient administration (Blau, 1968a, p. 31). That is, the effective attainment of large scale tasks requires that the total task be broken down into sub-tasks with qualified personnel assigned to each responsibility. But such differentiation creates problems of control and coordination and requires a precisely defined hierarchical distribution of circumscribed authority, and an administrative apparatus of consultants and clerks to attend to matters of organizational coordination and communication. But lest the closeness of supervision becomes dysfunctional, a system of general and impersonal rules and procedures is required to standardize operations and preclude the necessity of supervisory intervention except in extraordinary situations. A strictly impersonal orientation insures against the contaminating influence of personal considerations and allows the objective criteria of technical qualifications and impartial rules to

govern relations with employees and clients. However, if this impersonal discipline causes insecurity and results in the alienation of organizational participants, then career employment based upon technical qualifications creates a dimension of security and stability. In short, each attribute contributes to effective and efficient operations both in and of itself, and by compensating for the possible dysfunctions of other attributes.

Weber's analysis of bureaucracy has been justly criticized on several counts. By dealing with bureaucracy as an "ideal type"--which represents not "an average of the characteristics of all existing bureaucracies (or other social structures), but a pure type derived by abstracting the most characteristic aspects of all known organizations" (Blau and Meyer, 1971, pp. 23-24)--it is implied that all bureaucracies are characterized by these attributes and that the relationship between them may be assumed to be linear--i.e., the more of one, the more of the others. Although this criticism may derive from an inadequate understanding of Weber's use of the ideal type construct (see Weber, 1947, pp. 87-115), it is correct to assert that all organizations do not manifest the same degree of bureaucratization (as measured by the previously described characteristics) nor, as Hall (1963; 1972, pp. 19-20) has shown, are these organizational characteristics necessarily even positively related to one another. But, as Blau and Meyer have noted, "this criticism obscures the fact that the ideal type construct is intended as a guide in empirical research, not as a substitute for it. By indicating the characteristics of bureaucracy in its pure form it directs

the researcher to those aspects of organizations that he must examine in order to determine the extent of their bureaucratization" (Blau and Meyer, 1971, p. 24). In other words, the limitations of Weber's conceptual scheme should not be allowed to obscure the utility of his generalizations, particularly if they are regarded as testable hypotheses rather than as a set of infallible laws. The question, after all, is not whether this or that organization is a bureaucracy, but rather the extent, conditions and consequences of its bureaucratization.

Weber's analysis of bureaucratic organizations has also been criticized because it emphasizes the functional relationships of organizational characteristics and ignores their dysfunctional or unintended consequences (Merton, 1940, 1968; Selznick, 1949; Gouldner, 1954; March and Simon, 1958, pp. 34-82), and because it fails to take into consideration the impact of the informal relationships and unofficial patterns of behavior--the so-called "informal organization"--which inevitably emerge in formal organizations and which frequently determine the effectiveness of formalized procedures and structures (Barnard, 1938, p. 123 ff.; Roethlisberger and Dickson, 1939; Selznick, 1948). These criticisms of Weber's theory have generated a virtual cornucopia of theoretical and empirical studies concerned with the dysfunctions and informal structures which emerge in formal organizations. And although these investigations have made substantial contributions to the refinement of Weber's original propositions and to organizational theory generally, they have also, by focusing on the informal processes of organizational life, been

constrained to accept as given the very issues which Weber considered to be problematic: why organizations develop certain formal attributes (e.g., a particular division of labor, hierarchy of authority, administrative apparatus, etc.). And since, as Blau has noted, "the purpose of a theory of formal organizations is to explain the distinctive features of these complex structures in terms of some general principles . . . (such a theory) cannot take the characteristics of organizations as given but always raises the question of why these characteristics come into existence" (Blau, 1968a, p. 34). In short, case studies of organizational dysfunctions and of the informal processes which occur within organizational contexts make a significant contribution to a comprehensive understanding of organizations, but unless they engage in some form of psychological reductionism, they fail to account for the conditions and interrelationships of the structural attributes of organizations as such. (See, for example, Simon (1964) who maintains that organizations are to be understood as the actions and reactions of individuals, and who warns against reifying the concept of organization ". . . treating it as more than a system of interacting individuals"; see also the exchange between Homans and Blau (Borger and Cioffi, 1970) in which the former argues for a reduction of organizational phenomena to a system of psychological processes while the latter, in defense of his position, not-so-facetiously argues for a further reduction to physiological processes).

Empirical investigations of the structural attributes of organizations date from the mid-1950's. Since that time, such

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investigations have become increasingly complex, both in terms of the number of variables investigated and in terms of the statistical techniques employed in the analysis of their relationships. Whereas most of the earlier studies utilized relatively gross measures of two or three organizational attributes and relatively simple statistical techniques, later investigations have employed increasingly sensitive indicators and considerably more sophisticated statistical procedures to analyze the direct and indirect relationships among organizational attributes and between those attributes and one or more environmental or contextual characteristics and one or more performance or effect criteria.

The remainder of this chapter summarizes several of the more important of these investigations. The discussion consists of four sections. Three sections are concerned with the theoretical assumptions, operational definitions and correlates of one of the three structural attributes which comprise the core of bureaucratic organization: (1) division of labor, (2) hierarchy of authority, and (3) administrative apparatus. The fourth section summarizes the theoretical assumptions, operational definitions and correlates of selected performance criteria which have been used to measure the consequences of various configurations of organizational structure.

Three criteria were employed in selecting studies for inclusion in this review. First, several early investigations, particularly those which attempted to combine the individual, group and organizational dimensions of analysis, employed broad terms such as "bureaucratization" or "complexity" to represent organizational

conditions which were either defined impressionistically or measured by a single characteristic (e.g., "extent of rule-governed behavior" or "relative size of the administrative staff"). Since such usage is confusing at best, the former have been excluded from consideration while the latter have been incorporated in the discussion of the variables which were actually investigated. In short, terms such as "bureaucratization" and "complexity" will be regarded as meaningless except and insofar as they represent measurable organizational characteristics.

Second, several early comparative investigations studied organizations representing several functional types--e.g., business, industrial, governmental, service, voluntary, etc. Although several of these investigations have made significant contributions to the development of organization theory, most--by ignoring probable sources of variation deriving from obvious differences in organizational autonomy, technology, goals and operational activities--have had limited utility except as they have generated hypotheses for future investigations. In any case, the present review contains a clear bias in favor of investigations which have concentrated upon organizations of a single functional type.

Third, many organizational studies, lacking sources of more objective information concerning one or more organizational attributes, have attempted to elicit such information from individual organizational members either through interviews or more or less elaborate questionnaires. Although such procedures are obviously legitimate when the information requested concerns factual information

that the respondent can be expected to have at his disposal, their utility is somewhat questionable when the information requested is purely impressionistic. It is one thing, for example, to ask a top executive to list the officials who report directly to him in order to measure managerial span of control, but it is quite a different matter to measure the extent of organizational rules and regulations by asking even a large sample of operational employees to indicate their perceptions of the extent to which rules and regulations determine various aspects of their official behavior. Hall (1971, Chapter VI) while arguing for the legitimacy of the latter approach on the basis of its contribution to an understanding of informal organizational relationships, admits that the two approaches probably elicit different types of information and suggests further research to measure the relationship between them. In any case the following review contains a clear bias in favor of more objective measures of organizational variables.

Division of Labor

Weber maintained that bureaucracies are characterized by an extensive division of labor whereby organizational tasks are differentiated into more or less specialized occupational positions and distributed across a variety of differentiated organizational subunits and/or locations. Furthermore, his functional analysis of this characteristic implies that although such differentiation contributes to organizational efficiency, it also contributes to organizational complexity by creating problems of communication, coordination and control. Durkheim (1964, p. 367) also has noted

that "the more complex (i.e., the more specialized the division of labor) an organization is, the more is the need for extensive regulation felt." More recent investigations have subjected these claims to empirical tests and have investigated the relationship between an organization's division of labor and other organizational characteristics. This section reviews some of the findings of researchers who have examined the conditions and consequences of the division of labor of formal organizations.

Organizational investigators have used a great variety of indicators to measure and describe the division of labor in formal organizations. Some have used a simple enumeration of occupational titles (e.g., Blau, Heydebrand and Stauffer, 1966; Hage and Aiken, 1967b; and Blau and Schoenherr, 1971), others have employed either the Gini coefficient of concentration (e.g., Heydebrand, 1973; see also Heydebrand, 1972) or the Gibbs-Martin formula for measuring the distribution of personnel within the differentiated positions of a division of labor (see Gibbs and Martin, 1962; Gibbs and Browning, 1966). Other investigators have measured horizontal differentiation by enumerating the goals, activities or tasks of organizations under various conditions (e.g., Anderson and Warkov, 1961; Hall, Hass and Johnson, 1967; Heydebrand, 1973; and Heydebrand and Noell, 1973). In addition, whereas some investigators have examined the dispersion of organizational activities among geographical locations (e.g., Anderson and Warkov, 1961; Raphael, 1967; and Heydebrand and Noell, 1973), others have studied the assignment of organizational activities

to various department, divisions and sections (e.g., Pugh, Hickson Hinings and Turner, 1968; Blau, 1973; and Boland, 1973); and still others have utilized both measures of spatial dispersion (e.g., Hall, Haas and Johnson, 1967; Blau and Schoenherr, 1971). Finally, as discussed in detail below, several investigators examined the effects of a professionalized or technically specialized division of labor upon other organizational characteristics (e.g., Stinchcombe, 1959; Anderson and Warkov, 1961; Blau, Heydebrand and Stauffer, 1966; Hage and Aiken, 1967b; Bell, 1967; Aiken and Hage, 1968b; Blau, 1968b, Blau and Schoenherr, 1971; Heydebrand, 1973; Heydebrand and Noell, 1971; and Blau, 1973).

One consistent finding in the organizational research literature is the positive correlation between organizational size and the complexity of an organization's division of labor, regardless of the indicators used to measure either variable. This pattern appears so regularly that many assume organizational size is the independent variable--i.e., that increasing organizational size causes increasing structural differentiation. However, Hall, Haas and Johnson (1967) have questioned this assumption of causality. Indeed, their findings suggest that:

In these cases where size and complexity are associated, the sequence of causality may well be the reverse. If a decision is made to enlarge the number of functions or activities carried out in an organization, it then becomes necessary to add more members to staff the new functional areas. Clearly, what are needed are longitudinal studies which examine the preconditions of staff increases as well as the structural consequences of such increases (Hall, Haas and Johnson, 1967, p. 112).

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However, in the absence of such longitudinal data, most investigators (e.g., Blau and Schoenherr, 1971, pp. 27-29, 63; Blau, 1973, pp. 35-39), while assuming some degree of mutual interdependence, stipulate an order of precedence which flows from contextual variables (e.g., size) to structural attributes (e.g., division of labor) to performance or effect criteria (e.g., productivity). Given this convention, it will be assumed that, everything else being equal, division of labor is a function of organizational size rather than vice versa. (See Kimberly, 1976, for a critique of this convention).

Investigators have defined organizational size in a number of different ways, depending upon the nature of the organizations investigated and the substantive interests of the investigators. Although some researchers have employed economic criteria such as total assets, total sales, total value added by manufacture per establishment (Melman, 1951), most social scientists have used some enumeration of organizational employees, members or clients. For example, while Terrien and Mills (1955), Blau, Heydebrand and Stauffer (1966), Hage and Aiken (1967b), Blau (1968b), Blau and Schoenherr (1971) and Heydebrand and Noell (1973) enumerated all employees to define organizational size, Rushing (1967), Pondy (1969), Boland (1973) and Blau (1973) counted only production or operational employees in order to preserve the independence of measures of other personnel components. Some researchers have used organizational members as their measure of size either because they were investigating voluntary organizations (Tsouderos, 1955; Simpson and Gulley, 1962; and Raphael, 1967) or because they included voluntary associations

in their sample of organizations (Caplow, 1957, 1964; Indik, 1964; Hall, Haas and Johnson, 1967). Finally, researchers investigating hospitals (Anderson and Warkov, 1961; and Heydebrand, 1973) have used the number of patients treated during some specified period of time as their measure of size. Blau and Meyer (1971) have suggested that all of these measures are probably highly correlated and Price (1972, p. 174) has suggested that since they are probably highly correlated, researchers should employ scales of multiple indicators to facilitate comparability and replication. However, most investigators continue to use a single measure of organizational size.

With respect to the relationship between organizational size and specific measures of division of labor, Melman (1951), Baker and Davis (1954), Blau, Heydebrand and Stauffer (1966), Blau and Schoenherr (1971) and Heydebrand (1973) have demonstrated that as size increases, so does the number of occupational titles. Furthermore, Rushing (1967), Pondy (1969), Heydebrand (1973) and Blau and Schoenherr (1971) found a positive relationship between size and the concentration of personnel within occupational classifications.

These findings indicate that as organizations become larger, simpler tasks become segregated from more complex tasks, permitting a higher degree of routinization in some activities and a higher degree of professional specialization in others. As indicated below, these two forms of horizontal differentiation (among and within occupational specialties) combine to increase operational economy along several dimensions and, by facilitating occupational heterogeneity within organizations and homogeneity within subunits,

may contribute to a higher degree of organizational productivity and individual morale (Pelz, 1956).

Larger organizations also tend to be more differentiated in terms of functional units (divisions, departments, sections per division, etc.). Although Hall, Haas and Johnson (1967) found weak and inconsistent relationships between size and three measures of subunit differentiation in the seventy-five organizations they studied, the inconsistencies may have been due to the fact that their sample represented organizations of several functional types. Given that diversity, they are probably correct in attributing their findings to environmental and technological conditions rather than to organizational size. In studies of organizations representing a single functional type however, Meyer (1968, 1972), Blau (1968b) and Blau and Schoenherr (1971) found positive relationships between organizational size and subunit differentiation.

In addition to occupational and subunit differentiation, Raphael (1967), Hall, Haas and Johnson (1967) and Blau and Schoenherr (1971) have shown that as organizations become larger, they also manifest a higher degree of spatial differentiation (number of geographical locations). Although Blau and Schoenherr (1971) have demonstrated that this condition is at least partially a function of environmental conditions (e.g., population density), the effect of organizational size is no less significant.

Finally, Meyer (1968), Blau (1968b), Pondy (1969) and Blau and Schoenherr (1971) have shown that there are limits in the extent to which size encourages increased differentiation in an

organizational division of labor. They found that as size increases, all dimensions of horizontal differentiation increase quite rapidly at first, level off as size approaches the mean and actually declines in the largest organizations, indicating a point of diminishing returns in the extent to which further differentiation may be functional.

In summary, all of the research reviewed in this section indicates that the complexity of an organization's division of labor is a function of the size of the organization: the larger the organization, the more extensive the distribution of organizational tasks among differentiated and specialized personnel, organizational subunits and work locations.

Hierarchy of Authority

Weber's analysis of bureaucracy suggests that complex organizations are characterized by an extensive hierarchy of circumscribed authority: "The organization of offices follows the principle of hierarchy; that is, each lower office is under the control and supervision of a higher one" (Weber, 1947, p. 331) which mediates the distribution of power and status in the organization in such a way as to assure adequate supervision and control by both limiting and protecting the discretion exercised by officials.

Students of organizations have long recognized that "the authority structure may rightfully be considered the core of a formal organization" (Blau and Schoenherr, 1971, p. 111). However, most investigators have focused upon the consequences of various

configurations of authority upon the attitudes, morale, satisfaction, alienation and productivity of individuals and groups within organizations. Only recently have investigators examined the structural conditions and consequences of hierarchical differentiation as such. This section reviews the operational definitions and findings of several studies designed around this latter concern.

Organizational researchers have used a variety of indicators to measure and describe the structure of authority relations in organizations. Blau, Heydebrand and Stauffer (1966) used the ratio of managerial or supervisory personnel to operating employees to measure hierarchy of authority. However, although later studies (e.g., Blau and Schoenherr, 1971) revealed that this and other measures of vertical differentiation tend to be highly correlated, such ratios do not necessarily permit generalizations concerning other dimensions of hierarchical relations (e.g., hierarchical levels, span of control, centralized decision making, etc.). This same weakness applies to Rushing's (1966, 1967) ratio of managerial to production personnel (a sub-component of administrative apparatus), Pondy's proportion of managerial personnel per 100 employees (a sub-component of administrative intensity), and Heydebrand's (1973) proportion of graduate professional nurses who occupy administrative and supervisory positions.

Several researchers have based their measures of hierarchical relations upon perceptual-attitudinal scales derived from questionnaire data. For example, Hall (1963, 1968) developed such scales to measure "the extent to which the locus of decision making

is pre-structured by the organization" (Hall, 1968, p. 96). Hage and Aiken (1967b) used Hall's scales as indicators of hierarchy of authority and developed others to measure the extent of centralized decision making in sixteen health and welfare organizations. Finally, Boland (1973) used information derived from questionnaires administered to faculty members and department chairmen to measure the autonomy and decision making power of faculty senates and subject matter departments in U.S. colleges and universities.

Other investigators have developed measures of vertical differentiation based solely upon documentary evidence. For example, Hall, Haas and Johnson (1967) used the number of hierarchical levels in all divisions in their investigation of organizations representing several functional types. Heydebrand and Noell (1973) used the number of levels in the central division and the ratio of managerial and clerical personnel to total employees as their measures of vertical differentiation in welfare organizations. Pugh, Hickson, Hinings and Turner (1968, 1969) developed elaborate, ten-item scales of "centralization" and "configuration" to measure various aspects of the hierarchy of authority in English work organizations.

Finally, several investigators have developed multiple indicators of hierarchical relations based upon a combination of documentary and perceptual-attitudinal information. For example, Bell (1967) measured supervisory span of control by enumerating subordinates per supervisor and averaging across divisions in a community hospital. In addition, he developed a "closeness of

supervision index" based upon subordinates' responses to two questions concerning the frequency and influence of supervisory interventions in their work. Blau (1968b) and Meyer (1968, 1972) utilized seven indicators of authority relations in their studies of government finance organizations: managerial ratio, number of hierarchical levels, average span of control of first-line supervisors and of middle managers, proportion of time spent in supervision by managers and (as a measure of centralized decision making) the hierarchical levels on which specified financial and personnel decisions were made. Blau and Schoenherr (1971) utilized five indicators of "shape of the pyramid" (number of levels, number of divisions, number of sections per division, span of control of the agency director and division heads) and four indicators of "decentralization" (delegation of personnel decisions, delegation of budget decisions, delegation to local offices and the hierarchical locus of decisions with respect to change) as well as supervisory ratio (a sub-component of "administration") to measure the structure of authority relations in U.S. employment security agencies. Finally, Blau (1973) used three indicators to measure the hierarchy of authority in U.S. colleges and universities: levels (the number of hierarchical levels with the president and faculty counted as the two extreme levels); president's span of control (the number of officials reporting directly to the president); and mean span of control of officials reporting to the president (the number of officials two levels divided by the number one level below the president).

As was indicated above, Weber's theoretical model suggests that bureaucratic authority structure is a function of size and division of labor. Several researchers have conducted empirical investigations in a broad spectrum of formal organizations in order to explicate these relationships.

Indik (1964) examined the relationship between size and supervisory ratio in 116 organizations representing five different settings. Like Anderson and Warkov (1961), but contrary to Terrien and Mills (1955) and Parkinson (1957), he found that as size increases, the supervisory ratio tends to decrease, provided that the functional complexity of organizational tasks remains at a relatively low level. Rushing (1967) found a similar situation when he differentiated between administrators with supervisory responsibilities and those with clerical or staff responsibilities in U.S. industries. Blau, Heydebrand and Stauffer (1966) also found an inverse relationship between organizational size and managerial ratio in public personnel agencies, but only under conditions of low professionalization.

Hall, Haas and Johnson (1967) found weak and inconsistent relationships between organizational size and four measures of authority relations in seventy-five organizations representing several functional types. Although larger organizations tended to have more hierarchical levels than smaller ones, they suggested that authority relations are not so much a function of size as of the nature of technology (as indicated, for example, by the complexity of organizational tasks and activities). Furthermore, although they did

not test the relationships involved, they suggested that hierarchical differentiation probably varies with the extent of formalization (extent of rules and regulations), each representing an alternative mechanism for controlling organizational operations.

Blau (1968b) conducted an extensive study of the hierarchy of authority in 254 finance departments of state and local governments. He found that size is negatively related to managerial ratio, but only under conditions of low professionalization. Larger organizations with a more highly qualified work force tend to have more managers, narrower spans of control for first-line supervisors and more decentralized decision making with respect to specified budgetary and personnel policies. Furthermore, he found that managers spend less time in direct supervision under these conditions than managers of less qualified personnel. Meyer (1968) conducted a separate analysis of data from the same organizations and found an opposite set of relationships in organizations characterized by a high degree of routinized activities and automated procedures. These findings led these investigators to conclude that size has a differential effect upon the nature of authority relations, depending upon the degree to which tasks are either routinized or require the attention of professionally trained experts.

In a later study, Blau and Schoenherr (1971) expanded and refined this suggestion by demonstrating that size is positively related to the number of hierarchical levels, number of functional divisions and number of sections per division in governmental employment security agencies. They found, however, that these complex

relationships are contingent upon various aspects of division of labor and formalization.

In his re-analysis of the data from 254 finance agencies, Meyer (1972) found that although greater size is associated with more supervisory levels and wider spans of control at all levels, spans of control at intermediate levels are narrower than those at other levels, regardless of agency size. He attributed this finding to the necessity of translating the more abstract goals of large organizations into concrete means required for implementation at the operational level.

In summary, although size has been shown to have a major impact upon the structure of authority relations in formal organizations, this impact is highly complex and is mediated by other characteristics, especially the complexity of the organizational division of labor.

Blau, Heydebrand and Stauffer (1966) examined the relationship between division of labor (number of distinct job titles) and managerial hierarchy (the ratio of managers to employees in non-supervisory positions among the non-clerical staff) in 156 public personnel agencies. Assuming at the outset that a high managerial ratio indicated a high degree of centralized decision making and closeness of supervision, these investigators discovered an inverse relationship between these variables in larger organizations, except under conditions of a highly professionalized work force (proportion of staff required to have a college degree with a specified major). Rejecting the notion that highly qualified personnel require closer

supervision than less highly qualified employees, these investigators reformulated their assumptions and speculated that a high supervision ratio actually indicated a decentralized authority structure in which the additional managers are engaged, not in direct supervision, but in the communication functions required for the coordination of professional activities. On the other hand, they suggested that a low managerial ratio (associated with an extensive division of labor among less qualified personnel) indicated a centralized authority structure in which control is exercised through one-sided directives and the use of formalized rules and procedures. However, since these suggestions exceeded the evidence derived from a single, relatively simple measure of managerial hierarchy (supervisory ratio), these speculations required further empirical investigation.

Blau (1968b) and Meyer (1968) essentially confirmed these speculations in their separate analysis of data from 254 governmental finance organizations. They found that an extensive division of labor is associated with a lower supervisory ratio, fewer hierarchical levels, broader spans of managerial control and increased automation (extensive use of computerized data processing facilities). They concluded that governmental finance organizations tend to have one of two pyramidal shapes, depending upon the nature and degree of their horizontal differentiation. That is, organizations in which activities are minutely subdivided into a relatively large number of routinized and standardized tasks tend to have a relatively squat pyramid with few hierarchical levels, lower supervisory ratios, broader spans of managerial control and a greater emphasis upon

formalized procedures, rules and regulations. Organizations employing more professionally trained experts on the other hand tend to have taller pyramids, more hierarchical levels, higher managerial ratios, broader spans of managerial control, fewer formalized procedures, rules and regulations and more decentralized decision making processes.

Hage and Aiken (1967b) found similar conditions on the basis of a less extensive set of variables in their investigation of sixteen health and welfare organizations, and Hall (1968; see also Hall, 1972, p. 189) essentially replicated these findings on the basis of perceptual scales employed in his study of eleven occupations in twenty-seven organizational settings. Blau and Schoenherr (1971) on the other hand found a positive relationship between division of labor (number of distinct occupational titles) and hierarchy of authority (number of hierarchical levels) in U.S. employment security agencies, but further analysis revealed that this relationship disappeared when size was controlled. They also found that division of labor is inversely related to centralized decision making, but (like Pugh, Hickson, Hinings and Turner, 1969), only under conditions of extensive rules, regulations and other formalized procedures.

Rushing (1966; 1967) and Heydebrand (1973) found extremely complex relationships between their measures of division of labor and hierarchy of authority in U.S. industries and U.S. hospitals, respectively. As was indicated above, Rushing found that size and the relative size of the managerial component are negatively

related in U.S. industries. On the other hand, he found a positive association between division of labor (distribution of personnel within occupational categories) and the relative size of the managerial component. Furthermore, he found that the effect of these variables is independent (i.e., controlling for one does not decrease the effect of the other) and that they interact (i.e., the effects of division of labor are greater in smaller industries while the effects of size are greater in industries with a high division of labor--except under conditions of high professionalization). This latter exception led Rushing to conclude that "as the division of labor increases, clerical and professional personnel become functional substitutes for managerial personnel" (Rushing, 1967, p. 295).

Heydebrand (1973) found negative relationships between three measures of division of labor (functional specialization--i.e., the proportion of thirty-nine job titles actually occupied; departmental specialization--i.e., the concentration of employees in seven departments; and professionalization--i.e., the ratio of graduate professional nurses to total personnel); and hierarchy of authority--i.e., proportion of graduate professional nurses in administrative and supervisory positions. He also found these variables virtually unrelated to the proportion of personnel in business and clerical positions. However, further analysis (controlling for organizational size, organizational autonomy and task complexity) revealed that increasing task complexity (i.e., the number of objectives and medical services) is positively associated with increasing

departmental specialization, professionalization and the relative size of the administrative apparatus, but negatively associated with the hierarchy of authority. Heydebrand concluded that different aspects of division of labor have different effects upon bureaucratization (administrative apparatus and hierarchy of authority). Multi-purpose hospitals tend to be more departmentalized, and organizational tasks (including those performed by professionals) tend to be more specialized and fragmented, thus increasing the need for administrative coordination and hierarchical control. In less complex hospitals on the other hand, there tends to be less departmentalization, organizational tasks are less specialized and professionals tend to operate in a "generalist" mode in which they perform many of the administrative and regulative functions which might otherwise be performed by administrators and supervisors.

The evidence with respect to the effects of spatial differentiation (i.e., work performed in dispersed locations) upon hierarchical relations is contradictory and inconclusive and seems to vary with the type of organization under consideration. Anderson and Warkov (1961) and Raphael (1967) found opposite relationships between spatial dispersion and vertical differentiation in hospitals and local labor unions, respectively. But since neither study differentiated between the managerial and clerical components of the hierarchies examined, no conclusions are possible concerning the distribution of authority in either set of organizations. Pugh, Hickson, Hinings and Turner (1969) on the other hand found that spatial dispersion is positively related to the number of

hierarchical levels and "line control of workflow" (i.e., the extent to which authority is decentralized with respect to a central headquarters but centralized in the dispersed locations), but only under increasing "structuring of activities" (i.e., conditions of specialization, standardization and formalization) in English work organizations. These investigators concluded that "perhaps when the responsibilities of specialized roles are narrowly defined, and activities are formalized in records, then authority can be safely decentralized" (Pugh, Hickson, Hinings and Turner, 1969, p. 102).

With respect to the horizontal differentiation of organizational subunits, Blau and Meyer (1971, p. 94) suggest that the subdivision of organizations in divisions, departments and sections tends to be associated with centralized decision making because the larger the number of sub-divisions, the greater the probability that any given decision will affect more than one subunit. Blau (1968b), Meyer (1968) and Blau and Schoenherr (1971) found empirical support for this suggestion, but only in organizations having few hierarchical levels, low professionalization and extensive formalized procedures. Furthermore, Meyer (1972) found that increasing horizontal differentiation of governmental finance agencies is accompanied by increasing centralization of key decisions in the organizational hierarchy. Although vertical differentiation, on the other hand, is associated with increasing decentralization of decision making authority, it is also accompanied by increasing numbers of rules and regulations which tend to determine decisions in advance.

Thus the occupational, functional and spatial differentiation of organizations tends to exert considerable influence upon the structure of organizational authority and control in formal organizations. The more complex the division of labor, the more complex the hierarchy of authority. But, as has been suggested throughout the preceding discussion, probably the most influential characteristic of an organization's division of labor vis-a-vis its hierarchy of authority is the extent to which organizational activities are performed by technically expert or professional trained personnel. This issue relates to the question of the alleged conflict between professional authority (i.e., authority based upon technical knowledge) and bureaucratic authority (i.e., authority based upon official status).

As indicated above, Weber characterized bureaucracies by an extensive division of labor and an extensive hierarchy of authority consisting of a "firmly ordered system of super- and sub-ordination in which there is supervision of the lower offices by the higher ones" (Weber, 1947, p. 197). Furthermore, his analysis implies that these attributes are functionally interdependent and that they tend to occur together. Several writers have disputed this claim, however, and have pointed out that horizontal differentiation through technical specialization may take different forms depending upon the extent to which the knowledge base of the organization is rationalized. Heydebrand and Noell (1973) have argued that "rationalization of knowlege implies not only standardization, codification and systematization, but also accessibility and

availability. Thus the degree of rationalization of the knowledge base may vary from the 'vision' of a political leader or religious prophet to the expert 'judgment' of a doctor or lawyer to the technical 'precision' of a machine or computerized information system" (Heydebrand and Noell, 1973, p. 295). Different degrees of rationalization of an organizational knowledge base, therefore, can be expected to have quite different implications for the way in which tasks are differentiated and distributed. In a mass production or process industry, for example, in which organizational knowledge is highly rationalized and information is highly accessible, tasks may be minutely subdivided so that nonspecialists (or even machines) can perform them in a highly routine fashion. In a craft or professional organization on the other hand, activities may be such as to require the more comprehensive attention of highly trained experts. These alternative forms of horizontal differentiation can be expected to have different implications for the structure and dynamics of an organization's hierarchy of authority, not only in terms of the nature and extent of supervision, but also in terms of the way in which organizational goals are specified and articulated and in terms of the manner in which control is exercised over the resources utilized in goal attainment. Thus Parsons (Weber, 1947, pp. 58-60, note 4) and Gouldner (1954) have argued that far from being complementary in all cases, a division of labor characterized by a high degree of professional expertise (as opposed to task routinization) actually conflicts with the rigidities of hierarchical authority; and that just as task routinization and professional

specialization are alternative forms of horizontal differentiation, so bureaucratization (based on the authority of official position) and professionalization (based on the authority of technical competence) are alternative mechanisms of vertical differentiation--a distinction from which Gouldner (1954, pp. 22-24) derives his concepts of "representative" and "punishment centered" bureaucracy.

Although several investigators (Francis and Stone, 1956; Gouldner, 1957-58; Caplow and McGee, 1958; Hughes, 1958; and Blau and Scott, 1962) have found some empirical support for this claim in case studies conducted from the individual or group dimensions of organizational analysis, only a few investigators have examined the structural implications of this phenomenon.

Stinchcombe (1959) conducted a comparative analysis of mass production industries and the construction industry and found that the more "professionalized" construction industry is characterized by a higher degree of procedural (as opposed to goal-setting) decentralization and work group autonomy and proportionately smaller administrative and supervisory components than the more formalized ("rationalized") mass production industries. Stinchcombe used this evidence to distinguish between "craft" and "bureaucratic" administration as alternative forms of rational administration.

Hage and Aiken (1967b) examined the relationship between professionalization (as measured by training requirements) and the degree of centralized decision making in sixteen health and welfare agencies. They found that organizations employing a large number of professionals tend to be less centralized than organizations with

fewer professional personnel, indicating that the internalized norms and standards which guide the behavior of professionals tend to preclude the necessity of external supervision and regulation.

Hall (1968) found similar conditions and arrived at similar conclusions in his study of twenty-seven different professional organizations. Hage and Aiken (1967a; Aiken and Hage, 1968) also found that the combination of high professionalization and low centralization contribute to increased program innovation and increased organizational interdependence.

Bell (1967) examined the relationship between professionalization (as measured by four elements of job complexity) and supervisory span of control in thirty departments of a community general hospital. He found that increasing complexity is negatively related to supervisory span of control. He also discovered that span of control is unrelated to closeness of supervision.

From a somewhat different perspective, Montagna (1968) examined eight large and four medium sized public accounting firms ("professional bureaucracies") and found that the larger firms are both more professionalized (number of CPA's) and more centralized (location of key decisions) than medium sized firms. He attributed these findings to the influence of agency size on the one hand and to the pervasive influence of the increasingly rationalized professional norms promulgated by externally based professional associations on the other. He concluded that large firms have a decisive influence on the professional associations and, in turn, are more influenced by the norms and standards which they promulgate. Montagna also

found that the large professionalized and centralized firms also have smaller administrative components than the medium sized firms, a factor which he attributed to the pervasive influence of internalized norms and standards associated with professional behavior.

It was noted above that Blau, Heydebrand and Stauffer (1966) found a positive association between professionalization (i.e., the number of operating staff required to have a college degree with a specified major) and managerial hierarchy (ratio of managerial to operating personnel) in 156 public personnel agencies. This unexpected finding led these investigators to speculate that a high managerial ratio might indicate, not closeness of supervision, but dispersed authority in which managers facilitate the extensive communication required for the coordination of professional work. Although they found some empirical support for this suggestion, their single indicator of managerial hierarchy prevented more detailed analysis.

In a later study of 254 governmental finance organizations, Blau (1968b) utilized additional indicators of managerial hierarchy and confirmed the basic finding of the earlier study (i.e., that organizations with a large proportion of college trained personnel have a higher managerial ratio than agencies with less highly qualified employees). In addition, he found that these organizations have deeper hierarchies (more levels), narrower spans of control among first line supervisors, broader spans of control among middle managers and more decentralized decision making with respect to the implementation of accounting, promotion and dismissal

policies. Furthermore, he found that both first line supervisors and middle managers spend less time in actual supervision and more time on their own professional work than managers of less highly qualified personnel. Blau concluded that a fundamental difference exists between the structure of authority relations in organizations characterized by a highly professionalized work force and those which are not; the difference lies in the direction of greater autonomy and discretion for professionals despite the presence of a larger managerial component.

Meyer's (1968) analysis of data from the same finance organizations provides indirect support for Blau's conclusions. Focusing particularly upon the relationship between computerized data processing facilities and several organizational attributes, Meyer found a negative relationship between automation and hierarchical levels. However, automation (which he interpreted as an indication of advanced rationalization of the organizational knowledge base) had a differential effect upon span of control, encouraging narrower spans of control at higher levels and broader spans of control at lower levels of the hierarchy.

On the basis of these complementary findings, Blau and Meyer concluded that organizations tend to assume contrasting pyramidal shapes, depending upon the extent to which activities are routinized and standardized on the one hand or require the comprehensive attention of professional experts on the other.

Blau and Schoenherr (1971) found additional support for this "alternative shape hypothesis" in their investigation of employment

security agencies. Subunits concerned primarily with the processing of employment insurance benefits (high routinization) tend to be short and squat while subunits engaged in employment placement services (high professionalization) tend to be tall and thin.

