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THE TECHNOLOGICAL IMPERATIVE IN EDUCATIONAL ORGANIZATIONS:

An Investigation of Structural and Personnel
Factors Associated with the Flexibility of
Instructional Technology in Public
Elementary Schools

by

JAMES HENRY BALDERSON

A THESIS

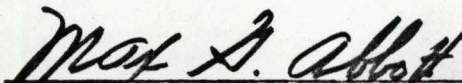
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Instructional Technology in Public Elementary
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This study of public elementary school organizations explored relationships among properties of three major variables: technology, structure and personnel. The relationships were examined (a) in the light of Charles Perrow's theoretical formulation of the "technological imperative" which states that the nature of an organization's technology determines the nature of its organizational structure and (b) in the light of the author's notion that the educational attitudes of organizational personnel were likely to affect the technology and structure of educational organizations.

The general research problem was stated as follows: Are public elementary school organizations characterized by systematic

variation in relationships among properties of personnel attitudes, technology and structure?

Four research questions were derived from the study's theoretical framework:

1. Is there evidence that the technological imperative operates in educational organizations? This question was addressed by an examination of (1.1) relationships of instructional flexibility (a measure of technological routineness) with the following structural characteristics: (a) bureaucratization of teacher behavior, (b) influence over school-wide matters, and (c) influence over classroom matters; and (1.2) the effects of control variables on the hypothesized negative relationship between instructional flexibility and bureaucratization of teacher behavior.

2. What weights may be assigned to characteristics of supervisory and instructional personnel regarding their association, if any, with instructional flexibility and properties of organizational structure? This question was addressed by an examination of (2.1) relationships of the educational attitudes of principals and staffs with instructional flexibility and (2.2) bureaucratization of teacher behavior and (2.3) the powers of two models to describe causal relationships among these variables.

3. What few variables compared with instructional flexibility best predict bureaucratization of teacher behavior?

4. What few variables compared with bureaucratization of teacher behavior best predict instructional flexibility?

Data was collected by a questionnaire survey of 41 elementary

schools in a large urban western Canadian school district. Computerized multivariate statistical techniques, including path analysis, were used to examine the data.

Selected results:

1. Instructional flexibility was significantly related to several characteristics of organizational structure.
2. Educational attitudes of principals and staffs were significantly related to instructional flexibility and to characteristics of organizational structure.
3. Contrary to Perrow's theory, the covariance of instructional flexibility with bureaucratization of teacher behavior was largely non-causal.
4. In accordance with the author's hypothesis, the covariance of educational attitudes with bureaucratization of teacher behavior was largely causal.
5. Instructional flexibility was the best predictor of bureaucratization of teacher behavior when compared with sets of principal background, staff background and school background variables. However, certain principal and staff attitudes were better predictors of bureaucratization than instructional flexibility.
6. The orientation of staffs toward educational traditionalism was the best predictor (negative) of instructional flexibility.

It was concluded that future studies of the technology and structure of school organizations should utilize a more complex theoretical framework than the simplistic concept of technological

determinism inherent in Perrow's formulation of the technological imperative.

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To Joan, with love and thanks.

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PART I

INTRODUCTION

CHAPTER 1

THEORETICAL FOUNDATION

CHAPTER 1

THEORETICAL FOUNDATION

PROBLEM: THE TECHNOLOGICAL IMPERATIVE IN EDUCATION

Recent theoretical and research developments indicate that the technology and structure of successful organizations are closely related. Other work has stressed that a complete account of an organization's operation requires an understanding of the nature of the organization's personnel.

This study explored the complex nature of public elementary school organizations by examining relationships between properties of three major variables: technology, structure and personnel. The relationships were examined (a) in the light of Charles Perrow's theoretical formulation of the "technological imperative" which states that the nature of an organization's technology determines the nature of its organizational structure and (b) in the light of the present author's extension of Perrow's theory which recognizes the educational attitudes of organizational personnel as variables likely to influence the technology and structure of educational organizations.

The general research problem addressed by the study was stated as follows:

Are public elementary school organizations characterized by systematic variation in relationships between properties of

personnel attitudes, technology and structure?

Four questions amenable to empirical investigation were derived from the study's theoretical framework. These research questions and the objectives of the study were stated as follows.

RESEARCH QUESTION 1

Is there evidence that the technological imperative operates in educational organizations?

OBJECTIVE 1.1

Determine the direction and degree of association of instructional flexibility (a measure of technological routineness) with the following structural characteristics: (a) bureaucratization of teacher-behavior, (b) influence over school-wide matters, and (c) influence over classroom matters.

OBJECTIVE 1.2

Explore the effects of control variables on the strength of the hypothesized relationship between instructional flexibility and bureaucratization of teacher behavior. (See also Objective 2.3)

RESEARCH QUESTION 2

What relative weights may be assigned to characteristics of supervisory and instructional personnel regarding their association, if any, with instructional flexibility and organizational structure?

OBJECTIVE 2.1

Determine and compare the directions and degrees to which educational attitudes of (a) principals, and (b) staffs are associated with instructional flexibility.

OBJECTIVE 2.2

Determine and compare the directions and degrees to which educational attitudes held by (a) principals, and (b) staffs are associated with the bureaucratization of teacher behavior.

OBJECTIVE 2.3

Explore the nature of causal relationships among the educational attitudes of school personnel, the instructional flexibility of schools and the bureaucratization of teacher behavior by comparing the powers of Model I and Model II to describe the data.

RESEARCH QUESTION 3

What few variables compared with instructional flexibility best predict bureaucratization of teacher behavior?

RESEARCH QUESTION 4

What few variables compared with bureaucratization of teacher behavior best predict instructional flexibility?

THEORETICAL FRAMEWORK

The organizational analysis literature displays a recent strong interest by theoreticians and researchers in relationships between the technologies utilized by organizations and other characteristics of organizations and their personnel, such as the structure of organizations and the morale of employees. The List of References and the Bibliography appended to this report attest to the activity in this field of investigation.

The theoretical framework for this study rested first on a consideration of relationships between the technology and structure of educational organizations in terms of Perrow's "technological imperative" and, second, on a consideration of possible relationships between personnel attitudes and the technology and structure of school organizations.

TECHNOLOGICAL IMPERATIVE

This study utilized the notion of a "technological imperative" as developed by Charles Perrow (1967, 1970, 1972). More specifically, the study focussed on Perrow's formulations regarding the relationship between the routineness of organizational technology and the structure of organizations.

The technological imperative is based on the assumption that the designers of an organization desire efficiency (Perrow, 1970:80). This desire leads to an attempt on the part of the designers to pattern arrangements among personnel so as to facilitate the application of the

organization's technology to the raw material. These patterns of arrangements among personnel, as differentiated from arrangements between (say) personnel and the raw material, form the social structure of an organization (Perrow, 1967:195, 200). According to the technological imperative, the nature of the structural arrangements is dependent on the nature of the technology used to transform the raw material.

Perrow viewed organizations as social systems deliberately constructed to transform raw material. The raw material could be people, symbols or objects (1967:195).

The set of techniques which an organization utilizes to transform raw material was viewed by Perrow as the primary or "core" technology of the organization. For example, the primary technology of a crude oil refinery would consist of the techniques applied to refine the crude oil. According to this view, data processing systems in an oil refinery organization would not be considered the core technology of the organization, whereas they could be considered as such in a data processing organization. (See Thompson, 1967: Chapter 2.)

A major characteristic of organizational technology is the degree to which the transformation of raw material is routinized. According to Perrow's formulation (1970:75-80) the degree of routinization stems from two basic factors related to the knowledge utilized by the organization: the knowledge the organization has of the nature

of the raw material and its knowledge of transformation procedures. High degrees of uncertainty about the nature of the material to be transformed and about the appropriateness of techniques results in technologies characterized by low degrees of routinization. High degrees of certainty about the nature of the material and about the appropriateness of techniques results in technologies with high degrees of routinization. In other words, organizations processing relatively standardized material with techniques known to be effective would tend to have routine technologies. Organizations which process non-standardized material with techniques having uncertain degrees of effectiveness would tend to have non-routine technologies.

Perrow's formulation of the technological imperative links variation in the routineness of organizational technology to variation in structural characteristics of organizations (1970:80-85; see also, Magnusen, 1973). Two of these structural characteristics, bureaucracy and influence, have been included in this study.

The technological imperative states that organizations with less routine technologies will have structures characterized by low degrees of bureaucracy, whereas organizations with more routine technologies will have structures characterized by high degrees of bureaucracy. The distribution of power over work decisions is also held to vary with the routineness of technology. According to the technological imperative, the power of managerial employees will be greater than that of technical level employees in organizations with routine technologies. In organizations with less routine technologies the power of managerial

and technical level employees will be more equal (collegial) and the balance of power will tend to swing in favor of the technical level employees, especially with reference to decisions closely affecting their work procedures.

(The terms technical and managerial as used above are based on the work of Talcott Parsons (1958). Parsons differentiated between three levels of systems within organizations: technical, managerial and institutional. In schools, teachers are at the technical level and principals are at the managerial level of operation. Perrow (1970:80) used a different model when he describes middle managers who are concerned with the administration of production as operating at the technical level, and lower managers concerned with the supervision of production as operating at the supervision level. According to Parson's model, both sets are at the managerial level. Although the terminology is different, Perrow's analysis may be extended on the basis of other research (Crozier, 1964: Chapter 6) to describe not only the power relationships between sets of employees at two levels within the managerial level, but also the nature of the relationships between managerial and technical level employees in organizations which differ in the degree to which their technologies are routinized.)

PERSONNEL ATTITUDES

Perrow's statement of the technological imperative suggests that an organization's technology will tend to become more routine as the organization gains greater knowledge of and control over the variability of the materials to be changed and the transformation procedures.

Increased routineness tends to decrease the influence of employees in the application of an organization's transformation processes to raw material. Complete automation of a transformation process illustrates the extreme case in which the material being changed is not subject to variation in process due to variation in employee performance.

For the most part, the technologies of people-changing organizations are not characterized by the high degrees of routineness characteristic of technologies which have been mechanized and automated (Hasenfeld, 1972; Hasenfeld and English, 1974). This observation is especially valid for educational organizations (March, 1974; Cohen and March, 1974). The technology of educational organizations is thus likely to be highly dependent on certain characteristics of the employees who are directly involved in providing transforming services to clients.

STAFF ATTITUDES

The general notion that employees engaged in tasks characterized by low degrees of routinization are likely to affect the nature of an organization's work processes has received considerable support in previous research.

Reports by Perrow (1970), Crozier (1964), Gouldner (1965), Trist (1963) and Coser (1958), for example, demonstrate that subordinates in organizations with less routine technologies, such as machine maintenance workers, miners, and nurses on medical wards, have comparatively greater amounts of discretion in shaping their work by selecting and applying techniques than do machine tenders, assembly-line workers, mail

clerks, and nurses in operating rooms and surgery wards.

The amount of discretion left to subordinates seems to be a function of the predictability of the steps required to process the raw materials, that is, the degree to which the transformation process has been routinized (Thompson, 1967). Since low predictability (high uncertainty) is strongly associated with low degrees of technological routineness, technical level employees are left with large areas of discretion regarding operating details. Employees with comparatively large areas of discretion have been shown by this line of research to have comparatively greater power within the work unit and other parts of the organization than employees with relatively narrow and well-defined areas of technical discretion.

There is research evidence to support the notion that teachers have wide areas of discretion in many aspects of their work. Pellegrin (1970b; 1976), for example, found that teachers had high degrees of influence in determining issues bearing on the nature of their work processes. As Pellegrin pointed out, his findings are in marked contrast with much of the literature which portrays teachers as being subject to tight bureaucratic regulation and control. Indeed, Pellegrin describes teachers as engaging in "idiosyncratic specialization" (Pellegrin and Stehr, 1971).

In a similar vein, the work of Philip Jackson (1968) has shown that teaching as a work process is characterized by high degrees of unpredictability thereby requiring continual adjustment of attention, plans, schedules and techniques by teachers. Furthermore, Carlson's (1965) observations indicate that even when instruction has been

programmed, certain characteristics of teachers may intrude to modify the instructional technology represented by the program package.

Thus there are both theoretical reasons and research findings which clearly support the general notion that some characteristics of a school's instructional staff are likely to be important in determining the nature of a school organization's work processes, especially its instructional technology.

Since the instructional technology of school organizations is unclear (Thompson, 1967:19; March, 1974) and therefore subject to the direct influence of an instructional staff, it seems likely that the way in which a staff performs its work will be affected by the staff's belief system with respect to education and teaching. In other words, the absence of explicit specification and control procedures will likely result in a staff basing its work decisions on characteristics such as attitude orientations related to the work to be performed rather than a set of organizationally tested and approved procedures. If this line of reasoning is correct and if we assume that an attitude "is an enduring structure of descriptive, evaluative, and exhortative beliefs that predispose the individual to behave selectively toward the referents of the attitude" (Kerlinger and Pedhazur, 1967:9), then we may expect that attitudes held by educational personnel and especially instructional staffs will be systematically associated with the technology and structure of school organizations.

PRINCIPAL ATTITUDES

Contrary to the argument developed to this point regarding the influence of the instructional staff on the technology and structure of school organizations is a view often found in the literature on school organizations and in the conversation of educators and the lay public. This conventional wisdom view holds that a school's arrangements for getting its work done (structure) and the way in which the work is done (technology) is largely a reflection of the school's principal.

Punch (1970), for example, reported that almost 60 percent of the variation in bureaucratization of the structure of the schools he studied could be accounted for by variation in the leader behavior of the principals. His research thus supported the common view captured by the phrase "as goes the principal, so goes the school."

These contrasting views lead to a major empirical question concerning the relative weights which characteristics of the administrators and characteristics of the instructional staffs have in shaping the nature of the technology and structure of educational organizations.

CHAPTER 2

CONCEPTUALIZATION OF VARIABLES AND HYPOTHESES

CHAPTER 2

CONCEPTUALIZATION OF VARIABLES AND HYPOTHESES

CONCEPTUALIZATION OF VARIABLES

This chapter extends the foregoing discussion of the theoretical framework by presenting conceptualizations of each of the major variables used in the study and by outlining the nature of the relationships which the theoretical framework suggests will be found between the variables. The chapter concludes by presenting specific research hypotheses derived from the theoretical framework and the conceptualizations of variables.

TECHNOLOGY

The characteristic of the school organization's instructional technology chosen for investigation in this study was instructional flexibility.

INSTRUCTIONAL FLEXIBILITY

Instructional flexibility was conceptualized and operationalized by Erickson, Hills and Robinson (1970) as representing the response of schools to certain particularistic needs. At the classroom level of the school organization the response is to needs of students. Ten areas of the instructional process which schools might vary in relation to the needs of students were identified by Erickson, Hills and Robinson:

curriculum, instructional materials, instructional methods, learning materials, instructional paces, time spent on subject-matter areas, marking procedures, and general time-allocation schedules.

When viewed in the light of Perrow's formulations regarding technology, instructional flexibility may be taken to represent the degree to which the instructional technology of school organizations is sensitive to variation in the nature of the clients being processed. This perspective is based on Perrow's notion that organizational technology has two components -- the variability of the material being processed and the availability of effective techniques for processing the material. Organizations which process relatively standardized material with effective techniques tend to have routine technologies. Organizations which process non-standardized material with techniques characterized by uncertain degrees of effectiveness tend to have non-routine technologies.

Thus schools with low degrees of instructional flexibility may be viewed as schools which operate as if their students have few particularistic needs and are therefore processed by the school with little or no adaptation in standard instructional techniques and materials. Schools with high degrees of instructional flexibility may be viewed as schools which operate as if their students have many particularistic needs which necessitate a continual search for, and adaptation of, suitable techniques and materials.

In other words, instructional flexibility was used in this study as an indicator of the degree to which a school's instructional technology was routinized with high flexibility indicating low

routinization, and low flexibility indicating high routinization.

STRUCTURE

The characteristics of the organizational structure of schools chosen for investigation in this study were bureaucracy and influence.

BUREAUCRACY

Hall's (1961) examination of the literature on bureaucracy revealed six dimensions for which he found empirical support. These were defined by Hall (1963:95) as follows:

- (1) Hierarchy -- the extent to which the locus of decision making is prestructured by the organization.
- (2) Division of labor -- the extent to which work tasks are subdivided by functional specialization decided by the organization.
- (3) Rules -- the degree to which the behavior of organizational members is subject to organizational control.
- (4) Procedures -- the extent to which organizational members must follow organizationally defined techniques in dealing with situations which they encounter.
- (5) Impersonality -- the extent to which both organizational members and outsiders are treated without regard to individual qualities.
- (6) Technical competence -- the extent to which organizationally defined universalistic standards are utilized in the selection and advancement process.

Research by MacKay (1964, 1969) revealed that the six dimensional framework was not fully substantiated by data from school organizations. MacKay reported that a two-factor framework, one "bureaucratic" and the other "abureaucratic", seemed more appropriate for school structure than the six dimensional model developed by Hall. Subsequent studies by Robinson (1966), Mansfield (1967), Kolesar (1967), Punch (1967, 1969), and Isherwood and Hoy (1972) have clarified and confirmed the nature of the two dimensions discovered by MacKay.

In brief, Punch's study of elementary schools led him to conclude that "Bureaucratic structure in schools is realistically conceptualized as a unitary homogeneous variable only if restricted to the dimensions of hierarchy of authority, rules for incumbents, procedural specifications and impersonality" (1969:53). The second composite dimension, professionalization, was found by Punch to be composed of the remaining two of Hall's original six dimensions, specialization and technical competence. The Isherwood and Hoy study of secondary schools tended to confirm Punch's findings. They concluded that their research supported a notion professed by Gouldner; that is, the organizational structure of schools seems based in "a dualistic notion of authority rather than in a monocratic one" (Isherwood and Hoy, 1972:50).

Given these research findings, it was decided to restrict a consideration of bureaucracy to four of Hall's dimensions. Thus bureaucracy as used in this study refers to the degree to which the structure of a school is characterized by hierarchy of authority, rules, procedural specifications, and impersonality. Furthermore, as pointed

out in the following section regarding the measurement of bureaucracy, in this study the term refers to the degree to which instructional personnel behave as if governed by these four dimensions.

Perrow's theoretical formulations and the results of related research indicate that effective organizations have organizational structures which are congruent with the nature of their primary technologies. Organizations with highly routinized technologies tend to achieve their goals most effectively when their structures are highly bureaucratized. Structures with low degrees of bureaucratization seem most appropriate for technologies with low degrees of routinization. (Perrow, 1972:166-7).

If we follow Perrow (1970:80) and assume that school personnel seek an optimum match between the technology and structure of their organizations, we may expect to find that schools with instructional programs evidencing high degrees of flexibility are likely to be schools which are less bureaucratized than schools characterized by low degrees of instructional flexibility.

This line of reasoning suggests that schools with high degrees of instructional flexibility (i.e., low routinization) are likely to be schools which de-emphasize dimensions of bureaucracy such as hierarchy of authority, the use of rules, the specification of procedures, and an impersonal approach to relationships.

Conversely, schools which have low degrees of instructional flexibility and which treat students according to universalistic as opposed to particularistic criteria, are likely to be schools in which heavy emphasis is placed on the formal hierarchy of authority, the use

of rules to govern the behavior of teachers and students, the specification of procedures by superordinates, and the maintenance of impersonality in relationships between principal, staff and students.

INFLUENCE

Influence in this study refers to the degree to which specific actors and groups of actors, internal and external to the school, are perceived as having (or ascribe to themselves as having) influence bearing on school-wide and classroom matters. That is, the degree to which the principal, instructional staff, and others external to the school, are perceived to (or believe they themselves) affect the outcome of decisions thought to be central to the work of the school organization.

The power and influence of employees at various levels in an organization has previously been shown to be associated with the nature of the organization's technology. (See Perrow, 1970; Crozier, 1964; Gouldner, 1965; Trist, 1963; Coser, 1958.) Perrow's paradigm suggests that the more routinized the technology, the more likely that decision-making related to work-process matters will be centralized at managerial levels in the hierarchy. Thus technical-level employees in organizations with highly routinized technologies will tend to have smaller areas of discretion and correspondingly less power and influence over the nature of their work processes than technical-level employees in organizations with technologies characterized by low degrees of routinization.

These notions are consistent with the previous discussion regarding bureaucratization and lead us to expect that the distribution

of power and influence in schools will be systematically related to instructional flexibility. In general, we may expect that administrators have a stronger influence over classroom and school-wide matters in schools with low degrees of instructional flexibility than in those with high degrees of instructional flexibility. Conversely, we may also expect that teachers will have more influence over classroom and school-wide matters in schools with high degrees of instructional flexibility. Furthermore, the influence structure in schools with high degrees of instructional flexibility is likely to be collegial in nature, whereas the influence structure of schools with low degrees of instructional flexibility is likely to be characterized by the traditional administrator dominated model. Collegiality would be evidenced by diminished administrator influence and increased teacher influence over (a) classroom matters such as administering school rules and regulations in the classroom, grouping students, curriculum (lesson) planning, teaching activities and the control and discipline of students in the classroom, and (b) school-wide matters such as determining school goals, rules and regulations, grading practices, general curriculum, and discipline practices.

PERSONNEL ATTITUDES

As outlined earlier, there are theoretical reasons and research observations which indicate that attitude orientations held by school personnel may be systematically associated with the technology and structure of school organizations. Two sets of attitude orientations

were chosen for examination in this study. The first set contains two general attitude orientations toward education and the second set contains five orientations towards teaching processes.