Empirical investigations of the relationship between professionalization and hierarchy of authority reveal that professionalization has significant consequences for the shape of the organizational hierarchy, but a critical factor remains the extent to which activities are routinized and standardized. In some situations the work of professionals may be highly standardized. In such instances one expects to find a relatively short hierarchy with authority concentrated in or near the top of the organization, and a strong emphasis upon formalized procedures and one-sided directives. In other situations, professional work may require a high degree of coordination between units and levels. In these instances, one expects to find a relatively tall hierarchy, narrow spans of control and a strong emphasis upon mechanisms which facilitate both vertical and horizontal communication.

In addition to their interest in the impact of organizational size, division of labor and professionalization and the configuration of authority relations in formal organizations, some researchers have investigated the inter-relationships among various dimensions of hierarchy of authority as such. The remainder of this section reviews the findings of several studies with this concern.

In her study of English manufacturing organizations, Woodward (1962) found that firms with multi-level hierarchies tend to

have narrower spans of control and fewer formalized rules and regulations than organizations with fewer hierarchical levels. Blauner (1964) made a similar observation about the firms he investigated. However, both of these investigators attribute these conditions to the nature of the technology utilized in the various organizations. That is, the advanced technology of continuous process (as opposed to small batch/unit production and large batch/mass production) industries require closer communication and consultation between managerial and operational levels of activity, thus increasing the proportion of managerial to operational personnel.

As was indicated above, Blau, Heydebrand and Stauffer (1966) found that public personnel agencies with a highly professionalized staff tend to have proportionately larger managerial components than agencies with less highly qualified employees. They speculated that since highly trained experts should require less supervision than less highly trained personnel, the enlarged managerial component in these organizations is probably arranged in taller hierarchies with narrower spans of control in order to facilitate the horizontal and vertical communication required for the coordination of complex professional activities.

Bell (1967) provided some support for this interpretation in *his* investigation of the determinants of span of control in thirty *departments* of a community hospital. Whereas he found an inverse *relationship* between the complexity of departmental tasks and the *span* of managerial control, he also found that span of control and *looseness* of supervision are virtually unrelated. Thus, a broad span

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of control, usually interpreted as indicating low control and high discretion, may be supplemented by extensive rules and regulations or mechanical devices which serve to regulate operational activities with relatively infrequent supervisory intervention. By the same token, a high managerial ratio and narrow span of control, usually interpreted as indicating high control and low discretion, may indicate the need for extensive vertical and horizontal communication associated with the coordination of complex technical processes or professional activities rather than rigid hierarchical control as such.

Rushing found that "the coordinative difficulties generated by size and division of labor are qualitatively different (Rushing, 1967, p. 295) and that increasing complexity in the division of labor is associated with greater increases in the clerical and professional staff components of U.S. industries than in the relative size of the managerial component. This finding led Rushing to conclude that under conditions of increasing complexity, clerical and professional personnel became functional substitutes for managerial personnel. This interpretation is supported by subsequent research by Blau (1968b) and Blau and Schoenherr (1971), Meyer (1968) and Pugh, Hickson, Hinings and Turner (1969), but only under conditions of highly routinized operations and extensive formalization.

In his study of hierarchy of authority in 254 governmental finance agencies, Blau (1968b) utilized six measures of vertical differentiation (managerial ratio, hierarchical levels, span of control of first-line supervisors and of middle managers, the

proportion of time managers spent supervising subordinates and the hierarchical level on which various financial and personnel decisions were made) and computed their interrelationships with one another and with other organizational characteristics. In addition to confirming the conclusions of an earlier study of public personnel agencies (Blau, Heydebrand and Stauffer, 1966)--that is, that a professionalized work force tends to result in a larger managerial ratio, more hierarchical levels, a narrower span of control of first-line supervisors, a broader span of control of middle managers, fewer supervisory interventions on the part of managerial personnel and more decentralized decision making than organizations with less qualified personnel--Blau found an inverse relationship between the number of hierarchical levels and the number of major divisions, he found these organizations tend to assume one of two distinctive shapes: tall pyramids with many levels and few divisions; or squat pyramids with few levels and many divisions. He also found that the supervisors in organizations with taller hierarchies spend proportionately less time supervising subordinates and that more decisions are delegated to officials lower in the hierarchy. Although he attributed part of the responsibility for the formation of tall, decentralized hierarchies to the presence of highly trained operational personnel whose expert qualifications tend to reduce the need for direct supervision and increase the need for horizontal and vertical communication, the major factors contributing to this configuration of authority relations are those indirect and impersonal mechanisms (e.g., automation) and procedures (e.g.,

entrance requirements, explicit promotion regulations, written examinations for promotion, etc.) "which make the reliable performance of duties relatively independent of direct intervention by top management" (Blau, 1968b, p. 463).

Blau and Schoenherr (1971) confirmed and expanded these conclusions in their investigation of U.S. employment security agencies. As indicated above, they found that the size of these agencies exert a predominant influence on all other structural attributes--division of labor, spatial differentiation, hierarchical levels, number of divisions and sections per division. They also found that the structural complexity caused by increasing size exert influences which are the opposite of those of large size. For example, whereas large size is associated with the number of hierarchical levels, the number of divisions and sections per division, multiple levels tend to reduce the number of divisions and the span of control of the agency director while multiple divisions tend to reduce the number of sections per division and the span of control of division heads. Thus, whereas size tends to increase all three dimensions of vertical differentiation, their interactions tend to produce either tall pyramids with many levels, few divisions and many sections per division, or squat pyramids with few levels, many divisions and few sections per division. With respect to the centralization or decentralization of decision making (and thus the distribution of authority) in these contrasting structural configurations, Blau and Schoenherr found that although agencies with tall, slim pyramids tend to be more decentralized than

agencies with short, squat pyramids, the degree of centralization is contingent upon the presence of formalized mechanisms and procedures to regulate the behaviors of operational personnel.

To summarize the research findings with respect to the relationships between an organization's hierarchy of authority and its other structural attributes, it may be said that, overall, larger organizations tend to have proportionately fewer managers and supervisors than smaller organizations provided that activities are subdivided among relatively routine, low-skill tasks. However, as activities become more differentiated and complex, the configuration of authority relations also becomes more complex. To this extent, the structure of authority relations is a function of the interaction between size and division of labor. With respect to the actual distribution of authority in organizations, however, control may be either centralized or decentralized, depending upon the need for procedures which assure the reliable performance of organizational tasks. If such reliability can be assured only through direct, personal supervision, one would expect to find relatively squat hierarchies with many divisions and few sections per division, supplemented by a large administrative component and extensive procedural rules and regulations. If, on the other hand, such reliability can be assured through the internalized norms and standards of professional employees or through rules and regulations which guarantee the technical competence of employees or through electronic or mechanical devices which reverse the flow of organizational demands, one would expect to find relatively tall hierarchies

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with few divisions and many sections per division. In short, variations in an organizational hierarchy of authority must be viewed as a function of size and the complexity of the division of labor on the one hand, and of the reliability of alternative control mechanisms on the other.

Administrative Component

Weber maintained that "the management of (bureaucracy) is based upon written documents ('the files') . . . There is, therefore, a staff of subaltern officials and scribes of all sorts" (Weber, 1946, p. 197) which is concerned primarily with matters of communication and coordination and which, unlike the "production staff," contributes to goal attainment only by attending to problems of organizational maintenance. Furthermore, his analysis implies that the administrative apparatus of organizations is functionally related to other bureaucratic characteristics. This section reviews the literature with respect to this structural attribute.

Organizational investigators have used a variety of indicators to measure the size, shape and function of the administrative component in complex organizations. Whereas earlier studies utilized measures that often confused administrative and managerial activities, later studies differentiated between these functions.

Terrien and Mills defined the administrative components of school districts as "the superintendent, his assistants and immediate staff, principals, business managers and the like" (Terrien and Mills, 1955, p. 12). Tsouderos combined "the number of administrative

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employees from year to year" (Tsouderos, 1955, p. 206) and an indicator of administrative expenditures to measure the administrative component in his sample of voluntary organizations. Lindenfeld (1961) differentiated between "top administrators," "principals" and "supervisors" in his investigation of the relative size of the administrative component of 323 school districts. Anderson and Warkov used "the percent of all employees classified in the category 'General Hospital Administration' . . . (including) the Manager's Office, the Registrar's Office and the Fiscal, Personnel and Supply units" (Anderson and Warkov, 1961, p. 25) in Veterans Administration hospitals. Heydebrand used a similar measure of "administrative-clerical staff (i.e., the proportion of personnel in business and clerical positions, including the hospital administrator and his immediate staff, but excluding department heads as well as nurses in administrative and supervisory position"--itallics original-- (Heydebrand, 1973, p. 164) in his study of U.S. hospitals. Heydebrand and Noell (1973) used the proportion of managerial and clerical personnel to total personnel as their indicator of administrative component in the private welfare organizations they investigated.

Although his study preceded several of these investigations by some years, Stinchcombe utilized only "the proportion of clerks to operational employees--i.e., the proportion of the people in administration who do not legitimate by their status the communications they process (e.g., typists, filing clerks, bookkeepers). They file the communications. They do not initiate them" (Stinchcombe, 1959, p. 170)--as his measure of administrative component in craft

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and mass production industries. Blau, Heydebrand and Stauffer (1966) and Montagna (1968) also maintained this functional distinction in their investigations of public personnel agencies and public accounting firms, respectively. Although Rushing (1967) and Pondy (1969) included managerial and professional staff personnel in their measures of "administrative personnel" and "administrative intensity," respectively, they also computed separate ratios of managerial, professional staff and clerical personnel to production personnel. Pugh, Hickson, Hinings and Turner used a compound variable--"configuration"--to indicate the shape of the role structure in English work organizations, one factor of which is "proportion of clerks" in which a clerical job is defined as one where there is no supervisory responsibility for subordinates other than typists" (Pugh, Hickson, Hinings and Turner, 1968, p. 76). Blau and Schoenherr (1971) employed three structural indicators (clerical ratio, supervisory ratio and staff ratio) and one procedural indicator (standardized ratings) to indicate the size, shape and function of "administration" in U.S. employment security agencies. Finally, Boland examined a specialized aspect of the administration of institutions of higher education: "a ratio . . . indicating the percentage of externally oriented administrative functions whose supervisors report directly to the president to the percentage of all administrative functions which have direct access to the president" (Boland, 1973, p. 431).

Many assume that as organizations become larger, they become increasingly top-heavy with "bureaucrats" who, unlike

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operational personnel (i.e., those individuals most directly involved in the production of goods or services), are primarily concerned with matters of organizational maintenance (i.e., coordination, communication, auxiliary services, etc.). Terrien and Mills (1955) and Tsouderos (1955) found empirical support for this assumption in their studies of school districts and voluntary associations, respectively. However, several other investigators (Melman, 1951; Baker and Davis, 1954; Bendix, 1956; Haire, 1959; Anderson and Warkov, 1961; Lindenfeld, 1961; Haas, Hall and Johnson, 1963; Terrien, 1963; Hawley, Boland and Boland, 1965; Blau, Heydebrand and Stauffer, 1966; Pondy, 1967; Blau and Schoenherr, 1971; and Heydebrand, 1973) found that organizational size and administrative apparatus were negatively related in the organizations they investigated. At least part of the discrepancy between these findings derives from different definitions of size and/or administrative apparatus. For example, whereas some investigators enumerated all employees in their measures of organizational size, others included only specific categories of personnel. More significantly, whereas some investigators enumerated all "headquarters personnel" (including managers and supervisors) in their measures of administrative staff, others used only "clerical," "supportive" or "staff" (as opposed to "line") personnel. However, those investigators who have limited their definitions of administrative component to include only non-supervisory, clerical and "staff" positions have established rather conclusively that, everything else being equal, larger

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organizations tend to have proportionately smaller administrative components than smaller organizations.

However, since everything else is not usually equal, these investigators have also established that the primary determinant of the magnitude of the administrative apparatus of formal organizations is not the size of the organization but the degree of organizational complexity. That is, the greater the differentiation in the division of labor (horizontal complexity) or hierarchy of authority (vertical complexity), the larger the administrative staff (Baker and Davis, 1954; Bendix, 1956; Anderson and Warkov, 1961; Haas, Hall and Johnson, 1963; Hawley, Boland and Boland, 1965; Blau, Heydebrand and Stauffer, 1966; Rushing, 1967; Pondy, 1969; Pugh, Hickson, Hinings and Turner, 1969; Blau and Schoenherr, 1971; and Heydebrand, 1973).

Anderson and Warkov (1961) hypothesized that organizational complexity, not size, is responsible for the proliferation of administrative responsibilities. To test this hypothesis they examined organizational size (annual average daily patient load), organizational complexity (single purpose versus multi-purpose hospitals) and the relative size of administrative component (percent of all employees classified as general hospital administration) in forty-nine Veterans Administration hospitals. Although they found that multi-purpose hospitals are larger than single purpose hospitals and that both types have the same percentage of administrative employees, they also found that larger hospitals of each type have proportionately smaller administrative components than smaller hospitals.

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However, when size is controlled, the more complex (multi-purpose) hospitals tend to have larger administrative components than the less complex (single purpose) hospitals. These findings led Anderson and Warkov to submit three hypotheses for further investigation:

1. The relative size of the administrative component decreases as the number of persons performing identical tasks increases.
2. The relative size of the administrative component increases as the number of places at which work is performed increases.
3. The relative size of the administrative component increases as the number of tasks performed at the same place increases (or as roles become increasingly specialized and differentiated (Anderson and Warkov, 1961, p. 27)).

Rushing (1967) tested these hypotheses using census data on U.S. industries (not organizations as such). He defined industry size as the total number of production personnel and administrative component as the ratio of the total number of administrative personnel to production personnel. Furthermore, he differentiated between three types of administrative personnel--managerial, clerical and professional--and computed ratios of each to the number of production personnel. Finally, he defined division of labor according to the Gibbs-Martin formula (Gibbs and Martin, 1962) which measures the distribution of individuals among the occupational categories of the organization or industry. (A high Gibbs-Martin score indicates an extensive division of labor and thus high organizational complexity). Rushing found a positive relationship between division of labor and the relative number of administrative

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personnel, but a negative relationship between organizational size and the relative number of administrative personnel. Secondly, he found that these relationships prevail (and even increase) when the effects of the other variable are controlled. Thirdly, he found that the two independent variables tend to interact (i.e., the effects of division of labor are greater in smaller industries, while the effects of size are greater in industries with a complex division of labor). Finally, he found that increasing complexity has greater effects upon the relative size of the clerical and professional components than on the relative size of the managerial component.

Although Pondy (1969) was primarily interested in the relationship between "administrative intensity" and the rational (i.e., profit maximizing) behavior of top executives, his use of similar variables in an investigation of forty-five industries resulted in findings which were very similar to those of Anderson and Warkov and Rushing. Furthermore, his finding that administrative intensity increases with the separation of ownership and management anticipated similar findings on the part of Pugh, Hickson, Hinings and Turner (1969) and Heydebrand (1973) with respect to the effects of organizational autonomy upon the administration of formal organizations.

Blau, Heydebrand and Stauffer (1966) examined the complex relationships between organizational size, four structural variables (division of labor, professionalization, managerial hierarchy and administrative apparatus) and a measure of operating costs in 156

public personnel agencies. They found that larger agencies tend to have proportionately fewer administrative personnel than smaller agencies except under conditions of increased structural complexity (either extensive division of labor or high professionalization). Furthermore, they found that while both an extensive division of labor and high professionalization tend to increase operating costs in large agencies, a larger administrative component tends to restore the economies of scale associated with large scale operations.

As noted above, the Anderson-Warkov "complexity administrative growth hypothesis" predicted a positive relationship between spatial dispersion and the relative size of an administrative component. Raphael (1967) tested this prediction in her study of sixty-five labor union locals and found that the relative number of administrators is positively related to organizational size and negatively related to spatial dispersion. She suggested, however, that these findings might be peculiar to voluntary associations in which formal control is located at the bottom of the hierarchical pyramid where many of the functions performed by the administrative staff of a centralized union are performed by local officers and members.

Heydebrand (1973) found an extremely complex set of relationships between the complexity of U.S. hospitals and the relative size of their administrative components. He defined organizational complexity as "(1) the diversity of major objectives, indicated by the distinction between teaching and non-teaching hospitals, and (2) the number of medical services, indicated by the distinction between psychiatric and general hospitals" (Heydebrand,

1973, p. 163), yielding four levels of organizational complexity. He measured size by the average daily inpatient census; division of labor (or functional specialization) by the proportion of thirty-nine job titles actually occupied; and administrative-clerical staff by the proportion of personnel in business and clerical positions. Heydebrand hypothesized that in these professional work organizations departmental specialization (as measured by the Gini coefficient of concentration) and professionalization (as measured by the proportion of graduate nurses to total personnel) would intervene to serve as substitutes for administrative proliferation in complex hospitals. He found that although size has a negative effect upon the relative size of the administrative apparatus in structurally simple hospitals, functional specialization tends to have a negative effect in more complex hospitals. He also found that although departmental specialization and professionalization tends to reduce the size of the administrative component in less complex hospitals, they tend to interact in their effects under conditions of high complexity, creating a requirement for more extensive administrative coordination as departments become more specialized and as professional work becomes more routinized and fragmented.

Finally, Haas, Hall and Johnson (1963), Blau and Schoenherr (1971) and Heydebrand (1973) have shown that although the combination of increasing organizational size and horizontal and/or vertical differentiation results in corresponding increases in the relative size of an organization's administrative apparatus, this increase occurs at declining rates--indicating that further administrative

proliferation reaches a point of diminishing returns in large, complex organizations. In addition, Blau and Schoenherr (1971) have shown that whereas increasing differentiation in the division of labor is positively related to increases in the relative size of the administrative staff, automation (which is also positively related to both size and horizontal differentiation) tends to result in proportionate reductions in the size of the administrative component.

In summary, the studies reviewed in this section suggest that whereas the size of an organization tends to be inversely related to the size of its administrative component, an extensive division of labor and/or an extensive hierarchy of authority contribute to organizational complexity which, in turn, contributes to the need for an extensive administrative apparatus to attend to matters of communication, coordination and auxilliary services.

Organizational Performance

Unlike other human collectivites (e.g., communities, families, tribes, friendship groups, etc.), formal organizations are social units with "specific purposes" (Parsons, 1960, p. 17). They are intentionally designed to provide specific product or service outcomes. This element of purposiveness makes it possible to formulate criteria to measure the extent to which organizations accomplish the outcomes they have been designed to serve. Such criteria are usually discussed under the rubric of organizational performance or organizational effectiveness.

Organizational researchers typically employ one of two fundamental approaches to the measurement of organizational performance: the goal approach or the system-resources approach. According to the former, organizational performance is measured according to the extent to which the organization attains the goals and objectives it is known or assumed to serve. According to the latter, organizational performance is measured according to an organization's ability to "exploit its environment in the acquisition of scarce and valued resources" (Yuchtman and Seashore, 1967, p. 898; see also Seashore and Yuchtman, 1967). Whereas the goal approach regards an organization as a "closed system," the system-resources approach emphasizes the dynamic relationship between an organization and its environment. The major advantage of the system-resources approach is that it is not burdened with the frequently impossible task of defining and differentiating organizational goals (see Etzioni, 1964, pp. 5-19; Perrow, 1970, pp. 133-175; and Hall, 1972, pp. 79-103), but utilizes higher order criteria of effectiveness and efficiency which apply to organizations generally, regardless of their specific purposes or products. The major advantage of the goal approach (assuming that there is some agreement about the goals and objectives of a given organization) is that the performance criteria are defined and measured in terms of specific products and outcomes (e.g., automobiles produced, clients served, student achievement, etc.).

Regardless of the theoretical model adopted, organizational researchers tend to use one or more of four types of variables to

measure organizational performance, depending upon their interest in process or product outcomes of an organization on the one hand and the perceptual or documentary sources of their data on the other. These four types of variables are illustrated in Figure 2-1.

		PERFORMANCE OUTCOMES	
		PROCESS	PRODUCT
DATA SOURCE	PERCEPTUAL	SATISFACTION	QUALITY OF CARE
	DOCUMENTARY	ABSENTEEISM	CLIENTS SERVED

Figure 2-1.--Types of Performance Criteria Categorized by Outcome and Data Source.

Some organizational investigators focus upon the product outcomes of organizational performance. These outcomes may include such products as the number or quality of manufactured items or client services, the performance of organizational members or clients, sales, profits, percentage of market, etc. However, the evidence concerning these product outcomes may be derived from documentary sources or from a survey of member or client attitudes or perceptions. For example, Blau and Schoenherr (1971) used agency records to obtain information about four product outcomes of fifty-three state and local employment security agencies and their local offices: the number of job applications per agency employee, the number of General Aptitude Test Batteries administered per agency,

the number of non-agricultural job placements relative to the number of job openings received, and the ratio of employees engaged in unemployment insurance benefits to insured unemployed in the agency jurisdiction. Georgopoulos and Mann (1962) on the other hand measured the attitudes of 880 respondents (physicians, nurses, technicians and administrators) concerning the effectiveness of four aspects of health care in ten community general hospitals.

Other organizational investigators focus upon the process outcomes of organizational performance. These outcomes, which sometimes are regarded as means to product outcomes and sometimes as ends in themselves, may include such conditions as employee satisfaction, morale, alienation, absenteeism, innovation, motivation, etc. Information concerning these conditions may be derived from either attitude surveys or from documentary sources. For example, Porter and Lawler (1968) administered a thirteen-item attitudinal questionnaire to 563 middle- and lower-level managers in three governmental agencies and four manufacturing and utility companies to measure their job satisfaction--i.e., "the extent to which rewards actually received meet or exceed the perceived equitable level of rewards" (Porter and Lawler, 1968, p. 31). Metzner and Mann (1953) on the other hand collected documentary evidence on the rates of absenteeism among 375 white- and 251 blue-collar employees of an electric light and power company.

In terms of volume, the existing literature is largely dominated by investigations concerned with the correlates of various process and product outcomes of a relatively small number of

organizations or organizational subunits. Since the present investigation is concerned with the conditions and consequences of the structural characteristics of a large number of organizations, the remainder of this review will focus upon the relatively small number of investigations which are most relevant to that concern.

Blau, Heydebrand and Stauffer (1966) examined the relationships between the size, structural characteristics and operating costs of 156 public personnel agencies in the United States. They defined operating cost--their measure of organizational performance--as "the ratio of the salary budget of the personnel agency itself to the total payroll for the entire civil service personnel under its jurisdiction--specifically whether this ratio exceeds one-half of one percent or not" (Blau, Heydebrand and Stauffer, 1966, p. 184). They found that larger organizations have relatively lower operating costs than smaller organizations. They also found that although an expanded division of labor (number of distinct job titles) tends to increase costs, those increases are not large enough to overcome the economy of scale associated with large size. Their analysis also revealed that a high degree of professionalization (proportion of staff required to have a college degree with a specified major) tends to reduce costs in small agencies (due to the contribution which professional personnel make to the administration of those agencies) but raises costs in larger agencies (due to the need for an expanded managerial hierarchy to coordinate the work of professional personnel). With respect to the size of the administrative apparatus, they found that whereas a relatively large administrative staff raises costs in small agencies with relatively low professionalization and a

rudimentary division of labor, an extensive administrative staff reduces costs in larger organizations characterized by extensive professionalization and an expanded division of labor. Finally, they found that centralization (which they speculatively defined as a relatively low ratio of managers to non-managerial personnel) reduces the costs of larger agencies with an extensive division of labor but increases the costs of large, highly professionalized agencies unless they are also characterized by an extensive administrative staff.

Blau and Schoenherr (1971) studied the structural characteristics of fifty-three state employment security agencies and their local offices. They also examined the relationships between these structural characteristics and four performance criteria which, in addition to personnel costs, included the number of job applications processed in each agency relative to the number of agency employees, the number of applicants given the General Aptitude Test Batteries and the number of non-agricultural job placements relative to the number of job openings received. Using multiple regression procedures to analyze their data, these investigators found that the ratio of job applications processed to the number of agency employees is influenced by five organizational characteristics: (1) the use of computers, which frees manpower and resources from the more routinized unemployment insurance activities for more extensive employment services; (2) a relatively low ratio of clerical to non-clerical personnel, since the latter are responsible for processing job applications; (3) a relatively high degree of delegation to local offices, since service needs are determined and responded to at the

local level; and (4) a relatively low administrative staff ratio in the central headquarters, since employment services must be decentralized to local offices in order to be effective.

Blau and Schoenherr also found that the extent of intensive employment services rendered to clients--i.e., the number of General Aptitude Test Batteries (GATB's) administered--is influenced by four organizational conditions: (1) organizational size--the larger the agency, the lower the number of GATB's administered, simply because of the volume of job applications received in large agencies; (2) a relatively large number of applications per agency employee, which reduces the manpower and resources available for more extensive employment services; (3) a relatively large administrative staff, which is associated with the provision of unemployment insurance benefits; and (4) the educational qualifications of interviewers, since the administration of the GATB's requires a highly trained staff.

With respect to placement productivity--i.e., the ratio of non-agricultural job placements to the number of job openings received--Blau and Schoenherr found three organizational conditions to be influential: (1) the administration of a relatively small number of GATB's, since extensive services require more time than the more straightforward activities associated with processing and placing job applicants; (2) a relatively large number of sections per division, which increases the likelihood of specialized subunits which concentrate on the processing and placement of job applicants; and (3) low reliance on standardized rating procedures, since

formalized evaluation procedures are frequently based upon minimally acceptable standards and fail to provide incentives for superior performance.

Finally, Blau and Schoenherr found that agency personnel costs--i.e., the ratio of the number of employees in positions administering unemployment benefits to the number of clients claiming such benefits--are influenced by four characteristics of U.S. employment security agencies; (1) a relatively large administrative staff, since such positions are used more extensively in the provision of unemployment insurance benefits than in providing employment services; (2) the use of computers, which reduces the number of employees required to process employment insurance benefits; (3) an extensive division of labor, since occupational differentiation increases the ratio of personnel involved in the provision of unemployment insurance benefits; and (4) extensive formalization of personnel procedures--i.e., the number of written regulations--since formalized rules and instructions tend to reduce the amount of supervision required for the regulation of employees engaged in routine activities.

In his investigation of U.S. colleges and universities, Blau (1973) examined the relationship between the structural characteristics and three performance criteria of those organizations: dropout/completion rate; continuation (in graduate school) rate; and faculty research productivity.

Blau defined dropout/completion rate as "the number of students who received their college degree in an institution in 1967,

divided by the total number of its undergraduates" (Blau, 1973, p. 218). Controlling for the rate of organizational expansion over the previous four years, he found that the number of graduate students, faculty qualifications, the willingness of faculty members to spend time with undergraduates and student-faculty ratio have the strongest positive influence upon the completion rate. He also found that the extent of research emphasis and two elements of "bureaucratization" (i.e., multi-level hierarchies and mechanical teaching aids) have the strongest negative influence upon the undergraduate completion rate of U.S. colleges and universities, other conditions equal.

Blau defined continuation rate as "the proportion of graduating seniors in 1976 expected to continue in graduate or professional school" (Blau, 1973, p. 218). Using multiple regression procedures, Blau found that the age of the institution, the number of graduate students and faculty qualifications have the strongest positive influence, while public ownership, low reputation and the local allegiance of the faculty have the strongest negative influence upon this criterion of the performance of U.S. colleges and universities.

Finally, using data derived from a study by Parsons and Platt (1973), Blau defined faculty research productivity as "the number of articles plus five times the number of books authored or coauthored by individual faculty members, averaged for the total number of respondents from a given institution" (Blau, 1973, p. 219). He found that this performance characteristic is most strongly influenced by

the university status of an institution, the high reputation of the institution--i.e., the number of received college choices by semi-finalists and recipients of letters of commendation from the 1961 National Merit Scholarship program, divided by the number of freshmen admitted" (Blau, 1973, p. 287) and the president's appointive power. The regression analysis revealed that the administration's influence in faculty appointments represents the strongest negative influence upon faculty research productivity, other conditions equal.

Summary

In summary, organizational researchers have employed a wide variety of indicators to measure the performance of formal organizations. However, most investigators have focused upon the psychological and social psychological conditions and consequences of individual and/or group behavior in organizational contexts. The findings of the relatively small number of recent studies which have included performance criteria in their comparative analyses of a large number of formal organizations suggest the importance of further research into the impact of various dimensions of organizational structure upon the performance of organizations as such.

Beginning with Weber's classical description of the structural characteristics of bureaucracies, this chapter has reviewed the findings of recent empirical investigations which have focused upon the conditions and consequences of the division of labor, hierarchy of authority and administrative apparatus of formal organizations. These investigations indicate that the complexity of an organization's division of labor is largely a function of the size of the organization

and the scope of its activities. Although organizational size also has a large impact upon the configuration of authority relations in formal organizations, this impact is highly complex and is mediated by other structural characteristics, especially the complexity of the organizational division of labor. The greater the occupational, functional and spatial differentiation of the division of labor, the more complex the configuration of authority relations. This is especially true in the case of organizations in which the work force is comprised of a large number of "professional" employees. Overall, however, the shape of a hierarchical pyramid in formal organizations (and thus the number of supervisors and managers) is a function of the extent to which organizational activities either require the intervention of supervisors and managers or are regulated by impersonal procedures (mechanical devices, rules and regulations, professional norms and standards, etc.). By the same token, the size of an organization and the complexity of its division of labor and hierarchy of authority have differential effects upon the size and shape of its administrative apparatus. Although larger organizations tend to have relatively fewer administrative personnel than smaller organizations, this condition tends to vary with the complexity of the division of labor and the configuration of authority relations, depending largely upon the need for coordination and communication horizontally between organizational subunits and vertically between hierarchical levels. Finally, although only a few investigators have examined the relationships between elements of organizational structure and organizational performance, even the limited evidence

of significant relationships suggests the importance of further research in this area.

In the light of these findings, the next chapter describes the procedures utilized in the examination of the environmental and contextual conditions and the performance consequences of the division of labor, hierarchy of authority and administrative apparatus of 508 public school district organizations in Michigan.

CHAPTER III

METHODOLOGY

This research consists of a comparative analysis of the environmental and contextual conditions and the performance consequences of the structural characteristics of Michigan K-12 school district organizations. This chapter describes the procedures employed in conducting the research. The first section provides a brief description of the study population: Michigan K-12 school district organizations. The next section summarizes the findings of the investigations reviewed in Chapter II and outlines the hypotheses and questions examined in this investigation. Following a discussion of the variables utilized to measure the environmental, contextual, structural and performance characteristics of Michigan K-12 school districts and the sources from which these data were obtained, a final section describes and illustrates the statistical procedures utilized in the analysis of the data.

The Study Population

Although Michigan K-12 school districts are engaged in a common enterprise and are very similar with respect to charter, goals, polity, technology and day-to-day activities, they manifest considerable variability with respect to their environmental, contextual, structural and performance characteristics. This section

describes the population of Michigan K-12 school district organizations, placing special emphasis upon their variability with respect to these characteristics.

There were 530 K-12 school districts in Michigan during the 1975-76 school year. These organizations provided educational services for 2,124,221 elementary and secondary students. The typical school district enrolled 4019 students (median = 2128). However, the Detroit Public Schools had a student population of over 250,000 students while the Whitefish Schools on the shores of Lake Superior enrolled only 113. Furthermore, Michigan school districts served geographical areas ranging in size from approximately two square miles to over 1200 square miles.

In addition, Michigan K-12 school districts manifested considerable variability with respect to community type. According to the definitions of the Michigan Department of Education (see Appendix A), 264 (50%) of these districts were classified as "Rural"; 129 (25%), "Town"; 93 (19%), "Urban Fringe"; 27 (5%), "City"; and 15 (3%), "Metropolitan Core City." It is interesting to note in this context, however, that over two-thirds (68%) of Michigan public school students were enrolled in 135 school districts, all of which were classified either as "Metropolitan Core City," "City," or "Urban Fringe."

Just as Michigan K-12 school districts differ with respect to size and community type, they also vary with respect to financial resources. The average income per family in the typical school district was approximately \$11,000 during the 1975-76 school year;

but this characteristic ranged from a low of \$5,112 to a high of \$33,972. More pertinent to the provision of educational services, property tax base per pupil in Michigan school districts ranged from a low of \$4,937 to a high of \$216,926 with a mean of \$26,578.

Although the financial resources available for the education of district pupils was contingent upon the tax rate in each district and the amount of aid received from state and federal sources, district operating expense per pupil ranged from a low of \$729.91 to a high of \$2,279.50 with a mean of \$1,196.47 during the 1975-76 school year.

Financial resources have a direct bearing upon the quality of services provided to district students as indicated by faculty experience ($r = .43$), faculty qualifications ($r = .61$), faculty salaries ($r = .63$) and student-faculty ratio ($r = -.57$). The variability of these characteristics of Michigan K-12 school districts is summarized in Table 3-1. (The operational definitions of these characteristics are furnished in Appendix A.)

TABLE 3-1.--Range and Mean of Faculty Experience, Faculty Qualifications, Faculty Salaries and Student-Faculty Ratio for Michigan K-12 School Districts During the 1975-76 School Year.

Variable	Low	High	Mean
1. Faculty Experience	2.36	18.10	8.99
2. Faculty Qualifications	3.23	72.40	31.34
3. Faculty Salaries	\$9914.00	\$19306.60	\$13026.39
4. Student-Faculty Ratio	14.20	32.70	21.06

Michigan K-12 school district organizations varied considerably with respect to their formal structural characteristics (i.e., division of labor, hierarchy of authority and administrative apparatus) during the 1975-76 school year. Since these characteristics are described in detail in the next chapter, it is sufficient for the purposes of this chapter to summarize the extent to which they varied in the study population. The Michigan Department of Education classifies teachers according to eighty-one teaching assignment categories (e.g., elementary education, reading, music, social studies, etc.). The teachers in some Michigan school districts occupied as many as fifty-two of these specialties while those in other districts occupied as few as six assignment categories. The mean for all Michigan K-12 school districts was twenty-five. With respect to spatial division of labor, some school districts had an average of 54 teachers per building whereas others averaged as few as 4.5 teachers per building. The mean for all Michigan school districts was 22.17 during the 1975-76 school year.

The administrative hierarchies of Michigan K-12 school districts manifested similar patterns of variability. The Michigan Department of Education classifies school administrators according to twenty-five assignment categories (e.g., superintendent, business manager, elementary principal, etc.), thus making it possible to measure the extent of administrative differentiation. Furthermore, school administrators occupy positions in various divisions and levels in the administrative hierarchy. In addition, the extent of their supervisory responsibilities is indicated by their respective

spans of control. Table 3-2 reports the range and mean of each of these characteristics of the administrative hierarchies of Michigan K-12 school districts. (The operational definition of each characteristic is furnished in Appendix A.)

TABLE 3-2.--Range and Mean of Administrative Differentiation, Major Divisions, Hierarchical Levels, Superintendent Span of Control, Supervisory Span of Control and Principal Span of Control in Michigan K-2 School Districts During the 1975-76 School Year.

Variable	Low	High	Mean
1. Administrative Differentiation	.04	1.00	.29
2. Major Divisions	1.00	8.00	1.34
3. Hierarchical Levels	2.00	7.00	3.32
4. Superintendent Span of Control	1.00	86.00	9.26
5. Supervisory Span of Control	1.00	80.00	5.83
6. Principal Span of Control	4.25	59.00	24.88

Michigan K-12 school districts also vary with respect to the relative number of supervisors, administrative staff persons, clerical personnel and auxiliary staff persons who make up their respective administrative components. For the purpose of this investigation, these dimensions of school district organizational structure are indicated by Administrative Ratio, Supervisory Ratio, Administrative Staff Ratio, Clerical Ratio and Supportive Staff Ratio. The range and mean of each dimension of school district administrative apparatus are

reported in Table 3-3. (The operational definition of each characteristic is furnished in Appendix A.)

TABLE 3-3.--Range and Mean of Administrative Ratio, Supervisory Ratio, Administrative Staff Ratio, Clerical Ratio and Supportive Staff Ratio of Michigan K-12 School Districts During the 1975-76 School Year.

Variable	Low	High	Mean
1. Administrative Ratio	.029	.167	.081
2. Supervisory Ratio	.028	.167	.062
3. Administrative Staff Ratio	.000	.084	.019
4. Clerical Ratio	.000	.195	.048
5. Supportive Staff Ratio	.200	1.815	.713

Finally, Michigan K-12 school districts vary considerably with respect to performance. Although the fact that school districts tend to emphasize different aspects of their educational programs often makes it difficult to measure school district performance, especially from the organizational dimension of analysis, six performance criteria were arbitrarily selected for examination in this investigation. Table 3-4 reports the range and mean for each criterion for Michigan K-12 school districts during the year of the study. (The operational definition of each criterion is furnished in Appendix A.)

This section has provided a brief description of Michigan K-12 school district organizations in terms of selected environmental,

TABLE 3-4. --Range and Mean for Student Achievement, Dropout Rate, Higher Education Matriculation, National Merit Scholarship Semifinalists, Faculty Attrition and Superintendent Longevity in Michigan K-12 School Districts During the 1975-76 School Year.

Variable	Low	High	Mean
1. Student Achievement	48.50	89.89	75.28
2. Dropout Rate	0.00%	15.68%	4.70%
3. Higher Education Matriculation	0.00%	99.47%	38.26%
4. National Merit Scholarship Semifinalists	0.00%	4.17%	.33%
5. Faculty Attrition	0.00	30.95	9.06
6. Superintendent Longevity	1.00	33.00	8.12

contextual, structural and performance characteristics, emphasizing the variability inherent in each. The next section summarizes the findings of the studies reviewed in Chapter II and outlines the hypotheses and questions examined in the investigation.

Hypotheses and Questions to be Examined

Weber maintained that the structural characteristics of formal organizations are interdependent, and more recent investigators have provided empirical evidence of these patterns of interdependence. Proceeding from the relationships observed in these studies, this section explicates the specific hypotheses and questions examined in this investigation.

Formal organizations are characterized by a more or less complex division of labor. Previous investigations have documented three fundamental sources of variability in this organizational attribute: (1) organizational size; (2) technological complexity; and, with respect to spatial differentiation, (3) geographical area. For the purposes of this investigation, it will be assumed that the principal operations of school district organizations are based upon a common technology (student-teacher interaction in self-contained classrooms in self-contained buildings). On the basis of these findings and this assumption, the following hypotheses are examined:

- Organizational size is the primary determinant of the functional and spatial division of labor of Michigan K-12 school district organizations.
- When organizational size is controlled, the size of the school district jurisdiction has an additional impact upon the spatial division of labor of Michigan K-12 school districts.

Furthermore, assuming that school district division of labor has qualitative as well as quantitative implications (i.e., that a highly differentiated faculty is capable of providing more intensive services than a less specialized teaching staff), and assuming that a more specialized faculty entails additional operational costs, the following hypothesis is examined in this investigation:

--When organizational size is controlled, the amount of district financial resources has an additional impact upon the functional division of labor of Michigan K-12 school districts.

Formal organizations are characterized by a hierarchy of circumscribed authority in which power and status are distributed such as to insure the supervision and direction of organizational activities. Whereas early empirical investigations used the ratio of managers and supervisors as the basis for inferences about hierarchy of authority, more recent investigations have examined this dimension of organizational structure in terms of the height and breadth of the organizational pyramid as manifested by the number of operational divisions and hierarchical levels and by the spans of control of managers at various levels in the organization. These investigations revealed that the primary determinants of the structure of authority relations in formal organizations are: (1) organizational size; (2) division of labor (both functional and spatial); and (3) technological complexity. Moreover, previous investigations assumed that the positive influence of size and division of labor upon the horizontal and vertical differentiation of the administrative hierarchy is attributable to an expansion of the

administrative division of labor. This investigation tests this assumption by examining the relationship between a specific measure of administrative differentiation (i.e., the proportion of twenty-five administrative assignment categories occupied by district administrators) and the horizontal and vertical differentiation of school district administrative hierarchies. Consequently, the following hypotheses are examined in this investigation:

- District size is the primary determinant of the administrative differentiation of Michigan K-12 school district organizations.
- When district size is controlled, the functional division of operational labor and the amount of district financial resources have an additional impact upon the administrative differentiation of Michigan K-12 school district organizations.
- When district size and the functional division of operational labor are controlled, the extent of administrative differentiation is the primary determinant of the horizontal (divisions) and vertical (levels) differentiation of Michigan K-12 school district organizations.
- When district size, functional division of operational labor and administrative differentiation are controlled, the number of major divisions (horizontal differentiation) is the primary determinant of the number of hierarchical levels (vertical differentiation) of Michigan K-12 school district organizations.

Formal organizations are characterized by an extensive administrative apparatus consisting of officials who, unlike operational and supervisory personnel, are primarily responsible for matters of internal coordination and communication. Most contemporary investigators treat this dimension of formal organizations in terms of the relative magnitude of the differentiated elements of the central headquarters and measure the ratio of each to the total number of

operational employees. These investigators have found that the relative magnitude of the administrative apparatus of formal organizations is contingent upon: (1) organizational size; (2) the extent to which the functional division of operational labor is either routinized or professionalized; and (3) the amount of financial resources available to the organization. Based on these findings, and assuming that the behavior of teachers is determined by norms internalized during an extensive period of professional training, the following hypotheses are examined with respect to the differentiated elements of the administrative apparatus of Michigan K-12 school district organizations:

- The overall administrative ratio of Michigan K-12 school districts is inversely related to the size of the school district.
- The supervisory ratio of Michigan K-12 school districts is inversely related to district size and positively related to the amount of district financial resources.
- The administrative staff ratio of Michigan K-12 school districts is positively related to district size and the amount of financial resources received from federal sources.
- The clerical ratio of Michigan K-12 school districts is positively related to district size and the number of faculty per building.
- The supportive staff ratio of Michigan K-12 school districts is positively related to district size, geographical jurisdiction and the financial resources of the district.

One of the major purposes of this investigation is to examine the relationship between the structural characteristics of Michigan K-12 school districts and selected criteria of school district performance. As indicated in Chapter II, only a few investigators

have examined the structure-performance nexus in formal organizations, and there is very little empirical evidence to suggest that such relationships even exist. Consequently, the following questions are entirely exploratory and are not guided by any expectations or assumptions derived from previous empirical research:

- What is the relationship between the structural characteristics of Michigan K-12 school districts and the level of student achievement in those districts?
- What is the relationship between the structural characteristics of Michigan K-12 school districts and the number of high school dropouts in those districts?
- What is the relationship between the structural characteristics of Michigan K-12 school districts and the number of graduating seniors from those districts who enroll in institutions of higher education?
- What is the relationship between the structural characteristics of Michigan K-12 school districts and the number of graduating seniors who are selected as national merit scholarship semifinalists?
- What is the relationship between the structural characteristics of Michigan K-12 school districts and the average annual rate of faculty turnover in those districts?
- What is the relationship between the structural characteristics of Michigan K-12 school districts and the average tenure of the current and two preceding superintendents of those districts?

Variables

The variables used in this investigation are listed in Appendix A. Each variable is listed by number, name, operational definition and source. In addition, the mean, standard deviation and number of cases is listed for each variable. The variables listed are ordered according to their assumed causal sequence. (The importance of this assumption is discussed below.) Variables 1-31

describe the environmental context of each school district organization (e.g., community type, relative affluence of community residents and the school district itself, characteristics of the school district staff, etc.). Variables 32-46 describe the structural characteristics of Michigan K-12 school districts. They include four measures of school district division of labor (32-35); eight measures of school district hierarchy or authority (36-43) and three measures of school district administrative apparatus (44-46). Variables 47-52 describe six outcome or effect criteria selected to measure the relative impact of district structural characteristics upon school district performance.

Although most of these variables are straightforward and self-explanatory, some require additional comments. Variables 1-5 are dummy variables which describe the community context of each school district organization. The categories and definitions were established by the Michigan Department of Education, apparently in an effort to differentiate between the type of community in which each school district is located. Since one of the interests of this investigation is to examine the impact of community type upon school district structure, these categories were incorporated into the variables list under the assumption that they would accurately discriminate between school districts assigned to different classifications. Unfortunately, this did not turn out to be the case, at least as far as the present investigation is concerned. When it was determined that none of these variables accounted for any significant portion of the variance of any of the dependent variables

utilized in the study, separate lists were constructed, ordering each school district by community type. A visual examination of these lists indicated a high degree of ambiguity with respect to the decision rules employed in assigning districts to community types. When efforts to clarify these ambiguities failed, it was decided to drop the variables from further consideration.

The measures for average family income (7) and community racial composition (8) were derived from 1970 census data and reflect conditions at least five years prior to the year of the study. Although these conditions may have changed to some extent in some communities during this period (c.f., Coleman, Kelly and More, 1975; Coleman, 1975), this source was the best available at the time of the study.

Four indicators are used to measure the racial composition of Michigan K-12 school districts: community racial composition (8), and the racial characteristics of district students (22), faculty (23) and administrators (24). Whereas community racial composition is measured by the percentage of community residents classified as black, the latter three are measured by the percentage of each group classified as caucasian. Although these differences are responsible for the initial confusion resulting from a cursory glance at the correlations of the first indicator with the latter three (see Appendix B), the substantive confusion resulting from the impact of all four measures may be more serious. The implications of this issue are discussed in a later section in which the

analysis of high school dropout rate reveals discrepant findings with respect to the influence of student body and community racial composition.

As was indicated in the previous chapter, organizational researchers have used a variety of indicators to measure the size of the organizations (e.g., the number of members, clients or employees; sales; profits, value added by manufacture; etc.). Since it is usual to think of the size of a school district in terms of its number of students, that would seem to be the logical denomination to use in a study of school district organizations. However, in the interest of comparability with investigations of organizations of different functional types, the convention of using the number of operational employees as the measure of organizational size is observed in this investigation. In any case, the very high simple correlation between number of students and number of faculty ($r = .99$) indicates that either measure would be equally appropriate.

A few of the variables used in this investigation are structurally interdependent and cannot be entered simultaneously into the same regression equation as independent variables. For example, operating expense per pupil (17) is the sum of local revenue per pupil (18), state revenue per pupil (19) and federal revenue per pupil (20) for each school district. By the same token, administrative ratio (42) is a composite consisting of supervisory ratio (43) and administrative staff ratio (44).

Two of the variables used in this study do not accurately represent the conditions in Michigan K-12 school districts they were

originally intended to measure. Clerical ratio (45) was intended to measure the ratio of the total number of district clerical aids to the total number of district faculty during the 1975-76 school year. As indicated in Appendix A, however, the actual measure includes only those clerical aids assigned to classroom buildings. The Michigan Department of Education reporting form consigns the secretaries and clerical aids who work in the central administrative offices to a category entitled "other." This category may also include any number of auxilliary positions which fail to conform to other specific designations on the report form. Consequently, the number of clerical aids assigned to classroom buildings does not provide an adequate measure of the clerical ratio of Michigan K-12 school districts.

By the same token, faculty attrition (51) was originally intended to provide a summary measure of teacher turnover in each Michigan K-12 school district. Although a two-year period (the only period for which information is available) provides a very limited purview, it was concluded that some information is better than none at all. However, a chance conversation with a personnel specialist in the Michigan Department of Education during the final stages of data analysis revealed that the information used for this measure includes only those teachers who either left the state or the teaching profession altogether and does not account for transfers between districts. In fact, the measure is undoubtedly heavily influenced by the number of faculty retirements. As will be noted in the

discussion, this weakness greatly reduces the utility of the measure as an indicator of teacher turnover.

Finally, the use of superintendent longevity (52) as a criterion of school district performance seems to imply that "long" tenure is somehow better than "short" tenure. This implication was seriously questioned by several superintendents during the interview process and, in any case, would be disallowed by Carlson's (1961) study of "career-bound" and "place-bound" superintendents. However, no such interpretation is intended and, as with the other performance criteria, the fundamental interest is to discover the environmental and structural conditions which influence it and its influence upon other performance criteria.

Data Collection

There were 530 public K-12 school districts in Michigan during the 1975-76 school year. Since much of the data describing the environmental, structural and performance characteristics of these districts is readily available in documentary sources, it was decided to include the entire universe of Michigan K-12 school districts in the study population with each school district defined as a case. This number was reduced to 528 when it was discovered that information for two districts was both incomplete and inaccurately recorded in one of the documentary sources. Later still, this number was reduced to 508 when it was discovered that data for two critical variables (average family income and community racial composition) were not available for twenty districts. In order to

determine whether to reduce the number of districts used in the study population or to eliminate the variables with missing cases, Z-tests were conducted to determine the extent of significant differences between the means of the two populations ($N = 528$ and $N = 508$). No significant differences were found. Further, otherwise identical multiple regression equations using the "long" ($N = 528$) and "short" ($N = 508$) data sets produced virtually identical results. On the basis of these tests it was decided to eliminate the twenty errant districts from the study population and to proceed with the study on the basis of 508 school districts.

The information used in the study was obtained from two types of sources: official documents and records and a survey conducted by the investigator.

The documentary information used in the investigation is straightforward and requires little further explication beyond that provided in Appendix A. With the exception of that obtained from the Executive Office of the Governor and the National Merit Scholarship Corporation (1976), all of the data is collected routinely by various divisions of the Michigan Department of Education and is recorded either in departmental publications or on magnetic tape. Information for fourteen variables was manually transcribed from official publications and information for twelve variables was mechanically transcribed from magnetic tape. Measures for seven additional variables were created by manipulating information from the magnetic tape to provide ratios, percentages, proportions, etc. In addition to providing a convenient source for seven demographic variables, a

magnetic tape maintained by the Executive Office of the Governor provided an opportunity to verify the reliability of the information concerning seven of the fourteen variables manually transcribed from official publications. The final source of documentary information was the official publication of the National Merit Scholarship Corporation (1976) which lists the semifinalists in the 1976 annual National Merit Scholarship competition.

In addition to these documentary sources, information for ten variables was derived from a survey designed, tested and administered by the investigator in 528 Michigan K-12 school districts. The survey instrument (see Appendix C) consists of three sections. Section I requests the names and dates of service of the current (as of the 1975-76 school year) and two preceding school district superintendents. This section was designed to provide information for two variables (i.e., superintendent tenure and superintendent longevity). Section II indicates the position, title and position code of each school district administrator (as recorded in the personnel files of the Michigan Department of Education) and requests the respondent to indicate (1) the immediate supervisor of each administrator and (2) the number of non-clerical personnel supervised by each administrator. Information from this section enabled the investigator to construct organization charts for each school district and to create measures for six variables (i.e., hierarchical levels, major divisions, superintendent span of control, supervisory span of control, supervisory ratio and administrative staff ratio) and to verify the reliability of information derived

from documentary sources regarding three variables (administrative differentiation, administrative ratio and principal span of control). Section III indicates the number and utilization code for each building occupied by the school district during the 1975-76 school year (as recorded in the files of the Michigan Department of Education) and requests the respondent to indicate the position code of the administrator directly responsible for each listed building. This section provided information for one variable (principal span of control) and verified the reliability of information derived from other sources concerning another variable (faculty per building).

This survey instrument was developed over a period of three months. An initial draft was submitted to five faculty members and two school district personnel administrators for critical comments. A second draft was administered to twenty-eight graduate students in an introductory course in school administration who were employed in sixteen of the districts under examination. A third draft was administered to the superintendents or personnel administrators of ten school districts. Although the instrument was not subjected to a formal reliability test as such, a follow-up interview was conducted with each of the ten third-draft respondents after an interval of approximately two weeks. No discrepancies were discovered in the information received from the second administration of the instrument and this ultimately became the instrument used in the investigation.

The survey instrument was originally designed to be mailed to 528 district superintendents for self-administration. However, during

the administration of the third-draft of the instrument, the investigator was advised that since superintendents frequently receive as many as a dozen questionnaires a month, the apparent complexity of this instrument might serve to reduce the response rate, particularly from larger school districts. Because of this possibility, the investigator decided to administer the questionnaire in a personal interview with the superintendents of the eighty largest school districts in the state. This number was subsequently expanded to ninety-four because of the proximity of an additional fourteen districts to the districts to be visited. This number was later increased to 104 in order to assure a 100% rate of return. These interviews were conducted by the investigator between December 15, 1976, and March 15, 1977.

Questionnaires for the remaining 434 school district superintendents were mailed on December 13, 1976. On January 21, 1977, a second mailing was sent to approximately eighty school districts which had not responded to the first mailing. During the first week of February, 1977, the investigator telephoned approximately twenty-five superintendents who had not responded to the first or second mailings. Fifteen superintendents agreed to complete and return their questionnaires forthwith; ten could not recall having received either mailing but indicated their willingness to participate in a personal interview. All interviews were completed and all questionnaires had been returned by March 15, 1977. Twenty-four additional telephone calls were required to clarify ambiguous questionnaire responses.

As indicated above, the survey instrument was designed to provide information concerning ten of the variables used in the investigation. This information was extracted from the survey instruments and recorded on a summary document in a form suitable for key punching. This information and that which had been manually transcribed from official publications and documents was subsequently key punched and, along with the information mechanically transcribed from magnetic tape, was entered on a magnetic tape maintained by the investigator in the Michigan State University Computer Center.

Statistical Analysis

As indicated throughout the previous discussion, the questions posed in this investigation are concerned with the conditions and consequences of the structural attributes of K-12 school district organizations in Michigan--how, for example, specific environmental or contextual conditions influence the structural configuration of school district organizations; how a given structural attribute influences other structural characteristics (and under what environmental conditions); and how the structural attributes of school district organizations influence specific performance or effect criteria under certain environmental conditions. In short, the questions to be answered in this investigation are: for a given structural characteristic or performance criterion, what conditions influence it and what are the relationships among and between those conditions?

Multiple regression analysis is especially appropriate for answering these questions. It is a method of analyzing the collective and separate contributions of two or more independent variables to the variation of a dependent variable. These contributions are indicated by the regression coefficients, which represent the average change in the dependent variable with each unit change in the corresponding independent variables when the effects of the other independent variables in the equation are held constant. The regression coefficients are typically reported in standardized and non-standardized form. The standardized regression coefficients are in standard score form with a mean of zero and a standard deviation of one. They thus "lend themselves well to the interpretation of research data because, as standard scores, all the independent variables . . . have the same scale of measurement . . . and are on the same level of discourse as the correlation coefficients from which they are calculated" (Kerlinger and Pedhazzer, 1973, pp. 64-65). This attribute makes them especially useful in the decomposition of the relationships among and between the independent variables in the regression equation (see below). The nonstandardized regression coefficients on the other hand reflect the relationship between the independent and dependent variables in the metric of their original measures. This makes them especially useful in communicating the practical importance of the relationships observed. (In this investigation, both the standardized and nonstandardized regression coefficients are reported in the tables and are used in the analysis).

Multiple regression analysis entails certain statistical assumptions. However, since these assumptions apply only when making inferences from a sample to a population (Kerlinger and Pedhazzer, 1973, p. 47), and since the school district organizations included in this investigation are assumed to comprise the universe of Michigan K-12 school districts, only two of these assumptions require specific comment.

Multiple regression analysis assumes that the variables employed are normally distributed and that their relationships are linear. The presence of extreme values in the study population (e.g., school district size and membership) raises the problem of curvilinearity. This problem can be resolved either by dropping the extreme cases from the analysis or by transforming the variable to make its distribution normal. The disadvantage of the former is obvious; the disadvantage of the latter is that transformations frequently distort the meaning of the variables and an understanding of their relationships. Since the disadvantages of the latter are outweighed by the advantages of retaining all cases in the study population, a variable is transformed in this investigation only if its strong curvilinear relationship with another necessitates transformation, and then only in one way, using its logarithm to the base 10, the criterion being that the transformation increases the correlation by at least .05. In the present investigation, this criterion applies only to the measures for school district size and membership.

A related issue is the problem of multicollinearity (i.e., when two or more independent variables are so highly correlated that their effects upon a dependent variable are either indistinguishable or, more importantly, exaggerate the importance of insignificant differences). In this investigation, the following decision rule is employed in instances of suspected multicollinearity: when the simple correlation between two independent variables is .70 or higher, they are not entered into the same multiple regression equation simultaneously; separate analyses are performed and the relative influence of each upon the dependent variable are noted in the discussion.

The method of reporting and decomposing the results of the regression analysis is that developed by Blau and his associates in the Comparative Organization Research Program (Blau and Schoenherr, 1971, pp. 21-29; Blau, 1973, pp. 34-45). As was indicated above, the standardized regression coefficient (beta) indicates the direct effect of an independent variable upon the dependent variable when the effects of the other independent variables are controlled. Since the standardized regression coefficient and the simple correlation coefficient (r) are in standard score form, any difference between them is the result of the effects of the other tabled variables upon the dependent variable. That is, the differences between the standardized regression coefficient (beta) and the corresponding simple correlation (r) derive from one of two conditions. First, a very high or very low simple correlation (relative to the magnitude of the standardized regression coefficient) may reflect the effect of common antecedents which have either produced a spurious simple

correlation on the one hand or suppressed an actual nexus between the variables on the other. Second, differences between beta and r may indicate that the influence of the independent upon the dependent variable is mediated by one or more intervening variables included in the regression problem. The determination of which of these conditions applies is based upon the sequence in which the independent variables are entered into the regression equation. This sequence is based upon a priori assumptions concerning the causal order of the variables used in the analysis. Thus, whereas the part of the simple correlation between an independent variable and the dependent variable produced by an independent variable assumed to precede the first independent variable in causal sequence is spurious, the part mediated by independent variables assumed to follow an independent variable indicates indirect effects. In other words, the indirect connection between an independent variable, x , and the dependent variable, y , resulting from a single other independent variable, i , is produced by the correlation between both independent variables, r_{ix} , and the direct effect of the other independent variable upon the dependent variable, β_{yi} . The strength of the indirect connection between x and y is indicated by the product of these two values, $r_{ix}\beta_{yi}$. The simple correlation is equal to the sum of the direct effect of x on y , β_{yi} , and all the other indirect connections so computed.

Since the interpretation of the decomposition procedure is ultimately dependent upon the order in which the variables are entered into the analysis, it is impossible to over-emphasize the

importance of the assumptions made concerning their causal sequence. Although such assumptions are highly tenuous and tentative, particularly in the absence of supporting longitudinal research, they represent the sine qua non of all empirical research. As Blau has noted:

All theorizing and all interpreting of empirical data involve, at least implicitly, assumptions about causal sequence. There is an advantage in putting one's cards on the table by making these assumptions explicit and letting others challenge them. To be sure, many conditions in academic institutions and other complex social structures are mutually dependent and exert reciprocal influences on one another. Hence the assumptions made about causal direction are sometimes arbitrary, and they may be wrong. Nevertheless, no meaningful analysis of social structures is possible if the investigator always vacillates, attributes any concomitant variation of conditions to reciprocal influences, and refuses to commit himself to a predominant causal direction. Every major social theory makes such a commitment. Weber emphasized that the Protestant Ethic brought about the development of modern capitalism, and the significance of his theory rests on this thesis, though he acknowledged reciprocal influences of economic or religious developments. Marx stressed that a society's economic organization determines its class structure and its other characteristics. Durkheim held that advances in the division of labor change the nature of social solidarity, and not vice versa (Blau, 1973, p. 35).

Thus for the purposes of this investigation, it is assumed that the variables in Appendix A are listed in the order of their causal sequence. The principle underlying this assumption is that although conditions of reciprocity may exist in some instances, characteristics over which school district organizations have no control may affect but cannot be affected by conditions they can control. Thus it is assumed that environmental and contextual conditions (i.e., variables 1-31) precede the structural

characteristics of school district organizations (i.e., variables 32-46) and that both the environmental-contextual and structural characteristics of school district organizations precede the performance or effect criteria (i.e., variables 47-52) in causal sequence. In some instances the placement of an individual variable within a larger category is purely arbitrary and is legitimately open to question. In other instances the location of a particular variable makes no difference since it does not enter into the analysis. In any case, the matrix of simple correlations in Appendix B together with the means and standard deviations in Appendix A makes it possible to reanalyze the data using a different set of assumptions.

In conclusion, Table 3-5 (which appears in the next chapter as Table 4-5) provides a concrete illustration of the analytical procedures employed in this investigation. The title of the table indicates that the dependent variable is administrative differentiation (i.e., the proportion of twenty-five administrative assignment categories occupied as first or second assignments by district administrators during the 1975-76 school year). The independent variables are listed in the title and in the upper and lower portions of the table in their assumed order of causal sequence.

The upper portion of Table 3-5 reports the following statistics: (1) the standardized regression coefficient, Beta, which indicates the direct effect of the independent upon the dependent variable in standard score form; (2) the nonstandardized regression coefficient, B, which indicates the direct effect of the independent

TABLE 3-5.--Multiple Regression and Decomposition of Administrative Differentiation on State Equalized Valuation per Pupil, District Size (Log) and Average Administrator Salary.

Variable	Beta	B	SE/B	r
1. State Equalized Valuation per Pupil	.08**	.00000088	.00000023	.09
2. District Size (Log)	.96**	.42	.012	.89
3. Average Administrator Salary	-.10**	-.00000061	.00000017	.56
$R^2 = .81$ ($\hat{R}^2 = .81$); $n = 508$				
**More than three times its standard error.				

Variable	1	2	3
1. State Equalized Valuation per Pupil	<u>.08</u>	.04	-.02
2. District Size (Log)	.00	<u>.96</u>	-.07
3. Average Administrator Salary	.01	.65	<u>-.10</u>

upon the dependent variable in the metric of the respective independent and dependent variables; (3) the standard error of the nonstandardized regression coefficient, SE/B , which is used to determine the statistical significance of the relationship between the independent and the dependent variable; (4) the simple correlation, r , which is equivalent to the zero-order standardized regression coefficient without controls; (5) the squared coefficient of multiple correlation or coefficient of determination, R^2 , which indicates the amount of the variability of the dependent variable accounted for by the independent variables in the regression equation; (6) the number of cases, n , from which the statistics were computed; and (7) the magnitude of the regression coefficient relative to the magnitude of its standard error, * or **, which, as was indicated above, reveals the statistical significance of the relationship between the independent and dependent variable, other conditions equal. (A regression coefficient that is less than twice its standard error is considered to be insignificant.) These statistics were computed at the Michigan State University Computer Center using the REGRESSION subprogram of the "Statistical Package for the Social Sciences, Version 6.5" (Michigan State University, 1976).

The lower portion of Table 3-5 decomposes the relationships observed in the upper portion of the table. The underlined values in the diagonal of the matrix are the standardized regression coefficients (Beta's) from the upper portion of the table. As was indicated above, these values represent the direct effect of the variable in the row, x , upon the dependent variable, y (administrative differentiation).

Values outside the diagonal represent the indirect connections between the variable in the row, x , and the dependent variable, y , produced by the variable in the column, i . These values are obtained by multiplying the simple correlation between variables in the respective row and column, r_{ix} (see Appendix B), by the standardized regression coefficient, $Beta_{yi}$. Except for rounding errors, the sum of the values in each row is equal to the simple correlation between x and y shown in the upper portion of the table. Assuming that the variables in the equation are ordered according to their causal sequence, values to the left of the diagonal represent the amount of the association between x and y which is spurious due to the effects of common antecedents. Values to the right of the diagonal represent the indirect effects of x on y which are mediated by the intervening variables listed in the columns. Decomposition coefficients of less than .10 are unimportant and receive no attention in the analysis.

Anticipating the analysis in Chapter IV, the regression equation summarized in Table 3-5 indicates that the extent of administrative differentiation in Michigan K-12 school districts is almost entirely a function of the size of the school district (row 2). The decomposition coefficient to the left of the diagonal in the second row of the lower portion of Table 3-5 (d.c. = .00) indicates that no portion of the simple correlation between district size (log) and administrative differentiation ($r = .89$) is spurious. In addition, the very small decomposition coefficient to the right of the diagonal in the second row of the lower portion of the table (d.c. =

-.07) indicates that the influence of the independent upon the dependent variable is virtually unmediated. Thus the larger the school district, the greater the spread of district administrators across specialized assignment categories. More specifically, the nonstandardized regression coefficient (B) in the second row of the upper portion of Table 3-5 indicates that, on the average, a one unit (i.e., ten teacher) increase in the size of a school district is associated with a 42% increase in the extent of administrative differentiation.

In addition, administrative differentiation is somewhat contingent upon the level of administrative salaries and the value of local residential, commercial and industrial property per pupil. Although the decomposition coefficient to the left of the diagonal in the third row of the lower portion of the table indicates that the simple correlation between average administrator salary and administrative differentiation ($r = .56$) is largely spurious due to the antecedent influence of district size (log) upon both variables (d.c. = .65), the small but statistically significant regression coefficient (Beta = $-.10$) indicates that this factor has a negative impact upon the dependent variable when the effect of district size is controlled. This finding makes sound intuitive sense: the greater the proportion of administrative assignment categories occupied in a school district, the greater the probability of incumbency in one of the less highly remunerated administrative positions--e.g., assistant principal, school-community coordinator, etc. The nonstandardized regression coefficient (B) in the third row

of the upper portion of the table indicates the extent of this contingency in the metric of the variables under consideration: all else equal, a one unit increase in the extent of administrative differentiation is associated with a reduction of 6,757.38 units (dollars) in the salary paid to the typical district administrator (mean = \$20,975).

By the same token, the extent of administrative differentiation is also somewhat contingent upon the value of the taxable real estate and personal property in the district (row 1). It is not entirely clear why state equalized valuation per pupil (which is a measure of raw tax base) should achieve statistical significance when neither operating millage nor local revenue per pupil do so when entered into the same multiple regression equation (not presented). However, given the assumptions concerning the causal sequence of the variables in the equation, the first row of the lower portion of Table 3-5 indicates that no portion of the simple correlation between state equalized valuation per pupil and administrative differentiation ($r = .09$) is spurious and that its influence upon the dependent variable is virtually unmediated. However, when the standardized regression coefficient (Beta) in the first row of the upper portion of the table is translated into the metric of the original measures (B), the importance of the relation is largely academic: it would require an increase of approximately \$50,000 in state equalized valuation per pupil (mean = \$26,037) to change the extent of administrative differentiation by one unit, ceteris paribus.

In summary, the larger the school district, the greater the differentiation of the administrative hierarchy into specialized administrative functions. Further, although large school districts tend to have higher average administrator salaries than small school districts ($r = .70$), the salary differential among administrative positions is such that extensive administrative differentiation has the effect of reducing the average salary of district administrators. Although the nexus between state equalized valuation per pupil and administrative differentiation under these conditions is statistically significant, the relationship has virtually no practical importance.

This chapter has discussed the hypotheses and questions to be examined in this investigation; the variables utilized to measure the environmental, contextual, structural and performance characteristics of the organizations examined; the procedures employed in selecting the study population; the sources from which data were obtained; the methods used in collecting and recording the data; and the procedures utilized in the analysis of the data. Chapter IV and Chapter V discuss the findings obtained concerning the environmental and contextual conditions and the performance consequences of the structural characteristics of Michigan K-12 school districts.

CHAPTER IV

FINDINGS I: ENVIRONMENTAL CONDITIONS OF THE FORMAL STRUCTURE OF MICHIGAN K-12 SCHOOL DISTRICT ORGANIZATIONS

Introduction

This chapter presents the results of an empirical investigation of the environmental conditions of three dimensions of the formal structure of Michigan K-12 school districts: division of labor, hierarchy of authority and administrative apparatus. The inquiry answers two fundamental questions: (1) What are the environmental conditions of the structural characteristics of Michigan K-12 school districts? and (2) To what extent is the formal structure of Michigan K-12 school districts homologous to the formal structure of other organizations despite differences in goals, functions and internal procedures? Each dimension of school district organization is presented in order. Following a description of the indicators utilized to measure each dimension, the discussion proceeds to identify those factors in the external and internal environments of Michigan school districts which have a significant influence upon each dimension. The following chapter is concerned with the performance consequences of these three dimensions of school district organization.

Division of Labor

Formal organizations are characterized by an extensive division of labor whereby organizational functions are differentiated into more or less specialized occupational positions and distributed across a variety of differentiated organizational subunits and/or work locations. Since no single measure can capture the full complexity of this variable, this investigation employs four indicators of school district division of labor: faculty differentiation, faculty distribution, faculty dispersion and faculty per building.

Faculty differentiation refers to the number of teaching assignment categories (e.g., social science, mathematics, elementary education, vocational education, etc.) filled by the district staff. This information is collected routinely by the Michigan Department of Education for inclusion in the Register of Professional Personnel (a personnel record system maintained on magnetic tape by the Michigan Department of Education). The specific measure is the proportion of ninety-five teaching assignment categories actually occupied as first or second assignments by district faculty members during the 1975-76 school year. The higher the district faculty differentiation score, the greater the number of teaching assignment categories occupied by the district faculty. In addition, since several teaching assignment categories represent sub-specialties of a more general category (e.g., "sociology," "psychology" and "anthropology" are classified as sub-specialties of "social science"), faculty differentiation also measures the extent of faculty specialization. Thus, the higher the district faculty differentiation score,

the greater the number of specialized teaching assignment categories occupied by the district faculty. Faculty members in the typical Michigan K-12 school district occupy 30.4 teaching assignment categories as first or second assignments.

Faculty distribution refers to the spread of faculty across occupied teaching assignment categories. Data for this measure are derived from the same source as faculty differentiation but are manipulated to indicate the extent to which staff members are either concentrated within a relatively small number of teaching assignment categories or evenly distributed across a wide range of assignments. A high faculty distribution score indicates that the staff occupy a broad range of teaching assignment categories and that they are relatively evenly distributed within those categories. A low district faculty distribution score indicates that the faculty occupy a narrow range of teaching assignments with relatively high concentrations within one or a few categories. The specific measure for faculty distribution is the Gibbs and Martin (1962, 1966) formula for measuring division of labor:

$$1 - \frac{\sum x^2}{(\sum x)^2}$$

where the unit of analysis (x) equals the number of district faculty members occupying a faculty assignment category as a first or second assignment. The typical Michigan K-12 school district has a faculty distribution score of .82, ranging from a low of .67 to a high of .90.