GENERAL ATTITUDE ORIENTATIONS TOWARD EDUCATION

John Dewey in 1902 outlined two fundamental points of view on education that have since been called "progressivism" and "traditionalism". A series of empirical investigations of the nature and structure of educational attitudes by Kerlinger and his associates have determined that two relatively uncorrelated factors underlie educational attitudes and that these two factors closely resemble Dewey's descriptions of progressivism and traditionalism (Kerlinger and Pedhazur, 1967).

People having progressive or traditional orientations have different criterial standards by which they judge the relevance, significance, and importance of ideas and behaviors associated with education. The educational attitudes of the progressive cluster around such criterial referents as child needs, individual differences, and social learning. The educational attitudes of the traditionalist, on the other hand, cluster around such criterial referents as discipline, subject matter, and moral standards. Thus we can view an individual's educational attitude as being based upon the educational referents that are criterial for him or her. In the case of progressive and traditional orientations toward education, referents criterial to the progressive have been shown to be not usually criterial to the traditionalist.

Kerlinger's work has demonstrated that the conceptions of traditional and progressive as orientations toward education are dualistic, not bi-polar (Kerlinger and Pedhazur, 1967:10):

With educational attitudes, this means that there are progressives and traditionalists and these two dimensions are not two aspects of one dimension, one linear continuum; they are rather, attitude-belief systems in their own rights. Progressive is not the opposite of traditional, nor is traditional the opposite of progressive. In short, the progressive is not necessarily an anti-traditionalist, nor is the traditionalist necessarily an anti-progressive.

Since progressives seem to focus on the particularistic nature of the students processed by schools whereas traditionalists tend to focus on the universalistic characteristics of students, the theoretical framework of this study suggested that the instructional flexibility of schools would increase with stronger orientations toward progressivism and decrease with stronger orientations toward traditionalism.

TEACHING PROCESS ORIENTATIONS

Whereas Kerlinger's work was directed toward establishing the structure of general attitude orientations toward education, Wehling and Charters (1969) focussed on determining the dimensions of teacher beliefs about the teaching process. They noted that many studies of teacher orientation toward the classroom employed measures of pre-conceived attitudinal dimensions. In contrast to the previous work, Wehling and Charters concentrated on investigating the general order

of dimensionality in the domain of belief systems regarding the classroom teaching-learning process.

By utilizing a factor analytic approach which attempted to achieve a broad coverage of the domain of classroom teaching and learning, Wehling and Charters found that the conceptual systems of teachers regarding teaching processes "are complex organizations of beliefs, consisting of several discrete sets of inter-related concepts." (1969:8) Their investigation and description of the fundamental dimensions within the belief systems of teachers led Wehling and Charters to speculate that the dimensions provide "a rational basis for hypothesizing some of the patterns of behavior which the various conceptions of the teaching-learning process tend to mediate" (1969:9).

The research by Wehling and Charters was directed toward the eventual establishment of relationships between teacher belief systems and corresponding teacher behavior. Their work thus seemed well suited to the basic theoretical position taken in this study regarding the expected influence of personnel attitudes on the instructional technology of schools.

Based on several analyses, Wehling and Charters found eight distinct and relatively independent dimensions of teacher beliefs about the teaching process. The dimensions did not appear to be idiosyncratic to particular populations or methods of study (1969:1). Five of the dimensions were chosen for inclusion in this investigation. The brief descriptions of these dimensions which follow have been adapted from those provided by Wehling and Charters (1969).

- (1) Subject-matter Emphasis. A subject-matter emphasis orientation represents the degree to which the staff of the school believes that the subject-matter content of the course--the facts and information, skills, principles, and disciplines of thought--has educational value in and of itself. Thus school personnel having this orientation feel that students must master the course content.
- (2) Personal Adjustment Ideology. A personal adjustment ideology orientation reflects the degree to which the staff believes that the instructional process should be organized around student interests and needs in order to contribute to social and emotional development. A central ingredient of this orientation is the belief that school personnel take an intense interest in students and their problems.
- (3) Student Autonomy vs. Teacher Control. The student autonomy vs. teacher control dimension was the only bi-polar factor regularly found by Wehling and Charters in the analysis of their data. An orientation toward this factor reflects the school personnel's conception of the proper locus of control over the classroom learning process--lying either with the students or with the teachers. Thus either the personnel feel they must guide and direct the flow of instructional events or they believe the initiative must be taken by the students and that students must then be accorded substantial autonomy and freedom from teacher direction. This orientation is taken to reflect the amount of faith the personnel have in the school's students and their capacity for spontaneous learning.

- (4) Consideration of Student Viewpoint. This orientation reflects the degree to which school personnel accept the use of empathy as an instructional strategy. Personnel having a strong orientation toward empathy feel that teachers must have the capacity to consider the student's perspective on the world and the capacity to give students warmth and personal support as needed. Such personnel emphasize the view that teachers should be sensitive to the feelings of students and that they should display friendliness and consideration in student-teacher relations.
- (5) Classroom Order. This orientation reflects the degree to which school personnel believe in the need to conduct classes according to established rules and procedures with quick punishment for students who depart from the rules. This orientation also stresses the need for the elimination of nonsense, noise, and distractions. The best learning situation, according to this view, is one in which there is a high degree of order and decorum in the classroom.

The theoretical framework of this study suggested that the instructional flexibility of schools would increase with stronger personnel orientations toward Personal Adjustment, Student Autonomy, and Consideration of Student Viewpoint, and that it would decrease with stronger orientations toward Subject-Matter Emphasis, and Classroom Order.

HYPOTHESES

This section specifies hypotheses which were delineated for investigation by this study. The hypotheses were based on the theoretical framework and conceptualization of variables as outlined earlier and the author's intuitive understanding of school organizations. They were developed to serve as guides for this study's exploration of the nature of school organizations.

The hypotheses predict relationships among aspects of the three major variables used in the study, that is, the educational attitudes of school personnel, the flexibility (routineness) of instructional technology and the organizational structure of schools. For reference purposes the hypotheses are grouped in terms of their relation to the research questions and objectives outlined earlier.

TECHNOLOGY-STRUCTURE HYPOTHESES

The following hypotheses relating the technology and structure of school organizations were designed to inform Research Question 1 which asked: Is there evidence that the technological imperative operates in educational organizations?

INSTRUCTIONAL FLEXIBILITY AND BUREAUCRACY

H₁ The more flexible the school's instructional technology, the less bureaucratized the school's organizational structure.

INSTRUCTIONAL FLEXIBILITY AND INFLUENCE

Influence Over School-wide Matters

- H₂ The more flexible the school's instructional technology, the greater the self-influence of teachers over school-wide matters.
- H₃ The more flexible the school's instructional technology, the greater the influence of teacher colleagues over school-wide matters.
- H₄ The more flexible the school's instructional technology, the less the principal's influence exceeds that of teacher colleagues.
- H₅ The more flexible the school's instructional technology, the less the influence of external actors over school-wide matters.

Influence Over Classroom Matters

- H₆ The more flexible the school's instructional technology, the greater the self-influence of teachers over classroom matters.
- H₇ The more flexible the school's instructional technology, the greater the influence of teacher colleagues over classroom matters.
- H₈ The more flexible the school's instructional technology, the less the principal's influence over classroom matters exceeds that of teacher colleagues.
- H₉ The more flexible the school's instructional technology, the less the influence of external actors over classroom matters.

PERSONNEL-TECHNOLOGY HYPOTHESES

The following hypotheses relating educational attitudes held by principals and staffs to the flexibility of instructional technology were designed to inform Research Question 2 which asked in part: What relative weights may be assigned to characteristics of instructional and supervisory personnel regarding their association, if any, with instructional flexibility?

PRINCIPAL ATTITUDES AND INSTRUCTIONAL FLEXIBILITY

General Attitudes

- H₁₀ The more traditional the principal's general attitude toward education, the less flexible the school's instructional technology.
- H₁₁ The more progressive the principal's general attitude orientation toward education, the more flexible the school's instructional technology.

Teaching Process Orientations

- H₁₂ The stronger the principal's attitude orientation toward a subject-matter emphasis, the less flexible the school's instructional technology.
- H₁₃ The stronger the principal's pupil adjustment ideology, the more flexible the school's instructional technology.

- H₁₄ The stronger the principal's orientation toward student autonomy, the more flexible the school's instructional technology.
- H₁₅ The stronger the principal's orientation toward the consideration of student viewpoints, the more flexible the school's instructional technology.
- H₁₆ The stronger the principal's orientation toward classroom order, the less flexible the school's instructional technology.

STAFF ATTITUDES AND INSTRUCTIONAL FLEXIBILITY

General Attitudes Toward Education

- H₁₇ The more traditional the staff's general attitude orientation toward education, the less flexible the school's instructional technology.
- H₁₈ The more progressive the staff's general attitude orientation toward education, the more flexible the school's instructional technology.

Teaching Process Orientations

- H₁₉ The stronger the staff's attitude orientation toward a subject matter emphasis, the less flexible the school's instructional technology.
- H₂₀ The stronger the staff's pupil adjustment ideology, the more flexible the school's instructional technology.

- H₂₁ The stronger the staff's orientation toward student autonomy, the more flexible the school's instructional technology.
- H₂₂ The stronger the staff's orientation toward the consideration of student viewpoints, the more flexible the school's instructional technology.
- H₂₃ The stronger the staff's orientation toward classroom order, the less flexible the school's instructional technology.

PERSONNEL-STRUCTURE HYPOTHESES

The following hypotheses relating educational attitudes held by principals and staffs to structural characteristics of school organizations were designed to inform Research Question 2 which asked in part: What relative weights may be assigned to characteristics of supervisory and instructional personnel regarding their association, if any, with organizational structure?

PRINCIPAL ATTITUDES AND BUREAUCRACY

General Attitudes Toward Education

- H₂₄ The more traditional the principal's general attitude orientation toward education, the more bureaucratized the school's organizational structure.
- H₂₅ The more progressive the principal's general attitude orientation toward education, the less bureaucratized the school's organizational structure.

Teaching Process Orientations

- H₂₆ The stronger the principal's orientation toward a subject matter emphasis, the more bureaucratized the school's organizational structure.
- H₂₇ The stronger the principal's pupil adjustment ideology, the less bureaucratized the school's organizational structure.
- H₂₈ The stronger the principal's orientation toward student autonomy, the less bureaucratized the school's organizational structure.
- H₂₉ The stronger the principal's orientation toward the consideration of student viewpoints, the less bureaucratized the school's organizational structure.
- H₃₀ The stronger the principal's orientation toward classroom order, the more bureaucratized the school's organizational structure.

STAFF ATTITUDES AND BUREAUCRACY

General Attitudes Toward Education

- H₃₁ The more traditional the staff's general attitude orientation toward education, the more bureaucratized the school's organizational structure.
- H₃₂ The more progressive the staff's general attitude orientation toward education, the less bureaucratized the school's organizational structure.

Teaching Process Orientations

- H₃₃ The stronger the staff's orientation toward a subject matter emphasis, the more bureaucratized the school's organizational structure.
- H₃₄ The stronger the staff's pupil adjustment ideology, the less bureaucratized the school's organizational structure.
- H₃₅ The stronger the staff's orientation toward student autonomy, the less bureaucratized the school's organizational structure.
- H₃₆ The stronger the staff's orientation toward the consideration of student viewpoints, the less bureaucratized the school's organizational structure.
- H₃₇ The stronger the staff's orientation toward classroom order, the more bureaucratized the school's organizational structure.

PART II
METHODOLOGY

CHAPTER 3
INSTRUMENTS

CHAPTER 3

INSTRUMENTS

This chapter presents the instruments used to measure the variables discussed earlier and briefly reviews their characteristics as determined in previous studies. In addition to instruments for the measurement of variables related in the hypotheses and theoretical framework, this chapter presents the survey questions which were used to measure background variables which might have affected the hypothesized relationships.

TECHNOLOGY

INSTRUCTIONAL FLEXIBILITY

The flexibility of a school's instructional technology was measured by the Instructional Flexibility Scale (IF Scale). The development of the IF Scale was described by Erickson, Hills and Robinson (1970) in Educational Flexibility in an Urban School District. The following discussion is restricted to a general description of the IF Scale, data regarding its validity and reliability, and a comment concerning a modification of the instrument.

The IF Scale is a Likert-type questionnaire which asks teachers to state the degree to which they agree or disagree with ten statements describing the way most teachers in their school adjust instructional techniques in relation to the needs of students.

The construct validity of the IF Scale was indicated by the results of tests conducted by Erickson, Hills and Robinson. They obtained statistically significant results ($p < .01$) from Chi Square tests of the independence of ratings supplied by a panel of superordinates familiar with the elementary schools studied and teacher responses to the IF Scale for both a purposive and a random sample of the schools. In addition, factor analysis of responses to the IF Scale demonstrated that all ten items loaded consistently and fairly high (.58 to .78).

Robinson (1973) reported the reliability of the IF Scale as $r = .937$.

The response format of the IF Scale was modified for this study. The five categories used by Erickson, Hills and Robinson (strongly agree, tend to agree, maybe and maybe not, tend to disagree, strongly disagree) were changed to a six point scale anchored at the low end with "strongly disagree" and at the high end with "strongly agree."

The Instructional Flexibility Scale as used in this study is presented below.

Instructional Flexibility Scale

This section contains questions about how teachers approach their work with students. Based on your best professional judgement, please indicate the extent to which you agree that the statements accurately describe the way most teachers in this school approach

their work.

Please indicate your judgement by writing one number from this scale on the line to the left of each statement.

1	2	3	4	5	6
Strongly Disagree	Moderately Disagree	Mildly Disagree	Mildly Agree	Moderately Agree	Strongly Agree

Most teachers in This School

- ___ 1. Modify curriculum content to suit the backgrounds and abilities of their students.
- ___ 2. Use instructional materials (including textbooks, workbooks, films, etc.) that are appropriate for their students.
- ___ 3. Use instructional methods well suited to their students.
- ___ 4. Have most of their students learning at the pace best suited to them.
- ___ 5. Adjust marking and reporting procedures to suit the specific conditions they face at the time.
- ___ 6. Vary the relative amount of time spent on different subject matter areas in accordance with the state of learning of their students.
- ___ 7. Readily depart from scheduled activities to take advantage of unforeseen opportunities.
- ___ 8. Handle disciplinary problems in the way that seems best for the students involved.

- ___ 9. Modify achievement standards to correspond with the abilities of their students.
- ___ 10. Have most of their students working with materials suited to their ability level.
-

STRUCTURE

As noted earlier, this study included measurements of two aspects of organizational structure, bureaucracy and influence. Influence was assessed with respect to influence over school-wide matters and influence over classroom matters.

BUREAUCRACY

The instrument used to measure bureaucracy was referred to as The Bureaucratization of Teacher Behavior (BTB) Scale. The BTB Scale was part of a larger instrument referred to as The Teacher Behavior Questionnaire which was based on The School Organizational Inventory first developed by MacKay (1964) and later refined by Punch (1967; 1969). Two modifications were made to Punch's instrument and new instructions were provided to create the Teacher Behavior Questionnaire which, upon analysis yielded the Bureaucratization of Teacher Behavior Scale.

MODIFICATION OF ITEMS

The most extensive modification consisted of rewording many of the 48 items in Punch's School Organization Inventory so that each item explicitly referred to the behavior of teachers within the school. For

example, the item "Students are treated within the rules of the school, no matter how serious a problem they have," was changed to read as follows: "Teachers in this school treat students within the rules of the school, no matter how serious a problem a student may have." These revisions were designed to narrow the referent for respondents from general and sometimes seemingly ambiguous descriptions of organizational characteristics to specific behaviors of teachers. The focus of the School Organizational Inventory was thereby refined from a general description of the degree to which the organizational structure of schools was bureaucratized and professionalized to a more direct description of the degrees to which the behavior of teachers was bureaucratized and professionalized. It was held that the nature of school structure could then be inferred from the obtained description of teacher behaviors, insofar as the structure consisted of the patterned behavior of teachers.

MODIFICATION OF RESPONSE SCALE

The response scale used by Punch asked respondents to circle one of the following five responses: A = VERY FREQUENTLY or ALWAYS true; B = OFTEN true; C = OCCASIONALLY true; D = SELDOM true; and E = VERY RARELY or NEVER true. The Teacher Behavior Questionnaire provided the following instructions and six-point rating scale.

As mentioned earlier, the findings of previous researchers led the author to restrict the measurements of bureaucratization of teacher behavior to those items forming the subscales of hierarchy, rules,

specifications and impersonality. The remaining two subscales, division of labor and technical competence, as modified by the author were referred to as the Professionalization of Teacher Behavior (PTB) Scale. The PTB Scale was not used in the analyses of relationships reported later in this study. However, the complete Teacher Behavior Questionnaire composed of items for both The Bureaucratization of Teacher Behavior Scale and the Professionalization of Teacher Behavior Scale is presented below because, as reported later, the BTB Scale was constructed from an analysis of responses to all items.

Teacher Behavior Questionnaire (TBQ)

Subscales: Hierarchy (I); Division of Labor (II); Rules (III); Specifications (IV); Impersonality (V); and Technical Competence (VI).

Instructions:

This section is concerned with the work of teachers and the school in which they work. Please indicate the extent to which you agree or disagree that the following statements accurately describe most teachers in this school.

Please indicate your response by writing one number from this scale on the line to the left of each statement.

1	2	3	4	5	6
Strongly Disagree	Moderately Disagree	Mildly Disagree	Mildly Agree	Moderately Agree	Strongly Agree

Item No.	Subscale	Reflect (R)	Item
1	I		Teachers in this school know they are supposed to get approval for decisions they make.
2	III		Teachers in this school strictly follow the rules stating when to arrive at and depart from the building.
3	VI	R	Teachers in this school receive promotions or favorable evaluations based on how well they are liked.
4	II	R	Teachers in this school are required to sponsor extra-curricular activities for which they have no suitable background or interest.
5	III	R	Teachers in this school are strictly regulated in terms of time for informal get-togethers during the school day.
6	IV		Teachers in this school are bothered by "red tape" in getting their work done.

Item No.	Subscale	Reflect (R)	Item
7	V	R	Teachers in this school have the opportunity to engage in social get-togethers sponsored by the school.
8	II		Teachers in this school receive help from the custodial staff in setting up audio-visual equipment.
9	I	R	Teachers in this school do almost as they please in classroom/area work.
10	V		Teachers in this school treat students within the rules of the school, no matter how serious a problem a student may have.
11	VI	R	Teachers in this school know they haven't much of a chance for a promotion or favorable evaluation unless they are "in" with the administration.
12	IV		Teachers in this school follow strict operating procedures at all times.
13	I		Teachers in this school who want to make their own decisions quickly become discouraged.

Item No.	Subscale	Reflect (R)	Item
14	III		Teachers in this school follow a set of rules and regulations.
15	II	R	Teachers in this school prepare their own stencils for classroom use.
16	IV		Teachers in this school feel it is important to go through proper channels.
17	VI	R	Teachers in this school are assigned teaching duties without regard for their training or qualifications.
18	V	R	Teachers in this school attend staff meetings which proceed in a friendly and informal manner.
19	II	R	Teachers in this school do a lot of paper work which could be done by a school office staff.
20	I		Teachers in this school refer even small matters to someone higher up for a final answer.
21	VI		Teachers in this school are periodically evaluated for competence in their work.

Item No.	Subscale	Reflect (R)	Item
22	IV		Teachers in this school use the same uniform methods and procedures in their classroom/area work.
23	V		Teachers in this school work in a school that has standard punishments for the usual student offenses and student behavior problems, regardless of the individual student involved.
24	I		Teachers in this school take little action until decisions are approved.
25	II		Teachers in this school work within specific subject areas of a departmentalized instructional program.
26	III		Teachers in this school do not leave their classes during class periods unless they have permission.
27	IV		Teachers in this school go to the same person for an answer whenever they have a problem with their work.

Item No.	Subscale	Reflect (R)	Item
28	V		Teachers in this school treat pupils and parents the same as anyone else, no matter how special a pupil's or parent's problem may be.
29	VI		Teachers in this school work in a school which keeps a record of every staff member's performance.
30	II		Teachers in this school refer discipline problems to a specific person within the school.
31	III	R	Teachers in this school know that nothing will be said to them if they get to school just before class time or leave right after dismissal.
32	V		Teachers in this school have formal and impersonal relationships with each other.
33	I		Teachers in this school cannot get necessary supplies without permission from the principal, the vice-principal, or some other designated person.

Item No.	Subscale	Reflect (R)	Item
34	III		Teachers in this school follow orders from their superiors in the school unquestioningly.
35	IV		Teachers in this school follow standard procedures in dealing with most situations which arise.
36	I	R	Teachers in this school make their own decisions without checking with anyone else.
37	III		Teachers in this school are careful not to violate the rules.
38	IV		Teachers in this school follow clearly specified procedures for doing their work.
39	VI	R	Teachers in this school know that teachers are hired, selected, or not transferred from the school simply because they have attractive personalities.
40	I		Teachers in this school ask someone higher up before they do almost anything.

Item No.	Subscale	Reflect (R)	Item
41	III		Teachers in this school are aware of rules regarding their behavior in and around the school.
42	I	R	Teachers in this school feel they are their own boss in most matters related to their work.
43	II	R	Teachers in this school are involved in a variety of tasks and responsibilities from day to day.
44	V	R	Teachers in this school have fun socializing together during school time.
45	IV	R	Teachers in this school experiment with procedures for teaching and other school work.
46	V	R	Teachers in this school have other staff members at this school as their closest friends.
47	I	R	Teachers in this school work in a school that leaves how things are done in the classroom up to the individual teacher.