Whereas faculty differentiation and faculty distribution measure the functional division of labor in Michigan K-12 school districts, faculty dispersion and faculty per building measure the spatial division of academic labor. Faculty dispersion refers to the spread of faculty members across a set of district buildings or work locations. Like faculty distribution, the measure for faculty dispersion is based upon the Gibbs and Martin (1962, 1966) division of labor formula except that the unit of analysis (x) is equal to the number of faculty members assigned to a district building or work location. Thus, a high faculty dispersion score indicates that the district faculty are spread across a large number of buildings with relatively even distributions within each building. The mean faculty dispersion score for Michigan K-12 school districts is .69 with a low of zero (indicating that all faculty members are assigned to a single building) and a high of .99 (indicating that faculty members are spread across a relatively large number of district buildings with relatively equal numbers in each building).

Faculty per building is a straightforward measure of the average number of faculty members assigned to district buildings or work locations and is obtained by dividing the total number of faculty by the total number of occupied classroom buildings. The higher the faculty per building score, the larger the number of faculty members assigned to district buildings. On the average, Michigan K-12 school districts have 22.56 faculty members per district building, with a high of 54.00 and a low of 5.67. (Faculty

per building differs from principal span of control since some principals supervise more than one building or work location.)

In summary, the division of academic labor in Michigan K-12 school districts is measured by four variables: faculty differentiation, faculty distribution, faculty dispersion and faculty per building. The first two measure the spread of district faculty members across a finite set of teaching assignment areas; the last two measure their spatial distribution within school district buildings. The remainder of this section documents the environmental conditions of each dimension of school district division of labor.

Faculty Differentiation

What environmental conditions influence the extent of faculty differentiation in Michigan K-12 school districts? Studies reviewed in an earlier section indicate that the key determinant of an organization's division of labor is the size of the organization: the larger the organization, the greater the spread of employees across occupational positions and work locations. Does this pattern apply to the formal structure of educational organizations as well? Do other environmental conditions have any effect upon this aspect of the formal structure of school district organizations? Specifically, what factors determine the proportion of ninety-five teaching assignment categories actually occupied as first or second assignments by district faculty members in Michigan K-12 school districts during the 1975-76 school year?

Table 4-1 summarizes the multiple regression equation that includes all the factors with a significant influence upon the extent of faculty differentiation in Michigan K-12 school districts. The beta weight (Beta) of school district size (log) represents over ninety-three percent of the simple correlation (r) between the independent and dependent variables. The decomposition coefficient

TABLE 4-1.--Multiple Regression and Decomposition of Faculty Differentiation on District Size (Log) and Faculty Qualifications.

Variable	Beta	B	SE/B	r
1. District Size (Log)	.85**	.20	.0054	.91
2. Faculty Qualifications	.09**	.00063	.00017	.61

$R^2 = .83$ ($\hat{R}^2 = .83$); $n = 508$.

** More than three times its standard error.

Variable	1	2
1. District Size (Log)	<u>.85</u>	.06
2. Faculty Qualifications	.53	<u>.09</u>

in the first row of the lower portion of Table 4-1 indicates that no part of the influence of district size upon faculty differentiation is spurious and that only a very small portion (d.c. = .06) is mediated by the other independent variable. Does this mean, as some have suggested (Hall, 1972), that this aspect of the division of labor is simply a surrogate for the size of the school district? Not

at all. Although a school district must have some minimum number of faculty members to fill ninety-five faculty assignment categories as first or second assignments, there is no logical necessity for doing so. On the contrary, even a very large school district might elect, for whatever reasons, to limit the scope of its teaching staff to some minimum number of basic subject matter areas and ignore those academic, aesthetic and vocational courses which require a more highly specialized and differentiated faculty. Furthermore, although most of the influence of faculty qualifications (i.e., the percentage of district faculty members holding an advanced degree) upon faculty differentiation is rendered spurious by the antecedent influence of school district size ($d.c. = .53$) upon both variables, the significant beta weight in the second row of Table 4-1 indicates that a highly differentiated faculty is also contingent upon the academic qualifications of the faculty.

Translating these relationships into the metric of the original measures, the influence of school district size upon the dependent variable is such that, on the average, an increase of one faculty member to the staff of a Michigan K-12 school district would increase its rate of faculty differentiation by two teaching assignment categories. The same rate of faculty differentiation would require an increase of approximately thirty-two percent in the number of faculty members with advanced degrees, other conditions equal.

In summary, the rate of faculty differentiation in Michigan K-12 school districts is highly contingent upon the number of faculty members in the district. However, the small but significant

influence of the academic credentials of the faculty upon this aspect of school district division of labor suggests that faculty differentiation has both qualitative and quantitative dimensions. Further evidence of this suggestion is presented in subsequent sections.

Faculty Distribution

Whereas faculty differentiation measures the total number of teaching assignment categories occupied by district faculty members, faculty distribution is concerned with the number of faculty members in each teaching assignment category across the total range of teaching assignment categories. For example, given two school districts with a faculty differentiation score of .47 (i.e., the district faculty occupy forty-five teaching assignment categories), the district having the greater number (or more even distribution) of faculty in each occupied teaching assignment category will have the higher faculty distribution score. In practical terms, this might mean that whereas both districts have twelve teachers assigned to the social sciences, one district might have nine teachers assigned to "social science" and one each to "psychology," "sociology" and "anthropology." The other district might have three teachers assigned to the more general category and three each to the more specialized disciplines. Thus, while both districts have the capacity for offering the same range of courses in the social sciences, the latter district is capable of teaching more students in a broader range of more specialized courses. In short, the measure for faculty distribution is designed to answer the following question:

To what extent are faculty members concentrated in one or a few teaching assignment categories and to what extent are they evenly distributed across a broad range of teaching assignment categories?

The multiple regression equation summarized in Table 4-2 indicates that the distribution of district faculty members within teaching assignment categories is a function of one structural and two environmental influences: the extent of faculty differentiation, the financial resources of the school district and the number of non-public school students in the district jurisdiction.

TABLE 4-2.--Multiple Regression and Decomposition of Faculty Distribution on Non-Public School Membership, Operating Expense per Pupil and Faculty Differentiation.

Variable	Beta	B	SE/B	r
1. Non-public School Membership	.13**	.00054	.00018	.26
2. Operating Expense per Pupil	.21**	.000041	.000009	.37
3. Faculty Differentiation	.26**	.099	.018	.39

$R^2 = .21$ ($\hat{R}^2 = .20$); $n = 508$.

** More than three times its standard error.

Variable	1	2	3
1. Non-public School Membership	<u>.13</u>	.06	.08
2. Operating Expense per Pupil	.04	<u>.21</u>	.12
3. Faculty Differentiation	.04	.10	<u>.26</u>

The influence of faculty differentiation upon faculty distribution is ambiguous: The spread of faculty members across teaching assignment areas provides no information about their distribution within those teaching areas. However, this ambiguity is resolved when the size of the school district is considered. The analysis of faculty differentiation (Table 4-1) indicated that this aspect of school district division of labor is overwhelmingly influenced by school district size (total number of faculty). Since the substantial simple correlation between district size (log) and faculty differentiation ($r = .91$) precludes their inclusion in the same regression equation as independent variables, it is impossible to determine their independent effects upon the dependent variable. However, when school district size (log) is entered into the regression equation summarized in Table 4-2 instead of faculty differentiation, its smaller beta weight (.13, greater than twice its standard error) and the larger beta weights of operating expense per pupil and non-public school membership (respectively .26 and .15, both greater than three times their standard errors) plus the smaller amount of variance accounted for by the variables in the equation ($R^2 = .17$) indicates that although faculty distribution is more highly contingent upon the size of the school district, faculty differentiation adds an increment of influence which is not accounted for by school district size. Thus school districts in which the faculty are more evenly distributed across a broader range of teaching assignment categories are both larger and have a more highly differentiated teaching staff, ceteris paribus.

The financial resources of school districts also exert an independent influence upon the extent of faculty distribution as indicated by the regression coefficient in the second row of Table 4-2. Although no part of this influence is rendered spurious by antecedent conditions, almost one-third of its impact is mediated by faculty differentiation ($d.c. = .12$). Since operating expense per pupil fails to achieve statistical significance when entered into the regression of faculty differentiation, it must be assumed that the combination of a highly differentiated and broadly distributed faculty requires more extensive financial resources. Although it is reasonable to assume that the higher costs associated with extensive faculty differentiation and faculty distribution are a function of either student-faculty ratio, faculty experience, faculty qualifications or average faculty salary, none of these conditions achieve statistical significance when entered into the regression equation with either school district size (log) or operating expense per pupil or both.

The influence of non-public school membership on faculty distribution is statistically straightforward--one-half of the influence represented by its simple correlation indicating a direct influence, one-half mediated by the combined influences of large financial resources and a high degree of faculty differentiation. However, the meaning of these relationships is not entirely clear. What difference should the number of private and parochial students in the district jurisdiction make for the way the faculty is distributed in the public schools? Initially, the best explanation

seems to be that since the parents of non-public school students pay local property taxes at the same rate as the parents of public school students, their taxes actually increase the pool of financial resources available for the education of each public school student. However, when operating millage and local revenue per pupil are entered into a regression equation with the variables in Table 4-2, their regression coefficients are small and insignificant while the influence of non-public school membership upon the criterion remains virtually unchanged.

A more speculative interpretation of this finding derives from an examination of the distribution of non-public school students in Michigan. Although the mean percentage of non-public school students in Michigan district jurisdictions is relatively small (5.42), the distribution is positively skewed (2.79) indicating that the mean is actually depressed by a large number of districts which have few, if any, non-public school students. The rank ordering of Michigan school districts according to percentage of non-public school students confirms this finding and reveals that districts with higher percentages of non-public school students are generally larger (or are adjacent to larger districts) and tend to be concentrated in the metropolitan counties of southeastern Michigan. Furthermore, a visual examination of the lists of non-public schools in these counties reveals an impressive array of prestigious private and parochial schools which are widely known for the excellence of their educational programs. Assuming a highly differentiated faculty which is broadly distributed across a large number of teaching

specialties represents a dimension of curricular breadth and depth, then the mere presence of one or more of these prestigious, privately endowed educational institutions may have an exemplary effect upon both the educational values and the expectations of community residents and public school curricular programs. The persistent influence of the measure for non-public school membership upon this and other quality-indicating variables (c.f., pp. 189-191) suggests the importance of future research concerning these speculations about the influence of non-public schools upon the public schools.

In summary, the distribution of district faculty members among teaching assignment categories is contingent upon the extent of faculty differentiation (which is a function of school district size), the financial resources available to the district and the number of non-public school students in the district jurisdiction. Translating these relationships into the metric of their original measures, a one percent increase in the rate of faculty distribution is associated with an average increase of ten percent in the rate of faculty differentiation, an average increase of \$243.90 in district operating expenses per pupil and an average increase of 18.52% in the number of non-public school students.

Faculty Dispersion

Whereas faculty differentiation and faculty distribution are concerned with the functional differentiation of district faculty members, faculty dispersion and faculty per building measure their

spatial differentiation. The former provides a summary measure of the distribution of district faculty members within district buildings or work locations while the latter measures staff density.

Table 4-3 indicates that the distribution of district faculty members within district buildings is primarily contingent upon district size (row 1). No part of the regression coefficient of

TABLE 4-3.--Multiple Regression and Decomposition of Faculty Dispersion on District Size (Log) and Operating Expense per Pupil.

Variable	Beta	B	SE/B	r
1. District Size (Log)	.85**	.38	.013	.81
2. Operating Expense per Pupil	-.09**	-.00009	.000028	.29

$R^2 = .66$ ($\hat{R}^2 = .66$); $n = 508$.

** More than three times its standard error.

Variable	1	2
1. District Size (Log)	<u>.85</u>	-.04
2. Operating Expense per Pupil	.38	<u>-.09</u>

district size (log) is spurious, and its influence on the dependent variable is virtually unmediated, indicating that the faculty in larger school districts are relatively more evenly distributed throughout a larger number of district buildings than the faculty in smaller school districts, ceteris paribus.

The extent of faculty dispersion may be contingent to some extent upon the degree of faculty differentiation. However, when this variable is entered into the multiple regression equation of faculty dispersion instead of district size (log), the magnitude of its beta weight (.73) and the smaller amount of variance accounted for by the variables in the equation ($R^2 = .53$) probably indicates the dependence of both conditions upon school district size. Assuming that this interpretation is correct, a one unit (ten teacher) increase in school district size is associated with a thirty-eight percent increase in the rate of faculty dispersion, other conditions equal.

Operating expense per pupil exerts a small but significant negative effect upon the rate of faculty dispersion in Michigan K-12 school districts (row 2). Although most of this influence is rendered spurious by the overwhelming impact of school district size (d.c. = .38) upon both variables, a one percent increase in the criterion is associated with an average decrease of \$109.89 in operating expense per pupil when district size is controlled.

In summary, faculty members in larger school districts are relatively more evenly distributed throughout a larger number of district buildings than faculty members in smaller districts. This finding should cause no great surprise given the population densities associated with larger school districts. However, the finding that larger concentrations of teachers in a larger number of buildings requires relatively fewer financial resources per pupil is somewhat surprising. It is probably due to the additional costs required for

operating the one-, two- and three-room school buildings which characterize some of the smaller school districts in Michigan.

Faculty Per Building

As might be expected, the evidence with respect to the average number of faculty assigned to each district building or work location is similar to that of faculty dispersion. The large and significant beta weight in the second row of Table 4-4 indicates that, other things equal, the number of faculty per building is a function of school district size (log). In fact, under the conditions represented in Table 4-4, a one unit (ten teacher) increase in the number of district faculty members is associated with an average increase of 7.23 faculty members per building.

TABLE 4-4.--Multiple Regression and Decomposition of Faculty per Building on Average Family Income and District Size (Log).

Variable	Beta	B	SE/B	r
1. Average Family Income	.17**	.00045	.00012	.41
2. District Size (Log)	.41**	7.23	.82	.51

$R^2 = .28$ ($\hat{R}^2 = .27$); $n = 508$.

** More than three times its standard error.

Variable	1	2
1. Average Family Income	<u>.17</u>	.23
2. District Size (Log)	.10	<u>.41</u>

Why the affluence of district residents should exert a major influence upon the average number of faculty per building (row 1) remains unclear. Perhaps average family income is a surrogate for other indicators of school district affluence. However, none of these (i.e., state equalized valuation per pupil, operating millage, local revenue per pupil or operating expense per pupil) or any other environmental condition achieves statistical significance when entered into the multiple regression summarized in Table 4-4. The fact that over half of the influence of average family income is mediated by school district size ($d.c. = .23$) may indicate that the relationship is purely fortuitous: both high average family income and a large number of faculty per building may be a function of the population density characteristic of large metropolitan school districts.

In summary, the evidence with respect to the functional and spatial division of labor in Michigan K-12 school districts demonstrates substantial agreement with the evidence of other studies of formal organizations: the primary determinant of organizational division of labor is the size of the organization. The faculty in larger school districts are assigned to more (and more specialized) teaching assignment areas than the faculty members in smaller districts. This condition is somewhat contingent upon the advanced academic credentials of the faculty, but the faculty in larger districts tend to have higher academic credentials in any case. The larger the school district, the greater the probability that the faculty are evenly distributed across a broad range of specialized

teaching areas. This condition is contingent to some extent upon the financial resources of the district and the number of non-public school students in the district. While the former contingency makes sound intuitive sense, the latter does not, and the available evidence is insufficient to permit more than tentative speculations. Faculty in larger school districts tend to be more evenly distributed throughout a larger number of buildings and work locations than the faculty in smaller districts. Such distributions tend to be somewhat less expensive than the more uneven distributions that characterize smaller school districts. Finally, larger school districts tend to have more faculty per building than smaller districts. This undoubtedly results from the location of these districts in more densely populated communities. The finding that the average income of community residents also affects this condition probably derives from the location of more affluent people in more densely populated communities.

Hierarchy of Authority

Formal organizations are characterized by a hierarchy of circumscribed authority which mediates the distribution of organizational power and status in such a way as to assure adequate supervision and direction of organizational activities. As indicated in an earlier section, the authority structure of formal organizations is exceedingly complex, and for the purposes of empirical analysis may (and probably must) be differentiated into two dimensions: (1) the formal structure of authority relations (i.e., that relatively

stable pattern of super- and subordination revealed in the typical organization chart); and (2) the informal structure of authority relations (i.e., those unofficial and frequently shifting patterns of influence and favor which derive from the personal, social and political characteristics of organizational members, but which often determine both what and how "things get done" in organizations). Since the latter, however ubiquitous, is contingent upon the internal dynamics of particular organizations, it is not entirely amenable to the comparative analysis of a large number of organizations. Thus, the present investigation only analyzes three aspects of the formal structure of authority relations in Michigan K-12 school districts: the extent of administrative differentiation, the number of major divisions and the number of hierarchical levels. Three closely related variables--administrative ratio, supervisory ratio and administrative staff ratio--are analyzed in the discussion of school district administrative apparatus. Three other variables that bear upon the distribution of authority in school district organizations--superintendent span of control, supervisory span of control and principal span of control--are included in the analysis of both hierarchy of authority and administrative apparatus, but only as independent variables.

Administrative differentiation refers to the functional division of managerial and administrative labor in school district organizations, and thus provides a context for the consideration of both hierarchy of authority and administrative apparatus. It is measured by the proportion of twenty-five administrative assignment

categories occupied as first or second assignments of district administrators during the 1975-76 school year. The administrative differentiation scores of Michigan K-12 school districts range from .04 to 1.00, with a mean of .29, indicating that the administrators in the typical Michigan school district are spread across approximately seven separate administrative assignment categories.

Major divisions refers to the horizontal differentiation of the school district hierarchy of authority, and is measured by the number of district subunits headed by an administrator who reports directly to the superintendent and who supervises two or more administrators other than building principals. This measure differs from the measure for superintendent span of control in that the latter includes all administrators reporting directly to the superintendent regardless of their supervisory responsibilities. The typical Michigan K-12 school district has 1.34 major divisions, ranging from a low of one to a high of eight.

Hierarchical levels refers to the vertical differentiation of the school district authority structure and is measured by the number of supervisory strata between the superintendent and the faculty, with the superintendent and faculty counted as extreme strata. Michigan K-12 school districts have from two to seven hierarchical levels, with a mean of 3.32.

Superintendent span of control refers to the total number of non-clerical personnel reporting directly to the district superintendent. This measure differs from major divisions in that it includes isolated specialists and consultants who report directly to

the superintendent but do not head major subunits. The spans of control of Michigan K-12 superintendents range from one to eighty-six with a mean of 9.26.

Supervisory span of control refers to the average number of non-clerical personnel reporting directly to administrators between (and excluding) the district superintendent and building principals. In the typical Michigan K-12 school district the average supervisory span of control is 5.84, ranging from a low of zero to a high of eighty.

Principal span of control refers to the average number of district professional personnel (faculty, assistant principals and other administrators) reporting directly to a principal or building supervisor. This measure differs from the measure for faculty per building in that it includes assistant principals and other administrators, and because some principals and building supervisors are responsible for more than one building. "Principal teachers" and "teachers-in-charge" are not counted as principals unless they are designated as administrators in the Register of Professional Personnel. The mean principal span of control for Michigan K-12 school districts is 24.87, ranging from a low of 4.25 to a high of fifty-nine.

Administrative Differentiation

As indicated above, administrative differentiation measures the proportion of twenty-five administrative assignment categories occupied by district administrators during the 1975-76 school year.

A high administrative differentiation score indicates that district administrators, regardless of their absolute number, have designated responsibilities for a relatively large proportion of twenty-five specialized administrative functions in the district hierarchy of authority. Administrators in the typical Michigan school district occupy 7.25 separate administrative assignment categories.

What are the environmental conditions of the administrative division of labor in Michigan K-12 school districts? The regression equation summarized in Table 4-5 indicates that the extent of administrative differentiation in Michigan K-12 school districts is almost entirely a function of the size of the school district. No portion of the regression coefficient in the second row of Table 4-5 is spurious and its influence upon the dependent variable is virtually unmediated. The larger the school district, the greater the spread of district administrators across specialized assignment areas. On the average, a one unit (ten teacher) increase in the size of a school district is associated with a 42% increase in the extent of administrative differentiation.

Perhaps the distribution of administrative labor is also influenced by the distribution of faculty labor in Michigan K-12 school districts. Administrative differentiation is highly correlated with both faculty differentiation ($r = .84$) and faculty dispersion ($r = .68$). However, the high correlations between these aspects of school district division of labor ($r = .73$) and between each and district size (log) ($r = .91$ and $.81$, respectively) precludes their simultaneous inclusion in the same regression equation. When faculty

TABLE 4-5.--Multiple Regression and Decomposition of Administrative Differentiation on State Equalized Valuation per Pupil, District Size (Log) and Average Administrator Salary.

Variable	Beta	B	SE/B	r
1. State Equalized Valuation per Pupil	.08**	.00000088	.00000023	.09
2. District Size (Log)	.96**	.42	.012	.89
3. Average Administrator Salary	-.10**	-.00000061	.00000017	.56
$\hat{R}^2 = .81$ ($\hat{R}^2 = .81$); $n = 508$				
** More than three times its standard error.				
Variable	1	2	3	
1. State Equalized Valuation per Pupil	<u>.08</u>	.04	-.02	
2. District Size (Log)	.00	<u>.96</u>	-.07	
3. Average Administrator Salary	.01	.65	<u>-.10</u>	

differentiation is entered into the regression equation summarized in Table 4-5, its beta weight is .76 (more than three times its standard error) and the amount of variance accounted for by the dependent variables (R^2) declines to .71. When faculty dispersion is entered into the same equation instead of district size (log), its beta weight is .57 (more than three times its standard error) and R^2 declines to .61. These findings indicate that while there is a definite association between the complexity of the academic division of labor and the extent of administrative differentiation, all of these conditions ultimately depend upon the size of the school district.

In addition, the differentiation of the division of administrative labor in Michigan K-12 school districts is somewhat contingent upon lower administrative salaries and a higher district tax base per pupil. Although the influence of average administrative salary is largely spurious due to the antecedent influence of district size (log) (d.c. = .65), the standardized regression coefficient in the third row of Table 4-5 indicates that this factor has a small negative effect upon the dependent variable when the influence of district size has been controlled. This finding makes sound intuitive sense: the greater the proportion of administrative assignment categories occupied in a school district, the greater the probability of incumbency is one or more of the less highly remunerated administrative positions--e.g., assistant principal, school community director, etc. Translating this value into the metric of the original variables, a one unit increase in the extent of

administrative differentiation is associated with a reduction of \$6,700 in the average salary paid to the typical district administrator (mean = \$20,975), other conditions equal.

By the same token, the extent of administrative differentiation is also somewhat contingent upon the value of the taxable real estate and personal property in the district (row 1). It is not entirely clear why state equalized valuation per pupil (which is a measure of raw tax base) should achieve statistical significance when neither operating millage nor local revenue per pupil do so when entered in the same multiple regression equation. However, when the standardized regression coefficient is translated into the metric of the original measures, the question is largely academic: it would require an increase of approximately \$50,000 in state equalized valuation per pupil (mean = \$26,037) to change the extent of administrative differentiation by one unit, other conditions equal.

In summary, the larger the school district, the greater the complexity of the academic division of labor and the greater the differentiation of the administrative hierarchy into specialized administrative functions. Further, although large school districts tend to have higher average administrator salaries than small school districts ($r = .70$), the salary differential among administrative positions is such that extensive administrative differentiation has the effect of reducing the average salary of district administrators. Although the nexus between state equalized valuation per pupil and administrative differentiation under these conditions is statistically significant, the relationship has virtually no practical importance.

Major Divisions

Whereas administrative differentiation measures the spread of school district administrators across a set of twenty-five specialized assignment categories, major divisions provides an index of their differentiation into organization subunits. The mean for Michigan K-12 school districts (1.34) indicates that, on the average, district functions are organized into a single division under the direct supervision of the superintendent with some additional differentiation of functions into an additional subunit under the supervision of an assistant superintendent, director of instruction or business manager. However, the positive skew of this distribution (4.21) indicates that the mean is inflated by the presence of a smaller number of districts which may have as many as eight major divisions.

What factors in the environment of Michigan K-12 school districts account for the differentiation of district functions into organizational subunits? The multiple regression equation summarized in Table 4-6 indicates that the number of major divisions in school district organizations is contingent upon two conditions: the extent of administrative differentiation and the amount of federal aid per pupil received by the district. Translating the standardized regression coefficients of these variables into the metric of their original measures, an increase of one major division is contingent upon an increase of .27 units (i.e., 6.67 administrative assignment categories) of administrative differentiation and an increase of \$5.00 per pupil in district federal aid.

TABLE 4-6.--Multiple Regression and and Decomposition of Major Divisions on Federal Revenue per Pupil and Administrative Differentiation.

Variable	Beta	B	SE/B	r
1. Federal Revenue per Pupil	.12**	.002	.00053	.16
2. Administrative Differentiation	.71**	3.73	.16	.71
$R^2 = .52$ ($\hat{R}^2 = .52$); $n = 508$				
** More than three times its standard error.				
Variable	1	2		
1. Federal Revenue per Pupil	<u>.12</u>	.04		
2. Administrative Differentiation	.01	<u>.71</u>		

However, these findings may not be as straightforward as they appear. First, the overwhelming influence of district size (log) upon administrative differentiation and its substantial simple correlation with major divisions ($r = .66$) raises the question of the relative impact of school district size upon the number of major divisions. Furthermore, the substantial simple correlation between faculty differentiation and administrative differentiation ($r = .84$) and major divisions ($r = .61$) raises the question of the relative impact of the division of academic labor upon subunit differentiation within the administrative hierarchy. As indicated in a previous section, other studies of formal organizations have attributed the extent of subunit differentiation to both organizational size and the complexity of the operational division of labor.

Unfortunately the substantial correlations between these variables preclude their simultaneous inclusion in the same regression equation as independent variables. However, when district size (log) is entered into the multiple regression equation summarized in Table 4-6 instead of administrative differentiation, its beta weight is smaller (.66) but equally significant, and the amount of variance explained by the independent variables is slightly reduced ($R^2 = .48$). The situation is similar with faculty differentiation. Its beta weight is even smaller (.56, more than three times its standard error) and the independent variables account for even less of the total variance of the dependent variable ($R^2 = .40$).

Although highly speculative and largely dependent upon the scheme of causal precedence presented in an earlier section (p. 99), these findings suggest that, although the number of major divisions in school district organizations is ultimately dependent upon the size of the school district, it is more directly a consequence of the complexity of the division of administrative labor, which is itself a function of the size of the school district (and, perhaps, the complexity of the division of academic labor). Thus, the increasing size of Michigan K-12 school districts is accompanied by increasing differentiation among the district faculty. Expanding size and increasing differentiation present problems of coordination and control which are resolved by further differentiation among the functions and positions in the administrative hierarchy. However, each additional increment of administrative differentiation expands the span of control of the superintendent and increases internal

pressures to subdivide administrative functions into organizational subunits headed by managers who report directly to the superintendent. (This interpretation would be considerably strengthened by evidence of negative and statistically significant beta weights for superintendent span of control and supervisory span of control in a regression equation similar to that summarized in Table 4-6. Neither variable achieves statistical significance when entered into that regression equation, however).

The interpretation of the impact of federal revenue per pupil upon major divisions is somewhat less speculative. Federal aid to local school districts is usually allocated (or reallocated through state channels) in the form of project grants directed to areas of special need. These projects are often coordinated by "soft money" specialists who are counted as part of the central administration. Since federal aid thus expands the number of district administrators (and the extent of administrative differentiation), it contributes to the dynamics which stimulate the creation of additional major divisions.

Hierarchical Levels

Hierarchical levels measures the vertical differentiation of the hierarchy of authority of Michigan K-12 school districts--i.e., the number of supervisory strata between the district superintendent and faculty with the superintendent and faculty counted as extreme strata. The typical Michigan K-12 school district has 3.32 hierarchical levels: e.g., the superintendent, building principals and

faculty, with the suggestion of some further differentiation, probably in the form of a director of elementary or secondary curriculum.

What factors in the environment of Michigan K-12 school districts influence the number of hierarchical levels in those districts? As with horizontal differentiation into major divisions, the primary determinants of vertical differentiation into hierarchical levels are the size of the school district and the extent of administrative differentiation. However, because of the very high simple correlation between these variables ($r = .90$), they cannot be entered into the same multiple regression equation as independent variables and must be examined separately. The first row of Table 4-7 indicates that administrative differentiation exerts a strong influence upon the number of hierarchical levels in Michigan K-12 school districts. In terms of the metric of the original measures, the creation of one additional hierarchical level is contingent, on the average, upon a forty-four percent increase (i.e., eleven additional administrative assignment categories) in the rate of administrative differentiation. The second row of Table 4-7 indicates that while most of the influence of major divisions upon hierarchical levels is rendered spurious by the antecedent effect of administrative differentiation upon both variables (d.c. = .45), its small but significant beta weight indicates an independent influence on the dependent variable when the effects of administrative differentiation are controlled. Translating this influence into the metric of the original measures, an increase of one hierarchical

level is contingent upon an average increase of 14.29 major divisions. Although this finding has little practical importance, its theoretical significance is important and is discussed below.

TABLE 4-7.--Multiple Regression and Decomposition of Hierarchical Levels on Administrative Differentiation and Major Divisions.

Variable	Beta	B	SE/B	r
1. Administrative Differentiation	.63**	2.23	.16	.70
2. Major Divisions	.10*	.07	.03	.55

$R^2 = .50$ ($\hat{R}^2 = .50$); $n = 508$

* More than twice its standard error.

** More than three times its standard error.

Variable	1	2
1. Administrative Differentiation	<u>.63</u>	.07
2. Major Divisions	.45	<u>.10</u>

When the logarithm of school district size is entered into the regression equation summarized in Table 4-7 instead of administrative differentiation, its beta weight (.56, three times its standard error) is somewhat smaller and the variables in the equation account for slightly less of the variance of the dependent variable ($R^2 = .49$). Furthermore, although fully two thirds of the influence of major divisions is rendered spurious by the antecedent effects of district size (log), its beta weight (.18, three times its standard error) increases in both magnitude and significance. Taken together,

these findings seem to indicate that although the number of hierarchical levels in Michigan K-12 school districts is ultimately dependent upon the size of the district, it is more directly contingent upon the extent of administrative differentiation (which is also contingent upon the size of the school district). In addition, major divisions has an independent impact upon hierarchical levels when the effects of either district size (log) or administrative differentiation are controlled.

As indicated previously, Blau and his associates (Blau, Heydebrand and Stauffer, 1966; Blau, 1968b; Meyer, 1968; and Blau and Schoenherr, 1971) found sufficient evidence to conclude that organizations take on different structural configurations--tall and thin versus short and squat--depending upon the size and complexity (i.e., the routinization or specialization) of the organization. They based their conclusions upon the consistent finding of an inverse relationship between measures for the vertical and horizontal differentiation of the headquarters staff when the effects of size and division of labor (number of occupational titles) were controlled. Moreover, Blau (1973) replicated this finding in his study of U.S. universities--when he substituted "president span of control" for his measure of horizontal differentiation.

The direction of the evidence from the study of Michigan K-12 school districts is similar to that which Blau obtained in his study of universities. First, in the regression of hierarchical levels on district size (log) and major divisions (Table 4-7), the regression coefficient of major divisions is positive and statistically

significant. However, when hierarchical levels is regressed on district size (log) and superintendent span of control, the beta weight of superintendent span of control is negative and statistically significant ($-.10$, more than twice its standard error).

These findings suggest a fundamental homology between Michigan K-12 school districts and U.S. universities and other formal organizations with respect to the development and shape of their respective hierarchical pyramids. Smaller organizations, characterized by low levels of both operational and administrative differentiation, tend to be relatively short and squat. Larger organizations on the other hand, characterized by more highly specialized and more geographically dispersed operational employees and a more highly differentiated and specialized administrative staff, tend to be relatively tall and thin.

Although it is dangerous to speculate about the temporal processes underlying cross-sectional data, these findings suggest a sequence in the development of school district authority structures. In the smallest Michigan school districts (thirteen in all), characterized by a relatively undifferentiated teaching staff, the superintendents are the only administrators and their spans of control equal the total number of district employees. Such organizations are extremely short and squat. Somewhat larger school districts, in which the faculty members are somewhat more highly differentiated and dispersed, have an additional level (building principals) which reduces the superintendent's span of control. This development increases the height and decreases the width of the organizational pyramid; it

typifies approximately one-third of all Michigan K-12 school districts. However, as school districts increase in size, the faculty becomes increasingly differentiated, distributed and dispersed, and the administrative staff becomes increasingly specialized. Initially, this set of conditions can be managed within the existing organizational framework by expanding the span of control of the superintendent. Over time, however, the superintendent becomes overburdened with an excessive span of control which limits the attention he can devote to other district responsibilities. The result is the creation of an additional level between the superintendent and the building principals and the consolidation of similar functions into two or more major divisions (e.g., elementary or secondary instruction, business affairs, etc.), each headed by a supervisor who reports directly to the superintendent. The organizational structure can then tolerate an almost exponential expansion of the headquarters staff in response to the dynamics of the continuing growth and differentiation of the teaching staff simply by adding new divisions or by expanding the span of control of the middle managers. If and when the superintendent becomes overburdened with excessive divisions (and decisions) and/or the middle managers become overburdened with excessive spans of control, the only alternative is the addition of yet another level which, theoretically at any rate, permits an almost exponential expansion and differentiation of the headquarters staff.

Summary

In summary, the evidence with respect to the hierarchy of authority in Michigan K-12 school districts demonstrates substantial agreement with the findings of other investigations of formal organizations: larger organizations, which are also characterized by a more extensive division of labor, tend to have increasingly more major divisions and more hierarchical levels than smaller organizations. Furthermore, like other organizations characterized by a professionalized division of labor, the hierarchical pyramids of school district organizations tend to become increasingly tall and thin as their size increases. Whereas earlier investigations attribute these conditions to the dynamics of organizational size and the division of operational labor, this investigation demonstrates that administrative differentiation--a new variable designed to measure the complexity of the administrative division of labor--mediates the influence of organizational size and division of labor upon the number of major divisions and the number of hierarchical levels in school district organizations. Although conditions of multicollinearity make this interpretation dependent upon the assumed causal sequence of the respective variables, the observed relationships make sound intuitive sense. A large and highly differentiated staff of professional employees at the operational level creates problems of control, coordination and communication. This condition requires a highly differentiated administrative superstructure consisting of supervisors, consultants and staff specialists. This latter condition creates additional problems of control, coordination and communication within the administrative hierarchy itself which results in further

administrative differentiation. Thus, the increasing complexity of the division of administrative labor is more directly responsible for the number of major divisions and the number of hierarchical levels in Michigan K-12 school district organizations. In addition to the influence of extensive administrative differentiation, the number of major divisions is also somewhat contingent upon the level of financial aid per pupil derived from federal sources. This condition probably reflects the presence of specialized educational and service projects which are typically coordinated by specialists in the administrative hierarchy. By the same token, the number of hierarchical levels is also somewhat contingent upon the number of major divisions. Although the impact of this condition upon the number of hierarchical levels is relatively minor, its statistical significance provides additional support for the interpretation advanced in this section concerning variations in the pyramidal structure of the hierarchies of Michigan K-12 school districts.

Administrative Apparatus

Weber maintained that "the management of (formal organizations) is based upon written documents ('the files') . . . (and that) there is, therefore, a staff of subaltern officials and scribes of all sorts" which is concerned with matters of communication and coordination and which, unlike the operational or production staff and the supervisory staff, contributes to goal attainment primarily through its attention to problems of organizational maintenance. Technically, therefore, the administrative apparatus of formal organizations refers only to those employees who provide clerical and

supportive services. However, most contemporary investigators expand the treatment of administrative apparatus to include other dimensions of the central administration which seem to relate more appropriately to descriptions of the hierarchy of authority. The difference is that whereas hierarchy of authority refers to the structure of authority relations in formal organizations, administrative apparatus is concerned with the relative magnitude of the components of the entire administrative superstructure. In keeping with this convention, this section examines the environmental and structural conditions which contribute to the relative magnitude of the administrative, supervisory, technical, clerical and supportive staff ratios of Michigan K-12 school districts.

Administrative ratio refers to the number of professional school administrators (both "line" and "staff") in Michigan K-12 school districts relative to the number of district faculty. It is measured by the ratio of district administrators (excluding clerical and supportive staff members) to the total number of district faculty members during the 1975-76 school year. The mean administrative ratio for Michigan K-12 school districts is .08, ranging from a low of .03 to a high of .17.

Supervisory ratio refers to the number of district administrators who have supervisory (i.e., "line") responsibilities relative to the number of district faculty. It is measured by the ratio of district administrators who supervise two or more non-clerical personnel to the total number of district faculty. The supervisory

ratios of Michigan K-12 school districts range from a high of .17 to a low of .03 with a mean of .06.

Administrative staff ratio refers to the number of district administrators whose contribution to the school district derives primarily from their technical knowledge and expertise. It is measured by the ratio of the total number of district administrators who do not supervise two or more non-clerical personnel to the total number of district faculty. The mean administrative staff ratio for Michigan K-12 school districts is .02, ranging from a low of zero to a high of .08.

Clerical ratio refers to the number of secretaries and clerks assigned to district classroom buildings relative to the number of district faculty members during the 1975-76 school year. The clerical ratios of Michigan K-12 school districts range from a low of zero to a high of .20 with a mean of .04.

Supportive staff ratio refers to the number of school district auxiliary personnel relative to the number of district faculty members. It is measured by the ratio of the total number of teacher aides, clerical aides, library aides, health aides, food service staff, transportation staff, custodial and maintenance staff to the total number of district faculty during the 1975-76 school year. The typical Michigan K-12 school district has a supportive staff ratio of .71, ranging from a low of .20 to a high of 1.81.

Administrative Ratio

As was indicated in the previous section, Michigan K-12 school districts develop increasingly complex administrative hierarchies as their size increases. Larger school districts have more major divisions, more hierarchical levels and their administrators are more highly differentiated among more highly specialized positions and functions. Many writers have observed that larger organizations have more administrators than smaller organizations and Parkinson (1957) has formulated "laws" with respect to the relationship between organizational size and the magnitude of the administrative staff.

That larger organizations have more administrators than smaller organizations is beyond dispute. But do these larger, more complex organizations require (or acquire) proportionately larger administrative hierarchies than smaller school districts? This is an empirical question which will be tested by examining the administrator-faculty ratios of Michigan K-12 school districts. In addition, this section will examine the environmental and structural conditions which influence the administrative ratios in Michigan school districts.

As indicated above, the administrative ratios of Michigan K-12 school districts are calculated by dividing the total number of district faculty. The mean administrative ratio for Michigan K-12 school districts (.08) indicates that the typical Michigan school district has one administrator for every 12.5 faculty members. Although it is very tempting to compare this finding with those

derived from studies of other types of organizations, fundamental differences in measurement techniques between studies makes such comparisons extremely unwise and unenlightening.

Table 4-8 summarizes the relative impact of those environmental and structural conditions which influence the magnitude of the administrative ratios of Michigan K-12 school districts. The degree of differentiation within the administrative division of labor exerts the greatest influence upon their administrative ratios (row 4). Part of this influence is rendered spurious by the antecedent and apparently contradictory influences of operating expense per pupil (d.c. = .18) and the average administrator salary (d.c. = -.22) and part is mediated by the relatively lower spans of control of building principals (d.c. = -.18). However, when these conditions are controlled, a one percent change in administrative ratio is contingent upon a twenty percent (five administrative assignment categories) increase in the rate of administrative differentiation.

By the same token, a high administrator-faculty ratio is dependent upon somewhat lower administrative salaries (row 3). Again, part of the influence of this condition is rendered spurious by the antecedent influence of operating expense per pupil (d.c. = .17) on both conditions and part is mediated by a high rate of administrative differentiation (d.c. = .26) and low principal span of control (d.c. = -.20). When these conditions are controlled, however, a one percent increase in administrative ratio is associated with a decrease of \$3571.43 in the average administrative salary.

TABLE 4-8.--Multiple Regression and Decomposition of Administrative Ratio on Student-Faculty Ratio, Operating Expense per Pupil, Average Administrator Salary, Administrative Differentiation and Principal Span of Control.

Variable	Beta	B	SE/B	r
1. Student-Faculty Ratio	.22**	.002	.00043	.01
2. Operating Expense per Pupil	.36**	.000038	.0000061	.20
3. Average Administrator Salary	-.40**	-.0000028	.00000035	-.17
4. Administrative Differentiation	.47**	.053	.0055	.25
5. Principal Span of Control	-.38**	-.001	.00012	-.29
$R^2 = .37$ ($\hat{R}^2 = .36$); $n = 508$				
** More than three times its standard error.				

Variable	1	2	3	4	5
1. Student-Faculty Ratio	.22	-.21	.00	-.00	.00
2. Operating Expense per Pupil	-.13	.36	-.18	.23	-.08
3. Average Administrator Salary	-.00	.17	-.40	.26	-.20
4. Administrative Differentiation	-.00	.18	-.22	.47	-.18
5. Principal Span of Control	-.00	.08	-.21	.22	-.38

As might be expected, a low principal span of control (row 5) contributes to a high administrator-faculty ratio even when the antecedent influences of operating expense per pupil (d.c. = .08), average administrator salary (d.c. = -.21) and administrative differentiation (d.c. = .22) are reduced to zero. Translating these statistics into the metric of their original measures, a one percent increase in administrative ratio is contingent upon the reduction of ten teachers in the average principal span of control.

A high administrative ratio is somewhat dependent upon the financial resources of the school district as is indicated by the regression coefficient in the second row of Table 4-8. Although part of this influence is rendered spurious by the effect of student-faculty ratio (d.c. = -.13) and is mediated by lower average administrator salary (d.c. = -.18) and higher administrative differentiation (d.c. = .23), a one percent increase in administrative ratio is associated with an average increase of \$263.16 in operating expense per pupil.

The reason for the substantial and highly significant influence of student-faculty ratio (row 1) upon administrator-faculty ratio is not entirely clear. Given the relationships reported in Table 4-8, the most plausible explanation seems to be that a higher student-faculty ratio creates a need for additional supervision which is met by reducing the span of control of the district principals. However, the decomposition of the influence of student-faculty ratio upon administrative ratio provides no support for such an

interpretation. Thus the relationship is either fortuitous or the consequence of variables not included in the analysis.

In summary, the administrative ratios of Michigan K-12 school districts are a function of extensive administrative differentiation and narrow principal span of control, both of which expand the size of the administrative hierarchy. Higher administrative ratios tend to be somewhat more expensive in absolute terms even though extensive administrative differentiation and low principal spans of control tend to reduce the average salary of district administrators. Large student-faculty ratios may tend to increase the requirement for additional administrators (and thus the number of principals with relatively low spans of control), but this speculation is not supported by the existing data.

But what of the relationship between the size of Michigan K-12 school districts and the magnitude of their administrative ratios? The consensus among organizational researchers is that the administrative ratios of formal organizations tend to decrease with increasing organizational size. Is there a fundamental homology between school districts and other types of organizations in this respect? The simple correlation between district size (log) and administrative ratio ($r = -.05$) seems to suggest that the size of Michigan K-12 school districts and the magnitude of their administrative ratios are virtually unrelated. However, as several investigators have suggested, administrative ratios are not so much a function of organizational size as of organizational complexity--i.e., the

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degree of differentiation in their divisions of labor and administrative hierarchies.

Table 4-9 summarizes the relationship between the size of Michigan K-12 school districts and the magnitude of their administrative ratios when other environmental and organizational conditions are controlled. As was indicated above, the probable collinearity between district size (log) and administrative differentiation precludes their inclusion in the same multiple regression equation. Therefore, in addition to district size (log), and in order to approximate some of the influence of a highly differentiated administrative hierarchy, major divisions and hierarchical levels have been entered into the regression equation along with the remaining variables from Table 4-8. The results indicate substantial agreement with the original findings. In fact, except for a slightly smaller coefficient of determination (R^2), Table 4-9 is actually preferable because of the additional information it provides. That is, the multiple regression equation summarized in Table 4-9 clearly explicates the relationship between the size and administrative ratios of Michigan K-12 school districts by mapping the complex web of relationships among and between antecedent and mediating factors. Thus in answer to the question, "Do larger school districts have lower administrative ratios than smaller school districts?," the answer is resoundingly "Yes!," provided that the influences of operating expense per pupil (d.c. = .22), average administrator salary (d.c. = -.16), major divisions (d.c. = .22), hierarchical levels (d.c. = .16) and principal span of control (d.c. = -.12) are

TABLE 4-9.--Multiple Regression and Decomposition of Administrative Ratio on District Size (Log), Student-Faculty Ratio, Operating Expense per Pupil, Average Administrator Salary, Major Divisions, Hierarchical Levels and Principal Span of Control.

Variable	Beta	B	SE/B	r
1. District Size (Log)	-.39**	-.02	.004	-.05
2. Student Faculty Ratio	.31**	.003	.0004	.01
3. Operating Expense per Pupil	.49**	.00005	.000006	.20
4. Average Administrator Salary	-.23**	-.000002	.0000004	-.17
5. Major Divisions	.34**	.007	.001	.27
6. Hierarchical Levels	.23**	.007	.002	.17
7. Principal Span of Control	-.21	-.0006	.0001	-.29
$R^2 = .35$ ($R = .34$); $n = 508$				
** More than three times its standard error.				

Variable	1	2	3	4	5	6	7
1. District Size (Log)	<u>-.39</u>	.01	.22	-.16	.22	.16	-.12
2. Student-Faculty Ratio	-.02	<u>.31</u>	-.28	.00	-.01	.00	.00
3. Operating Expense per Pupil	-.18	-.18	<u>.49</u>	-.11	.13	.08	-.04
4. Average Administrator Salary	-.27	-.00	.23	<u>-.23</u>	.12	.09	-.11
5. Major Divisions	-.26	-.01	.19	-.08	<u>.34</u>	.13	-.05
6. Hierarchical Levels	-.27	.00	.18	-.09	.19	<u>.23</u>	-.07
7. Principal Span of Control	-.22	-.00	.10	-.12	.08	.07	<u>-.21</u>

reduced to zero! Under these conditions, the administrative ratio of the typical Michigan K-12 school district decreases by one percent with each additional 5.26 teachers. Furthermore, since the influences represented by these conditions are seldom equal to zero, and since each is highly correlated with district size (log), the small negative simple correlation between district size (log) and administrative ratio ($r = -.05$) is really all the more remarkable.

Supervisory Ratio

The findings of the preceding section add further empirical support for the conclusion of earlier studies concerning the relationship between organizational size and the magnitude of the administrative hierarchy in formal organizations. When other conditions are controlled, larger school district organizations tend to have proportionately fewer administrators than smaller school district organizations. This and the next section goes beyond this finding to differentiate between those administrators who have managerial and supervisory responsibilities and those whose contributions to the organization derive primarily from their technical expertise and to examine the environmental and structural conditions which influence the magnitude of their respective ratios in the administrative hierarchies of Michigan K-12 school districts.

The supervisory ratio of Michigan K-12 school districts refers to the proportionate number of district administrators who supervise two or more non-clerical personnel relative to the total number of district faculty members. This ratio differs from both

administrative staff ratio (which includes only those administrators with no supervisory responsibilities) and administrative ratio (which includes all district administrators). The mean supervisory ratio for all Michigan K-12 school districts is .06 or one supervisor for every 16.57 faculty members.

Table 4-10 summarizes the environmental and structural conditions which exert the greatest influence upon the supervisory ratios of Michigan K-12 school districts. The large and significant beta weight in the first row of Table 4-10 indicates that the size of the school district organization is the primary factor determining the magnitude of its supervisory ratio. The larger the school district, the lower its supervisory ratio. Given the assumptions concerning the causal order of the variables in the equation, none of this influence is rendered spurious by antecedent conditions. However, as with the case of administrative ratio, part of the influence of district size (log) is mediated by operating expense per pupil (d.c. = .10), major divisions (d.c. = .17), hierarchical levels (d.c. = .18) and principal span of control (d.c. = -.21). When the influence of these conditions is reduced to zero, however, the influence of organizational size upon the supervisory ratio of Michigan K-12 school districts is such that the addition of 2.63 faculty members would reduce the supervisory ratio of the typical school district by one percent.

As might be expected, principal span of control (row 8) represents the next most potent influence upon the relative number of administrators with supervisory responsibilities in Michigan K-12

TABLE 4-10.--Multiple Regression and Decomposition of Supervisory Ratio on District Size (Log), Student-Faculty Ratio, Operating Expense per Pupil, Faculty Qualifications, Major Divisions, Hierarchical Levels, Supervisory Span of Control and Principal Span of Control.

Variable	Beta	B	SE/B	r
1. District Size (Log)	-.80**	-.038	.0028	-.60
2. Student-Faculty Ratio	.12**	.001	.00032	-.02
3. Operating Expense per Pupil	.22**	.000023	.0000049	-.15
4. Faculty Qualifications	-.10*	-.00015	.000059	-.41
5. Major Divisions	.25**	.0052	.0008	-.17
6. Hierarchical Levels	.26**	.008	.0012	-.21
7. Supervisory Span of Control	.10**	.00019	.000053	-.12
8. Principal Span of Control	-.37**	-.001	.000093	-.66
$R^2 = .63$ ($R^2 = .62$); $n = 508$				
* More than twice its standard error.				
** More than three times its standard error.				

Variable	1	2	3	4	5	6	7	8
1. District Size (Log)	-.80	.00	.10	-.06	.17	.18	.03	-.21
2. Student Faculty Ratio	-.03	.12	-.13	.01	-.01	.00	.00	.00
3. Operating Expense per Pupil	-.36	-.07	.22	-.06	.10	.09	.01	-.08
4. Faculty Qualifications	-.50	-.02	.13	-.10	.09	.10	.02	-.13
5. Major Divisions	-.53	-.00	.09	-.04	.25	.14	.01	-.09
6. Hierarchical Levels	-.54	.00	.08	-.04	.14	.26	.01	-.11
7. Supervisory Span of Control	-.22	.00	.02	-.02	.02	.03	.10	-.07
8. Principal Span of Control	-.46	-.00	.05	-.04	.06	.08	.02	-.37

school districts. The greater the span of control of the district principals, the lower the number of principals and thus the lower the overall supervisory ratio. Most of this influence is rendered spurious by the antecedent influence of the size of the school district (d.c. = $-.46$) upon both principal span of control and supervisory ratio, but its negative regression coefficient indicates a strong independent influence when district size (log) is controlled. Other conditions equal, the addition of ten teachers to the typical span of control of building principals is associated with a one percent decrease in the district supervisory ratio.

Since each additional unit of vertical or horizontal differentiation adds at least one supervisor to the administrative staff, and since both dimensions are largely contingent upon the size of the school district, the findings in rows 5 and 6 of Table 4-10 cause no surprise. The antecedent influence of district size (log) upon both major divisions (d.c. = $-.53$) and hierarchical levels (d.c. = $-.54$) reduces their impact upon the dependent variable, but their significant regression coefficients indicate an independent influence when the number of faculty is controlled. Translating to the metric of their original measures, either an additional 1.9 major divisions or an additional 1.25 hierarchical levels would increase the supervisory ratio of the typical Michigan K-12 school district by one percent, ceteris paribus.

The significant beta weight of operating expense per pupil (row 3) indicates that when district size (log) and its correlates are controlled, higher supervisory ratios require greater financial

resources. Under these conditions, a one percent increase in supervisory ratio is contingent upon an additional \$434.78 in operating expenses per pupil.

The student-faculty ratios of Michigan K-12 school districts have a marginal but significant impact upon the size of their supervisory ratios. Although most of this influence is mediated by operating expense per pupil (d.c. = $-.13$), a one percent increase in supervisory ratio is associated with an average increase of ten students per teacher. The meaning of this finding is not entirely clear. Although purely speculative, this may be a result of declining enrollments in Michigan schools. That is, under conditions of declining enrollment, the administration must adjust the size of the teaching staff. Since further declines may be anticipated, superintendents may decide to reduce the number of classrooms and increase the number of students in each. This would have the effect of increasing the student-faculty ratio, reducing the principal span of control and increasing the district supervisory ratio--exactly the pattern observed in Table 4-10.

At first glance the impact of supervisory span of control upon supervisory ratio (row 7) appears to contradict the more reasonable expectation suggested by their simple correlation ($r = -.12$). Most of the influence of supervisory span of control upon the dependent variable is rendered spurious by the antecedent influence of district size (log) (d.c. = $-.22$) upon both conditions. However, the regression coefficient of supervisory span of control indicates a small but independent influence upon supervisory ratio

when other conditions are controlled. The key to this situation is the decomposition coefficient for principal span of control (d.c. = $-.07$). A low principal span of control tends to increase the relative number of principals and thus the span of control of their immediate supervisors. The magnitude of the regression coefficient in row seven makes the issue largely academic, however. Other conditions equal, a one percent increase in the average supervisory ratio is contingent upon an average increase of 52.63 subordinates per supervisor (mean = 5.84).

The regression coefficient in the fourth row of Table 4-10 suggests an interesting line of speculation. It appears that school districts in which a high proportion of faculty members have advanced degrees require fewer supervisors than other school districts, other conditions equal. Although most of the influence of faculty qualifications upon supervisory ratio is rendered spurious by the antecedent effects of school district size (d.c. = $-.50$) upon both variables and part of its impact is mediated by principal span of control (d.c. = $-.13$), its small but statistically significant regression coefficient indicates an independent influence when other conditions are controlled. However, under these conditions a 1.5% decrease in the district supervisory ratio would require a 100% increase in the number of faculty members with at least one degree beyond the baccalaureate level (mean = 31.34%).

In summary, the supervisory ratio of Michigan K-12 school districts is largely a function of the size of the school district. The larger the district, the lower the average supervisory ratio.

Secondly, high principal span of control tends to depress district supervisory ratios. Thirdly, as with the overall administrative ratio, it is not so much the size of a school district as the complexity of its administrative hierarchy--i.e., the extent of vertical differentiation--which increases the supervisory ratio. Under these conditions, school district supervisory ratios also tend to have some independent influence upon the magnitude of school district supervisory ratios, but their respective influences are probably too small to make any practical difference.

Administrative Staff Ratio

Administrative staff ratio refers to the relative magnitude of that component of the administrative apparatus of Michigan K-12 school districts which is comprised of administrators who exercise few if any supervisory responsibilities and whose primary contributions to the district derive from their specialized knowledge and technical expertise. It is measured by the ratio of the total number of district administrators (excluding clerical and supportive personnel and teachers in quasi-administrative posts) who do not supervise two or more non-clerical personnel to the total number of district faculty. The typical Michigan K-12 school district has one administrative staff person for every fifty teachers.

The major prerequisite for a large staff of consultants and specialists in the administrative apparatus of Michigan K-12 school districts is a highly differentiated central administration, as is indicated by the large and significant regression coefficient in the

fourth row of Table 4-11. The greater the extent of administrative differentiation, the higher the administrative staff ratio. None of this influence is rendered spurious by the antecedent influence of other variables in the equation, but part of its impact is mediated by a relatively small number of hierarchical levels ($d.c. = -.10$).

In light of the high simple correlation between administrative differentiation and the logarithmic transformation of district size ($r = .90$) and faculty differentiation ($r = .84$), these variables were examined in separate analyses otherwise containing the same independent variables. Their regression coefficients were .48 and .43 (each greater than three times its standard error), respectively, and the variables in the respective regression equations accounted for forty-five and forty-three percent of the variance of the dependent variable. These findings suggest that although the degree of administrative differentiation is the best predictor of the magnitude of the administrative staff ratios of Michigan K-12 school districts, this condition (like the extent of administrative differentiation) is also contingent upon the size of the school district and the extent to which its faculty members are differentiated into specialized functions. In addition, when district size ($\log$) is substituted for administrative differentiation in the regression equation summarized in Table 4-11, and when major divisions is entered to approximate the full extent of administrative differentiation, the regression coefficient of the latter is .18 (three times its standard error), despite the antecedent influence of district size ($\log$) upon both major divisions ($d.c. = .32$) and administrative staff

TABLE 4-11.--Multiple Regression and Decomposition of Administrative Staff Ratio on Student-Faculty Ratio, Average Administrator Salary, Faculty Distribution, Administrative Differentiation, Hierarchical Levels and Principal Span of Control.

Variable	Beta	B	SE/B	r
1. Student-Faculty Ratio	.10**	.00078	.00022	.07
2. Average Administrator Salary	-.12**	-.00000073	.00000022	.38
3. Faculty Distribution	.11**	.051	.014	.28
4. Administrative Differentiation	.82**	.076	.0043	.74
5. Hierarchical Levels	-.14**	-.0036	.0011	.45
6. Principal Span of Control	.12**	.00028	.000081	.41
$R^2 = .58$ ($R^2 = .58$); $n = 508$				
** More than three times its standard error.				

Variable	1	2	3	4	5	6
1. Student-Faculty Ratio	<u>.10</u>	.00	.02	-.01	-.00	-.00
2. Average Administrator Salary	-.00	<u>-.12</u>	.03	.46	-.06	.06
3. Faculty Distribution	-.02	-.03	<u>.11</u>	.24	-.04	.02
4. Administrative Differentiation	-.00	.07	.03	<u>.82</u>	-.10	.06
5. Hierarchical Levels	.00	-.05	.03	.57	<u>-.14</u>	.04
6. Principal Span of Control	-.00	-.06	.02	.39	-.04	<u>.12</u>

ratio. This complex pattern of influences is consistent with the findings summarized in Table 4-11. Furthermore, it suggests that in addition to the size of the school district and the extent of the functional differentiation of both the faculty and the central administration, the magnitude of administrative staff ratio is contingent upon the extent of subunit differentiation. That is, whereas the supervisory ratio of Michigan K-12 school districts is dependent upon the number of both major divisions and hierarchical levels, their administrative staff ratios are more closely associated with the number of major divisions. This finding makes sound intuitive sense because additional supervisors expand the spans of control of higher level supervisors, eventually resulting in the creation of new hierarchical levels and more major divisions. On the other hand, since administrative staff persons exercise few if any supervisory responsibilities, they can be absorbed into the third echelon of a four-level organizational structure at an almost exponential rate simply by increasing the number of major divisions.

In addition to these major structural conditions, the administrative staff ratios of Michigan K-12 school districts are also contingent to some extent upon other school district characteristics. Principal span of control (row 6) and student-faculty ratio (row 2) exert independent influences upon the size of school district administrative staff ratios, suggesting that although these specialists and consultants exercise no formal supervisory responsibilities, their work with classroom teachers may be such as to permit both larger classes and more faculty members per principal. Higher

administrative staff ratios are also associated with somewhat lower administrator salaries. However, this influence is mediated by the extent of administrative differentiation ($d.c. = .46$), probably indicating that because these consultants and specialists are generally lower in the administrative hierarchy, they are less highly remunerated than superiors and colleagues who exercise supervisory responsibilities. Finally, the extent of faculty distribution exerts some influence upon administrative staff ratio. Although most of this influence is mediated by the extent of administrative differentiation, an independent impact remains when the effect of administrative differentiation is controlled. This finding adds further support to the earlier suggestion that the size and complexity of the administrative apparatus are directly related to the complexity of the school district division of labor.

Although each of these latter conditions have an independent and statistically significant influence upon the criterion when other conditions are controlled, that influence is frequently small and unimportant when translated into the metric of the original measures. Thus, other conditions equal, a one percent increase in the administrative staff ratio of Michigan K-12 school districts is, on the average, contingent upon an increase of 35.71 teachers per principal and 12.82 students per faculty member, a \$13,698.63 decrease in the average administrator salary and a twenty percent increase in the rate of faculty distribution.

In summary, whereas larger school districts tend to have lower overall administrative and supervisory ratios than smaller school

districts, they tend to have significantly more specialists and consultants per teacher than smaller school districts. Faculty members in these districts are considerably more specialized and disbursed and their administrators are distributed among more specialized functions and organizational subunits. This combination of conditions creates a set of complex pressures which tend to increase the administrative staff ratios of Michigan K-12 school districts. On the one hand, a large and highly differentiated faculty and central administration creates problems of coordination and communication which require the ministrations of persons whose technical expertise exceed that of the superintendent and his first-line supervisors. On the other hand, these same conditions increase the supervisory responsibilities of the superintendent, his middle managers and building principals, thereby reducing the attention they can give to specialized educational concerns and further increasing the need for specialists and consultants. Structurally, the addition of administrative staff persons contributes to the number of major divisions but, unlike increases in the size of the supervisory staff, not to the number of hierarchical levels. Perhaps some administrative staff persons exercise quasi-supervisory functions which tend to permit slightly higher student-faculty ratios and principal spans of control.

Clerical Ratio

In addition to the professionals who occupy supervisory and administrative staff positions, the administrative apparatus of

Michigan K-12 school districts is comprised of non-professional employees who perform various ancillary functions. For the purposes of this investigation, these positions are differentiated into two categories--the clerical staff and the supportive staff--which are measured by the ratio of the total number in each category to the total number of district faculty. Whereas the measure for clerical ratio includes only those clerical personnel (i.e., secretaries and clerks) assigned to classroom buildings, the measure for supportive staff ratio includes all auxilliary personnel (e.g., clerical aides, teacher aides, library aides, health aides, food service personnel, transportation staff and custodial personnel). The reporting system utilized by the Michigan Department of Education does not permit the inclusion of all district clerical personnel (i.e., those secretaries and clerks assigned to classroom buildings and those assigned to the central administration) in a single measure. Unfortunately, the investigator did not discover this peculiarity until after the Administrative Configuration Survey had been mailed to the participating school districts.

The average clerical ratio of Michigan K-12 school districts is .05 or one secretary for every twenty teachers. The statewide average of 22.56 teachers per classroom building would seem to indicate that, except for the very smallest, most classroom buildings have at least one secretary. However, given the large number of rural school districts in the state (50%) with their relatively small buildings (the simple correlation between rural community type and faculty per building is $-.31$), it is rather clear that a lot of teachers and

principals in Michigan must either do without or provide their own clerical services.

The search for conditions to account for the clerical ratios of Michigan K-12 school districts was not very productive, as is indicated by the very small coefficient of determination reported for Table 4-12 ($R^2 = .06$). Contrary to expectations, neither school

TABLE 4-12.--Multiple Regression and Decomposition of Clerical Ratio on Millage and Administrative Staff Ratio.

Variable	Beta	B	SE/B	r
1. Millage	.14*	.0016	.00054	.19
2. Administrative Staff Ratio	.15**	.40	.12	.20

$R^2 = .06$ ($\hat{R}^2 = .05$); $n = 508$.

* More than twice its standard error.

** More than three times its standard error.

Variable	1	2
1. Millage	<u>.14</u>	.06
2. Administrative Staff Ratio	.05	<u>.15</u>

district size nor any dimension of school district division of labor manifest any significant influence upon the magnitude of the clerical-faculty ratio. Furthermore, the reasons for the impact of those two conditions which do impact upon this ratio are somewhat ambiguous. For example, although school districts which tax themselves at a higher rate have more clerical aides than districts with lower rates,

the cost (6.25 mills for a one percent increase in the proportion of clerical aides) suggests that the relationship is either fortuitous (especially in the absence of any significant influence on the part of local revenue per pupil or operating expense per pupil) or the function of variables not included in the regression equation. It is not entirely clear why an average increase of 2.5% in the administrative staff ratio should increase the clerical ratio by one percent. In short, the best predictor of the clerical ratio of Michigan K-12 school districts is the mean for all school districts. Except for those indicated, none of the variables included in this study explain any of the variance of the dependent variable.

Supportive Staff Ratio

Supportive staff ratio refers to the number of auxilliary personnel (e.g., clerical aides, teacher aides, cafeteria workers, bus drivers, custodial personnel, etc.) relative to the number of faculty members in Michigan K-12 school districts. The mean supportive staff ratio for all Michigan K-12 school districts is .71, or one auxilliary staff person for every 1.4 faculty members.

Table 4-13 summarizes the environmental and structural conditions which have the greatest influence upon the magnitude of the supportive staff ratios of Michigan K-12 school districts. The most influential of these conditions is the amount of financial resources available for the education of each student in the district (row 4). This influence persists despite the contradictory pressures of high student-faculty ratio (d.c. = $-.26$) and low faculty

TABLE 4-13.--Multiple Regression and Decomposition of Supportive Staff Ratio on Area, Student-Faculty Ratio, Federal Revenue per Pupil, Operating Expense per Pupil, Faculty Experience, Faculty Qualifications and Faculty Differentiation.

Variable	Beta	B	SE/B	r
1. Area	.11*	.00017	.000064	.18
2. Student-Faculty Ratio	.45**	.038	.0043	.21
3. Federal Revenue per Pupil	.13*	.00044	.00015	.22
4. Operating Expense per Pupil	.54**	.00054	.000071	-.07
5. Faculty Experience	-.15**	-.013	.0041	-.17
6. Faculty Qualifications	-.38**	-.0053	.00088	-.30
7. Faculty Differentiation	-.13*	-.25	.10	-.19

$R^2 = .27$ ($\hat{R}^2 = .26$); $n = 508$

* More than twice its standard error.
 ** More than three times its standard error.

Variable	1	2	3	4	5	6	7
1. Area	.11						
2. Student-Faculty Ratio	.02	.07					
3. Federal Revenue per Pupil	.02	.45					
4. Operating Expense per Pupil	-.03	-.07	.13				
5. Faculty Experience	.01	-.26	.04	.14			
6. Faculty Qualifications	-.03	-.03	.02	.15	-.01		
7. Faculty Differentiation	-.03	-.06	-.01	.23	.08	.10	.03
		-.02	.00	.33	-.04	.05	.01
				.26	-.20	.02	-.00
					-.38	-.23	-.06
					-.24	-.04	-.04
						-.08	-.08
							-.13

qualifications (d.c. = $-.23$), both of which characterize school districts with high supportive staff ratios and both of which tend to reduce school district expenses. Consequently, when these conditions are controlled, a one percent increase in supportive staff ratio of the typical Michigan K-12 school district is contingent upon an increase of \$18.52 in the financial resources available for the education of each district student.

Although the influence of student-faculty ratio (row 2) upon supportive staff ratio is mediated by the contradictory impact of operating expense per pupil (d.c. = $-.31$), its substantial regression coefficient indicates that a relatively large number of auxiliary staff persons is also dependent upon relatively high student-faculty ratios. Translating to the metric of the original measures, one additional student per teacher is sufficient to raise the district supportive staff ratio by almost four percent. By the same token, although a portion of the influence of faculty qualifications (row 6) upon the dependent variable is rendered spurious by the antecedent influence of operating expense per pupil (d.c. = $.33$) upon both variables, a 5.2% increase in the supportive staff ratio is associated with a ten percent decrease in the average number of district faculty members with at least one advanced degree.

The remaining variables in Table 4-13 exert smaller influences upon the dependent variable, but their statistical significance adds further insight into the pattern of contingencies already observed. For example, faculty experience (row 5) is inversely related to supportive staff ratio and its influence persists even when the

antecedent influence of operating expense per pupil (d.c. = .23) and the mediating influence of faculty qualifications (d.c. = -.20) are controlled. Thus a 1.3% increase in the supportive staff ratio is associated with a one percent decrease in the average experience of the district faculty. A similar pattern is evident with respect to the extent of faculty differentiation (row 7). Part of its influence upon the dependent variable is rendered spurious by the antecedent effects of both operating expense per pupil (d.c. = .26) and faculty qualifications (d.c. = -.24). Nevertheless, a 2.5% increase in supportive staff ratio is contingent upon a ten percent decrease in the proportion of faculty assignment categories occupied by the district faculty. The supportive staff ratio of Michigan K-12 school districts is also contingent upon the amount of federal revenue available for district students (row 3). Although the influence of this condition is mediated by operating expense per pupil (d.c. = .15), a one percent increase in supportive staff ratio is contingent upon an additional \$22.73 in federal revenue per pupil, other conditions equal. Finally, the size of the geographical area covered by Michigan K-12 school districts exerts a small but statistically significant influence upon the size of their supportive staff ratios. A portion of this influence is mediated by operating expense per pupil (d.c. = -.14) and faculty qualifications (d.c. = .10), but when these conditions are controlled, a one percent increase in supportive staff ratio is associated with an additional 58.52 square miles in the typical school district jurisdiction.

The findings observed in Table 4-13 are relatively straightforward. However, their meaning is rendered somewhat ambiguous by the diversity of occupational titles included in the definition of the dependent variable. A proportionately large auxilliary staff is contingent upon the availability of significantly greater financial resources per pupil despite the savings attained through the maintenance of relatively higher student-faculty ratios and the employment of relatively less qualified, less experienced and less differentiated academic staff members. However, the causes of this additional expense are not entirely clear. Perhaps such districts attempt to compensate for higher student-faculty ratios (and less qualified, less experienced and less differentiated faculty members) by employing additional teacher aides and thus increasing the size of their supportive staff components. On the other hand, since these districts cover significantly larger geographical areas, they may require relatively more extensive equipment and personnel for transportation, food service and custodial-maintenance activities, all of which increase both operating expense per pupil and the magnitude of the district supportive staff ratio. In short, further clarification of the relationships observed in Table 4-13 would require an analysis of each of the constituent elements of supportive staff ratio.