Item No.	Subscale	Reflect (R)	Item
48	VI		Teachers in this school receive promotions or favorable evaluations that are <u>not</u> based on personal preferences of their superiors, but on an objective evaluation of their teaching capabilities.

INFLUENCE

INFLUENCE OVER SCHOOL-WIDE MATTERS

The perceived influence of various actors over school-wide matters was measured by an instrument developed by the author from one utilized by Meyer and Cohen (1971).

The Influence Over School-wide Matters (IOSM) Questionnaire requested school personnel to use a six point scale to rate the influence of each of four actors with regard to five school-wide matters. The four sources of influence were; the respondent himself (Self IOSM), other members of the instructional staff excluding the principal (Colleague IOSM), the principal (Principal IOSM), and actors external to the school such as parents, central office officials and trustees (External IOSM). The six point response format ranged from "Very Little Influence" to "Supreme Influence."

The IOSM Questionnaire as administered in this study is presented below.

Influence Over School-wide Matters (IOSM) Questionnaire

This section is concerned with the influence that different people may have over matters pertaining to your school-wide work. How much influence do the groups and individuals indicated below have over your work in this school with respect to the five school-wide matters listed below?

Please indicate your response by writing one number from this scale on the line to the left of each of the indicated individuals or groups.

1	2	3	4	5	6
Very Little Influence	Little Influence	Moderate Influence	Considerable Influence	Very Much Influence	Supreme Influence

1. Influence over determining educational goals and activities for this school.

_____ (1a). The influence of yourself.

_____ (1b). The influence of other staff members, excluding the principal.

_____ (1c). The influence of the principal.

_____ (1d). The influence of people external to the school such as parents, central office personnel, trustees, etc.

2. Influence over establishing rules and regulations for this school.

_____ (2a). The influence of yourself.

_____ (2b). The influence of other staff members, excluding the principal.

_____ (2c). The influence of the principal.

_____ (2d). The influence of people external to the school such as parents, central office personnel, trustees, etc.

3. Influence over determining student grading practices for this school.

_____ (3a). The influence of yourself.

- _____ (3b). The influence of other staff members, excluding the principal.
- _____ (3c). The influence of the principal.
- _____ (3d). The influence of people external to the school such as parents, central office personnel, trustees, etc.
4. Influence over planning the general curriculum for this school.
- _____ (4a). The influence of yourself.
- _____ (4b). The influence of other staff members, excluding the principal.
- _____ (4c). The influence of the principal.
- _____ (4d). The influence of people external to the school such as parents, central office personnel, trustees, etc.
5. Influence over determining student control and discipline practices for this school.
- _____ (5a). The influence of yourself.
- _____ (5b). The influence of other staff members, excluding the principal.
- _____ (5c). The influence of the principal.
- _____ (5d). The influence of people external to the school such as parents, central office personnel, trustees, etc.
-

INFLUENCE OVER CLASSROOM MATTERS

The Influence Over Classroom Matters (IOCM) Questionnaire was identical in development and design to the IOSM Questionnaire except that the IOCM Questionnaire focused on five matters pertaining to the classroom.

The IOCM Questionnaire is presented below.

 Influence Over Classroom Matters (IOCM) Questionnaire

The section is concerned with the influence that different people may have over matters pertaining to your classroom/area work. How much influence do the groups and individuals indicated below have over your work in this school with respect to the five classroom/area matters listed below?

Please indicate your response by writing one number from this scale on the line to the left of each of the individuals and groups.

1	2	3	4	5	6
Very Little Influence	Little Influence	Moderate Influence	Considerable Influence	Very Much Influence	Supreme Influence

1. Influence over your activities in administering the school rules and regulations in your classroom/area.

_____ (1a). The influence of yourself.

_____ (1b). The influence of other staff members, excluding the principal.

_____ (1c). The influence of the principal.

- _____ (1d). The influence of people external to the school such as parents, central office personnel, trustees, etc.
2. Influence over your activities in grouping students in the class/room/area for instruction.
- _____ (2a). The influence of yourself.
- _____ (2b). The influence of other staff members, excluding the principal.
- _____ (2c). The influence of the principal.
- _____ (2d). The influence of people external to the school such as parents, central office personnel, trustees, etc.
3. Influence over your activities in planning the curriculum for your classroom/area.
- _____ (3a). The influence of yourself.
- _____ (3b). The influence of other staff members, excluding the principal.
- _____ (3c). The influence of the principal.
- _____ (3d). The influence of people external to the school such as parents, central office personnel, trustees, etc.
4. Influence over your activities in teaching specific lessons, classes, or groups in the classroom/area.
- _____ (4a). The influence of yourself.
- _____ (4b). The influence of other staff members, excluding the principal.

- _____ (4c). The influence of the principal.
- _____ (4d). The influence of people external to the school such as parents, central office personnel, trustees, etc.
5. Influence over your activities in controlling and disciplining students in your classroom/area.
- _____ (5a). The influence of yourself.
- _____ (5b). The influence of other staff members, excluding the principal.
- _____ (5c). The influence of the principal.
- _____ (5d). The influence of people external to the school such as parents, central office personnel, trustees, etc.
-

PERSONNEL ATTITUDES

GENERAL ATTITUDE ORIENTATIONS TOWARD EDUCATION

The general attitude orientations toward education held by the school personnel studied were measured by using the Education Scale VII (ES-VII), the development of which has been described by Kerlinger and Pedhazur (1967).

The ES-VII is a 30 item, seven-point, summated rating scale with 15 items measuring Progressivism and 15 items measuring Traditionalism. As reported by Kerlinger and Pedhazur (1967), the criteria for item selection was item-total r's equal to or greater than .35, substantial factor loadings on one factor and one factor only, and

representativeness of educational content. In a study of four samples they reported that alpha reliabilities of the ES-VII ranged from .71 to .80, with a median of .76 for the Progressivism Scale and from .69 to .82, with a median of .76 for the Traditionalism Scale.

The ES-VII Questionnaire is presented below.

ES-VII Questionnaire

This section contains statements on educational ideas and problems about which we all have beliefs, opinions, and attitudes. We all think differently about such matters. Please express your own beliefs and opinions. Do not spend too much time on any one statement; go rapidly but carefully.

Write +1, +2, +3, for agreement, or -1, -2, -3, for disagreement -- depending on how you feel in each case.

-3	-2	-1	+1	+2	+3
Disagree Very Strongly	Disagree Strongly	Disagree	Agree	Agree Strongly	Agree Very Strongly

- _____ 1. Learning is essentially a process of increasing one's store of information about the various fields of knowledge.
- _____ 2. The curriculum consists of subject matter to be learned and skills to be acquired.
- _____ 3. The learning of proper attitudes is often more important than the learning of subject matter.
- _____ 4. It is more important that the child learn how to approach and solve problems than it is for him to master the subject

matter of the curriculum.

- _____ 5. The true view of education is so arranging learning that the child gradually builds up a storehouse of knowledge that he can use in the future.
- _____ 6. What is needed in the modern classroom is a revival of the authority of the teacher.
- _____ 7. Teachers should keep in mind that pupils have to be made to work.
- _____ 8. Schools of today are neglecting the three R's.
- _____ 9. Standards of work should not be the same for all pupils; they should vary with the pupil.
- _____ 10. The goals of education should be dictated by children's interests and needs, as well as by the demands of society.
- _____ 11. Each subject and activity should be aimed at developing a particular part of the child's makeup; physical, intellectual, social, moral, or spiritual.
- _____ 12. Right from the very first grade, teachers must teach the child at his own level and not at the level of the grade he is in.
- _____ 13. Teachers need to be guided in what they are to teach. No individual teacher can be permitted to do as he wishes, especially when it comes to teaching children.
- _____ 14. Learning experiences organized around life experiences rather than around subjects is desirable in our schools.
- _____ 15. We should fit the curriculum to the child and not the child to the curriculum.

- _____ 16. Subjects that sharpen the mind, like mathematics and foreign languages, need greater emphasis in the public school curriculum.
- _____ 17. Since life is essentially a struggle, education should emphasize competition and the fair competitive spirit.
- _____ 18. The healthy interaction of pupils one with another is just as important in school as the learning of subject matter.
- _____ 19. The organization of instruction and learning must be centered on universal ideas and truths if education is to be more than passing fads and fancies.
- _____ 20. The curriculum should contain an orderly arrangement of subjects that represent the best of our cultural heritage.
- _____ 21. True discipline springs from interest, motivation, and involvement in live problems.
- _____ 22. Emotional development and social development are as important in the evaluation of pupil progress as academic achievement.
- _____ 23. Education and educational institutions must be sources of new social ideas.
- _____ 24. Children should be taught that all problems should be subjected to critical and objective scrutiny, including religious, moral, economic, and social problems.
- _____ 25. One of the big difficulties with modern schools is that discipline is often sacrificed to the interests of children.

- _____ 26. Teachers should encourage pupils to study and criticize our own and other economic systems and practices.
 - _____ 27. Children need and should have more supervision and discipline than they usually get.
 - _____ 28. Schools should teach children dependence on higher moral values.
 - _____ 29. The public school should take an active part in stimulating social change.
 - _____ 30. Learning is experimental; the child should be taught to test alternatives before accepting any of them.
-

TEACHING PROCESS ORIENTATIONS

The attitudes of school personnel toward selected teaching processes were measured by using a modified version of an instrument developed by Wehling and Charters (1969). This study refers to the instrument as the Teaching Process Orientations (TPO) Questionnaire.

The TPO Questionnaire has five dimensions: Subject-Matter Emphasis (SME); Pupil Adjustment Ideology (PAI); Student Autonomy vs Teacher Direction (SA vs TD); Consideration of Student Viewpoint (CSV); and Classroom Order (CO). The TPO Questionnaire utilizes a six-point summated rating scale.

Factor analyses conducted by Wehling and Charters (1969) indicated that the five dimensions of the TPO Questionnaire were relatively independent and were not likely to be idiosyncratic to

particular populations or methods of study.

The TPO Questionnaire is presented below.

Teaching Process Orientations (TPO) Questionnaire

Would you please give your views on the various educative processes included in the items below (six-point scale).

Strongly Disagree 1 2 3 4 5 6 Strongly Agree

- _____ 1. Teaching of the specific skills and factual subject matter is the most important function of the school.
- _____ 2. The backbone of the school curriculum is subject matter; activities are useful mainly to facilitate the learning of subject matter.
- _____ 3. Pupil failure is averted when mastery of subject matter is the prime requisite for promotion.
- _____ 4. The overall plan of education suffers when teachers depart substantially from the subject outline.
- _____ 5. The structure of a field of knowledge is intrinsically interesting to pupils when it is clearly taught.
- _____ 6. The teacher assures optimum learning conditions by giving top priority to the social-emotional needs of pupils.
- _____ 7. The individuality of pupils is sustained when teachers make allowances in their grade reports for the varying interests pupils have.

- _____ 8. Teachers increase their chances of directing the work into productive channels by having pupils participate in the planning.
- _____ 9. Small group work uses to best advantage the contrasting personalities, skills, and interests pupils have.
- _____ 10. The effectiveness of the teacher depends entirely on the amount of personal interest he can invest in the progress of each pupil.
- _____ 11. Pupils master the essentials of a subject only when extensive plans are made for accommodating individual differences of pupils.
- _____ 12. There is too great an emphasis on keeping order in the classroom.
- _____ 13. Children should be given more freedom in the classroom than they usually get.
- _____ 14. A properly motivated group of mature students might learn more in a semester's time if they were left entirely to their own resources than if they had a teacher to guide them.
- _____ 15. Pupils frequently learn much more under their own initiative than they do under teacher direction.
- _____ 16. A firm hand by the teacher promotes emotional security for pupils.
- _____ 17. Pupils do their best work when they know exactly what to expect from day to day.

- _____ 18. Pupils must be kept busy or they soon get into trouble.
- _____ 19. A well established classroom routine enhances the emotional stability of pupils.
- _____ 20. Pupils must see clearly that it is the teacher, not they, who has charge of classroom learning.
- _____ 21. The effectiveness of teaching is enhanced when the teacher has the ability to see the world as each of his pupils see it.
- _____ 22. Students who misbehave or do not learn are generally children who need more love.
- _____ 23. The teacher's ability to see the world as each of his students sees it is an absolute must if he is to have any success at all in teaching.
- _____ 24. The use of sarcasm by the teacher can accomplish nothing but emotional harm for the pupil.
- _____ 25. Pupils learn to stay alert when they are expected to respond immediately to teacher demands.
- _____ 26. Proper control of a class is amply demonstrated when pupil's work quietly while the teacher is out of the room.
- _____ 27. Pupils learn efficiently the essentials of a subject when every member of the class moves simultaneously through carefully planned lesson sequences.
- _____ 28. Pupils gain more satisfaction from doing a difficult task well than any other achievement.
-

BACKGROUND VARIABLES QUESTIONNAIRE

Three sets of background variables were also measured. In the order of presentation below, the sets pertained to background characteristics of principals, staffs and schools.

PRINCIPAL BACKGROUND VARIABLES

Seven background characteristics of the principals were measured by responses to the following questions.

AGE

_____ How old were you on your last birthday?

- | | |
|-------------|----------------|
| 1. Under 26 | 4. 46 to 55 |
| 2. 26 to 35 | 5. 56 to 65 |
| 3. 36 to 45 | 6. 66 or older |

ACADEMIC BACKGROUND

_____ What is your academic background?

1. Less than a Bachelor's degree.
2. Bachelor's degree.
3. More than a Bachelor's degree
4. Master's degree.

REGENCY OF TRAINING

_____ When did you last take a university credit course?

1. Within the last year.
2. Less than three years ago.
3. Less than six years ago.
4. Less than 10 years ago.
5. Less than 15 years ago.
6. Less than 20 years ago.
7. Less than 30 years ago.
8. 30 or more years ago.

TOTAL EXPERIENCE

_____ What is your total experience as teacher and administrator?
(Include the present year.)

- | | |
|--------------|---------------------|
| 1. 1 year | 6. 15-21 years |
| 2. 2 years | 7. 22-34 years |
| 3. 3-5 years | 8. 35-43 years |
| 4. 6-9 years | 9. 44 or more years |

EXPERIENCE AS A TEACHER

_____ How many years have you been a principal?

TENURE AS PRINCIPAL IN PRESENT DISTRICT

_____ How many years have you been a principal in this district?

TENURE AS PRINCIPAL IN PRESENT SCHOOL

_____ How many years have you been principal of this school?

STAFF BACKGROUND VARIABLES

Fourteen background characteristics of the staffs were measured by computing school means and standard deviations for each of the following seven questions.

AGE

_____ How old were you on your last birthday?

- | | |
|-------------|----------------|
| 1. Under 26 | 4. 46-55 |
| 2. 26 to 35 | 5. 56 to 65 |
| 3. 36 to 45 | 6. 66 or older |

ACADEMIC BACKGROUND

_____ What is your academic background?

1. Less than a Bachelor's degree.
2. Bachelor's degree
3. More than a Bachelor's degree.
4. Master's degree.
5. More than a Master's degree.
6. Doctor's degree.

REGENCY OF TRAINING

_____ When did you last take a university credit course?

1. Within the last year.
2. Less than three years ago.
3. Less than six years ago.
4. Less than ten years ago.
5. Less than fifteen years ago.
6. Less than twenty years ago.
7. Less than thirty years ago.
8. Thirty or more years ago.

EXPERIENCE AS A TEACHER

_____ How many years have you been a teacher?

- | | |
|--------------|---------------------|
| 1. 1 year | 6. 15-21 years |
| 2. 2 years | 7. 22-34 years |
| 3. 3-5 years | 8. 35-43 years |
| 4. 6-9 years | 9. 44 or more years |

(The following three questions used the same response format as for this question.)

TENURE AS TEACHER IN PRESENT DISTRICT

_____ How many years have you been a teacher in this district?

TENURE AS TEACHER IN PRESENT SCHOOL

_____ How many years have you been a teacher in this school?

TENURE AS TEACHER IN PRESENT SCHOOL WITH PRESENT PRINCIPAL

_____ How many years have you been a teacher in this school with this principal?

SCHOOL BACKGROUND VARIABLES

Four background characteristics of the schools were measured by responses from principals to the following questions.

SIZE

_____ How many full-time teachers regularly work in this school?

_____ How many pupils are enrolled in this school?

SOCIO-ECONOMIC STATUS OF STUDENTS

_____ The best description of the students in this school is:

1. All children of professional and white collar workers.
2. Mostly children of professional and white collar workers.
3. Children from a general cross-section of workers.
4. Mostly children of factory and other blue collar workers.
5. All children of factory and other blue collar workers.
6. Children of rural families.

STAFFING PATTERN

_____ The best description of the staffing pattern in this school is:

- | | |
|-----------------------|-----------------|
| 1. All traditional | 3. Mainly teams |
| 2. Mainly traditional | 4. All teams |

TEACHING SPACE

_____ The best description of the teaching areas (spaces) in this school is:

- | | |
|-----------------------|----------------|
| 1. All traditional | 3. Mainly open |
| 2. Mainly traditional | 4. All open |

CHAPTER 4

RESEARCH SITE, DATA COLLECTION, COMPUTER FACILITIES

CHAPTER 4

RESEARCH SITE, DATA COLLECTION, COMPUTER FACILITIES

This chapter describes the selection of the research site, the collection of data and the computer facilities used to process the data.

RESEARCH SITE

Nine school districts (local jurisdictions) within the metropolitan area of Vancouver, British Columbia, Canada, were identified as potential research sites in January, 1974. Discussions and correspondence with officials in the Provincial Department of Education and with District Superintendents (or their representatives) resulted in two districts providing consent for the collection of data. Only one of these districts was able to provide for the collection of data at the end of the 1973-4 school year and it was therefore chosen as the research site. The Board of School Trustees officially authorized the project upon the recommendation of the Superintendent.

DATA COLLECTION

ADMINISTRATION OF QUESTIONNAIRE

On June 3, 1974, the author met with the principals of the district's elementary schools at a meeting called by the Superintendent. The author provided a general description of the project and answered

questions from the principals. The principals then took packets of questionnaires to their schools. Staff meetings were held at each school during which the principal provided information about the project and distributed the questionnaire to teachers. Besides the oral information provided by the principal, each school was provided with copies of a guide for the administration and completion of the questionnaires. In addition, letters from the author addressed to principals or teachers accompanied each questionnaire.

The completed questionnaires, in sealed envelopes, were collected by the secretary in each school. The secretary used the district's express service to forward the questionnaires to the central office where they were deposited for collection by the author.

The above procedures were followed by all but one of the schools. The principal of one school administered the questionnaire on June 28, 1974, the last day of the school year, and the author retrieved them directly from the school on that day.

CODING

Respondents were not asked to record their names.

To ensure anonymity of schools, a code number was assigned to each school in the following manner. The names of the schools, arranged alphabetically, were numbered consecutively 1 through 41. A table of random numbers was then used to identify the first school to be coded. The first number 1 through 41 to appear in the table of random numbers resulted in the school name with the corresponding

number being coded as School 1, and so on, until all 41 schools were coded. The code numbers assigned to the schools therefore had no systematic relationship to the original alphabetical list.

The school code number was recorded on each questionnaire in the packages received from each school. The questionnaires within a school package were numbered consecutively and the number recorded on the questionnaire. It was therefore impossible to identify individual respondents through the use of a code key. Only the author has access to the code key which identifies the 41 schools by name.

COMPUTER FACILITIES

The data was processed by the computer facilities of the Computing Services Department, The University of Alberta, Edmonton, Alberta, Canada. For the most part, the analyses utilized programs contained in the Statistical Package for the Social Sciences. (Nie, Hull, Jenkins, Steinbrenner and Brent, 1975; hereafter referred to as SPSS). Additional programs were written by C. Prokop, Computer Applications Analyst, Department of Educational Administration, The University of Alberta.

CHAPTER 5

SUBJECTS

CHAPTER 5

SUBJECTS

This chapter presents information concerning the rate of response to various instruments, and statistical descriptions of the respondents and their schools.

RESPONSE RATE

Two criteria were used to determine the inclusion or exclusion of data from individual teachers and school staffs in the analyses reported in later chapters. The first criterion for inclusion was that the individual teacher's response rate to items forming an instrument or a dimension of an instrument had to be equal to or greater than 60 percent. The second criterion for inclusion was that at least 60 percent of the teachers forming a school's staff had to have a 60 percent or greater individual response rate. These two criteria were referred to as the "60-60 rule."