Summary

In summary, the evidence with respect to the administrative apparatus of Michigan K-12 school districts demonstrates substantial

agreement with the findings of investigations of other organizations. However, by differentiating between the elements of the administrative apparatus of these organizations, and by measuring the influence of additional environmental, contextual and structural characteristics, this investigation provides additional insight into the conditions of this dimension of organizational structure. The overall administrative ratios of Michigan K-12 school districts are largely a function of extensive administrative differentiation and narrow principal span of control, both of which increase the total number of district administrators. Higher administrative ratios also tend to require additional financial resources despite the depressing effect of lower average administrative salaries which tend to characterize districts with a high degree of administrative differentiation and narrow principal span of control. Like other kinds of organizations, the overall administrative ratios of Michigan K-12 school districts tend to decrease with increasing organizational size. This condition prevails despite the presence of a larger number of major divisions and hierarchical levels, both of which increase the absolute number of district administrators. An examination of the constituent elements of the overall administrative ratio adds considerable clarity to this situation. Whereas the supervisory ratios of school district organizations tend to decrease with increasing organizational size, administrative staff ratios tend to increase with increasing district size. The former condition is largely a function of broader spans of control of principals in larger school districts and persists despite the contradictory impact of extensive horizontal

and vertical differentiation within the administrative hierarchy. An almost opposite set of conditions influence the magnitude of the administrative staff ratios of Michigan K-12 school districts. In addition to the positive influence of district size, administrative staff ratios are contingent upon a high degree of administrative differentiation, fewer hierarchical levels and broader principal span of control. Under these conditions, administrators in staff positions may exercise some quasi-supervisory responsibilities with respect to the district faculty and students. The clerical ratios of Michigan K-12 school districts are somewhat contingent upon a highly differentiated division of administrative labor and the willingness of district residents to tax themselves at a relatively high rate. Neither of these conditions account for very much of the variance of the dependent variable, however, and contribute little to an understanding of its environmental, contextual or structural prerequisites. Finally, the supportive staff ratios of Michigan K-12 school districts are largely dependent upon the financial resources available to the district, student-faculty ratios and the academic qualifications of the district faculty. However, the diversity of staff functions encompassed by the operational definition of this variable prevent a more precise interpretation of the observed relationships.

Summary

This chapter has described the relationships between the environmental and contextual conditions of the structural

characteristics of K-12 school districts in Michigan. The studies reviewed in Chapter II indicate that the size of an organization is the primary determinant of the differentiation of its division of labor. This observation is consistently confirmed in this investigation of school district organizations. The faculty in larger school districts occupy more (and more specialized) teaching assignment categories and are more evenly distributed across a broader range of specialized teaching assignment categories. In addition, larger school districts not only have more faculty per building, but the faculty are more evenly distributed throughout a larger number of buildings. Faculty differentiation is somewhat contingent upon the academic qualifications of the faculty, but this condition is also largely a function of school district size. Although the distribution of faculty members within teaching assignment categories and within classroom buildings is ultimately dependent upon the size of the district, these aspects of school district division of labor are differentially influenced by the level of financial resources available to the district, the former increasing and the latter decreasing the resources required for the education of each district pupil.

The evidence with respect to the hierarchy of authority in Michigan K-12 school districts is also highly consistent with the findings of earlier investigations. Larger school districts, which have a more complex division of labor, also tend to have relatively more major divisions and hierarchical levels than smaller school districts. Furthermore, the hierarchical pyramids of school

districts tend to become increasingly tall and thin as district size increases. This observation is also consistent with the findings of other investigations of professionalized organizations. However, whereas previous investigations have focused on the relationships between the size and division of labor of formal organizations and the characteristics of their hierarchies of authority, this investigation examines the relative influence of an intervening condition--administrative differentiation--upon the structure of school district authority relations. Assuming that increasing organizational size and the increasing complexity of the operational division of labor create pressures which expand the need for administrative coordination, communication and control, it is suggested that these conditions promote an expanded division of administrative labor, and that this latter condition increases the horizontal and vertical differentiation of the hierarchy of authority. This suggestion is confirmed by the evidence presented. The extent of administrative differentiation is largely a function of the size and division of labor of Michigan K-12 school district organizations. Furthermore, although the number of major divisions and hierarchical levels is ultimately dependent upon the size of the school district, the evidence presented in Table 4-6 and Table 4-7 indicates that the influence of district size upon both of these dimensions of school district authority relations is mediated by the extent of administrative differentiation. Consequently, assuming the causal sequence of the variables examined in this investigation, this pattern of conditions (organizational size, division of operational labor, division

of administrative labor, number of major divisions and number of hierarchical levels) accounts for variations in the structure of authority relations in Michigan K-12 school districts.

Finally, the evidence concerning the administrative apparatus of Michigan K-12 school districts is also strikingly similar to that found in investigations of other formal organizations. Although larger school districts have more administrators than smaller school districts, the proportion of administrators to faculty members tends to decline in larger school districts, other conditions equal. The overall administrative ratios of school district organizations are largely a function of extensive administrative differentiation and narrow principal span of control. They also tend to require greater financial resources per pupil despite the depressing effects of extensive administrative differentiation and principal span of control upon average administrator salaries. When administrative functions are differentiated into supervisory and staff components, however, the evidence is that larger school districts have relatively fewer supervisors than smaller school districts, probably because of the broader principal span of control which characterizes larger districts. On the other hand, larger school districts have relatively higher administrative staff ratios than smaller school districts. This condition is also contingent upon a relatively high degree of administrative differentiation, fewer hierarchical levels, higher average principal span of control and lower average administrator salaries. The relative number of secretaries and clerks assigned to classroom buildings appears to be a function of an extensive division

of administrative labor and a willingness of district residents to tax themselves at a higher rate, although neither of these conditions account for much of the variance of the dependent variable. By the same token, the supportive staff ratios of Michigan K-12 school districts are primarily contingent upon the financial resources available for the education of each district student, student-faculty ratios and the academic qualifications of the district faculty. However, the diversity of supportive staff functions included in the operational definition of this variable prevents further specification of the relationships observed.

CHAPTER V

FINDINGS II: PERFORMANCE CONSEQUENCES OF THE STRUCTURAL CHARACTERISTICS OF MICHIGAN K-12 SCHOOL DISTRICTS

Introduction

The previous chapter identified several conditions that contribute to various aspects of three dimensions of the formal structure of Michigan K-12 school districts. This chapter turns the tables, so to speak, and examines the relative impact of the structural characteristics of school organizations upon selected organizational performance criteria. In short, this chapter asks: When other relevant conditions are controlled, how do the structural characteristics of Michigan K-12 school districts affect the performance of those school districts?

Two specific cautions must be noted at the outset. First, the investigation is concerned with the relative impact of the structural characteristics of Michigan K-12 school district organizations upon selected dimensions of school district performance, not the evaluation of school district performance as such. Any legitimate performance evaluation must consider the goals and objectives that the unit of analysis pursues. The performance criteria included here were selected arbitrarily, largely on the basis of their similarity to

measures used in other studies, and because of the availability of accurate data from all elements in the population. There is no implication that any school district is, or should be, pursuing a high score on any of the performance criteria selected.

Secondly, whereas some performance criteria are directly relevant to the organizational unit of analysis (e.g., sales, profit and loss, energy consumption, affirmative action compliance, etc.), others are based upon aggregations of scores which are derived from observations of individual behavior. Although Lazarsfeld and Menzel (1961) have cogently defended this procedure on methodological grounds, such aggregated scores are relevant only to the organizational unit of analysis. That is, dropping out of high school is a distinctly individual behavior. When the total number of high school dropouts in a given school district is divided by the total number of district secondary students, a highly individual behavior is transformed into an organizational characteristic. Factors affecting organizational characteristics cannot thereby be assumed to have any influence upon the behavior of individual dropouts.

Performance Criteria

The criteria selected to measure the impact of the structural characteristics of Michigan K-12 school districts upon performance are student achievement, dropout rate, higher education matriculation, national merit scholarship semifinalists, faculty attrition and superintendent longevity.

Student achievement refers to the average number of reading and math objectives attained by district fourth and seventh graders on the Michigan Educational Assessment Test in 1976. School district scores range from a high of 89.89 to a low of 49.50, with a mean of 75.27.

Dropout rate refers to the number of district secondary students who leave school prior to graduation. It is measured by the percentage of public secondary (grades 9-12) students removed from the membership rolls for any reason other than transfer, death, illness or injury affecting attendance during the 1975-76 school year. The mean dropout rate for the 508 Michigan K-12 school districts included in this study is 4.70 percent, ranging from a low of zero to a high of 15.68 percent.

Higher education matriculation refers to the number of district graduates who continue their education beyond high school. It is measured by the percentage of 1975 graduates enrolled in post-secondary educational institutions for the 1975-76 school year. This information is collected routinely by the Michigan Department of Education. Although district scores are based upon the estimates of high school guidance counselors, program administrators claim that the use of the information (determination of state allocations for financial assistance programs), and the absence of any material benefits served by exaggeration, insures a high degree of accuracy. Higher education matriculation scores for Michigan K-12 school districts range from a low of zero to a high of 99.46 percent with a mean of 38.26 percent.

The percentage of 1975-76 district graduates who qualify as National Merit Scholarship Semifinalists represents a fourth measure of school district performance. This information is based upon the test results of those high school students who took the Preliminary Scholastic Aptitude Test/National Merit Scholarship Qualifying Test (PSAT/NMSQT) in October, 1975 as reported by the National Merit Scholarship Corporation (1976). Since this competition is voluntary for both high schools and students (and thus reflects such factors as student, family and community attitudes toward educational attainment), and since semifinalists are named on a state representational basis, the Corporation "considers comparisons of secondary schools or school systems on the basis of the number of semifinalists in each to be unwarranted and unwise" (National Merit Scholarship Corporation, 1976). However, given the nature of the present study and the controls possible through multiple regression procedures, the percentage of 1975-76 district graduates who qualified as National Merit Scholarship Semifinalists seems to be an appropriate measure of school district performance. The scores for all Michigan K-12 school districts in 1975-76 range from zero to 4.17 percent with a mean of .34 percent.

Whereas these first four measures of school district performance are based upon various dimensions of student behavior, the final two measures are based upon the employment stability of the district faculty and superintendent. Faculty attrition is measured by the average number of district faculty removed from the Register of Professional Personnel for any reason during the 1974-75

and 1975-76 school years. Scores for all Michigan K-12 school districts range from zero to 30.95 with a mean of 9.06.

Superintendent longevity measures the average tenure as superintendent of the current (as of 1975-76) and two preceding district superintendents. The mean for all Michigan K-12 school districts is 8.12 years for scores ranging from 1 to 33 years. As will be noted in the analysis, the weaknesses inherent in both faculty attrition and superintendent longevity restrict their utility as measures of school district performance.

Student Achievement

How do the structural characteristics of Michigan K-12 school districts influence the student achievement scores of those districts? The findings summarized in Table 5-1 indicate that none of the structural characteristics examined in this investigation has any significant influence upon district student achievement scores when key factors in the community and student environments are controlled. The primary determinants of district student achievement scores are the race and income of community residents, a set of factors that comprise the student school environment and the employment stability of the district faculty and superintendent.

Community racial composition--i.e., the percentage of community residents classified as black in the 1970 census--exerts the largest influence upon district student achievement scores. No portion of the regression coefficient of this measure is spurious and its influence upon the dependent variable is virtually unmediated by

TABLE 5-1.--Multiple Regression and Decomposition of Student Achievement on Family Income, Community Racial Composition, Dropout Rate, Higher Education Matriculation, National Merit Scholarship Semifinalists, Faculty Attrition and Superintendent Longevity.

Variable	Beta	B	SE/B	r
1. Family Income	.17**	.00036	.000074	.31
2. Community Racial Composition	-.43**	-.35	.028	-.54
3. Dropout Rate	-.24**	-.57	.083	-.46
4. Higher Education Matriculation	.15**	.066	.016	.27
5. National Merit Scholarship Semifinalists	.10**	.99	.33	.26
6. Faculty Attrition	-.10**	-.16	.053	-.18
7. Superintendent Longevity	.09*	.11	.039	.16

$R^2 = .50$ ($\hat{R}^2 = .49$); $n = 508$

* More than twice its standard error.

** More than three times its standard error.

Variable	1	2	3	4	5	6	7
1. Family Income	.17	-.01	.02	.06	.03	.00	.01
2. Community Racial Composition	.01	-.43	-.09	.01	-.00	-.01	-.01
3. Dropout Rate	.01	-.16	-.24	-.02	-.02	-.00	-.00
4. Higher Education Matriculation	.07	-.03	.03	.14	.03	.02	-.00
5. National Merit Scholarship Semifinalists	.05	.02	.04	.04	.10	.00	.00
6. Faculty Attrition	-.01	-.03	-.00	-.02	-.00	-.10	-.01
7. Superintendent Longevity	.02	.03	.01	.00	.00	.01	.09

other conditions. The higher the percentage of black residents, the lower the district student achievement score. More specifically, a one percent increase in the black population of a school district is associated with an average decrease of 2.86 reading and math objectives attained by district fourth and seventh graders, ceteris paribus.

Although the meaning is not entirely clear, the data indicate that community racial composition has a greater influence upon district student achievement scores than the racial composition of the student body. When the measure for student racial composition (i.e., the percentage of students classified as caucasian) is entered into the regression equation instead of the measure for community racial composition, its beta weight is .13 (three times its standard error) and the coefficient of determination (R^2) declines to .35. On the other hand, when the measure for faculty racial composition (the percentage of faculty classified as caucasian) or administrator racial composition (the percentage of administrators classified as caucasian) are entered into the regression equation instead of community racial composition, their respective beta weights are .37 and .26 while the total amount of variance accounted for by the variables in the equations declines by only four and ten percent, respectively. In each instance the values and relationships of the other variables in the equation remain essentially unchanged.

The average family income of school district residents also exerts an independent influence upon student achievement scores as indicated by the beta weight in the first row of Table 5-1.

Translating to the metric of the original variables, a one unit (objective) improvement in the district student achievement scores is associated with an increase of \$2777.78 in the average family income of district residents, other conditions equal. This finding based upon the organizational unit of analysis is consistent with the findings of other studies (e.g., Coleman, et al., 1966) concerning the close association between socio-economic variables and student achievement.

Table 5-1 indicates that three student environmental factors also have a significant influence upon district student achievement scores. The findings in the third, fourth and fifth rows of this table indicate that, all else equal, a 1.75% increase in the number of district national merit semifinalists is associated with a one unit increase in the average number of reading and math objectives attained by district fourth and seventh graders. Although the flow of influence between these factors may be just the reverse of that suggested here (and this will be measured in subsequent sections), perhaps high rates of high school completion and college attendance, and a high degree of interest in competition for scholarships, create an atmosphere that has a positive influence upon the motivation and achievement of district fourth and seventh graders.

The employment stability of the district faculty and superintendent have a small but statistically significant influence upon district student achievement scores, as indicated by the regression coefficients in the last two rows of Table 5-1. Translated into the metric of their original measures, an increase of one objective in

the total number of reading and math objectives attained by district fourth and seventh graders is associated with a 6.25 percent decrease in the faculty attrition rate and a 1.10 year increase in the average tenure of the current and two preceding district superintendents, other conditions equal. Although it might be difficult to implement policies which could affect employment stability sufficiently to make a significant difference in district student achievement scores, it is important to recognize that these conditions comprise a significant factor in the student environment, significant enough to have a discernible effect upon student achievement scores.

In summary, district student achievement scores are largely a function of the community and student environments of the school district. Community racial composition (as opposed to student body racial composition) and family income represent critical factors in the community environment. Further research is suggested with respect to the finding that it is community racial composition rather than student body racial composition which is chiefly responsible for depressed district student achievement scores. On the other hand, although the direction of influence may be open to question, it is clear that the quality and stability of the student environment have a major impact upon district student achievement scores. When these two sets of conditions are controlled, none of the structural characteristics of Michigan K-12 school districts examined in this study has any significant influence upon district student achievement scores.

High School Dropout Rate

How do the structural characteristics of Michigan K-12 school districts affect the high school dropout rates of these districts? Once again, when factors in the community and student environments are controlled, none of the structural characteristics examined in this study has any significant influence upon the percentage of secondary students (grades 9-12) who leave school prior to graduation.

The beta weight in the fourth row of Table 5-2 suggests that student achievement has the greatest influence upon the dropout rates of Michigan K-12 school districts. No portion of this influence is rendered spurious by antecedent conditions and all of its influence upon the dependent variable is direct. The higher the average student achievement scores of district fourth and seventh graders, the lower the district dropout rate. More specifically, if district fourth and seventh graders were to attain an average of 5.88 additional reading and math objectives, the district dropout rate would decline by one percent, all else equal. This finding suggests that district investments designed to improve the achievement scores (and those factors found to have a positive influence upon the achievement scores) of district fourth and seventh graders may have a significant pay-off in terms of reducing the district high school dropout rate.

Secondly, school district size exerts an important influence upon the dropout rates of Michigan K-12 school districts, as is indicated by the regression coefficient in the third row of Table 5-2. Although a small portion of this influence derives from the antecedent

TABLE 5-2.--Multiple Regression and Decomposition of Dropout Rate on Family Income, Non-public School Membership, District Size (Log) and Student Achievement.

Variable	Beta	B	SE/B	r
1. Family Income	-.15**	-.00013	.000042	-.08
2. Non-public School Membership	-.11*	-.03	.011	-.11
3. District Size (Log)	.38**	2.28	.28	.25
4. Student Achievement	-.41**	-.17	.017	-.46
$R^2 = .31$ ($\hat{R}^2 = .30$); $n = 508$				
* More than twice its standard error.				
** More than three times its standard error.				
Variable	1	2	3	4
1. Family Income	<u>-.15</u>	-.03	.22	-.13
2. Non-public School Membership	-.04	<u>-.11</u>	.10	-.06
3. District Size (Log)	-.09	-.03	<u>.38</u>	-.02
4. Student Achievement	-.05	-.02	.02	<u>-.41</u>

effect of family income (d.c. = .09), its large beta weight indicates an independent influence when the effect of family income is controlled. Thus, the larger the school district, the higher the percentage of students who leave school prior to graduation. More specifically, a one unit (ten teachers) increase in the size of the school district is associated with a 2.28% increase in the district dropout rate, ceteris paribus. But why should larger school districts have a higher dropout rate than smaller school districts? Could it be that some students, particularly those from low income families or who have low achievement scores, simply get lost in the depersonalized machinery of large school districts? As tempting as this suggestion may be, none of the variables typically associated with depersonalized bigness or overcrowding (e.g., student-faculty ratio, faculty per building, faculty dispersion, principal span of control) attain statistical significance when entered into the regression of high school dropout rate. On the other hand, since large school districts tend to be located in or near large commercial or industrial centers, it may not be the "push" of alienating school conditions but the "pull" or more attractive nonschool opportunities in the surrounding environment which is responsible for this phenomenon.

In addition, average family income (row 1) has a small but significant effect upon the high school dropout rates of Michigan K-12 school districts. The higher the average family income, the lower the dropout rate, other conditions equal. Although none of this influence can be attributed to antecedent conditions, some of

it is mediated through the contradictory effects of school district size (d.c. = .22) and student achievement (d.c. = -.13). When these influences are controlled, however, a \$7692.31 increase in the average family income of Michigan K-12 school districts is associated with a one percent decrease in the high school dropout rate.

It is interesting to note in this respect that, when other conditions are controlled, community and student body racial composition are not significantly related to the high school dropout rates of Michigan K-12 school districts. When the measures for community racial composition and student body racial composition are entered into the regression equation summarized in Table 5-2, their beta weights fail to attain statistical significance (.06 and -.04, respectively) and contribute nothing to the coefficient of determination (R^2). Further, the decomposition of the simple correlations between these variables and the dependent variable (.37 and -.18, respectively) indicates that most of their influence is mediated through school district size and student achievement. In short, if race is a factor in determining high school dropout rates, it appears to be so only because minority students tend to be concentrated in larger school districts and to have somewhat lower achievement scores.

Finally, the regression coefficient in the second row of Table 5-2 presents an enigma. Why should the rate of non-public school membership have any influence upon the dropout rate of the public schools? Although this relationship is very small (it would take a 32.26% increase in non-public school membership to effect a

one percent increase in the public school dropout rate), and most of its influence on the dependent variable is mediated by the effects of school district size ($d.c. = .10$), its persistence under controls invites speculation. The suggestion that availability of the non-public school alternative encourages transfers from the public schools is precluded by the definition of the variable. By the same token, the suggestion that potential high school dropouts are attracted to or channeled into the non-public schools because of their need for stricter discipline is probably too flattering both to anyone's ability to identify potential dropouts and to the allegedly superior discipline of the non-public schools. Perhaps the solution is less direct but more consistent with the organizational unit of analysis. Although the students in most public school districts have access to one or more non-public schools, most of the private and parochial schools in Michigan are located in the larger commercial-industrial centers of the state, particularly in the populous counties of southeastern Michigan. Further, a visual scan of the list of non-public schools in these counties indicates that although most are parochial schools, many are private preparatory schools, widely known for their academic standards, that attract students from many other regions. As suggested earlier, part of the influence of school district size upon dropout rate might derive from the "pull" of the non-school opportunities presented in the surrounding commercial-industrial environment. Could it be that a similar--though contradictory--dynamic operates with respect to the non-public school? Could it be that the mere presence of these schools, and the attitudes

and values they represent, have an exemplary influence upon the educational norms operating in their host communities, norms which tend to increase interest in scholarship and school achievement and thus reduce the high school dropout rate? This suggestion would be much more convincing if the data indicated that non-public school membership has a similar influence upon the student achievement scores of the public school districts, but this influence, if present, is not revealed under the conditions included in the analysis. Consequently, the suggestion raised here must remain in the realm of speculation pending further investigation of the impact of non-public schools upon various dimensions of public school performance.

In summary, the dropout rates of Michigan K-12 school districts are influenced primarily by district student achievement scores. Low achievement from an early age--and the kinds of reinforcement associated with low performance--probably create a climate which increases the likelihood of dropping out of school. Secondly, perhaps the location of large school districts in the major commercial-industrial centers presents students--particularly those with low achievement--with attractive non-school alternatives, thus increasing district dropout rates. Thirdly, average family income, associated with both district size and student achievement and mediated through both, has an expected negative influence upon dropout rate. Finally, the very small but significant influence of non-public school membership upon dropout rate may reveal an exemplary

influence deriving from the mere presence of non-public schools in the public school jurisdiction.

Higher Education Matriculation

What are the structural and environmental conditions that influence the rates of higher education matriculation in Michigan K-12 school districts? The variables listed in Table 5-3 include one structural characteristic, eight contextual characteristics and, with one exception, no surprises.

The number of district national merit scholarship semi-finalists (row 8) exerts a significant influence upon the extent to which students continue their education in institutions of higher learning. In fact, other conditions equal, a one percent change in the number of national merit scholarship semifinalists is associated with an average change of 4.42% in the number of students enrolled in two- or four-year colleges and universities. Although the direction of influence between these two variables is open to question, the interpretation suggested by the present arrangement is that just as the presence of one or more semifinalists indicates high achievement and academic excellence on the part of those students as individuals, so their presence in the organization contributes to an atmosphere which encourages a continuation of educational pursuits. An alternative interpretation--i.e., that a longstanding tradition of college attendance increases interest in scholarship competition--may be equally true.

TABLE 5-3.--Multiple Regression and Decomposition of Higher Education Matriculation on Family Income, Student Body Racial Composition, Student-Faculty Ratio, Faculty Qualifications, Administrative Staff Ratio, Student Achievement, Dropout Rate, National Merit Scholarship Semifinalists and Faculty Attrition.

Variable	Beta	B	SE/B	r
1. Family Income	.20**	.00095	.00022	.41
2. Student Body Racial Composition	-.20**	-.074	.014	-.14
3. Student-Faculty Ratio	-.15**	-.88	.22	-.21
4. Faculty Qualifications	.10*	.097	.046	.34
5. Administrative Staff Ratio	.12*	98.29	34.05	.28
6. Student Achievement	.11*	.24	.10	.27
7. Dropout Rate	-.08*	-.45	.23	-.13
8. National Merit Scholarship Semifinalists	.21**	4.42	.83	.32
9. Faculty Attrition	-.08*	-.30	.14	-.17

 $R^2 = .33$ ($\hat{R}^2 = .32$); $n = 508$
 * More than twice its standard error.
 ** More than three times its standard error.

Variable	1	2	3	4	5	6	7	8	9
1. Family Income	.20	-.01	.01	.05	.05	.03	.01	.06	.00
2. Student Body Racial Composition	.01	-.20	-.00	-.00	-.01	.02	.01	.02	-.00
3. Student-Faculty Ratio	-.02	-.01	-.15	-.01	.01	.01	-.00	.01	-.01
4. Faculty Qualifications	.11	.00	.02	.10	.05	.02	-.01	.03	.01
5. Administrative Staff Ratio	.08	.02	-.01	.05	.12	.00	-.01	.03	.01
6. Student Achievement	.06	-.04	.01	.02	.00	.11	.04	.05	.01
7. Dropout Rate	-.02	.04	-.00	.01	.02	-.05	-.08	.03	-.00
8. National Merit Scholarship Semifinalists	.06	-.02	.01	.02	.01	.03	.01	.21	.00
9. Faculty Attrition	-.01	-.01	-.01	-.02	-.02	.02	-.00	-.00	-.08

That school districts with more affluent families send more students on to institutions of higher education is indicated by the regression coefficient in the first row of Table 5-3. No portion of this relationship is spurious and its influence is not mediated by other variables in the equation. Its interpretation is equally straightforward. In addition to representing an expense which the more affluent are better able to afford, college attendance also represents a value commitment which is highly correlated with socioeconomic status.

The statistics in the second row of Table 5-3 indicate that the next most potent influence upon college attendance rates in Michigan K-12 school districts is the racial composition of the student body. The higher the percentage of caucasian students in the district, the lower the higher education matriculation rate. More specifically, to change this rate by one percent would require a 13.51% increase in the number of minority students in the district, other conditions equal. Although none of the community type variables attained statistical significance when entered into the regression equation presented in Table 5-3, it seems reasonable to suggest that school districts with larger concentrations of minority students send more graduates on to higher education because they are located in more densely populated areas which have greater access and exposure to both two- and four-year colleges and universities.

Student faculty ratio (row 3), administrative staff ratio (row 5) and faculty qualifications (row 4) each make an independent, positive contribution to the rate of higher education matriculation

in Michigan K-12 school districts. The influence of student-faculty ratio is direct and unmediated. A reduction of 1.14 students per teacher is associated with a one percent increase in college attendance, other conditions equal. The influence of administrative staff ratio is partially spurious because of the antecedent influence of average family income and faculty qualifications (d.c. = .08 and .05, respectively), but the statistically significant regression coefficient which remains after controls indicates an independent influence. In terms of the original metric of both variables, one additional administrative staff specialist is associated with a one percent increase in the number of high school graduates who continue their education in two- or four-year colleges or universities. Faculty qualifications--i.e., the percentage of the district faculty which have masters, specialist or doctoral degrees--makes a significant contribution to higher education matriculation rate despite the antecedent influence of average family income on both variables (d.c. = .11). In terms of the metric of their original measures, however, a one percent increase in the rate of higher education matriculation would require a 10.31% increase in faculty qualifications. Quite apart from the substantive contributions of these three variables to the dependent variable, their presence in the regression equation itself is significant because they represent the only so-called "school effects" which have any statistically significant influence upon any of the performance criteria examined in this study.

Student achievement and high school dropout rate each have a small influence upon the higher education matriculation rates of Michigan K-12 school districts. The beta weights of these variables (row 7 and row 9, respectively) are substantially lower than their simple correlations with the dependent variable because of the influence of antecedent and mediating conditions, but their significant beta weights indicate an independent influence when these conditions are controlled. Their influence is such that, other conditions equal, the attainment of either an additional 4.17 reading and math objectives or a 2.22% decrease in the high school dropout rate would produce a one percent increase in the school district higher education matriculation rate.

Finally, faculty attrition makes a very small but significant contribution to the percentage of school district graduates who enroll in some form of advanced education. Almost half of the simple correlation of this variable with the dependent variable is rendered spurious by the presence of antecedent conditions in the equation, but when these conditions are controlled, a 3.33% decrease in the rate of faculty attrition is associated with a one percent increase in the college matriculation rate.

In summary, the higher education matriculation rate of Michigan K-12 school districts is a function of community, school district and student environmental influences. School districts with somewhat higher average family incomes and somewhat larger proportions of minority students send more graduates on to higher education. This is especially true if those school districts also have lower

student-faculty ratios and higher administrative staff ratios and if their faculty members have relatively more advanced degrees.

Finally, much of a school district's higher education matriculation rate depends upon the student environment. More students tend to enroll in colleges and universities when the presence of one or more national merit scholarship semifinalists is present in the system, when district student achievement is high and the high school drop-out rate is low and when the rate of faculty turnover is relatively stable. None of the structural characteristics of Michigan K-12 school districts examined in this study has any influence upon the higher education matriculation rates of those districts.

National Merit Scholarship Semifinalists

How do the structural characteristics of Michigan K-12 school districts influence the number of national merit scholarship semifinalists in those districts? The multiple regression equation summarized in Table 5-4 indicates that none of the structural characteristics examined in this investigation have any impact upon the percentage of district graduates who attain this honor. Moreover, the exceedingly small amount of variability of the dependent variable explained by those conditions which do have a statistically significant impact upon the criterion ($R^2 = .17$) indicates that this performance characteristic is virtually unpredictable (at least in terms of the organizational characteristics examined in this investigation). This may be an artifact of the extremely small number of national merit scholarship semifinalists in the state and the even

TABLE 5-4.--Multiple Regression and Decomposition of National Merit Scholarship Semifinalists on Average Family Income, Student Body Racial Composition, Student Achievement and Higher Education Matriculation.

Variable	Beta	B	SE/B	r
1. Average Family Income	.13*	.000029	.00001	.28
2. Student Body Racial Composition	.12*	.0021	.00076	.11
3. Student Achievement	.13*	.014	.0047	.26
4. Higher Education Matriculation	.25**	.012	.0022	.32

$$R^2 = .17 (\hat{R}^2 = .16); n = 508$$

* More than twice its standard error.

** More than three times its standard error.

Variable	1	2	3	4
1. Average Family Income	<u>.13</u>	.01	.04	.10
2. Student Body Racial Composition	.01	<u>.12</u>	.03	-.04
3. Student Achievement	.04	.02	<u>.13</u>	.07
4. Higher Education Matriculation	.05	-.02	.04	<u>.25</u>

smaller number of school districts which have even a single national merit scholarship semifinalist. Or, more probably, this phenomenon may be explained by the fact that the characteristics which determine the performance represented by this achievement are so fundamentally individual that they are unaffected by either structural or environmental influences.

The full impact of these considerations becomes evident when the statistically significant beta weights in Table 5-4 are translated into their nonstandardized values. A one percent increase in the number of district national merit scholarship semifinalists would require a 83.33% increase in the percentage of district graduates matriculating in institutions of higher education, an additional 71.43 reading and math objectives in district student achievement scores, a \$34,482.76 increase in the average family income of school district families and a 476.76% increase in the average number of district students classified as caucasian, other conditions equal. Thus, whereas these findings contribute to an understanding of the statistical predictability of the number of district students who become national merit scholarship semifinalists in a given district, they offer precious little guidance for the establishment of policies which could significantly increase the number of such scholars.

Faculty Attrition

The performance characteristics of Michigan K-12 school districts considered in previous sections have been based upon various aspects of student behavior--the reading and math achievement of district fourth and seventh graders, the district high school dropout rate, the percentage of district graduates matriculating in institutions of higher education and the percentage of district graduates named as national merit scholarship semifinalists. The two remaining school district performance characteristics--faculty

attrition and superintendent longevity--measure the employment stability of the district faculty and superintendent.

The measure for faculty attrition is the average number of district faculty removed from the Register of Professional Personnel for any reason during the 1974-75 and 1975-76 school years. Two weaknesses of this measure--i.e., the limitation of a two-year purview and the inability to measure intra- or interdistrict mobility--were discussed in an earlier section (p. 88). A third weakness is revealed in the coefficient of determination reported for Table 5-5 ($R^2 = .13$). This statistic indicates that the variables included in the regression equation account for only 13% of the variability associated with the dependent variable. Thus, although the statistical significance of the regression coefficients reported in Table 5-5 permit a high degree of confidence in the predictive value of the variables examined, the magnitude of the coefficient of determination indicates that the primary determinants of this measure of faculty attrition are simply not included in the present investigation.

Thus, other things equal, the factor that has the largest influence upon faculty attrition is faculty experience--i.e., the average teaching experience (years) of the district faculty prior to the 1975-76 school year. The longer the average experience of the district faculty, the lower the district attrition rate. Translating to the original metric of both variables, two additional years in the average teaching experience of the district faculty is associated with a one unit decrease in faculty attrition, ceteris paribus.

TABLE 5-5.--Multiple Regression and Decomposition of Faculty Attrition on Community Racial Composition, District Size (Log), Average Faculty Experience and Average Faculty Salary.

Variable	Beta	B	SE/B	r
1. Community Racial Composition	.16**	.081	.021	.08
2. District Size (Log)	-.21**	-1.87	.53	-.21
3. Faculty Experience	-.30**	- .50	.083	-.30
4. Average Faculty Salary	.08	.00014	.00014	-.21
$R^2 = .13$ ($\hat{R}^2 = .13$); n = 508				
** More than three times its standard error.				
Variable	1	2	3	4
1. Community Racial Composition	<u>.16</u>	-.05	-.04	.01
2. District Size (Log)	.04	<u>-.21</u>	-.09	.05
3. Faculty Experience	.02	-.06	<u>-.30</u>	.04
4. Average Faculty Salary	.03	-.15	-.17	<u>.07</u>

Secondly, larger school districts lose fewer teachers, on the average, than smaller school districts as indicated by the beta weight in the second row of Table 5-5. In fact, when the influence of other conditions is reduced to zero, a one unit (10 teachers) increase in school district size is associated with a one unit decrease in faculty attrition.

Thirdly, community racial composition--i.e., the percentage of community residents classified as black--has a positive influence upon faculty attrition. Although part of this influence is mediated by district size (log) and faculty experience (combined d.c. = $-.09$)--communities with relatively large black populations tend to have both larger school districts and more experienced faculty members than other communities--the highly significant beta weight in the first row of Table 5-5 indicates that community racial composition has an independent impact upon faculty attrition. Again, translating into the original metric of the independent and dependent variables, a one percent increase in the percentage of community residents classified as black is associated with an average increase of 8.1 faculty members removed from the Register of Professional Personnel.

Finally, the beta weight in the fourth row of Table 5-5 is non-significant. This indicates that when other factors are controlled, the average faculty salary of Michigan K-12 school districts is not associated with the rate of faculty attrition. The entire impact of the simple correlation between average faculty salary and faculty attrition ($r = -.21$) is accounted for by antecedent

conditions, notably the size of the school district (d.c. = $-.15$) and faculty experience (d.c. = $-.17$).