Table 5.1 presents the instruments with corresponding response rates for teachers and staffs after the 60-60 rule was applied. The application of the rule reduced the number of teachers for which at least some data was received from 426 to 309. The number of schools was reduced from a possible 41 to 28. The number of individual principals included in the study was also reduced from a possible 36, five of whom were each in charge of two schools, to 24, of whom four were

Table 5.1
Response Rates After Application of the 60-60 Rule

Instrument	Mean Response Rates (%)		
	Teachers (N=309)	Staffs (N=28)	Principals (N=24)
Technology			
IF Scale	99.47 ^a	81.27 ^b	99.58 ^c
Structure			
BTB Scale	98.77	81.12	98.87
IOSM - Self	99.07	80.15	d
- Colleague	99.24	80.15	d
- Principal	99.15	80.15	d
- External	99.23	79.54	d
IOCM - Self	99.54	78.99	d
- Colleague	99.48	78.99	d
- Principal	99.59	78.99	d
- External	99.23	79.54	d
Attitudes			
Traditionalism	98.34	82.38	97.50
Progressivism	98.53	81.02	98.61
Subject Matter Emphasis	98.37	79.90	100.00
Pupil Adjustment Ideology	99.44	79.97	99.31
Student Autonomy	99.09	80.37	99.07
Student Viewpoint	99.55	80.21	98.96
Classroom Order	99.24	79.76	100.00
Overall Mean	99.10	80.19	99.10

^aEach of the 309 teachers had a response rate \leq 60% of the items forming the scale.

^bEach of the 28 staffs had 60% or more teachers who had a response rate \leq 60% of the items forming the scale.

^cEach of the 24 principals had a response rate \leq 60% of the items forming the scale.

^dPrincipals were not asked to respond.

each in charge of two schools. As shown in Table 5.1, the average individual response rate for teachers was 99 percent and for school staffs the mean response rate was 80 percent. The 309 teachers in the 28 schools retained for analysis represented 84 percent of the teachers assigned to those schools.

TEACHERS

The following general description of the 309 teachers is based on data presented in Tables 5.2 to 5.9.

Seventy-nine percent of the Teachers were female (Table 5.2). Sixty-five percent were thirty-five years old or younger (Table 5.3). Sixty-six percent had at least a Bachelor's degree (Table 5.4). Sixty-one percent had taught (regardless of jurisdiction) for nine years or less (Table 5.5). Fifty-one percent had five or less years tenure in the jurisdiction (Table 5.6). Seventy-two percent had five or less years tenure in the school to which they were assigned at the time of the study (Table 5.7). Eighty-two percent of the teachers had been assigned to a school with the same principal for five years or less, fifty-three percent for two years or less and twenty-eight percent were completing their first year in the school with the principal (Table 5.8). The distribution of teachers over the various grade levels was approximately even (Table 5.9).

Table 5.2
Sex of Teachers (N=309)

Category:	No Response	Male	Female	Total
% :	.65	20.39	78.96	100

Table 5.3
Age of Teachers (N=309)

Category	%
No Response	.32
> 26	19.09
26-35	46.28
36-45	18.77
46-55	9.71
56.65	5.84
Total	100

Table 5.4
Academic Background of Teachers (N=309)

Category	%
No Response	.65
Less than Bachelor's Degree	33.01
Bachelor's Degree	45.31
More than Bachelor's Degree	17.48
Master's Degree	2.91
More than a Master's Degree	.6
Doctor's Degree	
Total	100

Table 5.5
Years Teaching Experience of Teachers (N=309)

Category	%
No Response	.32
1	9.06
2	5.50
3-5	24.27
6-9	22.33
10-14	18.45
15-21	11.97
22-34	6.47
35-43	1.62
Total	100

Table 5.6
Years Teaching Experience of Teachers in Present District

Category	%
No Response	.65
1 (years)	17.15
2	5.83
3-5	27.51
6-9	19.09
10-14	16.18
15-21	9.71
22-34	3.24
35-43	.32
≥ 44	.32
Total	100

Table 5.7
 Years Teaching Experience of Teachers in Present School (N=309)

Category	%
No Response	.32
1 (year)	28.48
2	14.89
3-5	28.16
6-9	17.48
10-14	6.80
15-21	2.59
22-34	.65
35-43	nil
≥ 44	.65
Total	100

Table 5.8
 Years Teaching Experience of Teachers in
 Present School with Present Principal (N=309)

Category	%
No Response	.65
1 (year)	27.83
2	24.92
3-5	28.80
6-9	12.30
10-14	2.59
15-21	1.29
22-34	.97
35-43	.65
≥ 44	nil
Total	100

Table 5.9
Teaching Assignment of Teachers (N=309)

Category	%
No Response	.97
Kindergarten	6.15
Grade One	14.56
Grade Two	9.71
Grade Three	10.36
Grade Four	11.33
Grade Five	13.27
Grade Six	10.03
Grade Seven	11.65
Remedial, Library, etc.	11.97
Total	100

PRINCIPALS

The following general description of the 24 principals is based on data presented in Tables 5.10 to 5.15.

Ninety-six percent of the principals (N=24) were male (Table 5.10). Sixty-seven percent were forty-six or older (Table 5.11). Eighty-eight percent had more than a Bachelor's degree (Table 5.12). Seventy-nine percent had twenty-two or more years cumulative experience as a teacher and administrator (Table 5.13). Thirty-three percent had been principals for six through nine years, and an additional thirty-three percent had been principals for fifteen through twenty-one years (Table 5.14). Thirty-eight percent had six

through nine years tenure as principal in the jurisdiction and an additional twenty-nine percent had 15 through twenty-one years experience (Table 5.15).

Table 5.10
Sex of Principals (N=24)

Category	No Response	Male	Female	Total
%	Nil	95.83	4.17	100
N	Nil	23	1	24

Table 5.11
Age of Principals (N=24)

Category	N	%
26-35	1	4.17
36-45	7	29.17
46-55	11	45.83
56-65	5	20.83
Total	24	100

Table 5.12
Academic Background of Principals (N=24)

Category	N	%
Bachelor's Degree	3	12.50
More than a Bachelor's Degree	14	58.33
Master's Degree	6	25.00
More than a Master's Degree	1	4.17
Total	24	100

Table 5.13
Total Years Experience of Principals
as Teacher and Administrator (N=24)

Category	N	%
6-9 (years)	1	4.17
10-14	nil	nil
15-21	4	16.67
22-34	15	62.50
35-43	4	16.67
Total	24	100

Table 5.14
Years Experience of Principals as Principal (N=24)

Category	N	%
1 (year)	1	4.17
2	2	8.33
3-5	3	12.50
6-9	8	33.33
10-14	1	4.17
15-21	8	33.33
22-34	1	4.17
Total	24	100

Table 5.15
Years Experience of Principals as Principal
in Present District (N=24)

Category	N	%
1	1	4.17
2	2	8.33
3-5	3	12.50
6-9	9	37.50
10-14	1	4.17
15-21	7	29.17
22-34	1	4.17
Total	24	100

SCHOOLS

PRINCIPALS

The following general description of the 28 schools and their principals is based on Tables 5.16 to 26.

All but one (96%) of the schools had male principals (Table 5.16). Sixty-one percent of the schools had principals who were forty-six or older (Table 5.17). Eighty-nine percent of the schools had principals who had more than a Bachelor's degree (Table 5.18). Sixty-eight percent of the schools had principals who had 22-34 years cumulative experience as a teacher and administrator (Table 5.19). Thirty-six percent of the schools had principals with 6-9 years experience as principal and thirty-two percent had principals with 15-21 years experience as principal (Table 5.20). Thirty-nine percent of the schools had principals who had 6-9 years experience as principal in the jurisdiction and twenty-nine percent had principals with 15-21 years experience in the jurisdiction (Table 5.21). Fifty percent of the schools had principals who had been assigned to the school for five years or less, and forty-three percent had principals who had been assigned to the school for 6-9 years (Table 5.22).

SIZE

The size of the schools was indicated by the number of full time teachers based in the school and by the number of pupils enrolled. The number of teachers (Table 5.23) ranged from four to 21. The mean

number of teachers was 13.39 and the median was 14.00. The number of pupils enrolled ranged from 120 to 526. The mean number of pupils was 350 and the median was 400.00.

SOCIO-ECONOMIC STATUS OF STUDENTS

The SES of students in the schools was indicated by the principals who were asked to characterize the school in terms of the best description of the students in the school, and by the teachers who provided a similar description of the students they taught (Table 5.24). Table 5.24 shows that 68% of the schools enrolled children from a general cross section of workers.

STUDENT TURNOVER

Principals were asked to indicate to the nearest decile the percent of students enrolled in September who were still in the schools in June (Table 5.25). Forty-three percent of the schools retained 90% of their students, and twenty-nine percent retained 80%. Only one school retained less than 60%.

STAFFING PATTERN

The staffing pattern of ninety-three percent of the schools was described as mainly traditional by their principals (Table 5.26).

TEACHING AREAS (OPENNESS)

Fifty-seven percent of the schools were described as having

mainly traditional teaching areas and twenty-nine percent as having all traditional (Table 5.27).

Table 5.16
Sex of School's Principal (N=28)

Category:	Male	Female	Total
N :	27	1	28
% :	96.43	3.57	100

Table 5.17
Age of School's Principal (N=28)

Category	N	%
26-35 (years)	1	3.57
36-45	7	25.00
46-55	13	46.43
56-65	7	25.00
Total	28	100

Table 5.18
Academic Background of School's Principal (N=28)

Category	N	%
Bachelor's Degree	3	10.71
More than Bachelor's Degree	17	60.71
Master's Degree	7	25.00
More than Master's Degree	1	3.57
Total	28	100

Table 5.19

Total Years Experience of School's Principal
as Teacher and Administrator (N=28)

Category	N	%
6-9 (years)	1	3.57
10-14	nil	nil
15-21	4	14.29
22-34	19	67.86
35-43	4	14.29
Total	28	100

Table 5.20

Years Experience of School's Principal as Principal (N=28)

Category	N	%
1 (year)	1	3.57
2	2	7.14
3-5	3	10.71
6-9	10	35.71
10-14	2	7.14
15-21	9	32.14
22-34	1	3.57
Total	28	100

Table 5.21
 Years Experience of School's Principal as
 Principal in Present District (N=28)

Category	N	%
1 (year)	1	3.57
2	2	7.14
3-5	3	10.71
6-9	11	39.29
10-14	2	7.14
15-21	8	28.57
22-34	28	100
Total		

Table 5.22
 Years Experience of School's Principal as
 Principal of Present School (N=28)

Category	N	%
1 (year)	1	3.57
2	5	17.86
3-5	8	28.57
6-9	12	42.86
10-14	1	3.57
15-21	1	3.57
Total	28	100

Table 5.23
 Size of Schools as Indicated by Number
 of Full-time Teachers (N=28)

Number of Teachers	Number of Schools	%
4	1	3.57
5	1	3.57
6	2	7.14
7	1	3.57
8	3	10.71
9	1	3.57
10	1	3.57
11	1	3.57
12	2	7.14
13	nil	nil
14	2	7.14
15	nil	nil
16	2	7.14
17	3	10.71
18	2	7.14
19	nil	nil
20	4	14.29
21	2	7.14
Total	28	100
Mean	13.39	
Median	14.00	

Table 5.24
Socio-Economic Status (SES) of Schools Based
on Principals' Reports (N=28)

Category	N	%
All children of professional and white collar workers	nil	nil
Mostly children of professional and white collar workers	4	14.29
Children from a general cross-section of workers	19	67.86
Mostly children of factory and other blue collar workers	4	14.29
All children of factory and other blue collar workers	1	3.57
Total	28	100

Table 5.25
School Student Turnover (N=28)

Percent of Students Enrolled in September still Enrolled in June.	Number of Schools	Percent of Schools
NR	1	3.57
20	1	3.57
60	2	7.14
70	4	14.29
80	8	28.57
90	12	42.86

Table 5.26
Staffing Pattern of Schools (N=28)

Category	N	%
No Response	1	3.57
All traditional	nil	nil
Mainly traditional	26	92.86
Mainly teams	1	3.57
All teams	nil	nil
Total	28	100

Table 5.27
Teaching Space

Type	N	%
All traditional	8	28.6
Mainly traditional	16	57.1
Mainly open	<u>4</u>	<u>14.3</u>
Total	28	100.0

DESCRIPTIVE STATISTICS FOR MAJOR INSTRUMENTS

Table 5.28 presents descriptive statistics for the major instruments. An examination of these statistics revealed sufficient variance for further analysis of the data. It was noted that the relatively narrow range of the staff scores was due to their being mean scores of the individual teachers within each of the 28 schools.

Table 5.28
Descriptive Statistics for Major Instruments

Instruments	Staffs (N = 28)					Principals (N = 24)				
	Min.	Max.	Range	M	SD	Min.	Max.	Range	M	SD
IF	4.19	5.78	1.59	4.88	0.43	2.90	5.90	3.00	4.70	0.71
BTB	2.09	3.69	1.60	2.90	0.36	1.77	3.57	1.80	2.59	0.52
IOSM - self	2.20	4.00	1.80	3.24	0.44	--	--	--	--	--
- colleague	2.42	3.67	1.24	3.27	0.31	--	--	--	--	--
- principal	3.07	4.60	1.53	3.95	0.35	--	--	--	--	--
- external	1.93	4.23	2.30	2.86	0.49	--	--	--	--	--
IOCM - self	4.63	5.60	0.97	5.14	0.27	--	--	--	--	--
- colleague	1.10	3.73	2.63	2.14	0.48	--	--	--	--	--
- principal	1.77	3.20	1.43	2.51	0.36	--	--	--	--	--
- external	1.18	3.18	1.99	1.84	0.36	--	--	--	--	--
Traditionalism	-0.58	0.91	1.49	0.39	0.32	-2.87	1.47	4.33	-0.40	1.08
Progressivism	1.39	2.22	0.83	1.77	0.21	0.67	3.00	2.33	1.71	0.61
Subject Matter Emphasis	1.60	3.45	1.85	2.64	0.40	1.00	4.20	3.20	2.52	0.81
Pupil Adjustment	4.04	4.88	0.85	4.37	0.22	3.67	5.50	1.83	4.57	0.48
Student Autonomy	2.47	3.51	1.04	2.92	0.28	2.33	5.33	3.00	3.34	0.76
Student Viewpoint	3.40	5.00	1.60	4.04	0.37	3.00	5.50	2.50	4.40	0.61
Classroom Order	1.42	3.78	2.36	3.00	0.47	1.00	4.50	3.50	3.00	0.84

CHAPTER 6

CHARACTERISTICS OF INSTRUMENTS

CHAPTER 6

CHARACTERISTICS OF INSTRUMENTS

This chapter presents findings regarding the characteristics of the major instruments used in the study and the results of an analysis made to assess the independence of responses from attitudinal bias.

INSTRUCTIONAL FLEXIBILITY SCALE

VALIDITY

The previous findings of Erickson, Hills and Robinson (1970) regarding the validity of the IF Scale based on comparisons between the ratings of elementary schools provided by panels of judges and teachers' responses to the IF Scale were presented earlier.

For this study, teacher responses to the 10 items of the IF Scale were subjected to analysis by the SPSS subprogram FACTOR (PA2). This program utilizes communality estimates in the main diagonal elements of the correlation matrix and employs an iteration procedure for improving the estimates of communality. The program therefore produces inferred principal-factor solutions. (See SPSS, 1975: 479-480).

The factor analysis extracted only one principal factor with an eigen value greater than or equal to 1 (Table 6.1). The eigen value was 4.7196. The factor loadings for each of the items are presented

in Table 6.1) The loadings ranged from .55 to .86. This range is high and similar to that reported by Erickson, Hills and Robinson (1970:A-39) which had a minimum of .58 and a maximum of .78.

RELIABILITY

Responses to the IF Scale were subjected to analysis by the SPSS subprogram RELIABILITY. Alpha, the generalized variance estimate of internal consistency (Cronbach, 1951; Kerlinger, 1973, Chapter 22), was .891. This compared favorably to the $r = .937$ found by Robinson (1973).

ABILITY TO DISCRIMINATE

Responses to the IF Scale were analyzed by the SPSS program BREAKDOWN to determine the ability of the instrument to differentiate among schools. The results of the one-way analysis of variance performed by this program were as follows: $F = 3.8420$; $df = 27,280$; $p = 0.00000$. These findings demonstrate that the IF Scale was capable of differentiating between schools ($p \leq .05$) on the basis of within-school responses to the items forming the scale.

BUREAUCRATIZATION OF TEACHER BEHAVIOR SCALE

VALIDITY

As explained earlier the BTB Scale was based on four of the original six subscales which comprised the School Organization Inventory. Punch (1969) and Isherwood and Hoy (1972) reported that

Table 6.1

Factor Loadings for Items of the
Instructional Flexibility Scale (N=309)

Item	Loading
1. Modify curriculum content to suit the backgrounds and abilities of their students.	.66624
2. Use instructional materials (including textbooks, workbooks, films, etc.) that are appropriate for their students.	.62722
3. Use instructional methods well suited to their students.	.73100
4. Have most of their students learning at the pace best.	.83936
5. Adjust marking and reporting procedures to suit the specific conditions they face at the time.	.61804
6. Vary the relative amount of time spent on different subject matter areas in accordance with the state of learning of their students.	.67738
7. Readily depart from scheduled activities to take advantage of unforeseen opportunities.	.55215
8. Handle disciplinary problems in the way that seems best for the students involved.	.58841
9. Modify achievement standards to correspond with the abilities of their students.	.64355
10. Have most of their students working with materials suited to their ability level.	.85870
Eigen value	4.71960
% of Variance	100

factor analysis of the six subscales revealed two dimensions, one of which was composed of the four subscales chosen for this study. The four subscales with modified items used in the BTB Scale for this study were Hierarchy, Rules, Specifications and Impersonality. The two remaining subscales, Division of Labor and Technical Competence, were excluded from the BTB Scale on the basis of previous research. Since the expected construct validity of the BTB Scale was premised on these findings by Punch and by Isherwood and Hoy, it was decided to determine if similar results could be obtained through an analysis of responses to the modified items used in this study.

Table 6.2 reports intercorrelations between school mean scores on the six subscales of the Teacher Behavior Questionnaire composed of modified items from The School Organizational Inventory. The Hierarchy, Rules, Specifications and Impersonality subscales which were expected to form the BTB Scale correlated strongly and positively with each other. This result is in accord with that reported by Punch (1969:50) for the School Organizational Inventory.

The SPSS subprogram FACTOR (PA2) initially produced two factors with eigen values ≥ 1 when the number of factors to be extracted was left unspecified. After two iterations only one factor with an eigen value ≥ 1 remained. Table 6.3 presents the iterated unrotated principal factor matrix, communalities, eigen values and proportion of total and common variance. Table 6.4 presents the varimax rotated factor matrix. It is clear from these tables that the four subscales Hierarchy, Rules, Specifications and Impersoality loaded significantly

Table 6.2
Intercorrelations Among the Six Subscales
of the Teacher Behavior Questionnaire

Subscale	1	2	3	4	5
1. Hierarchy ^a					
2. Division of Labor	-.079				
3. Rules ^a	.726	.121			
4. Specifications ^a	.783	.173	.878		
5. Impersonality ^a	.751	.254	.620	.681	
6. Technical Competence	-.541	.098	.242	-.309	-.320

^aUsed as a subscale of the BTB Scale. Intercorrelations among these subscales were significant at the $p < .01$ level.

Table 6.3
Unrotated Principal Factor Matrix for Subscales of the
Teacher Behavior Questionnaire after Two Iterations

Subscale	Factor 1	Factor 2	Communality
Hierarchy ^a	.928	-.319	.963
Division of Labor ^b	.117	.509	.273
Rules ^a	.844	.164	.740
Specifications ^a	.911	.175	.861
Impersonality ^a	.781	.124	.625
Technical Competence ^b	-.427	.372	.320
Eigen value	3.210	.571	
% of Variance	84.9	15.1	

^aBureaucratization of Teacher Behavior Subscales = Factor 1

^bProfessionalization of Teacher Behavior Subscales = Factor 2

Table 6.4
 Varimax Rotated Factor Matrix for Subscales of the
 Teacher Behavior Questionnaire

Subscale	Factor 1	Factor 2
Hierarchy ^a	.924	-.332
Division of Labour ^b	.125	.507
Rules ^a	.847	.152
Specifications ^a	.914	.162
Impersonality ^a	.783	.112
Technical Competence ^b	.421	.373

^aBureaucratization of Teacher Behavior Subscales = Factor 1.

^bProfessionalization of Teacher Behavior Subscales = Factor 2.

($\geq .78$) on one and only one factor. This result is similar to that found by Punch (1969:53) who reported varimax rotated loadings on one factor $\geq .52$ for the four subscales when six factors were extracted (only one of which had an eigen value ≥ 1); and by Isherwood and Hoy (1972:49) who reported unrotated orthogonal loadings on one factor $\geq .66$ when four factors were extracted (only one of which had an eigen value $\geq .1$).

RELIABILITY

Responses to the BTB Scale were subjected to analysis by the SPSS subprogram RELIABILITY. Alpha for the BTB Scale was .83. The subscale alpha's were as follows: Hierarchy, .70; Rules, .59; Specifications, .64; Impersonality, .43.

ABILITY TO DISCRIMINATE

Responses to the BTB Scale were analyzed by the SPSS program BREAKDOWN to determine the ability of the instrument to differentiate among schools. The results of the one-way analysis of variance performed by this program were as follows: $F = 1.6487$; $df = 27$; $p = 0.02578$. These findings demonstrate that the BTB Scale was capable of differentiating among schools ($p \leq .05$) on the basis of within-school responses to the items forming the scale.

GENERAL ATTITUDE ORIENTATIONS: PROGRESSIVISM AND TRADITIONALISM

VALIDITY

Findings from previous research regarding the construct validity of the Progressivism and Traditionalism scales was presented earlier. Since the scales were based on the results of previous factor analyses of responses to the 30 items comprising Kerlinger's ES-VII it was decided to determine if the data gathered for this study verified previous results.

The responses to the ES-VII were subjected to analysis by the SPSS subprogram FACTOR (PA2). The extraction of two factors was specified. Table 6.5 presents the varimax rotated factor matrix, communalities, eigen values and proportion of the common variance accounted for by the factors. An examination of the item loadings revealed that all of the 15 items forming the Progressivism Scale loaded highest on Factor 1 with loadings ranging from .38 to .56. The

Table 6.5
 Factor Analysis (Varimax Rotated) of
 Responses to the ES-VII Scale (N=309)

Item	Factor Loading	
	1	2
1. Learning is essentially a process of increasing one's store of information about the various fields of knowledge. (T) ^a	-0.08031	0.39654
2. The curriculum consists of subject matter to be learned and skills to be acquired. (T)	-0.07275	0.38564
3. The learning of proper attitudes is often more important than the learning of subject matter. (P) ^b	0.46927	-0.02553
4. It is more important that the child learn how to approach and solve problems than it is for him to master the subject matter of the curriculum. (P)	0.51573	-0.11824
5. The true view of education is so arranging learning that the child gradually builds up a storehouse of knowledge that he can use in the future. (T)	0.05287	0.48570
6. What is needed in the modern class-room is a revival of the authority of the teacher. (T)	-0.19623	0.64756
7. Teachers should keep in mind that pupils have to be made to work. (T)	-0.28060	0.52926
8. Schools of today are neglecting the three R's. (T)	-0.17225	0.51277
9. Standards of work should not be the same for all pupils; they should vary with the pupil. (P)	0.39486	-0.10165

Table 6.5 (continued)

Item	Factor Loading	
	1	2
10. The goals of education should be dictated by children's interests and needs, as well as by the demands of society. (P)	0.45766	-0.16225
11. Each subject and activity should be aimed at developing a particular part of the child's makeup: physical, intellectual, social, moral, or spiritual. (T)	0.23913	0.19342
12. Right from the very first grade, teachers must teach the child at his own level and not at the level of the grade he is in. (P)	0.43333	-0.19511
13. Teachers need to be guided in what they are to teach. No individual teacher can be permitted to do as he wishes, especially when it comes to teaching children. (T)	-0.07324	0.27151
14. Learning experiences organized around life experiences rather than around subjects is desirable in our schools. (P)	0.47754	-0.29633
15. We should fit the curriculum to the child and not the child to the curriculum. (P)	0.53817	-0.26223
16. Subjects that sharpen the mind, like mathematics and foreign languages, need greater emphasis in the public school curriculum. (T)	0.11433	0.43690
17. Since life is essentially a struggle, education should emphasize competition and the fair competitive spirit. (T)	-0.15295	0.50012

Table 6.5 (continued)

Item	Factor Loading	
	1	2
18. The healthy interaction of pupils one with another is just as important in school as the learning of subject matter. (P)	0.54309	-0.10833
19. The organization of instruction and learning must be centred on universal ideas and truths if education is to be more than passing fads and fancies. (T)	0.13494	0.30811
20. The curriculum should contain an orderly arrangement of subjects that represent the best of our cultural heritage. (T)	0.19234	0.40009
21. True discipline springs from interest, motivation, and involvement in live problems. (P)	0.47371	0.00887
22. Emotional development and social development are as important in the evaluation of pupil progress as academic achievement.	0.55515	-0.02990
23. Education and educational institutions must be sources of new social ideas. (P)	0.42467	-0.02990
24. Children should be taught that all problems should be subjected to critical and objective scrutiny, including religious, moral, economic, and social problems. (P)	0.38429	0.19382
25. One of the big difficulties with modern schools is that discipline is often sacrificed to the interests of children. (T)	0.02844	0.53957

Table 6.5 (continued)

Item	Factor Loading	
	1	2
26. Teachers should encourage pupils to study and criticize our own and other economic systems and practices. (P)	0.53016	0.05007
27. Children need and should have more supervision and discipline than they usually get. (T)	-0.09353	0.62563
28. Schools should teach children independence on higher moral values. (T)	0.16110	0.51797
29. The public school should take an active part in stimulating social change. (P)	0.43646	0.17155
30. Learning is experimental; the child should be taught to test alternatives before accepting any of them. (P)	0.44585	0.04804
Eigen value	4.27650	3.07893
% of Variance	58.1	41.9

^a_T = Traditionalism subscale item.

^b_P = Progressivism subscale item.

largest positive loading of a Progressivism item on Factor 2 was .19. All the items but one forming the Traditionalism Scale loaded highest on Factor 2 with loadings ranging from .27 to .65. The one exception was item 11 which had a positive loading of .24 on Factor 1 and a positive loading of .19 on Factor w. These findings (including those regarding the cross-loadings) are similar to those reported by Kerlinger and Pedhazur (1967:63).

The construction of the Traditionalism and Progressivism scales were described earlier. The results of the factor analysis just described confirmed that the dualistic orientations are relatively orthogonal to each other. Further evidence of this characteristic was obtained by correlating the staff mean scores of the 28 schools on the Progressivism Scale with those on the Traditionalism Scale. The r was $-.42$ which was significant at $p \leq .01$. The r for scores of principals was $-.41$, which was also significant at $p \leq .01$.

RELIABILITY

The general attitude orientations of respondents toward education was measured by Kerlinger's ES-VII which comprised two scales: Progressivism and Traditionalism. Responses to these scales were subjected to analysis by the SPSS subprogram RELIABILITY. The alpha reliabilities obtained for Progressivism (.80) and for Traditionalism (.77) were similar to those reported by Kerlinger and Pedhazur (1967:62).

ABILITY TO DISCRIMINATE

Responses to the Traditionalism and Progressivism Scales were analyzed by the SPSS program BREAKDOWN to determine the abilities of the instruments to differentiate among schools. The results of the one-way analysis for Traditionalism were as follows: $F = 1.9055$; $df = 27.267$; $p = .00563$. The results for Progressivism were: $F = 1.1443$; $df = 27$; $p = .28836$. These findings demonstrate that the Traditionalism Scale was capable of satisfactorily ($p \leq .05$) differentiating between schools on the basis of within school responses to the scale, and that the Progressivism Scale did not meet the acceptable level of statistical significance ($p \leq .05$).

TEACHING PROCESS ORIENTATIONS

VALIDITY

Findings from previous research regarding the original teaching process orientation scales have been presented by Wehling and Charters (1969) and were reviewed earlier. The scales used in this study contained a reduced number of items from those reported by Wehling and Charters, and since these researchers had noticed several anomalies which suggested the need for further research -- low loadings on expected factors and large loadings on unexpected factors -- it was decided to determine if the responses to the teaching process orientation items tended to factor together as indicated by the earlier research.

The responses to the 28 teaching process orientation items were subjected to analysis by the SPSS subprogram FACTOR (PA2). The number of factors to be extracted was not specified. Table 6.6 presents the varimax rotated factor matrix, communalities, eigen values and proportion of the common variance accounted for by the factors. The analysis resulted in six factors being extracted rather than five as expected. Three of the factors had eigen values ≥ 1 . Although Kaiser's criterion suggested that only these three factors should be retained, Cattell's scree test (Figure 6.1) indicated that it was appropriate to retain the first five (Cattell, 1966; Child, 1970).

An examination of the matrix presented in Table 6.6 revealed that the groups of items forming each scale clustered with high loadings on separate factors as expected, except for two items of the Student Autonomy vs. Teacher Direction scale which had higher positive loadings on Factor 6. Except for these two items, each scale was found to be composed of items with positive factor loadings which ranged as follows: Subject Matter Emphasis (Factor 2), .45 to .78; Pupil Adjustment Ideology (Factor 4), .51 to .69; Student Autonomy vs. Teacher Direction (Factor 1), .36 to .77; Consideration of Student Viewpoint (Factor 3), .36 to .63; and Classroom Order (Factor 5), .46 to .59. The crossloadings tended to be minimal. The first four items of the Student Autonomy Scale (Items 12, 13, 14 and 15) cross-loaded highly on Factor 6. This group of items formed one pole of this scale which Wehling and Charters found to be bi-polar.

Table 6.6

Factor Analysis (Varimax Rotated) of Responses to the Teaching Process Orientation Scales (N=309)

Scale and Item	Factor Loading					
	1	2	3	4	5	6
<u>Subject Matter Emphasis</u>						
1. Teaching of the specific skills and factual subject matter is the most important function of the school.	0.00439	0.74735	-0.00745	0.04683	0.15519	0.02295
2. The backbone of the school curriculum is subject matter; activities are useful mainly to facilitate the learning of subject matter.	-0.00409	0.78161	0.05668	0.12106	0.09023	-0.00914
3. Pupil failure is averted when mastery of subject matter is the prime requisite for promotion.	0.09254	0.45367	-0.00237	0.00608	0.15956	0.11057
4. The overall plan of education suffers when teachers depart substantially from the subject outline.	-0.03205	0.52877	0.14600	0.03368	0.10979	-0.05418
5. The structure of a field of knowledge is intrinsically interesting to pupils when it is clearly taught.	-0.16623	0.47926	0.18629	0.22851	0.26349	-0.00539

Table 6.6 (continued)

Scale and Item	Factor Loading					
	1	2	3	4	5	6
<u>Pupil Adjustment Ideology</u>						
6. The teacher assures optimum learning conditions by giving top priority to the social-emotional needs of pupils.	0.17719	0.06611	0.20714	0.67538	0.06912	0.10663
7. The individuality of pupils is sustained when teachers make allowances in their grade reports for the varying interests pupils have.	0.16242	0.10822	0.13983	0.50582	0.17005	0.00408
8. Teachers increase their chances of directing the work into productive channels by having pupils participate in the planning.	0.20534	-0.05306	0.31842	0.53501	0.07931	0.22269
9. Small group work uses to best advantage the contrasting personalities, skills, and interest pupils have.	0.22131	0.03780	0.18659	0.69162	0.13790	0.11991

Table 6.6 (continued)

Scale and Item	Factor Loading					
	1	2	3	4	5	6
10. The effectiveness of the teacher depends entirely on the amount of personal interest he can invest in the progress of each pupil.	0.03798	0.11302	0.14683	0.63920	0.27221	0.08727
11. Pupils master the essentials of a subject only when extensive plans are made for accommodating individual differences of pupils.	0.14271	0.14464	0.19960	0.65694	0.02433	0.09833
<u>Student Autonomy</u>						
12. There is too great an emphasis on keeping order in the classroom.	0.36212	-0.08583	0.27072	0.24035	-0.09922	0.38729
13. Children should be given more freedom in the classroom than they usually get.	0.38095	-0.03976	0.33168	0.20410	-0.11023	0.41300
14. A properly motivated group of mature students might learn more in a semester's time if they were left entirely to their own resources than if they had a teacher to guide them.	0.17443	0.06634	-0.00699	0.06131	0.06239	0.73410

Table 6.6 (continued)

Scale and Item	Factor Loading					
	1	2	3	4	5	6
15. Pupils frequently learn much more under their own initiative than they do under teacher direction.	0.26839	0.02668	0.04289	0.17863	0.03624	0.64950
16. A firm hand by the teacher promotes emotional security for pupils.	0.58115	0.04380	-0.04998	0.18278	-0.06223	0.14690
17. Pupils do their best work when they know exactly what to expect from day to day.	0.66274	-0.08699	0.05686	0.05856	0.04346	0.15206
18. Pupils must be kept busy or they soon get into trouble.	0.65668	0.10697	0.03051	0.17185	-0.09063	0.08297
19. A well established classroom routine enhances the emotional stability of pupils.	0.77219	-0.03536	0.02845	0.01317	0.08613	0.13375
20. Pupils must see clearly that it is the teacher, not they, who has charge of classroom learning.	0.57922	-0.01857	0.15364	0.19902	-0.08371	0.06069

Table 6.6 (continued)

Scale and Item	Factor Loading					
	1	2	3	4	5	6
<u>Consideration of Student Viewpoint</u>						
21. The effectiveness of teaching is enhanced when the teacher has the ability to see the world as each of his pupils see it.	0.09620	0.14343	0.60459	0.33755	0.23498	0.00068
22. Students who misbehave or do not learn are generally children who need more love.	0.03014	0.08486	0.57188	0.24077	0.21199	0.08909
23. The teacher's ability to see the world as each of his students sees it is an absolute must if he is to have any success at all in teaching.	0.06066	0.08969	0.63679	0.35445	0.13839	0.04707
24. The use of sarcasm by the teacher can accomplish nothing but emotional harm for the pupil.	0.10358	0.22462	0.35921	0.26309	0.17834	0.00800

Table 6.6 (continued)

Scale and Item	Factor Loading					
	1	2	3	4	5	6
<u>Classroom Order</u>						
25. Pupils learn to stay alert when they are expected to respond immediately to teacher demands.	-0.07546	0.29885	0.09575	0.20767	0.46137	-0.08472
26. Proper control of a class is amply demonstrated when pupils work quietly while the teacher is out of the room.	-0.08692	0.22604	0.12865	0.29597	0.55178	0.07027
27. Pupils learn efficiently the essentials of a subject when every member of the class moves simultaneously through carefully planned lesson sequences.	-0.02569	0.25189	0.12251	0.05794	0.59447	0.01414
28. Pupils gain more satisfaction from doing a difficult task well than any other achievement.	-0.0149	0.17693	0.29018	0.15578	0.51113	0.08739
Eigen value	6.28844	3.27760	1.50184	.84602	.70154	.59197
% of Variance	47.6	24.8	11.4	6.4	5.3	4.5

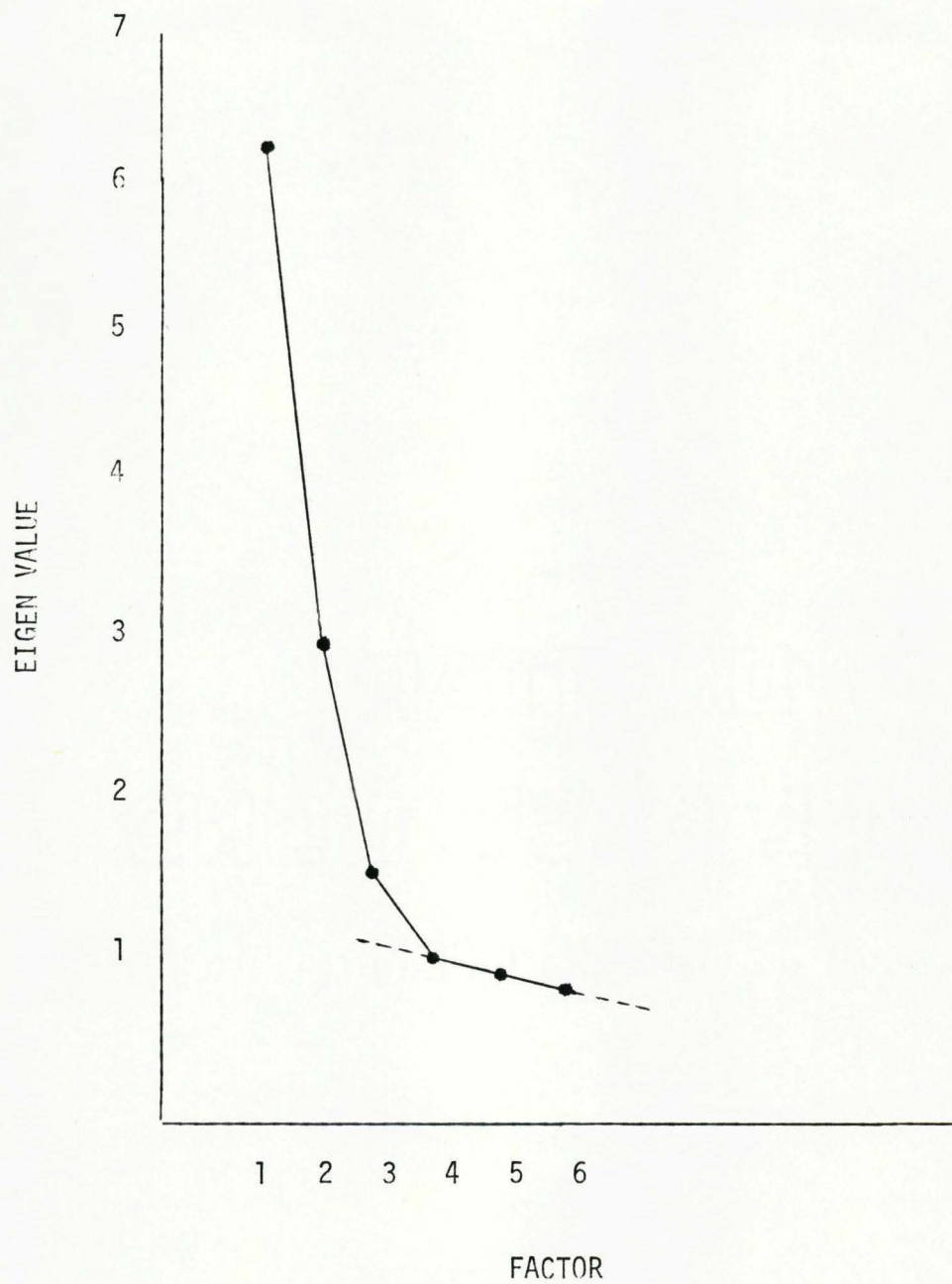


Figure 6.1: Application of Cattell's scree test to determine the number of factors to be extracted in the factor analysis of responses to the Teaching Process Orientation Scales.

RELIABILITY

The responses to the teaching process orientation scales were analyzed by the SPSS subprogram RELIABILITY. The alpha reliabilities were as follows: Subject Matter Emphasis, .76; Pupil Adjustment Ideology, .84; Student Autonomy, .83; Consideration of Student Viewpoint, .76; Classroom order, .72.

ABILITY TO DISCRIMINATE

Responses to the five Teaching Process Orientation Scales were analyzed by the SPSS program BREAKDOWN to determine the ability of each scale to differentiate among schools. The results of the one-way analyses of variance performed by this program are set out below.

<u>Scale</u>	<u>F</u>	<u>df</u>	<u>p</u>
Subject Matter Emphasis	1.5756	27,267	.03867
Pupil Adjustment Ideology	1.1297	27,269	.30469
Student Autonomy	1.3476	27,266	.12261
Consideration of Student Viewpoint	1.6130	27,268	.03149
Classroom Order	1.5747	27,268	.03884

These findings demonstrate that three of the scales -- Subject Matter Emphasis, Consideration of Student Viewpoint and Classroom Order -- were capable of satisfactorily ($p \leq .05$) differentiating among schools on the basis of within-school responses to the items forming the scales. The Pupil Adjustment Ideology and Student Autonomy scales did not meet the acceptable level of statistical significance.

INDEPENDENCE OF MEASUREMENTS

Since the measurement of the technological variable (IF) and the structural variables (BTB, IOCM, and IOSM) were based on teacher perceptions, and since some of the hypotheses to be tested involved relationships between the attitudes of teachers aggregated as school staffs and these variables, it was decided to determine if the responses of individual teachers to the instruments measuring the technological and structural variables were systematically associated with the attitude orientations held by the teachers. The presence of systematic associations between the attitudes and descriptions of organizational characteristics provided by individuals would jeopardize the validity of the study's measurements of technology and structure. The desired result of the analysis was therefore to demonstrate that correlations between attitudes held by individual teachers and their perceptions of instructional flexibility, bureaucratization and influence were close to zero.

Table 6.7 presents the zero-order correlation coefficients for individual teacher responses to the measures of attitudes and their responses to the measures of technology and structure. Most of the coefficients (62 of 70 or 88.6%) were close to zero and not statistically significant at the $p \leq .05$ level. Of the eight which were significant, the largest r^2 indicated that only 4.164% of the variance was common. On the basis of this analysis it was concluded that the measurements of technology and structure were essentially independent of the educational attitudes of the observers; and, given

Table 6.7

Zero-order Correlation Coefficients for Individual Teacher Responses to Measures of Attitudes, Technology and Structure

Attitudes	Technological and Structural Properties									
	IF	BTB	IOCM				IOSM			
			Self	Colleague	Principal	External	Self	Colleague	Principal	External
Traditionalism	-.012 ^a	.075	.016	.011	.051	.099*	.013	.048	.034	.042
Progressivism	.063	-.149*	-.054	-.027	-.045	.003	.035	.080	-.023	-.035
Subject Matter Emphasis	.060	.185*	.011	.011	.070	.009	.099*	.126*	.072	.002
Pupil Adjustment Ideology	.071	-.008	.055	-.036	.003	.065	.008	.027	.051	.036
Student Autonomy	-.140*	-.074	-.033	-.039	-.051	-.006	-.092	-.030	-.068	-.000
Consideration of Student Viewpoint	.011	-0.47	.030	.077	.086	.059	.030	.074	.029	.050
Classroom Order	-.158*	.204*	-.034	.078	.074	.056	.008	-.056	-.020	.026

*p ≤ .05

^aDue to pair-wise deletion, the N for the correlations ranges from 269 to 304 of the 309 teachers.

the large N's, that for the few relationships where the degree of association was statistically significant the small amount of common variance present could be safely ignored as a threat to measurement validity.

PART III

RESULTS

CHAPTER 7

OBJECTIVE 1:

TESTS OF TECHNOLOGY-STRUCTURE HYPOTHESES

CHAPTER 7

OBJECTIVE 1:

TESTS OF TECHNOLOGY-STRUCTURE HYPOTHESES

Research Question 1 asked if there was evidence that the technological imperative operated in school organizations. This chapter reports observations made when hypotheses relating the flexibility of instructional technology to bureaucracy and to influence were tested. It also reports the results of analyses conducted to determine the effects of control variables on the technology-bureaucracy relationship.