Thus, as far as thirteen percent of the variability of the dependent variable is concerned, a high degree of faculty turnover is associated with small school districts with relatively young (in terms of teaching experience) faculty members and larger school districts with more experienced faculty in predominantly black communities. Other conditions equal, average faculty salaries have little effect upon the rate of faculty attrition.

Does this configuration of conditions permit any speculation with respect to the other 87% of the variance in the dependent variable not accounted for by the variables in the equation? Perhaps. The measure for faculty attrition is the average number of district faculty members removed from the Register of Professional Personnel for any reason during the 1974-75 and 1975-76 school years. It excludes those teachers who transferred to other districts, who moved into the administrative ranks, who took positions in state government or state government schools. Thus, the measure actually reflects the number of teachers who left the teaching profession altogether. Indications are that if the number of teachers reaching the age of retirement were controlled, a much different pattern of influences would emerge. In addition, a measure of interdistrict mobility would provide even more valuable information concerning the relationship between school district structure and faculty turnover.

Superintendent Longevity

Do the structural characteristics of Michigan K-12 school districts affect the employment stability of superintendents of those districts? The measure for this variable is the average tenure as superintendent of the current and two preceding district superintendents. Although the qualitative assumptions underlying this measure--i.e., that long tenure is somehow superior to short tenure--have been seriously questioned (c.f. p. 89), there can be little doubt that Michigan K-12 school districts vary considerably with respect to the length of service of their superintendents. Whether or not this condition is subject to qualitative judgments is beside the point. The variable measures turnover in the superintendent's office and the question posed here concerns the structural and environmental conditions which influence that turnover.

Table 5-6 indicates that none of the structural characteristics of Michigan K-12 school districts has any significant influence upon the average tenure of the current and two preceding superintendents of Michigan K-12 school districts. In fact, controlling for the tenure of the current superintendent, the variables that do influence superintendent longevity account for only seven percent of the total variability of the dependent variable. Thus, although the reverse implications are probably more significant, the best predictor of superintendent longevity is the tenure of the current superintendent.

Superintendent salary has a small influence upon the average tenure of Michigan K-12 school district superintendents. Part of this influence is mediated by the tenure of the current superintendent

TABLE 5-6.--Multiple Regression and Decomposition of Superintendent Longevity on Superintendent Salary, Superintendent Tenure and Student Achievement.

Variable	Beta	B	SE/B	r
1. Superintendent Salary	.13**	.00011	.00003	.22
2. Superintendent Tenure	.51**	.43	.031	.54
3. Student Achievement	.09*	.071	.03	.16
$R^2 = .32$ ($\hat{R}^2 = .32$); $n = 508$				
* More than twice its standard error.				
** More than three times its standard error.				

Variable	1	2	3
1. Superintendent Salary	<u>.13</u>	.08	.01
2. Superintendent Tenure	.02	<u>.51</u>	.01
3. Student Achievement	.01	.06	<u>.09</u>

d.c. = .08), but the beta weight in the first row of Table 5-6 indicates an independent effect after other conditions are controlled. The actual importance of this finding for policy considerations is another question, however. On the average, it would take a salary increase of \$9,090.91 to increase the average tenure of Michigan superintendents by one year.

Except for its statistical significance, the influence of district student achievement scores upon superintendent longevity is hardly worth mentioning. A one year increase in superintendent longevity is associated with an additional 14.08 reading and math objectives in the reading and math scores of district fourth and seventh graders.

Summary

In summary, this chapter examined the impact of the structural characteristics of Michigan K-12 school district organizations upon six school district performance criteria: student achievement, high school dropout rate, higher education matriculation, national merit scholarship semifinalists, faculty attrition and superintendent longevity. Except for the very small contribution of administrative staff ratio to the percentage of district graduates enrolled in higher education, none of the structural characteristics has any significant influence upon any of these performance criteria when other conditions are controlled. School district student achievement scores are largely a function of community racial composition and

average family income on the one hand and high school dropout rate and higher education matriculation on the other. High school dropout rates are contingent upon student achievement, school district size, average family income and non-public school membership. Except for the influence of administrative staff ratio, student-faculty ratio and faculty qualifications, the analysis of higher education matriculation and national merit scholarship semifinalists reveals a similar pattern of community and student body environmental influences. Neither faculty attrition nor superintendent longevity manifest any contingency upon any of the structural characteristics of Michigan K-12 school district organizations examined in this study.

CHAPTER VI

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

Introduction

This research examined the conditions and consequences of the structural characteristics of Michigan K-12 school district organizations. Building upon Weber's classic analysis, and the findings of more recent empirical research, this study sought relationships among and between four elements of the division of labor, six elements of the hierarchy of authority, and five elements of the administrative apparatus of Michigan K-12 school districts. It also examined the relative influence of selected environmental and contextual conditions upon the structural characteristics of these organizations. Finally, the research explored relationships between the structural attributes of school districts and six indicators of their performance.

This chapter summarizes the findings and conclusions of this investigation, discusses their theoretical and practical implications and makes several recommendations for further research.

Summary of Findings

Formal organizations are characterized by a more or less complex division of labor. Previous investigations indicate that the primary determinants of this structural attribute are the size of

the organization, the complexity of the technology employed in producing organizational outcomes and--with respect to spatial differentiation--the size of the geographical area served by the organization. This investigation examined four aspects of the division of labor of Michigan K-12 school district organizations. Assuming a common technology across the population of Michigan K-12 school districts, each aspect of division of labor was examined for its environmental and contextual antecedents. As anticipated, district size (number of faculty members) is the primary determinant of all four aspects of school district division of labor. Faculty differentiation (proportion of eighty-one assignment categories occupied) is also contingent upon the academic credentials of the district faculty (percentage of faculty with an advanced degree) but not, as expected to the extent of requiring a larger pool of financial resources (operating expense per pupil). Although the distribution of district faculty members within specialized assignment areas ultimately depends upon district size, the extent of faculty differentiation mediates this influence. This aspect of division of labor is also contingent upon a larger pool of financial resources per pupil, perhaps because concentrations of personnel within specialized categories create problems of communication, coordination and control that contribute to an expansion of the administrative hierarchy and thus raise operational expenses. Although faculty distribution is also contingent upon the percentage of students attending non-public schools in the district jurisdiction, the meaning of this finding is not entirely clear. With respect to

the spatial division of labor, increasingly larger school districts have both more faculty per classroom building and more even concentrations of faculty within a larger number of buildings. This latter condition tends to be relatively less expensive than the more uneven distributions of fewer teachers in fewer buildings which characterize smaller school districts, indicating an economy of scale for districts with a larger number of faculty members. Furthermore, the number of faculty per building is also somewhat contingent upon the affluence of district families (average family income), but this contingency is probably the fortuitous consequence of the location of more affluent households in more densely populated communities.

Formal organizations are also characterized by a hierarchy of circumscribed authority that mediates the distribution of organizational power and status so as to assure effective supervision and direction of organizational activities. Previous investigations indicate that the primary determinants of the structure of authority relations in formal organizations are the size of the organization and the complexity of the operational division of labor. The importance of this latter condition is especially evident in organizations characterized by a professionalized division of labor. This investigation examined six elements of the hierarchy of authority of Michigan K-12 school district organizations. On the basis of previous investigations, it was anticipated that district size would have a predominant influence upon all aspects of the hierarchy of authority of school district organizations in Michigan.

However, assuming that organizations characterized by a professionalized division of labor require specialized mechanisms of coordination, communication and control, it was anticipated that larger school districts would be characterized by a more complex division of administrative labor and that this condition--administrative differentiation--would be responsible for the expanded horizontal and vertical differentiation of the school district hierarchy of authority. As predicted, the increasing size of these professionalized organizations contributes to increasing increments of administrative differentiation. Also, a high degree of administrative differentiation is associated with lower average administrator salaries, probably because an expanded division of administrative labor increases the proportion of administrators in less highly remunerated positions. In addition, it was found that whereas school district size is ultimately responsible for the number of major divisions and hierarchical levels, its influence is mediated in both instances by the extent of administrative differentiation. The number of major divisions is also somewhat contingent upon the level of federal revenue per pupil--probably because of the presence of specialized projects coordinated from within the central administration--and the number of hierarchical levels is mediated to some extent by the number of major divisions. This configuration of structural elements suggests the following temporal sequence of organizational events: Expanding district size results in a more highly differentiated, distributed and dispersed teaching staff. These conditions place additional pressure upon the mechanisms of

supervision, coordination and control within the central administration. These pressures result in an expansion of the administrative staff, both in absolute terms and in terms of its differentiation among specialized positions. This, in turn, creates additional problems of supervision, coordination and control within the administrative hierarchy itself by increasing the number of specialized positions and by expanding the spans of control of middle and higher level supervisors. This latter condition results in increasing numbers of major divisions and, ultimately, hierarchical levels.

Although these suggestions concerning the evolution of the hierarchy of authority in Michigan K-12 school districts exceed the evidence provided by the cross-sectional research design employed in the present investigation, they receive additional support from the evidence concerning the administrative apparatus of these organizations.

Formal organizations are characterized by a more or less extensive administrative apparatus, a dimension of organizational structure typically measured by computing the ratios of professional, clerical and auxiliary staff positions in the central administration of formal organizations. Previous investigations indicate that, contrary to popular expectations, formal organizations experience an economy of scale with respect to each of these elements of the administrative apparatus. This investigation examined the environmental and contextual conditions of five elements of the administrative apparatus of Michigan K-12 school district organizations. On the basis of the findings of previous research, it

was anticipated that larger school districts would manifest an economy of scale with respect to overall administrative ratio, supervisory ratio, clerical ratio and supportive staff ratio. On the other hand, it was anticipated that larger school districts would have relatively higher administrative staff ratios, largely because of the complexity of the division of academic labor in those districts. As anticipated, larger school districts did have lower overall administrative ratios despite the presence of a more extensive division of administrative labor, more major divisions and more hierarchical levels, all of which tend to expand the absolute number of professional personnel in administrative positions. This phenomenon is explained by an examination of the determinants of the constituent elements of the overall administrative ratios of these organizations. Despite the presence of more major divisions and hierarchical levels in larger school district organizations, their supervisory ratios tend to undergo a radical decline as the number of faculty increases. This finding is largely attributable to the increasing spans of control of building principals in larger school districts. On the other hand, the administrative staff ratios of school districts tend to increase with increasing size, due to the increasing complexity of both the operational and administrative divisions of labor. This combination of findings is thoroughly consistent with those studies suggesting that professional norms internalized over an extensive period of specialized training tend to reduce the need for close personal supervision and to increase the need for the kinds of horizontal and vertical communication

typically provided by the administrators enumerated in the administrative staff ratio.

The findings with respect to the clerical and supportive staff ratios of Michigan K-12 school districts are severely limited by the unanticipated shortcomings of their respective operational measures. The clerical ratios of Michigan K-12 school districts (which in this case include only those secretaries and clerks assigned to classroom buildings) are largely contingent upon the relative number of administrative consultants and technicians and the willingness of district residents to tax themselves at a relatively high rate. However, these conditions account for only a very small portion of the variance of clerical ratio and, therefore, contribute very little to an understanding of the environmental and contextual prerequisites of this dimension of school district administrative apparatus. The supportive staff ratios of Michigan K-12 school districts depend upon the financial resources, student-faculty ratios and the academic qualifications of the district faculty. However, the diversity of supportive staff functions included in the definition of this variable preclude further specification of the relationships observed.

Formal organizations are purposive social units. That is, unlike other human collectivities, they pursue specific outcomes that permit evaluation with respect to relevant performance criteria. Although numerous investigators have examined the relationships between other organizational conditions and the performance of individuals and groups in organizational contexts,

there is little empirical evidence to suggest that the structural characteristics of formal organizations have any influence upon their outcomes. However, assuming that the structural attributes of formal organizations place constraints upon the behavior of individuals and groups in organizational contexts, this investigation examined the relationships between four attributes of the division of labor, six attributes of the hierarchy of authority and five attributes of the administrative apparatus of Michigan K-12 school districts and six performance criteria of those organizations while controlling for selected environmental and contextual conditions which are known or suspected to have an influence upon these educational outcomes. Although each of these performance criteria are ultimately based upon the behavior of individual organizational members, their measures were calculated to reflect the performance of school district organizations. With one notable exception, none of the structural characteristics had any significant influence upon the performance criteria selected.

Student achievement (the average number of reading and math objectives attained by district fourth and seventh graders) was influenced by two community characteristics (community racial composition and average family income) and five student body environmental characteristics (dropout rate, higher education matriculation, national merit scholarship semifinalists, faculty attrition and superintendent longevity). These conditions accounted for fifty percent of the variability of the student achievement scores of Michigan K-12 school districts. High school dropout rate (percentage

of secondary students leaving school prior to graduation) was influenced positively by the size of the school district and negatively by district student achievement scores, average family income and non-public school membership. These conditions explained approximately one-third of the variability of the high school dropout rates. The higher education matriculation rates of these organizations were found to be contingent upon one characteristic of the community environment (average family income), two contextual characteristics (student-faculty ratio and faculty qualifications), one structural characteristic (administrative staff ratio) and five student body environmental characteristics (student body racial composition, student achievement, dropout rate, national merit scholarship semifinalists and faculty attrition). These conditions accounted for one-third of the variability of the higher education matriculation rates of Michigan K-12 school districts. The number of national merit scholarship semifinalists in Michigan K-12 school districts was found to be contingent upon the average family income, student body racial composition, student achievement scores and higher education matriculation rates of these organizations. However, the very small coefficient of determination associated with this regression equation ($R^2 = .17$) probably indicates that the conditions of this attribute are so highly individual that it is an inappropriate indicator of the performance of school district organizations.

The faculty attrition rates (number of district faculty removed from the Register of Professional Personnel) were positively

related to community racial composition, negatively related to district size and faculty experience and had no relationship to average faculty salary. Unlike national merit semifinalists, however, the small amount of the variance accounted for by the predictors of this criterion is probably due to inherent weaknesses of the measure itself. Finally, the best predictor of superintendent longevity (average tenure of the current and two preceding district superintendents) was found to be the tenure of the current superintendent. Although superintendent salary and student achievement scores influenced superintendent longevity, their impact is too small to have any important implications.

Conclusions

The organizational structure of Michigan K-12 school districts exhibits a remarkable homology with that of other formal organizations, especially those characterized by a professionalized work force. The relationships observed between various dimensions of the division of labor, hierarchy of authority and administrative apparatus of Michigan K-12 school district organizations are very similar to those observed in other organizations. This does not suggest that the coefficients of correlation and multiple regression are identical to those observed in other investigations for many differences in the research designs preclude simple direct comparison. It does suggest, however, that the structural characteristics of formal organizations tend to respond to common sets of conditions, despite obvious differences in the goals, resources, operating

procedures and personnel of the respective organizations. This investigation of Michigan K-12 school districts provides evidence to support this suggestion from yet another type of formal organization. Longitudinal research should be undertaken to verify or qualify the dynamics of the observed relationships over time.

As with other formal organizations, organizational size comprises the most influential determinant of the structural characteristics of Michigan K-12 school districts. This influence may be either direct or mediated through the influence of other structural characteristics. In either case, school district size (the number of district faculty members) has a major impact upon the functional and spatial division of operational labor, the functional division of administrative labor, the vertical and horizontal differentiation of the hierarchy of authority and the relative magnitude of various dimensions of the administrative apparatus of these organizations. Furthermore, as in other organizations, increasing organizational size produces an economy of scale with respect to the magnitude of the administrative and supervisory ratios of Michigan K-12 school districts.

Whereas the fundamental homology observed between school districts and other kinds of organizations suggests, from a structural perspective, that there may be fewer major differences between these organizations and those of other functional types, the size-complexity nexus observed within Michigan K-12 school districts suggests that, from an administrative perspective, there may be more significant differences between school districts of

different sizes than between school districts and other kinds of organizations of the same size. That is, the findings of this investigation suggest that the major and most important difference between larger and smaller school districts is not that larger school districts simply have more students, teachers, buildings, administrators, divisions and levels, but that, in order to accommodate more students, teachers, etc., they must have significantly more complex administrative structures than smaller school districts. Furthermore, the findings suggest that larger school districts are so much more complex than their smaller counterparts that, administratively, they may be more similar to other kinds of organizations of the same relative size than to smaller school districts. If this is the case, the managerial skills and competencies required of the administrators of progressively larger school districts are fundamentally different from those required by administrators in smaller school districts. Further research will determine the relationship between the size and complexity of school district organizations and the skills and competencies required for their administration. Such research could have important implications for the recruitment, training, placement and evaluation of administrators of schools and other organizations.

Previous investigations have attributed the horizontal and vertical differentiation of the hierarchy of authority of formal organizations to organizational size and the complexity of the division of operational labor. The larger and more highly differentiated the operational workforce, the greater the need for mechanisms of

communication, coordination and control and thus the greater the horizontal and vertical differentiation of the administrative hierarchy. However, this investigation demonstrates that the influence of these conditions upon the structure of authority relations in Michigan K-12 school districts is mediated by the complexity of the division of administrative labor. This finding makes sound intuitive sense since it grounds the number of major divisions and hierarchical levels in--and thus ties the shape of the administrative pyramid to--the extent of administrative differentiation rather than the differentiation of the operational workforce. It is anticipated that future investigations in other kinds of organizations will verify the important mediating influence of administrative differentiation upon the structure of authority relations in those organizations.

Numerous investigations have documented the inverse relationship between the size and the administrative ratios of formal organizations. This observation is supported in this investigation of Michigan K-12 school district organizations. Furthermore, in an effort to clarify the meaning of this relationship in these organizations characterized by a professionalized division of labor, this investigation subdivided administrative ratio into its constituent supervisory and administrative staff components. The finding that larger school districts have increasingly fewer supervisors and increasingly more administrative specialists and consultants relative to the number of faculty provides additional support for the observations of earlier investigations of professional organizations. As

professionals who have undergone an extensive period of specialized training and socialization, school teachers are permitted a relatively high degree of independence and discretion with respect to their day-to-day activities. This observation is supported by the broad span of control of building principals (mean: 24.87) and the substantial negative relationship between organizational size and supervisory ratio and the substantial positive relationship between organizational size and principal span of control. On the other hand, as the division of labor of progressively larger school districts becomes increasingly differentiated, school districts tend to employ additional specialists and consultants who provide technical services and communication linkages among the increasingly specialized faculty. Since these observations are based solely upon an interpretation of the meaning of increasing and decreasing administrative ratios, further study is suggested with respect to the actual functions of supervisory and administrative staff personnel represented by these ratios. It may be that the increasing administrative staff ratios simply represent additional support systems (e.g., labor relations, data processing, fringe benefits, etc.) within the central administration of the district.

Recognizing that the structural configuration of formal organizations requires an investment of resources which must be acquired from the larger environment, this investigation examined the impact of thirty-one environmental and contextual conditions upon the structural characteristics of Michigan K-12 school districts. The overwhelming influence of organizational size upon various aspects

of school district structure has been emphasized throughout this discussion. However, with the exception of the influence of operating expense per pupil upon faculty distribution, faculty dispersion, administrative ratio and supervisory ratio, and the influence of federal revenue per pupil upon major divisions and supportive staff ratio, none of the other environmental or contextual characteristics examined in this investigation have a major impact upon the structural configuration of Michigan K-12 school districts. Since the financial resources available to these organizations are equalized by the state legislature, it is quite remarkable that operating expense per pupil should manifest any significant influence upon any dimension of school district structure. The magnitude of the influence of this variable upon the dimensions indicated suggests the importance of including some measure of financial resources in future investigations of the determinants of the structural characteristics of formal organizations. It is anticipated that such measures will prove to be especially important in the investigation of profit-making organizations. If so, it may be possible to identify other environmental or contextual conditions which are contingent upon available financial resources and which have an influence upon organizational structure.

Assuming at the outset that the purpose of a given organizational structure is to channel the behavior of members and/or clients and to focus the impact of other resources upon the attainment of specific organizational outcomes, this investigation examined the

influence of fifteen structural characteristics of Michigan K-12 school districts upon six criteria of school district performance. With one minor exception, none of these structural characteristics had any significant influence upon any of the performance criteria examined. This finding may indicate that there is, in fact, no relationship between the structure and performance of Michigan K-12 school districts. On the other hand, this finding may be a function of the particular performance criteria selected for examination. Although each criterion represents a dimension of organizational performance, the behavior underlying each criterion (e.g., mastering reading and math objectives, dropping out of school, enrolling in college, etc.) is fundamentally individual. Therefore, there should probably be little surprise that the conditions found to influence these criteria, even on the organizational dimension of analysis, represent compelling influences in the environment of the individuals whose behavior comprised the basis for each of the performance criteria. Future investigations of the relationship between organizational structure and performance should focus upon outcome criteria which are more closely related to the organizational unit of analysis. For example, instead of regarding operating expense per pupil as a measure of available financial resources, this variable might be turned around and used as an indicator of organizational efficiency. Indicators of compliance with state or federally mandated programs or regulations might also provide useful measures of organizational performance. Employee absenteeism and turnover are based upon highly individual behavior, but they may be a reflection

of conditions on the organizational level of analysis. Although it might be unfeasible to obtain measures of organizational climate from a very large sample of organizations, this dimension would provide an extremely useful measure of organizational performance.

Recommendations for Further Research

One outcome of this study of the conditions and consequences of the structural characteristics of Michigan K-12 school districts is a set of questions which were either not anticipated at the outset or which have been suggested by the findings of this investigation. This section summarizes these questions and makes recommendations for future research.

Whereas most investigations of the structural characteristics of formal organizations employ a single indicator of the division of operational labor, this investigation has utilized two indicators for the functional and two indicators of the spatial division of labor in Michigan K-12 school district organizations. The relationships observed between these measures and other structural characteristics indicate that each provides a slightly different perspective regarding the division of operational labor. It is recommended that future investigations use multiple measures of division of labor in order to capture these different nuances of meaning and to facilitate comparisons across investigations.

This investigation introduced a new variable and a new notion in the investigation of formal organizations. The new variable--administrative differentiation--measures the proportion of

administrative assignment categories occupied by school district administrators. The new notion is that it is the extent of differentiation in the administrative division of labor rather than (or in addition to) the extent of differentiation in the operational division of labor which is responsible for the structural complexity of the hierarchy of authority of formal organizations. Although the use of this variable and the exploration of this notion were greatly facilitated by the administrative classification system utilized by the Michigan Department of Education, this system could be adapted easily to any organization. The important contributions of this variable to the findings of the present investigation suggest the importance of attempts to replicate those findings in other kinds of organizations.

This investigation employed six indicators to describe the hierarchy of authority of Michigan K-12 school district organizations. Although this and previous investigations have established the usefulness of these and similar measures for describing the structure of authority relations in formal organizations, they contribute very little to an understanding of how authority is exercised in formal organizations. Assuming that formal status and power are based upon the authority to make decisions concerning the disposition of scarce resources, it should be possible to identify key decisions in formal organizations, the official(s) responsible for making them and the channels of accountability associated with those decisions. Blau and his associates (Blau, 1968; Blau and Schoenherr, 1971; Blau, 1973) have done considerable work in this

area. However, efforts to collect this type of information for the present investigation were continually frustrated by disagreements among respondents concerning the relative importance of several administrative decisions and a high degree of uncertainty concerning the ultimate responsibility for making those decisions. Future research in this area would contribute greatly to an understanding of the actual distribution of authority in formal organizations.

This investigation utilized five measures of the administrative apparatus of Michigan K-12 school districts. The shortcoming of the two measures of the non-professional administrative staff have been noted in a previous section and should be avoided in future research. The provision of separate measures for the supervisory and administrative staff components of the administrative apparatus was highly beneficial and should be continued in future investigations.

One of the major purposes of this investigation was to examine the relationship between the structural characteristics of Michigan K-12 school districts and selected performance criteria. As was indicated in the previous section, the failure to observe any kind of structure-performance nexus in this investigation may be a function of the particular performance criteria selected for examination. Future investigations should attempt to define and measure performance criteria which are more closely related to the organizational dimension of analysis.

As was indicated in the previous section, the size-complexity nexus observed in this investigation suggests that, in addition to

being more complex, larger school district organizations may be fundamentally different from smaller school district organizations in terms of the skills and competencies required for their administration. Further research with respect to the relationships between degree of organizational complexity and levels or kinds of administrative skills would determine the veracity of this suggestion and, as was suggested above, could have important implications for the recruitment, training, placement and evaluation of administrators in these and other organizations.

Although highly serendipitous and not related to the central thrust of this investigation, two observations concerning school district performance deserve further study. First, it was found that the percentage of non-public school students in a public school district jurisdiction has a small but statistically significant influence upon the functional division of labor and the dropout rates of the public schools. The interpretation of these findings was highly speculative and the relationships observed may be the fortuitous result of unknown antecedent conditions. However, the persistence of the relationships under controls may suggest a structural effect which merits further exploration. Secondly, it was found that community racial composition has a greater influence upon school district student achievement scores than student body racial composition. This difference may derive from the different dates of data collection (1970 versus 1975) or from differences in the operational definitions of the respective independent variables

(percent black versus percent caucasian). However, the magnitude of the differences suggests the importance of further exploration of these relationships.

APPENDICES

APPENDIX A

VARIABLE DEFINITIONS, BASIC STATISTICS
AND SOURCES

This appendix furnishes the operational definitions of the 52 variables analyzed in the tables. It provides the mean and standard deviation for each variable and the number of cases on which these data are based. The parenthesized, capitalized letters immediately following the variable name are used to designate each variable in the correlation matrix on Appendix B. The parenthesized Roman numerals following each operational definition refer to the source(s) from which the data for each variable were obtained. A key identifying each source is at the end of this appendix.

	Mean	Standard Deviation	N
1. <u>Metropolitan Core City (METRO)</u> Dummy variable indicating that the district is in a community classified by the Michigan Department of Education (MDE) as a Metropolitan Core City (i.e., the community meets one of the following criteria: (1) is the central city of a Michigan Standard Metropolitan Statistical Area (MSMSA); (2) is an enclave within the central city of a MSMSA; or (3) was previously classified as a Metropolitan Core City). (I)	.030	.169	508
2. <u>City (CITY)</u> Dummy variable indicating that the district is in a community classified by MDE as a City (i.e., has a population of 10,000 or more and is not classified as a Metropolitan Core City or Urban Fringe). (I)	.053	.225	508
3. <u>Town (TOWN)</u> Dummy variable indicating that the district is in a community classified by MDE as a Town (i.e., has a population of 2,500 to 9,999 including Rural communities impacted by large military installations). (I)	.250	.433	508
4. <u>Urban Fringe (URBAN)</u> Dummy variable indicating that the district is in a community classified by MDE as Urban Fringe (i.e., meets at least one of the following criteria: (1) the mailing address of the community is a Metropolitan Core City unless it is a RFD route; (2) the community is within ten miles of a Metropolitan Core City; or (3) the community is within five miles of a City). (I)	.183	.387	508
5. <u>Rural (RURAL)</u> Dummy variable indicating that the district is in a community classified by MDE as Rural (i.e., has a population of less than 2,500, or if the district address is an RFD route of a City, Town, Urban Fringe or Metropolitan Core City, and it lies outside the perimeter defined above under Urban Fringe, except that no communities in Wayne County are classified as Rural). (I)	.484	.500	508

	Mean	Standard Deviation	N
6. <u>State Equalized Valuation (SEV)</u> The taxable value of real estate and personal property (assessed value as finally equalized by the State Tax Commission) in the district in 1975-76, divided by Membership. (II)	26036.66	14655.28	508
7. <u>Family Income (INCOME)</u> The average income of the families in the district as reported in the U.S. Census of 1970. (I)	10914.21	2737.86	508
8. <u>Community Racial Characteristics (CRACE)</u> The percentage of community residents classified as Negro in the U.S. Census of 1970. (I)	2.176	7.097	508
9. <u>Non-public School Membership (NPSM)</u> The percentage of K-12 students in the community legally enrolled in non-public schools in 1975-76. (IV)	5.426	8.391	508
10. <u>Area (AREA)</u> The total square miles within the district jurisdiction during the 1975-76 school year. (VI)	105.51	121.57	508
11. <u>Membership (MEMBER)</u> The total number of K-12 students legally enrolled in the district at the close of school on the fourth Friday following Labor Day (September 26) 1975. (II)	4125.69	12130.01	508
12. <u>Membership (log) (LOGMEM)</u> Logarithmic transformation to base 10 of membership. (II)	3.365	.403	508
13. <u>Size (SIZE)</u> The total number of faculty employed by the district during the 1975-76 school year. (VII)	192.25	472.04	508
14. <u>Size (log) (LOGSIZE)</u> Logarithmic transformation to base 10 of Size. (VII)	2.044	.399	508

	Mean	Standard Deviation	N
15. <u>Student Faculty Ratio (SFRAT) Membership divided by Size.</u> (II, VII)	21.06	2.18	508
16. <u>Growth (GROWTH)</u> The proportionate increase/decrease in district Membership between the 1971-72 and 1975-76 school years. (II, V)	1.01	.40	508
17. <u>Operating Millage (MILLAGE)</u> The tax rate in mills applied to the state equalized valuation of the district to produce revenue for the operation of schools during the 1975-76 school year. (II)	25.18	3.65	508
18. <u>Local Revenue/Pupil (LRP)</u> Revenue produced within the district during the 1975-76 school year for operating the schools and available to the district in the amount produced, divided by Membership. (II)	740.88	318.09	508
19. <u>State Revenue/Pupil (SRP)</u> All funds received from the State during the 1975-76 school year which were appropriated by the State out of State funds, divided by Membership. (II)	481.29	222.22	508
20. <u>Federal Revenue/Pupil (FRP)</u> All funds received from the Federal Government either directly or as reallocated by the State for the 1975-76 school year, divided by Membership. (II)	59.46	53.81	508
21. <u>Operating Expense/Pupil (OEXP)</u> The basic expenses of the school district including instruction, administration, attendance, health, transportation, fixed charges and operation and maintenance of plant but excluding capital outlay, community services and student services, divided by Membership. (II)	1196.47	182.52	508

	Mean	Standard Deviation	N
22. <u>Student Racial Characteristics (SRACE)</u> The percentage of K-12 students in the district classified as caucasian as of the close of school on the fourth Friday following Labor Day (September 26), 1975. (III)	95.08	33.68	508
23. <u>Faculty Racial Characteristics (FACRACE)</u> The percentage of district faculty classified as caucasian during the 1975-76 school year. (VII)	97.54	8.85	508
24. <u>Administrator Racial Characteristics (ADMFACE)</u> The percentage of district administrators classified as caucasian during the 1975-76 school year. (VII)	97.17	11.75	508
25. <u>Faculty Experience (FACEXP)</u> The average teaching experience (years) of the district faculty prior to the 1975-76 school year. (VII)	8.99	2.13	508
26. <u>Faculty Qualifications (FACQUAL)</u> The percentage of district faculty holding a Masters, Doctors or Specialist degree during the 1975-76 school year. (VII)	31.34	13.05	508
27. <u>Average Faculty Salary (FACSAL)</u> The average contractual salary of the district faculty during the 1975-76 school year. (VII)	13026.39	1764.87	508
28. <u>Beginning Faculty Salary (BEGSAL)</u> The average contractual salary of a first year baccalaureate faculty member with no previous experience during the 1975-76 school year. (VII)	9263.11	897.97	508
29. <u>Average Administrator Salary (ADMSAL)</u> The average contractual salary of district administrators during the 1975-76 school year. (VII)	20975.00	2745.47	508

	Mean	Standard Deviation	N
30. <u>Superintendent Salary (SUPSAL)</u> The contractual salary of the district superintendent during the 1975-76 school year. (VII)	27244.08	5775.23	508
31. <u>Superintendent Tenure (SUPTEN)</u> The number of years the current (as of the 1975-76 school year) superintendent has been superintendent. (VIII)	6.70	5.59	508
32. <u>Faculty Differentiation (FACDIFF)</u> The proportion of eighty-one (81) faculty assignment categories occupied by the district faculty during the 1975-76 school year. (VII)	.32	.09	508
33. <u>Faculty Distribution (FACDIST)</u> The distribution of district faculty within occupied faculty assignment categories during the 1975-76 school year--i.e., one minus the sum of the X^2 divided by (the sum of the X) ² where X = the number of faculty in each of eighty-one (81) faculty assignment categories. (VII)	.82	.04	508
34. <u>Faculty Dispersion (FACDISP)</u> The distribution of district faculty within work locations (buildings) during the 1975-76 school year--i.e., one minus the sum of the X^2 divided by (the sum of the X) ² where X = the number of faculty assigned to each district building. (VII)	.69	.18	508
35. <u>Faculty per Building (FACBLDG)</u> The average number of faculty assigned to each district building during the 1975-76 school year. (VII)	22.56	7.09	508
36. <u>Administrative Differentiation (ADMDIFF)</u> The proportion of twenty-five (25) administrative assignment categories occupied by district administrators during the 1975-76 school year. (VII, VIII)	.29	.17	508

		Mean	Standard Deviation	N
37.	<u>Major Divisions (DIV)</u> The number of district subunits headed by an administrator (other than a building principal) who reports directly to the superintendent and who supervises two or more administrators, during the 1975-76 school year. (Districts in which building principals and other first line supervisors report directly to the superintendent have one Major Division, by definition.) (VIII)	1.34	.92	508
38.	<u>Hierarchical Levels (LEVELS)</u> The number of supervisory strata between the district superintendent and the district faculty during the 1975-76 school year, with the superintendent and faculty counted as extreme strata. (VIII)	3.32	.62	508
39.	<u>Superintendent Span of Control (SPTSC)</u> The total number of non-clerical personnel reporting directly to the district superintendent during the 1975-76 school year. (VIII)	9.26	10.44	508
40.	<u>Supervisory Span of Control (SUPSC)</u> The average number of non-clerical personnel reporting directly to administrators between (and excluding) the district superintendent and the building principals during the 1975-76 school year. (VIII)	5.84	10.23	508
41.	<u>Principal Span of Control (PRINSC)</u> The average number of district faculty reporting to a principal or building supervisor. (VII, VIII)	24.87	7.02	508
42.	<u>Administrative Ratio (ADM RAT)</u> The ratio of the total number of district administrators (excluding clerical and supportive personnel) to the total number of district faculty during the 1975-76 school year. (VII, VIII)	.08	.02	508

	Mean	Standard Deviation	N
43. <u>Supervisory Ratio (SUPRAT)</u> The ratio of the total number of district administrators who supervise two or more non-clerical personnel to the number of district faculty during the 1975-76 school year. (VII, VIII)	.06	.02	508
44. <u>Administrative Staff Ratio (ASRAT)</u> The ratio of the total number of district administrators (excluding clerical and supportive personnel) who do <u>not</u> supervise two or more non-clerical personnel to the total number of district faculty during the 1975-76 school year. (VII, VIII)	.02	.02	508
45. <u>Clerical Ratio (CLERRAT)</u> The ratio of the total number of district clerical aides to the total number of district faculty during the 1975-76 school year. (I, VII)	.05	.04	508
46. <u>Supportive Staff Ratio (SPRTRAT)</u> The ratio of the total number of teacher aides, library aides, clerical aides, health aides, food service staff, transportation staff, custodial staff and maintenance staff to the total number of district faculty during the 1975-76 school year. (I, VII)	.71	.19	508
47. <u>Student Achievement (SA)</u> The average number of reading and math objectives answered correctly by district fourth and seventh graders on the Michigan Assessment Test in 1975-76. (IX)	75.27	5.70	508
48. <u>High School Dropouts (DROPOUT)</u> The percentage of district secondary students (9-12) removed from the school membership rolls in 1975-76 for any reason other than transfers to other school districts, death, illness or injury affecting attendance. (X)	4.70	2.39	508

	Mean	Standard Deviation	N
49. <u>Higher Education Matriculation (HEM)</u> The percentage of 1975-76 district graduates enrolled in post-secondary educational institutions for the 1976-77 school year. (XI)	38.26	12.77	508
50. <u>National Merit Semifinalists (NMS)</u> The percentage of 1975-76 high school graduates who qualified as National Merit Scholar Semifinalists. (XII)	.34	.60	508
51. <u>Faculty Attrition (ATTRIT)</u> The average number of district faculty removed from the Register of Professional Personnel for any reason during the 1975-75 and 1975-76 school years. (XIII, XIV)	9.06	3.53	508
52. <u>Superintendent Longevity (SPTLONG)</u> The average tenure as superintendent of the current (as of 1975-76) and two preceding district superintendents. (VIII)	8.12	4.63	508

SOURCES

- I. "All District Data" (Magnetic Tape), Office of the Governor, Lansing, Michigan, 1976.
- II. "Ranking of Michigan Public High School Districts by Selected Financial Data" (Bulletin 1012), Michigan Department of Education, Lansing, Michigan, 1976.
- III. "School Racial-Ethnic Census" (Printout), Michigan Department of Education, Office of Equal Education Opportunity, Lansing, Michigan, 1976.
- IV. "Annual Non-public Membership Summary Report" (Printout), Michigan Department of Education, Lansing, Michigan, 1976.
- V. "Ranking of Michigan Public High School Districts by Selected Financial Data" (Bulletin 1012), Michigan Department of Education, Lansing, Michigan, 1972.
- VI. "1975-1976 K-12 District Data" (Printout), Michigan Department of Education, School Management Services, School Plant Section, Lansing, Michigan, 1976.
- VII. "1975-1976 Register of Professional Personnel" (Magnetic Tape), Michigan Department of Education, Teacher Preparation and Professional Development Services Section, 1976.
- VIII. "Administrative Configuration Survey." A questionnaire which was self-administered (n = 417) or administered by the investigator (n = 111) between December 10, 1976 and March 15, 1977.
- IX. "Michigan Education Assessment Program" (Magnetic Tape), Michigan Department of Education; Research, Evaluation and Assessment Services, Lansing, Michigan, 1976.
- X. "Michigan Public School Dropouts by County and School District, 1975-76" (Printout), Michigan Department of Education; Research, Evaluation and Assessment Services, Lansing, Michigan, 1976.