INSTRUCTIONAL FLEXIBILITY AND BUREAUCRACY

Objective 1.1a called for an examination of the direction and degree of association between instructional flexibility and bureaucracy.

Bivariate correlations computed to test the hypothesis relating instructional flexibility to bureaucracy are reported in Table 7.1.

The data supported the hypothesis (H_1) that schools with higher degrees of instructional flexibility would have lower degrees of bureaucratization. As predicted, the direction of the zero-order correlation between instructional flexibility (IF) and bureaucratization (BTB) was negative and the size of the coefficient was statistically significant: $r = -.441$, $p \leq .01$.

Table 7.1

Bivariate Correlations Between Instructional Flexibility (IF) and Bureaucratization of Teacher Behavior (BTB) and BTB Subscales^a

	IF
	<u>r</u>
BTB	-.442**
Hierarchy	-.498**
Rules	-.276
Specifications	-.419**
Impersonality	-.533**

^aN = 28 schools; df = 26

** $p \leq .01$

Given the study's theoretical framework, r^2 indicated that variation in the flexibility of instructional technology accounted for 20% of the variation in bureaucratization of teacher behavior.

Correlations were also computed to examine the relationships between instructional flexibility and each of the four sub-scales of the BTB Scale. The expectation was that instructional flexibility would be negatively correlated with each sub-scale. The observed correlations reported in Table 7.1 supported this expectation. The directions of all of the correlations were negative and all but one (IF with Rules) were statistically significant at the $p \leq .05$ level.

The zero-order correlation between instructional flexibility

and bureaucratization of teacher behavior and those computed for instructional flexibility with hierarchy of authority, procedures, and impersonality tended to support Hypothesis 1. Schools with higher degrees of instructional flexibility tended to have organizational structures characterized by lower degrees of bureaucracy.

INSTRUCTIONAL FLEXIBILITY AND INFLUENCE

INFLUENCE OVER SCHOOL-WIDE MATTERS (IOSM)

Objective 1.1b called for an examination of the direction and degree of association between instructional flexibility and influence over school-wide matters.

Bivariate correlations computed to test the hypotheses relating instructional flexibility to the influence of selected actors over school-wide matters are reported in Table 7.2.

IF AND SELF-IOSM

The data supported the hypothesis (H_2) that the self-influence of teachers over school-wide matters would be higher in schools with higher degrees of instructional flexibility. As predicted, the direction of the correlation between IF and Self-IOISM was positive and the size of the coefficient was statistically significant: $r = .611$, $p \leq .001$.

Given the study's theoretical framework, r^2 indicated that variation in the flexibility of instructional technology accounted for 44% of the variation in the influence of individual teachers over

school-wide matters.

Table 7.2
Bivariate Correlations Between Instructional
Flexibility (IF) and Influence Over School-Wide Matters (IOSM)

	IF
	<u>r</u>
Self IOSM ^a	.611***
Colleague IOSM ^a	.553***
Principal IOSM ^a	.030
Principal IOSM > Colleague IOSM ^b	-.245
Principal IOSM < Colleague IOSM ^c	-1.00
External IOSM ^a	-.253

^aN = 28 schools; df = 26

^bN = 26 schools; df = 24

^cN = 2; the perfect correlation is an artifact of the N.

*** $p \leq .001$

IF AND COLLEAGUE-IOSM

The data supported the hypothesis (H_3) that the influence of teacher colleagues over school-wide matters would be higher in schools with higher degrees of instructional flexibility. As predicted, the direction of the correlation between IF and Colleague-IOSM was positive and the size of the coefficient was statistically significant: $r = .553$, $p \leq .001$.

Given the study's theoretical framework, r^2 indicated that variation in the flexibility of instructional technology accounted for 31% of the variation in the influence of teacher colleagues over school-wide matters.

IF AND PRINCIPAL-IOSM

The correlation between IF and Principal IOSM was positive and close to zero: $r = .030$, $p > .05$.

The data partially supported the hypothesis (H_4) that the degree to which the principal's influence exceeds that of teacher colleagues would be lower in schools with higher degrees of instructional flexibility. As predicted for the schools in which the principal's influence exceeded the influence of teacher colleagues ($N = 26$), the direction of the correlation between IF and Principal-
IOSM was negative; however, the size of the coefficient was not statistically significant; $r = -.245$, $p > .05$.

Since there were only two schools in which the influence of teacher colleagues was greater than the influence of the principals a meaningful correlation could not be computed. It was noted, however, that the direction of the indicated relationship was negative.

Given the study's theoretical framework, r^2 indicated that variation in the flexibility of instructional technology accounted for only 6% of the variation in the principal's influence over school-wide matters in schools where the influence of the principal exceeded that of teacher colleagues.

The data thus confirmed the direction of the hypothesized relationship but failed to confirm the expected degree of association between instructional flexibility and the influence of principals over school-wide matters in schools in which their influence exceeded that of teacher colleagues.

IF AND EXTERNAL-IOSM

The data partially supported the hypothesis (H_5) that the influence of external actors over school-wide matters would be lower in schools with higher degrees of instructional flexibility. As predicted, the direction of the correlation between IF and External-IOSM was negative; however, the size of the coefficient was not statistically significant: $r = -.253$, $p > .05$.

Given the study's theoretical framework, r^2 indicated that variation in the flexibility of instructional technology accounted for only 6% of the variation in the influence of external actors over school-wide matters.

The data thus confirmed the direction of the hypothesized relationship but failed to confirm the expected degree of association between instructional flexibility and the influence of external actors over school-wide matters.

INFLUENCE OVER CLASSROOM MATTERS (IOCM)

Objective 1.1c called for an examination of the direction and degree of association between instructional flexibility and influence over classroom matters.

Bivariate correlations computed to test the hypotheses relating instructional flexibility to the influence of selected actors over classroom matters are reported in Table 7.3.

Table 7.3

Bivariate Correlations Between Instructional Flexibility (IF) and Influence Over Classroom Matters (IOCM)

	IF
	<u>r</u>
Self-IOCM ^a	.413*
Colleague-IOCM ^a	.426**
Principal-IOCM ^a	-.324*
Principal-IOCM > Colleague-IOCM ^b	-.421*
Principal-IOCM > Colleague-IOCM ^c	-.331
External-IOCM	-.430**

^aN = 28 schools; df = 26

^bN = 23 schools

^cN = 5 schools; the small N and the scatterplot suggest that this r should be interpreted cautiously.

* p ≤ .05

** p ≤ .01

IF AND SELF-IOCM

The data supported the hypothesis (H_6) that the self-influence of teachers over classroom matters would be higher in

schools with higher degrees of instructional flexibility. As predicted, the direction of the correlation between IF and Self-IOCM was positive and the size of the coefficient was statistically significant: $r = .413$, $p \leq .05$.

Given the study's theoretical framework, r^2 indicated that variation in the flexibility of instructional technology accounted for 17% of the variation in the influence of individual teachers over classroom matters.

IF AND COLLEAGUE-IOCM

The data supported the hypothesis (H_7) that the influence of teacher colleagues over classroom matters would be higher in schools with higher degrees of instructional flexibility. As predicted, the direction of the correlation between IF and Colleague-IOCM was statistically significant: $r = .426$, $p \leq .01$.

Given the study's theoretical framework, r^2 indicated that variation in the flexibility of instructional technology accounted for 18% of the variation in the influence of teacher colleagues over classroom matters.

IF AND PRINCIPAL-IOCM

The correlation between IF and Principal-IOCM was negative and statistically significant. This finding supports the notion that the instructional flexibility of schools would be lower in schools with higher degrees of superordinate influence over classroom matters.

The data supported the hypothesis (H_8) that the degree to

which the principal's influence exceeds that of teacher-colleagues would be lower in schools with higher degrees of instructional flexibility. As predicted for the schools in which the principal's influence exceeded the influence of teacher colleagues ($N = 23$), the direction of the correlation between IF and Principal-IOCM was negative and the size of the coefficient was statistically significant: $r = -.421$, $p \leq .05$.

Given the study's theoretical framework, r^2 indicated that variation in the flexibility of instructional technology accounted for 18% of the variation in the principal's influence over classroom matters in schools where the influence of the principal exceeded that of teacher colleagues.

There were five schools in which the influence of principals over classroom matters was less than that of teacher colleagues. Although the number of schools was small, it was noted that the direction of the relationship between IF and Principal-IOCM for these schools was negative. The size of the coefficient was not statistically significant at the $p \leq .05$ level.

IF AND EXTERNAL-IOCM

The data supported the hypothesis (H_9) that the influence of external actors would be lower in schools with higher degrees of instructional flexibility. As predicted, the direction of the correlation between IF and External-IOCM was statistically significant: $r = -.430$, $p \leq .01$.

Given the study's theoretical framework, r^2 indicated that variation in the flexibility of instructional technology accounted for 19% of the variation in the influence of external actors over classroom matters.

EFFECTS OF CONTROL VARIABLES ON THE IF-BTB RELATIONSHIP

Objective 1.2 called for an exploration of the effects of control variables on the hypothesized causal relationship between instructional flexibility and bureaucratization of teacher behavior.

CONTROL VARIABLES

Selitz et al. (1959:422) have identified the following three types of evidence which are necessary if one wishes to draw the inference that one variable (X) is the "cause" of another variable (Y):

1. that X and Y vary together in the way predicted by the specific hypothesis;
2. that Y did not precede X in time, and
3. that other factors did not determine Y.

The first of these criteria was met when it was determined that instructional flexibility (X) and bureaucratization of teacher behavior (Y) were negatively and significantly related as hypothesized.

Inasmuch as the data for this study was gathered ex post facto there was no control over the order in which changes in the variables took place. Indeed, as discussed earlier, there was reason to expect

that the order of causality might be the reverse of that deduced from Perrow's thesis. In other words, changes in the level of bureaucracy may cause changes in the level of instructional flexibility. This point is pursued in greater detail during the discussion of Objective 2.3.

The next few pages are addressed to the third point made by Selitz et al. That is, they address the possibility that factors other than instructional flexibility may have determined the degree to which the organizational structure of the schools was bureaucratized.

Thirty-one control variables were selected for an examination of their influence on the relationship between instructional flexibility and bureaucracy. The control variables were arranged in five sets: (1) principal background; (2) principal attitudes; (3) staff background; (4) staff attitudes; and (5) school background variables. The analyses utilized the SPSS program PARTIAL CORRELATION.

PRINCIPAL BACKGROUND

The zero-order correlations for each of seven background characteristics of principals with the instructional flexibility and bureaucratization are presented in Table 7.4.

All but one of the principal background variables had statistically non-significant ($p > .05$) zero-order correlations with instructional flexibility (IF) and bureaucratization of teacher behavior (BTB). The length of the principal's tenure in the school was

Table 7.4
 Zero-Order Correlations of Control Variables with
 Instructional Flexibility (IF) and with Bureaucratization
 of Teacher Behavior (BTB)

	IF r	BTB r
<u>Principal Variables</u>		
<u>Background^a</u>		
Age	.055	.045
Academic Background	-.244	-.324
Recency of Training	.099	.246
Total Experience	-.012	.065
Experience as Principal	-.001	.235
Tenure as Principal in Present District	-.009	.193
Tenure as Principal in Present School	.413*	-.040
<u>Attitude^a</u>		
Traditionalism	-.068	.518**
Progressivism	.404*	-.566**
Subject Matter Emphasis	-.483**	.488**
Pupil Adjustment Ideology	.012	.045
Student Autonomy vs. Teacher Direction	.173	-.468**
Consideration of Student Viewpoint	-.128	.275
Classroom Order	-.026	.648**
<u>Staff Variables^b</u>		
<u>Background</u>		
Age - M	-.069	-.263
S	-.055	-.172
Academic Background - M	.040	-.017
SD	.022	.125
Recency of Training - M	.103	-.226
SD	-.030	-.079

Table 7.4 (Cont.)

	IF r	BTB r
Experience as Teacher - M	-.089	-.139
SD	-.266	-.069
Experience as Teacher in Present District - M	-.256	.037
SD	-.176	-.124
Experience as Teacher in Present School - M	.127	-.147
SD	-.295	-.079
Experience as Teacher in Present School with Present Principal - M	.416*	-.223
SD	.273	.227
<u>Attitudes^a</u>		
Traditionalism	.522**	.699***
Progressivism	.224	-.156
Subject Matter Emphasis	-.506**	.421*
Pupil Adjustment Ideology	.189	-.168
Student Autonomy vs. Teacher Direction	.130	-.361
Consideration of Student Viewpoint	-.096	.096
Classroom Order	-.480**	.361
<u>School Variables^c</u>		
Size	-.121	.167
Socio-economic Status of Pupils	-.103	.390*
Staffing Pattern	.298	-.248
Teaching Space	.467**	-.251

^aN = 28; df = 26

^bM = mean score; N = 28, df = 26; SD = standard deviation score; N = 27, df = 25; list wise deletion resulted in one school being dropped due to lack of variance for one variable; $r_{IF-BTB} = -.433$, N = 27, $p \leq .05$.

^cN = 27, df = 25; list wise deletion resulted in one school being dropped due to lack of response. $r_{IF-BTB} = -.453$, N = 27, $p \leq .05$.

* $p \leq .05$

** $p \leq .01$

*** $p \leq .001$

positively and significantly related to the school's flexibility of instruction: $\underline{r} = .413$, $\underline{p} \leq .05$.

The first-order partial correlation coefficients for the relationship between instructional flexibility and bureaucratization of teacher behavior (IF-BTB) controlled for each of the seven background characteristics of principals are reported in Table 7.5.

An examination of these first-order partials revealed that the academic background of principals acted to suppress the zero-order \underline{r} between IF and BTB. Controlling for the academic background of principals increased the size of the relationship from $\underline{r} = -.441$ to $\underline{r} = -.567$. The corresponding increase in the common variance between IF and BTB when the academic background of principals was controlled amounted to 12 percent. The recency of training of the principals also tended to suppress the relationship but to a lesser degree. The remaining background characteristics of principals had little effect on the relationship between instructional flexibility and bureaucratization.

The background characteristics of principals were also used as controls in second-, third-, fourth- and seventh order partial correlation analyses (Table 7.5).

The minimum multiple partial correlation revealed by these analyses ($\underline{r} = -.407$, $\underline{df} = 22$, $\underline{p} \leq .05$) was observed when the age, total experience as teacher and principal, experience as principal and tenure as principal at the school were controlled simultaneously.

The maximum multiple partial correlation ($\underline{r} = -.616$, $\underline{df} = 22$, $\underline{p} \leq .01$) occurred when the age, academic background, recency of

Table 7.5

Selected Results of Partial Correlation Analyses of the
IF-BTB Relationship Controlled for Principal Background

Order of Analysis and Variable(s) Controlled	IF-BTB Partial Correlation
Zero-Order Partial ^a (<u>df</u> = 26)	-.441*
<hr/>	
First-Order Partial (df = 25)	
Age	-.444*
Academic Background	-.567**
Recency of Training*	-.482**
Total Experience	-.441*
Experience as Principal	-.453*
Experience as Principal in District	-.447*
Experience as Principal in School	-.466**
<hr/>	
Minimum Partial: Third-Order (<u>df</u> = 23)	
Total Experience, Experience as Principal and Experience as Principal in School	-.406*
<hr/>	
Maximum Partial: Fourth-Order (<u>df</u> = 22)	
Age, Academic Background, Recency of Training, Total Experience	-.616***
<hr/>	
Seventh-Order Partial (<u>df</u> = 19)	
Age, Academic Background, Recency of Training, Total Experience, Experience as Principal, Experience as Principal in District, and Experience as Principal in School	-.595**

^aN = 28 schools

* $p \leq .05$

** $p \leq .01$

*** $p \leq .001$

training and total experience as teacher and principal were controlled simultaneously.

When all seven background characteristics of the principals were controlled simultaneously, the multiple partial correlation was $-.595$ ($df = 19, p \leq .01$).

The background characteristics of the principals thus played an important role in determining the strength of the relationship between instructional flexibility and bureaucratization. In general they tended to suppress the relationship. One of the background characteristics of principals, academic background, was found to suppress the relationship by 12 percent of the common variance between instructional flexibility and bureaucratization. When all seven were controlled simultaneously the increase in common variance (r^2) between IF and BTB amounted to 15 percent.

PRINCIPAL ATTITUDES

The zero-order correlations for each of seven principal attitudes with instructional flexibility and bureaucratization are presented in Table 7.6.

Two of the attitudes held by principals were significantly correlated with instructional flexibility. The progressivism of principals was positively related ($r = .404, p \leq .05$) and the subject matter emphasis orientation of principals was negatively related to instructional flexibility ($r = -.483, p \leq .01$).

Five of the attitudes held by principals were significantly

Table 7.6

Selected Results of Partial Correlation Analyses of the IF-BTB
Relationship Controlled for Principal Attitudes

Order of Analysis and Variables Controlled	IF-BTB Partial Correlation
Zero-Order Partial ^a (<u>df</u> = 26)	-.441
<hr/>	
First-Order Partial (<u>df</u> = 25)	
Traditionalism	-.475**
Progressivism	-.281
Subject Matter Emphasis	-.268
Pupil Adjustment Ideology	-.442*
Student Autonomy	-.413*
Consideration of Student Viewpoint	-.430*
Classroom Order	-.461
<hr/>	
Minimum Partial: Fourth-Order (<u>df</u> = 22)	
Progressivism, Subject Matter Emphasis, Pupil Adjustment Ideology, and Classroom Order	-.163
<hr/>	
Maximum Partial: Third-Order (<u>df</u> = 23)	
Traditionalism, Pupil Adjustment Ideology, and Student Autonomy	-.497**
<hr/>	
Seventh-Order Partial (<u>df</u> = 19)	
Traditionalism, Progressivism, Subject Matter Emphasis, Pupil Adjustment Ideology, Student Autonomy, Consideration of Student Viewpoint and Classroom Order	-.264

^aN = 28 schools

* $p \leq .05$

** $p \leq .01$

related to bureaucratization. Positive significant relationships were observed for traditionalism ($r = .518$, $p \leq .01$), subject matter emphasis ($r = .483$, $p \leq .01$), and classroom order ($r = .648$, $p \leq .01$). Negative significant relationships were observed for progressivism ($r = -.518$, $p \leq .01$) and student autonomy ($r = -.468$, $p \leq .01$).

(These zero-order correlations for the attitudes of principals with instructional flexibility and bureaucratization receive further discussion later in this report.)

The first-order partial correlation coefficients for the relationship between instructional flexibility and bureaucratization controlled for each of the seven attitudes of principals are presented in Table 7.6.

An examination of the first-order analyses revealed that two of the principal attitudes acted to inflate the relationship between instructional flexibility and bureaucratization such that when the relationship was controlled for either the progressivism or the subject matter emphasis of the principals the significant zero-order r of $-.441$ was reduced to non-significant ($p > .05$) partial r 's of $-.281$ and $-.268$ respectively.

Slight increases or less severe reductions of the zero-order r between instructional flexibility and bureaucratization were observed when each of the remaining attitudes of principals were controlled.

The attitudes of principals were also used as controls in second-, third-, fourth-, and seventh-order partial correlation analyses of the relationships between instructional flexibility and bureaucratization (Table 7.6).

The minimum multiple partial correlation ($\underline{r} = -.163$, $\underline{df} = 22$, $\underline{p} > .05$) was observed when principal attitudes toward progressivism, subject matter emphasis, pupil adjustment ideology and classroom order were controlled simultaneously.

The maximum multiple partial correlation ($\underline{r} = -.497$, $\underline{df} = 23$, $\underline{p} \leq .05$) occurred when the attitudes of principals toward traditionalism, pupil adjustment ideology and student autonomy were controlled simultaneously.

When all seven principal attitudes were controlled simultaneously the multiple partial correlation was $-.163$ ($\underline{df} = 19$, $\underline{p} > .05$).

The educational attitudes of principals thus played an important role in determining the strength of the relationship between instructional flexibility and bureaucratization. Three attitudes, traditionalism, pupil adjustment ideology and student autonomy acted together to increase the common variance between instructional flexibility and bureaucratization from 20 percent to 25 percent. However, when controlled separately for the progressivism and subject matter emphasis orientations of principals the zero-order correlation between instructional flexibility and bureaucratization was shown to be spurious. The common variance dropped from 20 percent to 8 percent and 7 percent respectively and the sizes of the first-order partial correlations were not statistically significant at the $\underline{p} < .05$ level. When all seven of the principal attitudes were controlled simultaneously the multiple partial correlation was not statistically significant thus indicating that the observed relationship between instructional flexibility and bureaucratization was spurious.

STAFF BACKGROUND

The zero-order correlations for both mean and standard deviation values of each of seven staff background characteristics with instructional flexibility and with bureaucratization are presented in Table 7.7. In addition to mean values, standard deviation values were used to determine if the variance of staff background characteristics within individual schools was related to instructional flexibility and/or bureaucratization.

Only one correlation was significant at the $p < .05$ level. The staff's mean tenure with the principal was positively and significantly related to instructional flexibility: $r = .416$, $p < .05$.

There was little difference between correlations which used mean values and those which used standard deviation values. (It was noted, however, that the variances were artificially limited due to the small number of response categories for the staff background questions. Finer interval level measurements may be needed to adequately test the notion that the variance within a staff of background variables may be related to instructional flexibility and/or to bureaucratization.)

The first-order partial correlation coefficients for the relationship between instructional flexibility and bureaucratization of teacher behavior (IF-BTB) controlled for the mean and standard deviation values of each of seven staff background characteristics are presented in Table 7.7.

When mean scores were used all seven first-order partial correlations were statistically significant at the $p \leq .05$ level. They ranged from $-.392$ when the staff's mean tenure with the principal was

Table 7.7

Selected Results of Partial Correlation Analyses of the IF-BTB
Relationship Controlled for Staff Background

Order of Analysis and Variable(s) Controlled	IF-BTB Partial Correlation
Zero-Order Partial (M) ^a (N = 28, df = 26)	-.441*
(SD) ^b (N = 27, df = 25)	-.433*
<hr/>	
First-Order Partial (M : df = 25, SD : df = 24)	
<hr/>	
Age (M)	-.477**
(SD)	-.450*
Academic Background (M)	-.440*
(SD)	-.440*
Recency of Training (M)	-.431*
(SD)	-.437
Experience as Teacher (M)	-.459*
(SD)	-.469**
Experience as Teacher in District (M)	-.446*
(SD)	-.466**
Experience as Teacher in School (M)	-.430*
(SD)	-.479**
Experience as Teacher with Principal (M)	-.392*
(SD)	-.396**
<hr/>	
Minimum Partial (M) : Fourth-Order (df = 22)	
<hr/>	
Age, Recency of Training, Experience as Teacher in District, and Experience as Teacher with Principal	-.363
<hr/>	
Minimum Partial (SD) : Second-Order (df = 23)	
<hr/>	
Academic Background, Experience as Teacher with Principal	-.398*
<hr/>	
Maximum Partial (M) ^a : Third Order (df = 23)	
<hr/>	

Table 7.7 (Cont.)

Order of Analysis and Variable(s) Controlled	IF-BTB Partial Correlation
Age, Academic Background, Experience as Teacher in School	-.500**
<hr/>	
Maximum Partial (SD) ^b : Second-Order (<u>df</u> = 23)	
Experience as Teacher, Experience as in School	-.500**
<hr/>	
Seventh-Order Partial (M) (<u>df</u> = 19)	
Age, Academic Background, Recency of Training, Experience as Teacher, Experience as Teacher in District, Experience as Teacher in School, Experience as Teacher with Principal	-.373
<hr/>	
Seventh-Order Partial (SD) (<u>df</u> = 18)	
Age, Academic Background, Recency of Training, Experience as Teacher, Experience as Teacher in District, Experience as Teacher in School, Experience as Teacher with Principal	-.424

^aMean Scores

^bStandard Deviation Scores

* $p \leq .05$

** $p \leq .01$

controlled to $-.477$ when the mean age of the staff was controlled.

When standard deviation scores were used all of the first-order partial correlations were also significant at the $p \leq .05$ level. They ranged from $-.396$ when the staff's variation in tenure with the principal was controlled to $-.478$ when the variance in school tenure was controlled.

When staff means were used in second-, third-, and fourth-order analyses (Table 7.7), the minimum multiple partial correlation ($r = .363$, $df = 22$, $p > .05$) occurred when the staff's academic background, recency of last university credit course, tenure with the district and tenure with the principal were controlled simultaneously. It was not statistically significant.

When mean scores for all seven staff background characteristics were controlled simultaneously (Table 7.7) the multiple partial r was $-.373$ ($df = 19$, $p > .05$).

When standard deviations were used in the second-, third-, and fourth-order analyses (Table 7.7), the minimum multiple partial correlation ($r = -.398$, $df = 23$, $p \leq .05$) occurred when the variance in staff academic background and tenure with the principal were controlled simultaneously. This partial correlation was statistically significant.

When standard deviations were used the maximum multiple partial correlation ($r = -.500$, $df = 23$, $p \leq .01$) occurred when the variance in staff total experience and tenure at the school were controlled simultaneously.

When the variances for each of the seven staff background

variables were controlled simultaneously (Table 7.7) the multiple partial correlation was $-.424$ ($df = 18, p > .05$).

STAFF ATTITUDES

The zero-order correlations for seven staff attitudes with instructional flexibility and with bureaucratization are presented in Table 7.8.

Three staff attitudes were significantly negatively related to instructional flexibility: traditionalism ($r = -.522, p \leq .01$); subject matter emphasis ($r = -.506, p \leq .01$); and classroom order ($r = -.480, p \leq .01$).

Two of the staff attitudes were significantly and positively related to bureaucratization: traditionalism ($r = .699, p \leq .001$) and subject matter emphasis ($r = .421, p \leq .05$).

(The zero-order correlations between staff attitudes and instructional flexibility are discussed beginning on page 157. The correlations for staff attitudes with bureaucratization are discussed beginning on page 169.)

The first-order partial correlation coefficients for the relationship between instructional flexibility and bureaucratization of teacher behavior (IF-BTB) controlled for each of the seven staff attitudes are reported in Table 7.8.

An examination of the first-order partials revealed that three of the staff attitudes substantially inflated the IF-BTB relationship. When the traditionalism of staffs was controlled the original correlation of $-.441$ ($p \leq .05$) was reduced to a non-significant partial

Table 7.8

Selected Results of Partial Correlation Analyses of the IF-BTB
Relationship Controlled for Staff Attitudes

Order of Analysis and Variable(s) Controlled	IF-BTB Partial Correlation
Zero-Order Partial ^a (df = 26)	-.441*
<hr/>	
First-Order Partial (df = 25)	
Traditionalism	-.124
Progressivism	-.422*
Subject Matter Emphasis	-.291
Pupil Adjustment Ideology	-.422*
Student Autonomy	-.426*
Consideration of Student Viewpoint	-.436*
Classroom Order	-.327
<hr/>	
Minimum Partial : Fourth-Order (df = 22)	
Traditionalism, Pupil Adjustment Ideology, Student Autonomy, Consideration of Student Viewpoint	-.033
<hr/>	
Maximum Partial : Second-Order (df = 24)	
Progressivism, Student Autonomy	-.441*
<hr/>	
Seventh-Order Partial	
Traditionalism, Progressivism, Subject Matter Emphasis, Pupil Adjustment Ideology, Student Autonomy, Consideration of Student Viewpoint, Classroom order	-.082

^aN = 28 schools

* $p \leq .05$

correlation of $-.124$ ($p > .05$). Likewise the common variance was reduced from 20 percent to 2 percent. Similar but smaller reductions also occurred when the subject matter emphasis and classroom order attitudes of staffs were controlled separately. No increases were observed.

Staff attitudes were also used as controls in second-, third-, and fourth-order analyses of the IF-BTB relationship (Table 7.8).

The minimum multiple partial correlation ($r = -.033$, $df = 22$, $p > .05$) was observed when staff attitudes toward traditionalism, pupil adjustment ideology, student autonomy and consideration of student viewpoint were controlled simultaneously.

The maximum multiple partial correlation ($r = -.033$, $df = 22$, $p > .05$) was observed when staff attitudes toward traditionalism, pupil adjustment ideology, student autonomy and consideration of student viewpoint were controlled simultaneously.

The maximum multiple partial correlation ($r = -.441$, $df = 24$, $p \leq .05$) occurred when the staff attitudes toward progressivism and student autonomy were controlled simultaneously.

When all seven staff attitudes were controlled simultaneously the multiple partial correlation was $-.084$ ($df = 19$, $p > .05$).

SCHOOL BACKGROUND

The zero-order correlations for four school background variables with instructional flexibility and with bureaucratization are reported in Table 7.9.

Table 7.9

Selected Results of Partial Correlation Analyses of the IF=BTB
Relationship Controlled for School Background

Order of Analysis and Variable(s) Controlled	IF-BTB Partial Correlation
Zero-Order Partial ^a (<u>df</u> = 25)	-.453*
<hr/>	
First-Order Partial (df = 24)	
<hr/>	
Size	-.443*
Socio-economic Status	-.451*
Staffing Pattern	-.411*
Teaching Space	-.393*
<hr/>	
Minimum Partial : Third-Order (<u>df</u> = 22)	
<hr/>	
Size, Staffing Pattern, Teaching Space	-.366
<hr/>	
Maximum Partial : Second-Order (<u>df</u> = 23)	
<hr/>	
Size, Socio-economic Status	-.443*
<hr/>	
Fourth-Order Partial (<u>df</u> = 21)	
<hr/>	
Size, Socio-economic Status, Staffing Pattern, Teaching Space	-.396
<hr/>	

^aN = 27 schools

* p ≤ .05

The socio-economic status (SES) of the students attending the schools was significantly and negatively related to bureaucratization: $\underline{r} = -.390$, $\underline{p} \leq .05$. Low SES schools tended to be more bureaucratized than high SES schools.

The openness of teaching area was significantly and positively related to instructional flexibility: $\underline{r} = .467$, $\underline{p} \leq .01$. Schools with proportionately more open space teaching area tended to have higher degrees of instructional flexibility.

The first-order partial correlation coefficients for the relationship between instructional flexibility and bureaucratization controlled for each of the four school background characteristics are presented in Table 7.9.

There was little change in the correlation between instructional flexibility and bureaucratization when the relationship was controlled separately for the effects of school size, SES of students, staffing pattern and openness of teaching space. All of the first-order partial correlations were statistically significant at the $\underline{p} \leq .05$ level.

The school background characteristics were also used as controls in second-, third-, and fourth-order analyses of the relationship between instructional flexibility and bureaucratization (Table 7.9).

The minimum multiple partial correlation ($\underline{r} = -.366$, $\underline{df} = 22$, $\underline{p} > .05$) was observed when size, staffing pattern and teaching space were controlled simultaneously.

The maximum multiple partial correlation ($\underline{r} = -.443$, $\underline{df} = 23$, $\underline{p} < .05$) occurred when size and student SES were controlled

simultaneously.

When all four school characteristics were controlled simultaneously the school background characteristics were also used as controls in second-, third-, and fourth-order analyses of the relationship between instructional flexibility and bureaucratization (Table 7.9).

The minimum multiple partial correlation ($\underline{r} = -.366$, $\underline{df} = 22$, $\underline{p} > .05$) was observed when size, staffing pattern and teaching space were controlled simultaneously.

The maximum multiple partial correlation ($\underline{r} = -.443$, $\underline{df} = 23$, $\underline{p} \leq .05$) occurred when size and student SES were controlled simultaneously.

When all four school background characteristics were controlled simultaneously, the multiple partial correlation was $\underline{r} = -.396$ ($\underline{df} = 21$, $\underline{p} > .05$).

SUMMARY OF CONTROL ANALYSES

The results of the partial correlation analyses reported above indicated that the strength of the relationship between instructional flexibility and bureaucratization was affected by the confounding actions of several control variables, some of which tended to suppress the relationship and some of which inflated it.

Two principal attitude orientations (progressivism and subject matter emphasis) and three staff attitudes (traditionalism, subject matter emphasis, and classroom order) were particularly influential in inflating the relationship between instructional flexibility and

bureaucratization. When controlled separately for the confounding effects of these attitude variables the simple relationship between instructional flexibility and bureaucratization was shown to be spurious, that is, the simple relationship was due in large measure to the relationships between these attitudes and their relationships with instructional flexibility and with bureaucratization.

The academic background of principals was found to be particularly strong in tending to suppress the relationship between instructional flexibility and bureaucratization. Controlling for the variance in instructional flexibility and bureaucratization which was common to the academic backgrounds of principals revealed that the strength of the relationship was considerably larger than indicated by the zero-order correlation.

No large changes in the relationship between instructional flexibility and bureaucratization were observed when it was separately controlled for the effects of staff background variables.

The effects of school background variables on the size of the relationship between instructional and bureaucratization were minimal.

CHAPTER 8

OBJECTIVE 2.1:

TESTS OF PERSONNEL-TECHNOLOGY HYPOTHESES

CHAPTER 8

OBJECTIVE 2.1:

TESTS OF PERSONNEL-TECHNOLOGY HYPOTHESES

PRINCIPAL ATTITUDES AND INSTRUCTIONAL FLEXIBILITY

Objective 2.1a called for an examination of the directions and degrees of association between educational attitudes held by the principals and the degree to which the principals' schools were characterized by instructional flexibility.

Bivariate correlations computed to test the hypotheses relating principal attitudes to instructional flexibility are reported in Table 8.1.

PRINCIPAL GENERAL ATTITUDES TOWARD EDUCATION

PRINCIPAL TRADITIONALISM AND IF

The data partially supported the hypothesis (H_{10}) that instructional flexibility would be lower in schools with principals having stronger orientations toward traditionalism. As predicted, the direction of the correlation between the traditionalism orientations of principals and IF was negative; however, the size of the coefficient was not statistically significant: $\underline{r} = -.068$, $\underline{p} > .05$.

Given the study's theoretical framework, \underline{r}^2 indicated that

Table 8.1
 Bivariate Correlations Between Principal
 Attitude Orientations and Instructional Flexibility (IF)

	IF
	<u>r</u>
<u>General Attitude Orientations</u>	
Traditionalism	-.068
Progressivism	.404*
<u>Teaching Process Orientations</u>	
Subject Matter Emphasis	-.483**
Pupil Adjustment Ideology	.012
Student Autonomy	.173
Consideration of Student Viewpoint	-.128
Classroom Order	-.026

* $p \leq .05$

** $p \leq .01$

variation in the traditionalism of principals accounted for less than 1% of the variation in the flexibility of instructional technology.

The data thus confirmed the direction of the hypothesized relationship but failed to confirm the expected strength of association between the educational traditionalism of principals and the degree to which their schools were characterized by instructional flexibility.

PRINCIPAL PROGRESSIVISM AND IF

The data supported the hypothesis (H_{11}) that instructional flexibility would be higher in schools with principals having stronger orientations toward progressivism. As predicted, the direction of the correlation between the progressivism orientations of principals and IF was positive and the size of the coefficient was statistically significant: $r = .404$, $p \leq .05$.

Given the study's theoretical framework, r^2 indicated that variation in the educational progressivism of principals accounted for 16% of the variation in the flexibility of instructional technology.

The data thus supported the hypothesis. There was a significant positive association between the progressivism of principals and the level of instructional flexibility. Instructional flexibility increased as the progressivism of principals increased.

PRINCIPAL TEACHING PROCESS ORIENTATIONS

PRINCIPAL SUBJECT MATTER EMPHASIS AND IF

The data supported the hypothesis (H_{12}) that instructional

flexibility would be lower in schools with principals having stronger orientations toward a subject matter emphasis. As predicted, the direction of the correlation between the subject matter emphasis orientations of principals and IF was negative and the size of the coefficient was statistically significant: $r = -.483$, $p \leq .01$.

Given the study's theoretical framework, r^2 indicated that variation in the subject matter emphasis orientations of principals accounted for 23% of the variation in the flexibility of instructional technology.

The data thus supported the hypothesis. There was a significant negative association between the subject matter emphasis orientations of principals and the level of instructional flexibility. Instructional flexibility decreased as the subject matter emphasis of principals increased.

PRINCIPAL PUPIL ADJUSTMENT IDEOLOGY AND IF

The data partially supported the hypothesis (H_{13}) that instructional flexibility would be higher in schools with principals having stronger orientations toward a pupil adjustment ideology. As predicted, the direction of the correlation between the pupil adjustment ideology orientations of principals and IF was positive; however, the size of the coefficient was not statistically significant: $r = .012$, $p > .05$.

Given the study's theoretical framework, r^2 indicated that variation in the pupil adjustment ideology orientations of principals accounted for less than 1% of the variation in instructional

flexibility.

The data thus confirmed the direction of the hypothesized relationship but failed to confirm the expected strength of association between the orientations of principals toward a pupil adjustment ideology and the degree to which their schools were characterized by instructional flexibility.

PRINCIPAL STUDENT AUTONOMY AND IF

The data partially supported the hypothesis (H_{14}) that instructional flexibility would be higher in schools with principals having stronger orientations toward student autonomy. As predicted, the correlation between the student autonomy orientations of principals and IF was positive; however, the size of the coefficient was not statistically significant: $r = .173$, $p > .05$.

Given the study's theoretical framework, r^2 indicated that variation in the orientations of principals toward student autonomy accounted for less than 3% of the variation in instructional flexibility.

The data thus confirmed the direction of the hypothesized relationship but failed to confirm the expected strength of association between the orientations of principals toward student autonomy and the instructional flexibility of their schools.

PRINCIPAL CONSIDERATION OF STUDENT VIEWPOINT AND IF

The data did not support the hypothesis (H_{15}) that instructional

flexibility would be higher in schools with principals having stronger orientations toward a consideration of student viewpoints. Contrary to the prediction, the direction of the correlation between the consideration of student viewpoint orientations of principals and IF was negative, not positive; however, the size of the coefficient was not significant: $r = -.128$, $p > .05$.

Given the study's theoretical framework (but contrary to the expected direction), r^2 indicated that variation in the orientations of principals toward the consideration of student viewpoints accounted for only 2% of the variation in instructional flexibility.

The data thus failed to confirm the direction and the strength of the hypothesized association between the orientations of principals toward the consideration of student viewpoints and the instructional flexibility of their schools.

PRINCIPAL CLASSROOM ORDER AND IF

The data partially supported the hypothesis (H_{16}) that instructional flexibility would be lower in schools with principals having stronger orientations toward classroom order. As predicted the direction of the correlation between the classroom order orientations of principals and IF was negative; however, the size of the coefficient was not statistically significant: $r = -.026$, $p > .05$.

Given the study's theoretical framework, r^2 indicated that variation in the orientations of principals toward classroom order accounted for less than 1% of the variation in instructional flexibility.

The data thus confirmed the direction of the hypothesized relationship but failed to confirm the expected strength of association between the orientations of principals toward classroom order and the instructional flexibility of their schools.

STAFF ATTITUDES AND INSTRUCTIONAL FLEXIBILITY

Objective 2.1b called for an examination of the directions and degrees of association between educational attitudes held by teaching staffs and the degree to which their schools were characterized by instructional flexibility.

Bivariate correlations computed to test the hypotheses relating staff attitudes to instructional flexibility are reported in Table 8.2.

STAFF GENERAL ATTITUDES TOWARD EDUCATION

STAFF TRADITIONALISM AND IF

The data supported the hypothesis (H_{17}) that instructional flexibility would be lower in schools with staffs having stronger orientations toward traditionalism. As predicted, the direction of the correlation between the traditionalism of staffs and IF was negative and the size of the coefficient was statistically significant: $r = -.522$, $p \leq .01$.

Given the study's theoretical framework, r^2 indicated that variation in the orientations of staffs towards traditionalism accounted for 27% of the variation in the flexibility of instructional technology.

Table 8.2
Bivariate Correlations Between Staff Educational
Attitude Orientations and Instructional Flexibility (IF)

	IF
	<u>r</u>
<u>General Attitude Orientations</u>	
Traditionalism	-.522**
Progressivism	.244
<u>Teaching Process Orientations</u>	
Subject Matter Emphasis	-.506**
Pupil Adjustment Ideology	.189
Student Autonomy	.130
Consideration of Student Viewpoint	-.096
Classroom Order	-.480**

** $p \leq .01$

The data thus supported the hypothesis. There was a significant negative association between the traditionalism of staffs and the level of instructional flexibility. Instructional flexibility decreased as the traditionalism of staffs increased.

STAFF PROGRESSIVISM AND IF

The data partially supported the hypothesis (H_{18}) that instructional flexibility would be higher in schools with staffs

having stronger orientations toward progressivism. As predicted, the direction of the correlation between the progressivism of staffs and IF was positive; however, the size of the coefficient was not statistically significant: $r = .244$, $p > .05$.

Given the study's theoretical framework, r^2 indicated that variation in the orientations of staffs towards progressivism accounted for only 5% of the variation in instructional flexibility.

The data thus confirmed the direction of the hypothesized relationship but failed to confirm the expected strength of association between the orientation of staffs toward progressivism and the instructional flexibility of their schools.

STAFF TEACHING PROCESS ORIENTATIONS

STAFF SUBJECT MATTER EMPHASIS AND IF

The data supported the hypothesis (H_{1g}) that instructional flexibility would be lower in schools with staffs having stronger orientations toward a subject matter emphasis. As predicted, the direction of the correlation between the subject matter emphasis orientations of staffs and IF was negative and the size of the coefficient was statistically significant: $r = -.506$, $p \leq .01$.

Given the study's theoretical framework, r^2 indicated that variation in the orientations of staffs toward a subject matter emphasis accounted for 26% of the variation in instructional flexibility.

The data thus supported the hypothesis. There was a significant negative association between the subject matter emphasis

orientations of staffs and the level of instructional flexibility. Instructional flexibility decreased as the subject matter emphasis of principals increased.

STAFF PUPIL ADJUSTMENT IDEOLOGY AND IF

The data partially supported the hypothesis (H_{20}) that instructional flexibility would be higher in schools with staffs having stronger orientations toward a pupil adjustment ideology. As predicted, the direction of the correlation between the pupil adjustment ideology orientations of staffs and IF was positive; however, the size of the coefficient was not statistically significant: $r = .189$, $p > .05$.

Given the study's theoretical framework, r^2 indicated that variation to the orientations of staffs towards a pupil adjustment ideology accounted for only 4% of the variation in instructional flexibility.

The data thus confirmed the direction of the hypothesis but failed to confirm the expected strength of association between the orientations of staffs toward a pupil adjustment ideology and the flexibility of instructional technology.