- XI. "Summary Data: 1975 Michigan High School Graduates" (Printout), Michigan Department of Education, Student Financial Assistance Services, June, 1976.
- XII. "Semifinalists in the Twenty-second Annual National Merit Scholarship Competition," National Merit Scholarship Corporation, 1976.
- XIII. "Report of 1973-74 Teachers Not Employed for School Year 1974-75" (Printout), Michigan Department of Education, Division of Teacher Certification, Lansing, Michigan, 1975.
- XIV. "Report of 1974-75 Teachers Not Employed for School Year 1975-76" (Printout), Michigan Department of Education, Division of Teacher Certification, Lansing, Michigan, 1976.

APPENDIX B

MATRIX OF SIMPLE CORRELATIONS

This appendix furnishes the simple correlations between each of the variables examined in this investigation. The variable numbers heading each row and column correspond to the variable numbers in Appendix A. The capital letters heading each row and column represent a shorthand version of the variable name. These also are included in the variable definitions in Appendix A for ease of cross reference.

	METRO	CITY	TOWN	URBAN	RURAL	SEV	INCOME	CRACE	NPSH	AREA	MEMBER	LOGMEM	SIZE	LOG	SIZE	SPRAT	GROWTH	AGE	MILL	LRP
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18		
1	METRO	1.000																		
2	CITY	-0.041	1.000																	
3	TOWN	-0.101	-0.137	1.000																
4	URBAN	-0.083	-0.112	-0.273	1.000															
5	RURAL	-0.169	-0.230	-0.559	-0.459	1.000														
6	SEV	0.036	0.027	0.101	-0.061	-0.065	1.000													
7	INCOME	0.020	0.094	0.538	-0.036	-0.488	0.126	1.000												
8	CRACE	0.459	0.138	0.007	-0.076	-0.165	0.051	-0.030	1.000											
9	NPSH	0.203	0.125	0.159	0.017	-0.276	0.217	0.257	0.002	1.000										
10	AREA	-0.069	-0.009	-0.375	0.071	0.297	-0.002	-0.436	-0.110	-0.057	1.000									
11	MEMBER	0.429	0.081	0.068	-0.036	-0.213	0.012	0.316	0.111	-0.057	-0.057	1.000								
12	LOGMEM	0.372	0.281	0.378	0.095	-0.653	0.002	0.559	0.243	0.236	-0.219	0.517	1.000							
13	SIZE	0.475	0.103	0.095	-0.046	-0.254	0.030	0.205	0.134	-0.079	0.994	0.580	0.579	1.000						
14	LOGSIZE	-0.050	0.383	0.289	0.078	-0.662	0.036	0.574	0.258	-0.239	0.511	0.994	0.579	1.000						
15	SPRAT	-0.086	-0.048	-0.130	0.165	0.024	-0.289	-0.107	-0.107	-0.067	0.162	0.115	0.074	0.036	1.000					
16	GROWTH	-0.100	-0.220	0.032	0.239	-0.032	-0.114	-0.146	-0.195	0.112	-0.080	-0.117	-0.099	-0.150	0.287	1.000				
17	MILLAGE	0.196	0.157	0.494	-0.141	-0.456	-0.138	0.598	0.099	0.162	-0.392	0.147	0.206	0.521	-0.265	-0.196	1.000			
18	LRP	0.110	0.080	0.263	-0.100	-0.224	0.838	0.337	0.015	0.264	-0.080	0.066	0.159	0.107	-0.403	-0.188	0.248	1.000		
19	SRP	-0.006	-0.052	-0.083	0.017	0.085	-0.808	-0.145	0.440	-0.211	-0.061	0.006	-0.011	-0.035	0.206	0.086	0.069	-0.864		
20	FRP	0.322	0.016	-0.201	-0.008	0.064	-0.029	-0.308	0.352	-0.008	0.160	0.109	-0.034	0.119	-0.151	-0.117	-0.094	-0.031		
21	CEXP	0.320	0.144	0.370	-0.138	-0.386	0.452	0.427	0.243	0.283	-0.253	0.198	0.383	0.261	-0.454	-0.573	0.348	0.573	0.684	
22	SPACE	-0.197	-0.059	0.081	0.007	0.018	0.028	0.070	-0.341	0.014	0.015	-0.124	-0.086	0.051	0.034	0.051	-0.036	0.021		
23	PACRACE	-0.407	-0.129	-0.021	0.084	0.149	-0.048	0.002	-0.815	-0.035	0.121	-0.306	-0.241	-0.320	0.101	0.145	-0.147	-0.103		
24	ADRACE	-0.336	-0.187	0.005	0.099	0.117	-0.048	-0.009	-0.690	-0.042	0.112	-0.220	-0.184	-0.236	-0.203	0.145	-0.163	-0.114		
25	PACEXP	0.177	0.201	0.163	0.073	-0.348	0.278	0.109	0.134	0.255	0.080	0.188	0.274	0.215	0.287	-0.073	-0.453	0.231	0.407	
26	PACQUAL	0.178	0.232	0.456	0.063	-0.608	0.223	0.533	0.156	0.280	-0.255	0.594	0.286	0.617	-0.138	-0.338	0.562	0.442		
27	PACAL	0.244	0.181	0.514	0.032	-0.634	0.222	0.596	0.209	0.315	-0.301	0.306	0.692	0.355	0.701	-0.002	-0.305	0.578	0.428	
28	BEGAL	0.173	0.036	0.282	0.004	-0.322	0.074	0.362	0.142	0.170	-0.230	0.197	0.360	0.216	0.358	0.057	-0.085	0.313	0.152	
29	ADMSAL	0.137	0.130	0.516	0.045	-0.587	0.149	0.622	0.142	0.260	-0.367	0.241	0.671	0.286	0.679	-0.002	-0.169	0.521	0.309	
30	SUPPAL	0.345	0.226	0.445	0.062	-0.651	0.097	0.634	0.122	0.261	-0.317	0.403	0.872	0.466	0.876	0.046	-0.146	0.539	0.266	
31	SUPTEM	-0.030	-0.051	0.067	0.067	-0.077	-0.049	0.067	-0.101	-0.037	-0.032	-0.060	-0.026	-0.064	0.071	0.071	-0.004	-0.061	-0.081	
32	PACDIFF	0.392	0.294	0.374	0.040	-0.620	0.067	0.520	0.230	0.285	-0.230	0.404	0.893	0.477	0.908	-0.052	-0.164	0.511	0.235	
33	PACDIST	0.069	0.128	0.209	0.024	-0.280	0.126	0.294	-0.041	0.259	-0.124	0.116	0.261	0.149	0.289	-0.217	-0.172	0.303	0.235	
34	PACDISP	0.222	0.213	0.349	0.138	-0.580	0.016	0.475	0.176	0.169	-0.209	0.286	0.812	0.335	0.809	0.089	-0.112	0.411	0.119	
35	PACBLDG	0.096	0.061	0.281	0.010	-0.312	-0.003	0.408	0.114	0.091	-0.215	0.197	0.502	0.228	0.507	-0.003	0.013	0.306	0.118	
36	ADMDIFF	0.447	0.306	0.337	0.022	-0.598	0.096	0.489	0.278	0.249	-0.218	0.445	0.884	0.521	0.895	-0.011	-0.105	0.496	0.259	
37	DIV	0.606	0.151	0.121	-0.077	-0.319	0.053	0.275	0.296	0.178	-0.126	0.596	0.647	0.661	0.660	-0.020	-0.059	0.380	0.188	
38	LEVELS	0.343	0.318	0.209	0.001	-0.441	0.064	0.315	0.233	0.179	-0.105	0.497	0.678	0.546	0.684	0.004	-0.193	0.126	0.182	
39	SPFSC	0.003	-0.096	-0.096	-0.068	0.177	-0.046	-0.132	-0.029	-0.055	0.112	0.007	-0.137	-0.006	-0.143	0.050	0.067	-0.153	-0.072	
40	SUPSC	0.027	0.035	0.090	0.135	-0.208	-0.017	0.160	0.026	0.090	-0.064	0.071	0.265	0.082	0.265	0.021	-0.075	0.122	0.027	
41	PRINSC	0.104	0.125	0.256	0.067	-0.364	-0.032	0.361	0.147	0.090	-0.154	0.203	0.567	0.234	0.572	-0.001	-0.057	0.256	0.068	
42	ADRAT	0.192	-0.001	-0.041	-0.051	0.010	0.155	-0.044	0.127	0.075	-0.052	0.158	-0.047	0.161	-0.047	0.014	-0.005	0.061	0.191	
43	SUPRAT	-0.097	-0.126	-0.246	-0.147	0.416	0.080	-0.373	-0.091	-0.127	0.091	-0.098	-0.602	-0.136	-0.605	-0.021	0.051	-0.252	-0.005	
44	ASRAT	0.343	0.145	0.234	0.108	-0.267	0.087	0.375	0.258	0.233	-0.163	0.302	0.638	0.350	0.638	0.070	-0.053	0.366	0.228	
45	CLERAT	0.051	-0.020	0.189	0.041	-0.204	0.037	0.101	-0.006	0.092	-0.095	0.096	0.203	0.107	0.202	0.030	-0.101	0.194	0.112	
46	SPRAT	0.090	-0.040	-0.265	-0.088	0.285	0.007	-0.227	0.132	-0.105	0.181	0.005	0.132	0.107	-0.156	0.207	-0.129	-0.136	-0.040	
47	SA	-0.280	0.016	0.161	0.133	0.155	0.088	0.311	-0.535	0.141	0.013	-0.134	0.039	-0.125	0.046	-0.061	0.004	0.157	0.152	
48	DROPOUT	0.248	0.116	-0.003	-0.035	-0.106	-0.014	-0.084	0.371	-0.109	-0.091	0.214	0.252	0.224	0.251	0.027	-0.092	0.046	-0.030	
49	HEM	0.154	0.117	0.183	0.067	-0.315	0.140	0.406	0.080	0.092	-0.091	0.121	0.283	0.115	0.311	-0.208	-0.119	0.308	0.294	
50	NMS	0.011	0.159	0.042	-0.049	-0.150	0.046	0.282	-0.042	0.061	-0.054	0.027	0.049	0.049	-0.061	-0.037	0.204	0.156	0.157	
51	ATTRIT	-0.045	-0.073	-0.093	-0.048	0.166	-0.039	-0.042	0.082	-0.138	-0.053	-0.052	-0.069	-0.206	0.078	0.021	-0.080	-0.083		
52	SPTLONG	-0.055	0.034	0.139	0.121	-0.211	-0.058	0.103	-0.060	0.042	0.007	-0.027	0.125	0.119	0.061	-0.100	0.016	-0.055		

	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36
	SIP	FRP	OEXP	SPACE	PACRACE	ADMACE	PACEXP	PACQUAL	PACFAL	BEGFAL	ADMFAL	SUPFAL	SUPTEN	PACDIFF	PACDIST	PACDISP	FACBLDG	ADMDIFF
1 METRO	1.000																	
2 CITY	0.053	1.000																
3 TOWN	-0.321	0.278	1.000															
4 URBAN	-0.083	-0.216	-0.124	1.000														
5 RURAL	-0.006	-0.333	-0.289	-0.333	1.000													
6 SEV	-0.005	-0.301	-0.319	-0.247	0.808	1.000												
7 INCOME	-0.303	0.137	0.425	-0.079	-0.131	-0.112	1.000											
8 CRACE	-0.215	-0.040	0.613	-0.003	-0.146	-0.138	0.526	1.000										
9 NPSH	-0.202	-0.015	0.630	-0.052	-0.194	-0.142	0.549	0.767	1.000									
10 AREA	-0.010	-0.037	0.309	-0.037	-0.119	-0.087	0.165	0.382	0.581	1.000								
11 MEMBER	-0.119	-0.175	0.458	0.021	-0.129	-0.079	0.249	0.611	0.793	0.456	1.000							
12 LOGRCH	-0.077	-0.091	0.471	-0.064	-0.240	-0.178	0.258	0.535	0.747	0.406	0.810	1.000						
13 SIZE	0.053	-0.151	-0.126	0.040	0.097	0.113	-0.060	-0.052	-0.013	0.028	0.110	0.155	1.000					
14 LOGSIZE	-0.066	0.010	0.478	-0.068	-0.241	-0.189	0.282	0.615	0.670	0.365	0.635	0.800	-0.037	1.000				
15 SPFAT	-0.086	-0.002	0.367	0.035	0.007	-0.019	0.186	0.327	0.296	0.106	0.268	0.266	-0.074	0.391	1.000			
16 GROWTH	-0.003	-0.086	0.293	-0.053	-0.177	-0.095	0.201	0.492	0.552	0.260	0.556	0.713	0.018	0.729	0.193	1.000		
17 MILLAGE	0.007	-0.034	0.249	-0.001	-0.111	-0.131	0.041	0.352	0.407	0.282	0.479	0.468	-0.050	0.436	0.183	0.129	1.000	
18 LRP	-0.081	0.062	0.492	-0.123	-0.262	-0.201	0.279	0.550	0.619	0.289	0.564	0.792	-0.043	0.837	0.294	0.680	0.432	1.000
19 SUPRAT	-0.052	0.161	0.388	-0.141	-0.295	-0.238	0.208	0.352	0.409	0.185	0.340	0.572	-0.100	0.606	0.205	0.419	0.256	0.714
20 SUPRAT	-0.061	0.065	0.361	-0.112	-0.216	-0.165	0.258	0.395	0.466	0.183	0.407	0.593	-0.017	0.608	0.248	0.451	0.284	0.704
21 SUPRAT	0.025	-0.005	-0.135	-0.011	0.036	0.035	-0.075	-0.134	-0.153	-0.075	-0.131	-0.162	-0.009	-0.097	-0.009	-0.096	-0.112	-0.134
22 SUPRAT	0.008	0.043	0.106	-0.012	-0.001	-0.001	0.063	0.150	0.206	0.131	0.219	0.242	-0.022	0.238	0.044	0.241	0.169	0.229
23 SUPRAT	0.031	-0.031	0.213	0.023	-0.119	-0.079	0.086	0.356	0.407	0.232	0.531	0.523	-0.018	0.500	0.150	0.343	0.689	0.466
24 SUPRAT	-0.124	0.147	0.200	-0.093	-0.111	-0.085	0.083	-0.016	-0.001	-0.035	-0.168	-0.012	-0.021	-0.038	0.064	-0.070	-0.145	0.246
25 SUPRAT	-0.076	0.083	-0.154	-0.009	0.083	0.062	-0.089	-0.407	-0.406	-0.223	-0.494	-0.545	-0.054	-0.560	-0.175	-0.502	-0.480	-0.384
26 SUPRAT	-0.053	0.079	0.406	-0.102	-0.228	-0.173	0.211	0.448	0.470	0.214	0.375	0.614	0.049	0.597	0.281	0.494	0.377	0.738
27 SUPRAT	-0.059	0.029	0.151	-0.034	0.019	0.024	0.138	0.134	0.179	0.125	0.107	0.175	0.005	0.167	0.078	0.179	0.064	0.189
28 SUPRAT	0.014	0.221	-0.068	-0.062	-0.077	-0.091	-0.166	-0.303	-0.258	-0.111	-0.270	-0.191	-0.054	-0.194	-0.129	-0.131	-0.145	-0.089
29 SUPRAT	-0.140	-0.308	0.018	0.196	0.469	0.361	0.146	0.167	0.120	0.064	0.107	0.065	0.117	0.072	0.169	0.050	0.016	-0.020
30 SUPRAT	-0.047	0.181	0.083	-0.180	-0.340	-0.265	0.060	0.071	0.092	0.021	0.084	0.176	-0.078	0.209	-0.030	0.202	0.088	0.245
31 SUPRAT	-0.171	-0.007	0.350	-0.144	-0.093	-0.084	0.202	0.344	0.288	0.142	0.223	0.314	0.020	0.283	0.229	0.238	0.169	0.293
32 SUPRAT	-0.118	-0.012	0.149	0.114	0.039	-0.002	0.084	0.162	0.140	0.097	0.097	0.160	0.043	0.175	0.123	0.121	0.057	0.145
33 SUPRAT	0.043	0.084	-0.100	0.047	-0.065	-0.117	-0.304	-0.161	-0.209	0.029	-0.167	-0.186	-0.026	-0.181	-0.058	-0.128	-0.128	-0.185
34 SUPRAT	0.046	-0.131	-0.066	-0.011	0.083	0.083	0.083	0.083	0.121	0.118	0.223	0.219	0.544	0.126	0.020	0.160	0.019	0.071

	DIV	LEVELS	SPTSC	SUPSC	PRINSC	ADMAT	SUPRAT	ASRAT	CLERRAT	SPRTRAT	SA	DROPOUT	HEM	NMS	ATTRIT	SPTLONG
	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52
1	METRO															
2	CITY															
3	TOWN															
4	URBAN															
5	RURAL															
6	SEV															
7	INCOME															
8	CRACK															
9	WPSH															
10	AREA															
11	MEMBER															
12	LOGMEM															
13	SIZE															
14	LOGSIZE															
15	SPRAT															
16	GROWTH															
17	MILLAGE															
18	LRP															
19	SRP															
20	FRP															
21	OEIP															
22	SPACE															
23	PACRACE															
24	ADMFACE															
25	PACCLIP															
26	PACQUAL															
27	PACCSAL															
28	BEGSAL															
29	ADMSAL															
30	SUPSAL															
31	SUPTEN															
32	PACDIFF															
33	PACDIST															
34	PACDISP															
35	PACBLDG															
36	ADMDIFF															
37	DIV	1.000														
38	LEVELS	0.554	1.000													
39	SPTSC	-0.055	-0.192	1.000												
40	SUPSC	0.062	0.130	-0.098	1.000											
41	PRINSC	0.241	0.313	-0.151	0.192	1.000										
42	ADMAT	0.265	0.173	-0.048	-0.018	-0.293	1.000									
43	SUPRAT	-0.171	-0.214	0.056	-0.123	-0.662	0.643	1.000								
44	ASRAT	0.514	0.454	-0.119	0.118	0.409	0.452	-0.387	1.000							
45	CLERRAT	0.116	0.136	-0.024	0.116	0.077	0.062	-0.106	0.203	1.000						
46	SPRTRAT	-0.022	-0.030	0.062	-0.053	-0.134	0.136	-0.150	-0.004	0.138	1.000					
47	SA	-0.099	-0.024	-0.050	0.047	0.035	-0.102	-0.113	0.012	0.084	-0.266	1.000				
48	DROPOUT	0.219	0.227	-0.088	0.071	0.126	0.056	-0.055	0.127	0.017	0.067	-0.457	1.000			
49	HEM	0.225	0.215	-0.025	0.053	0.143	0.045	-0.200	0.281	0.076	-0.133	0.268	-0.131	1.000		
50	NMS	0.117	0.098	0.030	0.015	0.086	-0.029	-0.132	0.115	0.019	-0.047	-0.156	0.324	1.000		
51	ATTRIT	-0.120	-0.096	0.015	-0.064	-0.126	0.039	0.158	-0.138	-0.032	-0.181	0.024	-0.170	-0.009	1.000	
52	SPTLONG	-0.043	0.061	-0.019	0.073	0.117	-0.054	-0.139	0.100	0.017	0.156	-0.029	0.027	0.036	-0.068	1.000

APPENDIX C

ADMINISTRATIVE CONFIGURATION SURVEY INSTRUMENTS

MICHIGAN STATE UNIVERSITY

COLLEGE OF EDUCATION
DEPARTMENT OF ADMINISTRATION AND HIGHER EDUCATION
ERICKSON HALL

EAST LANSING • MICHIGAN • 48824
December 13, 1976

Dear Superintendent:

School district organizations are frequently described as top-heavy bureaucracies which squander scarce resources on administrative "frills" to the detriment of the processes of teaching and learning. We believe that this characterization is patently false and are engaged in an extensive study which will document the conditions and consequences of key administrative characteristics of school districts in Michigan.

Although some of the information we need for our study is available in published documents and records, our success will depend upon information which only you provide.

We have designed the enclosed survey instrument to gather the necessary information at minimal costs to yourself. In essence, we need to know:

1. the dates of service of the current (as of the 1975-1976 school year) and two preceding superintendents of your district;
2. the title of the immediate supervisor of each administrator in your district;
3. the number of non-clerical personnel under the immediate supervision of each administrator in your district; and
4. the titles of the administrators responsible for each of the buildings in your district.

All information requested refers to the 1975-1976 school year.

Please read the accompanying instructions carefully and return your completed survey instrument in the stamped, self-addressed envelope at your earliest convenience. No individual or school district will be identified in reporting the results of this study and your responses will be treated with the strictest standards of professional confidentiality.

If you have any questions or comments about our study, please do not hesitate to call either of us (collect, of course) at the numbers listed below.

Thank you in advance for your assistance in this important study.

Sincerely,

Frederick R. Ignatovich
Department of Administration
and Higher Education
(517) 353-5342

Stanley E. Hecker
Department of Administration
and Higher Education
(517) 355-4595

Robert H. Richardson
Survey Director
(517) 372-1369

Enclosures

Code _____

ADMINISTRATIVE CONFIGURATION SURVEY

Please indicate the name and telephone number of the person completing this survey instrument in case we have questions requiring further clarification.

Name _____ Telephone _____

SECTION I

Instructions: We need to know the dates of service of the current (as of the 1975-1976 school year) and two preceding superintendents of your district.

On line one please enter the name of the current (as of the 1975-1976 school year) superintendent of your district and the date on which he/she began his/her superintendency.

On lines two and three, please enter the names of the two preceding superintendents of your district and the dates of their respective superintendencies.

	<u>Name</u>	<u>From</u>	<u>To</u>
1.	_____	_____	<u>6/30/76</u>
2.	_____	_____	_____
3.	_____	_____	_____

Thank You

PLEASE CONTINUE TO THE NEXT SECTION

ADMINISTRATIVE CONFIGURATION SURVEY

Section II

Instructions: We need to know (1) the title of the immediate supervisor of each administrator in your district during the 1975-1976 school year and (2) the number of individuals supervised by each administrator in your district during the 1975-1976 school year.

The table on the following pages lists the 25 administrative classifications utilized by the Michigan Department of Education in the "Register of Professional Personnel." Column 1 indicates the title of each position. Column 2 indicates our code for each position. (NOTE: Since some districts have more than one person in a given position, and since we are prevented from using the names of individuals, this is our way of differentiating between individuals. For example, AH-1 and AH-2 refer to two different Secondary Principals). An "X" in Column 3 indicates that you had an individual in a given position during the 1975-1976 school year. Please enter the appropriate codes and numbers in Columns 4 and 5 as follows:

Column 4 - Immediate Supervisor: Please enter the Position Code (from Column 2) of the immediate supervisor and each administrative position indicated by "X" under Column 3, Position Occupied 1975-1976.

Column 5 - Number Supervised: Please enter the total number of non-clerical personnel under the immediate supervision of each administrator indicated by "X" under Column 3, Position Occupied 1975-1976.

E X A M P L E				
(1)	(2)	(3)	(4)	(5)
SUPERVISOR, SECONDARY	AQ-1	X	AB-2	3
SUPERVISOR, SECONDARY	AQ-2			
SPECIAL EDUCATION DIRECTOR	AR-1	X	AA-1	16

This fictitious school district had one SUPERVISOR, SECONDARY (AQ-1) who was supervised by the second of two ASST. SUPERINTENDENT, GENERAL (AB-2) and who was responsible for the supervision of three non-clerical personnel during the 1975-1976 school year. The district also had one SPECIAL ED. DIRECTOR (AR-1) who reported directly to SUPERINTENDENT, GENERAL (AA-1) and who supervised 16 non-clerical personnel during the 1975-1976 school year.

In the following table, please enter the appropriate Position Code and Number Supervised for each administrative position indicated by "X" in Column 3, Position Occupied 1975-1976.

Code _____

ADMINISTRATIVE CONFIGURATION SURVEY

Section 1:

(1) <u>Position Title</u>	(2) <u>Position Code</u>	(3) <u>Position Occupied 1975-1976</u>	(4) <u>Immediate Supervisor</u> , (Enter <u>Position Code</u> of the immediate supervisor of each administrator indicated by "X" under <u>Position Occupied 1975-1976.</u>)	(5) <u>Number Supervised</u> (Enter the <u>total number</u> of non-clerical personnel under the immediate supervision of each administrator indicated by "X" under <u>Position Occupied 1975-1976.</u>)
SUPERINTENDENT, GENERAL	AA-1			
SUPERINTENDENT, GENERAL	AA-2			
ASST. SUPERINTENDENT, GENERAL	AB-1			
ASST. SUPERINTENDENT, GENERAL	AB-2			
ADMIN. OF FINANCE OR BUSINESS	AC-1			
ADMIN. OF FINANCE OR BUSINESS	AC-2			
ADMIN. OF INSTRUCTION	AD-2			
ADMIN. OF INSTRUCTION	AD-2			
ADMIN. OF PLANT & FACILITIES	AE-1			
ADMIN. OF PLANT & FACILITIES	AE-2			
ADMIN. OF EMPLOYED PERSONNEL	AF-1			
ADMIN. OF EMPLOYED PERSONNEL	AF-2			
ADMIN. OF RESEARCH	AG-1			
ADMIN. OF RESEARCH	AG-2			
PRINCIPAL, SECONDARY	AH-1			It will not be necessary to report <u>number</u> <u>supervised</u> for Principals or
PRINCIPAL, SECONDARY	AH-2			
PRINCIPAL, SECONDARY	AH-3			
PRINCIPAL, SECONDARY	AH-4			
PRINCIPAL, SECONDARY	AH-5			
PRINCIPAL, ELEMENTARY	AI-1			
PRINCIPAL, ELEMENTARY	AI-2			
PRINCIPAL, ELEMENTARY	AI-3			
PRINCIPAL, ELEMENTARY	AI-4			
PRINCIPAL, ELEMENTARY	AI-5			
ASST. PRINCIPAL, SECONDARY	AJ-1			
ASST. PRINCIPAL, SECONDARY	AJ-2			
ASST. PRINCIPAL, SECONDARY	AJ-3			

* Indicates second assignment

PLEASE CONTINUE TO NEXT PAGE

Code _____

ADMINISTRATIVE CONFIGURATION SURVEY

Section II

(1) <u>Position Title</u>	(2) <u>Position Code</u>	(3) <u>Position Occupied 1975-1976</u>	(4) <u>Immediate Supervisor</u> (Enter Position Code of the immediate supervisor of each administrator indicated by "X" under Position Occupied 1975-1976.)	(5) <u>Number Supervised</u> (Enter the total number of non-clerical personnel under the immediate supervision of each administrator indicated by "X" under Position Occupied 1975-1976.)
ASST. PRINCIPAL, ELEMENTARY	AK-1			Assistant Principals
ASST. PRINCIPAL, ELEMENTARY	AK-2			
ASST. PRINCIPAL, ELEMENTARY	AK-3			
CONSULTANT, SUBJECT AREA	AL-1			
CONSULTANT, SUBJECT AREA	AL-2			
CONSULTANT, ELEMENTARY	AM-1			
CONSULTANT, ELEMENTARY	AM-2			
CONSULTANT, SECONDARY	AN-1			
CONSULTANT, SECONDARY	AN-2			
COORDINATOR, SUBJECT AREA	AO-1			
COORDINATOR, SUBJECT AREA	AO-2			
SUPERVISOR, ELEMENTARY	AP-1			
SUPERVISOR, ELEMENTARY	AP-2			
SUPERVISOR, SECONDARY	AQ-1			
SUPERVISOR, SECONDARY	AQ-2			
SPECIAL EDUCATION DIRECTOR	AR-1			
SPECIAL EDUCATION DIRECTOR	AR-2			
CONSULT., STATE, & FED. PROGS	AS-1			
CONSULT., STATE & FED. PROGS	AS-2			
COMMUNITY SCHOOL DIRECTOR	AT-1			
COMMUNITY SCHOOL DIRECTOR	AT-2			
DIRECTOR, VOCATIONAL EDUCATION	AU-1			
DIRECTOR, VOCATIONAL EDUCATION	AU-2			
DIRECTOR, DATA PROCESSING	AV-1			
DIRECTOR, DATA PROCESSING	AV-2			
DIRECTOR, TRANSPORTATION	AW-1			
DIRECTOR, TRANSPORTATION	AW-2			
DIRECTOR, ADULT-CONT. ED.	AX-1			
DIRECTOR, ADULT-CONT. ED.	AX-2			
SUPERVISOR, SPECIAL EDUCATION	AY-1			
SUPERVISOR, SPECIAL EDUCATION	AY-2			

* Indicates second assignment

THANK YOU FOR COMPLETING SECTION II

Code _____

ADMINISTRATIVE CONFIGURATION SURVEY

Section III

Instructions: We need to know the titles of the administrators responsible for each of the buildings in your district during the 1975-1976 school year.

The following table lists the buildings utilized in your district during the 1975-1976 school year. Column 1 indicates the Building Code and Column 2 indicates the Utilization Code of each building.

In Column 3, you are requested to enter the Position Code (from Section II of this survey instrument) of the administrator responsible for each building utilized in your district during the 1975-1976 school year.

E X A M P L E		
402	A	AI-2
1243 1243	XD	AI-1
5678	C	AH-3
7890	N	AU-1

In this fictitious school district, Building 402--an Elementary Building--was supervised by a PRINCIPAL, ELEMENTARY (AI-2); Building 1243--a Middle School--was supervised by a PRINCIPAL, ELEMENTARY (AI-1); Building 5678--a Senior High School--was supervised by a PRINCIPAL, SECONDARY (AH-3); and Building 7890--a Vocational Center--was supervised by a DIRECTOR, VOCATIONAL EDUCATION (AU-1). (PLEASE NOTICE that the Superintendent kindly corrected two errors in our table).

In the following table, please enter the Position Code (from Section II of this survey instrument) of the Building Supervisor of each building utilized in your district during the 1975-1976 school year.

(1) <u>Building Code</u>	(2) <u>Utilization Code</u>	(3) <u>Building Supervisor</u>

Utilization Code Key

- | | |
|---|---|
| A Elementary School P or K-6 or 8
B Junior High School 7-8 or 7-9
C Senior High School 9-12 or 10-12
D Middle School
E Junior-Senior High School 7-12
F Elementary through High School | N Special Education Center
I Administrative Building
L Library
M Vocational, Training & Apprentice Center
O Other |
|---|---|

Code _____

ADMINISTRATIVE CONFIGURATION SURVEY

Section III

[illegible]

THANK YOU FOR COMPLETING SECTION III

MICHIGAN STATE UNIVERSITY

COLLEGE OF EDUCATION
DEPARTMENT OF ADMINISTRATION AND HIGHER EDUCATION
FRICKSON HALL

EAST LANSING • MICHIGAN • 48824

January 21, 1977

Dear Superintendent:

Last month we wrote to you to request your assistance in the Administrative Configuration Survey--a research project designed to document the conditions and consequences of key administrative characteristics of school districts in Michigan.

We are now in the process of analyzing the survey instruments which have been returned--almost 500 of the 530 districts surveyed--and we regret that we have not received a response from your district.

Since we are anxious to include every Michigan K-12 district in our research, the absence of information from your district diminishes the impact of the study. We are, therefore, sending you another set of survey instruments with the request that you complete and return them at your earliest convenience.

All information requested refers to the 1975-1976 school year. No individual or school district will be identified in reporting the results of the study and your responses will be treated with the strictest standards of professional confidentiality.

If you have any questions or comments about the study, please do not hesitate to call one of us at the numbers listed below.

If you mailed the original survey instruments after January 21, please ignore this request.

Thank you for your cooperation and assistance in this important study.

Sincerely,

Frederick R. Ignatovich
Department of Administration
and Higher Education
(517) 353-5342

Stanley E. Hecker
Department of Administration
and Higher Education
(517) 355-4595

Robert H. Richardson
Survey Director
(517) 372-1369

Enclosures

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