STAFF STUDENT AUTONOMY AND IF

The data partially supported the hypothesis (H_{21}) that instructional flexibility would be higher in schools having staffs with stronger orientations toward student autonomy. As predicted, the

direction of the correlation between the student autonomy orientations of staffs and IF was positive; however, the size of the coefficient was not statistically significant.

Given the study's theoretical framework, r^2 indicated that variation in the orientations of staffs toward student autonomy accounted for only 2% of the variation in instructional technology.

The data thus confirmed the direction of the hypothesized relationship but failed to confirm the expected strength of association between the orientations of staffs toward student autonomy and the flexibility of instructional technology.

STAFF CONSIDERATION OF STUDENT VIEWPOINT AND IF

The data did not support the hypothesis (H_{22}) that instructional flexibility would be higher in schools with staffs having stronger orientations toward the consideration of student viewpoints. Contrary to the prediction, the direction of the correlation between the consideration of student viewpoint orientations of staffs and IF was negative, not positive; however, the size of the coefficient was not significant: $r = -.096$, $p > .05$.

Given the study's theoretical framework (but contrary to the expected direction), r^2 indicated that variation in the orientations of staffs toward the consideration of student viewpoints accounted for only 1% of the variation in instructional flexibility.

The data thus failed to confirm the direction and the strength of the hypothesized association between the orientations of staffs

toward the consideration of student viewpoints and the instructional flexibility of their schools.

STAFF CLASSROOM ORDER AND IF

The data supported the hypothesis (H_{23}) that instructional flexibility would be lower in schools with staffs having stronger orientations toward classroom order. As predicted, the direction of the correlation between the classroom order orientations of staffs and IF was negative and the size of the coefficient was statistically significant: $r = -.480$, $p \leq .01$.

Given the study's theoretical framework, r^2 indicated that variation in the orientations of staffs toward classroom order accounted for 23% of the variation in instructional flexibility.

The data thus supported the hypothesis. There was a significant negative association between the classroom order orientations of staffs and the level of instructional flexibility. Instructional flexibility decreased as the classroom order orientations of staffs increased.

CHAPTER 9

OBJECTIVE 2.2:

TESTS OF PERSONNEL-STRUCTURE HYPOTHESES

CHAPTER 9

OBJECTIVE 2.2:

TESTS OF PERSONNEL-STRUCTURE HYPOTHESES

PRINCIPAL ATTITUDES AND BUREAUCRACY

Objective 2.2a called for an examination of the direction and degree of association between the educational attitudes of principals and school bureaucratization.

Bivariate correlations computed to test the hypotheses relating the attitudes of principals to the bureaucratization of teacher behavior (BTB) are reported in Table 9.1.

PRINCIPAL GENERAL ATTITUDES AND BUREAUCRACY

PRINCIPAL TRADITIONALISM AND BTB

The data supported the hypothesis (H_{24}) that schools with higher levels of bureaucratization would have principals with stronger orientations toward traditionalism. As predicted, the direction of the correlation between BTB and the orientations of principals toward traditionalism was positive and the size of the coefficient was statistically significant: $r = .518$, $p \leq .01$.

Given the study's theoretical framework, r^2 indicated that variation in the orientations of principals toward traditionalism accounted for 27% of the variation in the bureaucratization of

Table 9.1

Bivariate Correlations Between Principal Educational
Attitudes and Bureaucratization of Teacher Behavior (BTB)

	BTB
	<u>r</u>
Principal General Attitude Orientations	
Traditionalism	.518**
Progressivism	-.566**
Principal Teaching Process Orientations	
Subject Matter Emphasis	.488**
Pupil Adjustment Ideology	.045
Student Autonomy	-.468**
Consideration of Student Viewpoint	.423**
Classroom Order	.349*

* $p \leq .05$

** $p \leq .01$

*** $p \leq .001$

teacher behavior.

PRINCIPAL PROGRESSIVISM AND BTB

The data supported the hypothesis (H_{25}) that schools with lower levels of bureaucratization would have principals with stronger orientations toward progressivism. As predicted, the direction of the correlation between BTB and the orientations of principals toward progressivism was negative and the size of the coefficient was statistically significant: $r = -.566$, $p \leq .001$.

Given the study's theoretical framework, r^2 indicated that variation in the orientations of principals toward progressivism accounted for 32% of the variation in the bureaucratization of teacher behavior.

PRINCIPAL TEACHING PROCESS ORIENTATIONS AND BUREAUCRACY

PRINCIPAL SUBJECT MATTER EMPHASIS AND BTB

The data supported the hypothesis (H_{26}) that schools with higher levels of bureaucratization would have principals with stronger orientations toward a subject matter emphasis. As predicted, the direction of the correlation between BTB and the orientation of principals toward a subject matter emphasis was positive and the size of the coefficient was statistically significant: $r = .488$, $p \leq .01$.

Given the study's theoretical framework, r^2 indicated that variation in the orientations of principals toward an emphasis on subject matter accounted for 24% of the variation in the

bureaucratization of teacher behavior.

PRINCIPAL PUPIL ADJUSTMENT IDEOLOGY AND BTB

The data did not support the hypothesis (H_{27}) that schools with lower levels of bureaucratization would have principals with stronger orientations toward a pupil adjustment ideology. Contrary to the prediction, the direction of the correlation between BTB and the orientations of principals toward a pupil adjustment ideology was positive, not negative; however, the size of the coefficient was not statistically significant: $r = .045$, $p > .05$.

Given the study's theoretical framework, but contrary to the expected direction, r^2 indicated that variation in the orientations of principals toward a pupil adjustment ideology accounted for less than 1% of the variation in the bureaucratization of teacher behavior.

PRINCIPAL STUDENT AUTONOMY AND BTB

The data supported the hypothesis (H_{28}) that schools with lower levels of bureaucratization would have principals with stronger orientations toward student autonomy. As predicted, the direction of the correlation between BTB and the orientation of principals toward student autonomy was negative, and the size of the coefficient was statistically significant: $r = -.468$, $p \leq .01$.

Given the study's theoretical framework, r^2 indicated that variation in the orientations of principals toward student autonomy accounted for 22% of the variation in bureaucratization of teacher behavior.

PRINCIPAL CONSIDERATION OF STUDENT VIEWPOINT AND BTB

Contrary to the hypothesis (H_{29}) which stated that schools with lower levels of bureaucratization would have principals with stronger orientations toward the consideration of student viewpoints, the data supported the converse relationship. That is, the data indicated that schools with higher levels of bureaucratization had principals with stronger orientations toward a consideration of student viewpoints. The direction of the correlation between BTB and the orientations of principals toward the consideration of student viewpoints was positive and the size of the coefficient was statistically significant: $\underline{r} = .423$, $\underline{p} \leq .01$.

Given the study's theoretical framework, but contrary to the expected direction, \underline{r}^2 indicated that variation in the orientations of principals toward the consideration of student viewpoints accounted for 18% of the variation in the bureaucratization of teacher behavior.

PRINCIPAL CLASSROOM ORDER AND BTB

The data supported the hypothesis (H_{30}) that schools with higher levels of bureaucratization would have principals with stronger orientations toward classroom order. As predicted, the direction of the correlation between BTB and the orientations of principals toward classroom order was positive and the size of the coefficient was statistically significant: $\underline{r} = .349$, $\underline{p} \leq .05$.

Given the study's theoretical framework, \underline{r}^2 indicated that variation in the classroom order orientations of principals accounted

for 12% of the variation in the bureaucratization of teacher behavior.

STAFF ATTITUDES AND BUREAUCRACY

Objective 2.2b called for an examination of the direction and degree of association between the educational attitudes of staffs and school bureaucratization.

Bivariate correlations computed to test the hypotheses relating the attitudes of staffs to the bureaucratization of teacher behavior (BTB) are reported in Table 9.2.

STAFF GENERAL ATTITUDES AND BUREAUCRACY

STAFF TRADITIONALISM AND BTB

The data supported the hypothesis (H_{31}) that schools with higher levels of bureaucratization would have staffs with stronger orientations toward traditionalism. As predicted, the direction of the correlation between BTB and the orientations of staffs toward traditionalism was positive and the size of the coefficient was statistically significant: $r = .699$, $p \leq .001$.

Given the study's theoretical framework, r^2 indicated that variation in the orientations of staffs toward traditionalism accounted for 49% of the variation in bureaucratization of teacher behavior.

STAFF PROGRESSIVISM AND BTB

The data partially supported the hypothesis (H_{32}) that schools with lower levels of bureaucratization would have staffs with stronger

Table 9.2

Bivariate Correlations Between Staff Educational
Attitudes and Bureaucratization of Teacher Behavior (BTB)

	BTB
	<u>r</u>
Staff General Attitude Orientations	
Traditionalism	.699***
Progressivism	-.156
Staff Teaching Process Orientations	
Subject Matter Emphasis	.421**
Pupil Adjustment Ideology	-.168
Student Autonomy	-.361*
Consideration of Student Viewpoint	.096
Classroom Order	.361

* $p \leq .05$

** $p \leq .01$

*** $p \leq .001$

orientations toward progressivism. As predicted, the direction of the correlation between BTB and the orientations of staffs toward progressivism was negative but the size of the coefficient was not statistically significant: $r = -.156$, $p > .05$.

Given the study's theoretical framework, r^2 indicated that variation in the orientations of staffs toward progressivism accounted for only 2% of the variation in the bureaucratization of teacher behavior.

TEACHING PROCESS ORIENTATIONS

STAFF SUBJECT MATTER EMPHASIS AND BTB

The data supported the hypothesis (H_{33}) that schools with higher levels of bureaucratization would have staffs with stronger orientations toward a subject matter emphasis. As predicted, the correlation between BTB and the orientations of staffs toward a subject matter emphasis was positive and the size of the coefficient was statistically significant: $r = .421$, $p \leq .01$.

Given the study's theoretical framework, r^2 indicated that variation in the orientations of staffs toward a subject matter emphasis accounted for 18% of the variation in the bureaucratization of teacher behavior.

STAFF PUPIL ADJUSTMENT IDEOLOGY AND BTB

The data partially supported the hypothesis (H_{34}) that schools with lower levels of bureaucratization would have staffs with stronger

orientations toward a pupil adjustment ideology. As predicted, the direction of the correlation between BTB and the orientations of staffs toward a pupil adjustment ideology was negative but the size of the coefficient was not statistically significant: $r = -.168$, $p > .05$.

Given the study's theoretical framework, r^2 indicated that variation in the orientations of staffs toward a pupil adjustment ideology accounted for only 3% of the variation in the bureaucratization of teacher behavior.

STAFF STUDENT AUTONOMY AND BTB

The data supported the hypothesis (H_{35}) that schools with lower levels of bureaucratization would have staffs with stronger orientations toward student autonomy. As predicted, the direction of the correlation between BTB and the orientation of staffs toward student autonomy was negative, and the size of the coefficient was statistically significant: $r = -.361$, $p \leq .05$.

STAFF CONSIDERATION OF STUDENT VIEWPOINT AND BTB

The data did not support the hypothesis (H_{36}) that schools with lower levels of bureaucratization would have staffs with stronger orientations toward the consideration of student viewpoints. Contrary to the prediction, the direction of the correlation between BTB and the orientations of staffs toward the consideration of student viewpoints was positive, not negative; however, the size of the coefficient was not statistically significant: $r = .096$, $p > .05$.

Given the study's theoretical framework (but contrary to the predicted direction) r^2 indicated that variation in the orientations of staffs toward the consideration of student viewpoints accounted for only 1% of the variation in the bureaucratization of teacher behavior.

STAFF CLASSROOM ORDER AND BTB

The data supported the hypothesis (H_{37}) that schools with higher levels of bureaucratization would have staffs with stronger orientations toward classroom order. As predicted, the correlation between BTB and the orientations of staffs toward classroom order was positive and the size of the coefficient was statistically significant: $r = .361$, $p \leq .05$.

Given the study's theoretical framework, r^2 indicated that variation in the orientations of staffs toward classroom order accounted for 13% of the variation in the bureaucratization of teacher behavior.

CHAPTER 10

OBJECTIVE 2.3:

PATH ANALYSES OF MODELS I AND II

CHAPTER 10

OBJECTIVE 2.3:

PATH ANALYSES OF MODELS I AND II

MODEL I

Model I had two components. The first of these was suggested by Perrow's conceptualization of the technological imperative. As used in this study's theoretical framework, Perrow's work implied that the bureaucratization of teacher behavior would be (negatively) dependent on the flexibility of instructional technology. The second component of Model I was based on the present author's suggestion that the flexibility of instructional technology would be dependent on attitude orientations toward education held by principals and staffs. The influence of educational attitudes on bureaucratization of teacher behavior was, according to this view, expected to be both direct, and, as mediated by instructional flexibility, indirect. These notions which form Model I are presented in Figure 10.1.

As shown in Figure 10.1, the path analysis of Model I was restricted to a consideration of the general attitude orientations toward education (traditionalism and progressivism) held by principals and staffs, instructional flexibility and bureaucratization of teacher behavior. The information necessary for the path analysis of Model I was provided by two standard SPSS multiple regressions with the following design statements: (1) REGRESSION = IF WITH TRADP, PROGP,

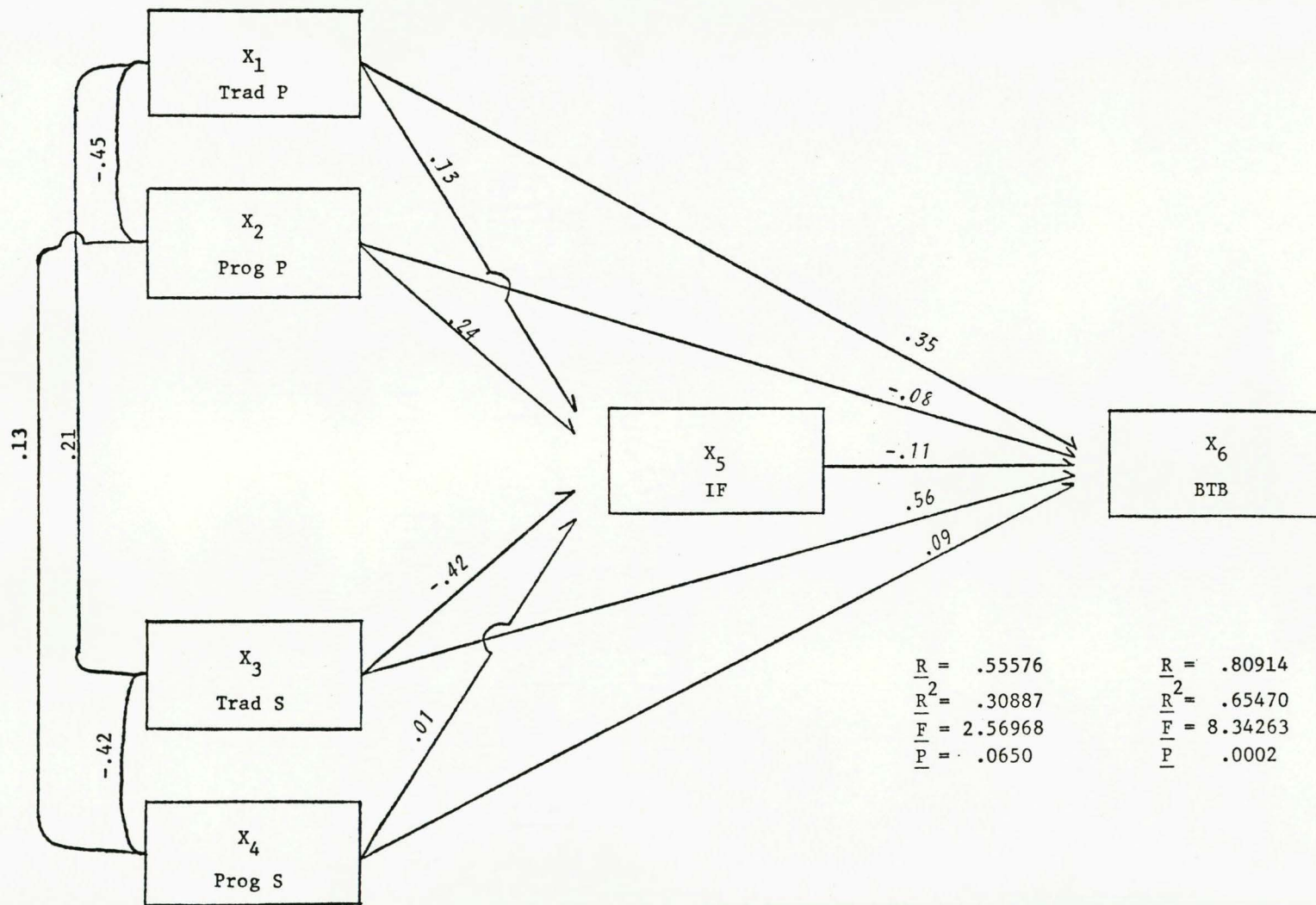


Figure 10.1 Model I: The Balderson-Perrow conceptualization of the technological imperative in Educational organizations. Zero-order correlation coefficients are shown in Roman type. Path coefficients are shown in italic type. N = 28 elementary schools.

TRADS, PROGS (2)/; and (2) REGRESSION = BTB WITH TRADP, PROGP, TRADS, PROGS, IF (2)/.

As indicated by \underline{r}^2 , the orientations of principals and staffs toward traditionalism and progressivism accounted for 31% of the variance in instructional flexibility and the combination of these attitude orientations with instructional flexibility accounted for 66% of the variance in bureaucratization of teacher behavior.

Table 10.1 presents an analysis of the covariation between the variables as arranged in Model I in terms of causal and noncausal sources of variance. This analysis revealed that the major causal sources of variance in instructional flexibility were staff traditionalism which was negatively related to instructional flexibility ($\underline{r} = -.522$; $\underline{r}^2 = .273$) and principal progressivism which was positively related with instructional flexibility ($\underline{r} = .404$; $\underline{r}^2 = .163$). The major causal sources of variance in bureaucratization of teacher behavior were staff traditionalism ($\underline{r} = .609$; $\underline{r}^2 = .371$) and to a much lesser degree, principal traditionalism ($\underline{r} = .336$; $\underline{r}^2 = .113$), both of which were positively related to bureaucratization of teacher behavior. The major portions of the covariances of principal and staff progressivism with bureaucratization were negative and noncausal.

Only a small portion of the covariance between instructional flexibility and bureaucratization was found to be causal ($\underline{r} = -.110$; $\underline{r}^2 = .012$), the major portion (11%) of the association was noncausal ($\underline{r} = -.330$; $\underline{r}^2 = .109$). Thus the analysis of Model I revealed that only about 1% of the variation in bureaucratization was causally

Table 10.1

Decomposition of Bivariate Covariation for Model I

Bivariate Relationship	Total Covariance	Causal			Noncausal
		Direct	Indirect	Total	
X_5X_1 (IF-Trad P)	$r_{51} = -.06834$	$r_{51} = -.06834$	None	-.06834	None
X_5X_2 (IF-Prog P)	$r_{52} = .40365$	$r_{52} = .40365$	None	.40365	None
X_5X_3 (IF-Trad S)	$r_{53} = -.52207$	$r_{53} = -.52207$	None	-.52207	None
X_5X_4 (IF-Prog S)	$r_{54} = .22398$	$r_{54} = .22398$	None	.22398	None
X_6X_1 (BTB-Trad P)	$r_{61} = .51772$	$p_{61} = -.35022$	$(p_{65}) (p_{51}) = (-.11036) (.12669)$ = $-.01398$	.33624	.18148
X_6X_2 (BTB-Prog P)	$r_{62} = -.56611$	$p_{62} = -.07981$	$(p_{65}) (p_{52}) = (-.11036) (.23982)$ = $.02646$	-.10627	-.45984
X_6X_3 (BTB-Trad S)	$r_{63} = .69884$	$p_{63} = .56259$	$(p_{65}) (p_{53}) = (-.11036) (-.41904)$ = $.04624$	.60883	.09001
X_6X_4 (BTB-Prog S)	$r_{64} = -.15545$	$p_{64} = .08739$	$(p_{65}) (p_{54}) = (-.11036) (.00873)$ = $-.00096$	.08643	-.24188
X_6X_5 (BTB-IF)	$r_{65} = -.44060$	$p_{65} = -.11036$	None	-.11036	-.33024

dependent on variation in instructional flexibility.

The results of the path analysis of Model I thus supported the theoretical notion that instructional flexibility and bureaucratization of teacher behavior were dependent on attitude orientations of principals and staffs. The analysis also revealed, contrary to expectation, that the covariance between instructional flexibility and bureaucratization of teacher behavior was largely noncausal.

MODEL II

Model II was constructed as an alternative to Model I. Model II, presented in Figure 10.2, utilized the same variables on Model I but held that instructional flexibility would be dependent on bureaucratization of teacher behavior and educational attitudes held by principals and staffs.

The information necessary for the path analysis of Model II was provided by two standard SPSS multiple regressions with the following design statements: (1) REGRESSION = BTB WITH TRADP, PROGP, TRADS, PROGS (2)/; and (2) REGRESSION = IF WITH BTB, TRADP, PROGP, TRADS, PROGS (2)/.

As indicated by \underline{r}^2 , the orientations of principals and staffs toward traditionalism and progressivism accounted for 64% of the variance in bureaucratization of teacher behavior and the combination of these attitude orientations with bureaucratization accounted for 38% of the variance in instructional flexibility.

Table 10.2 presents an analysis of the covariation between the

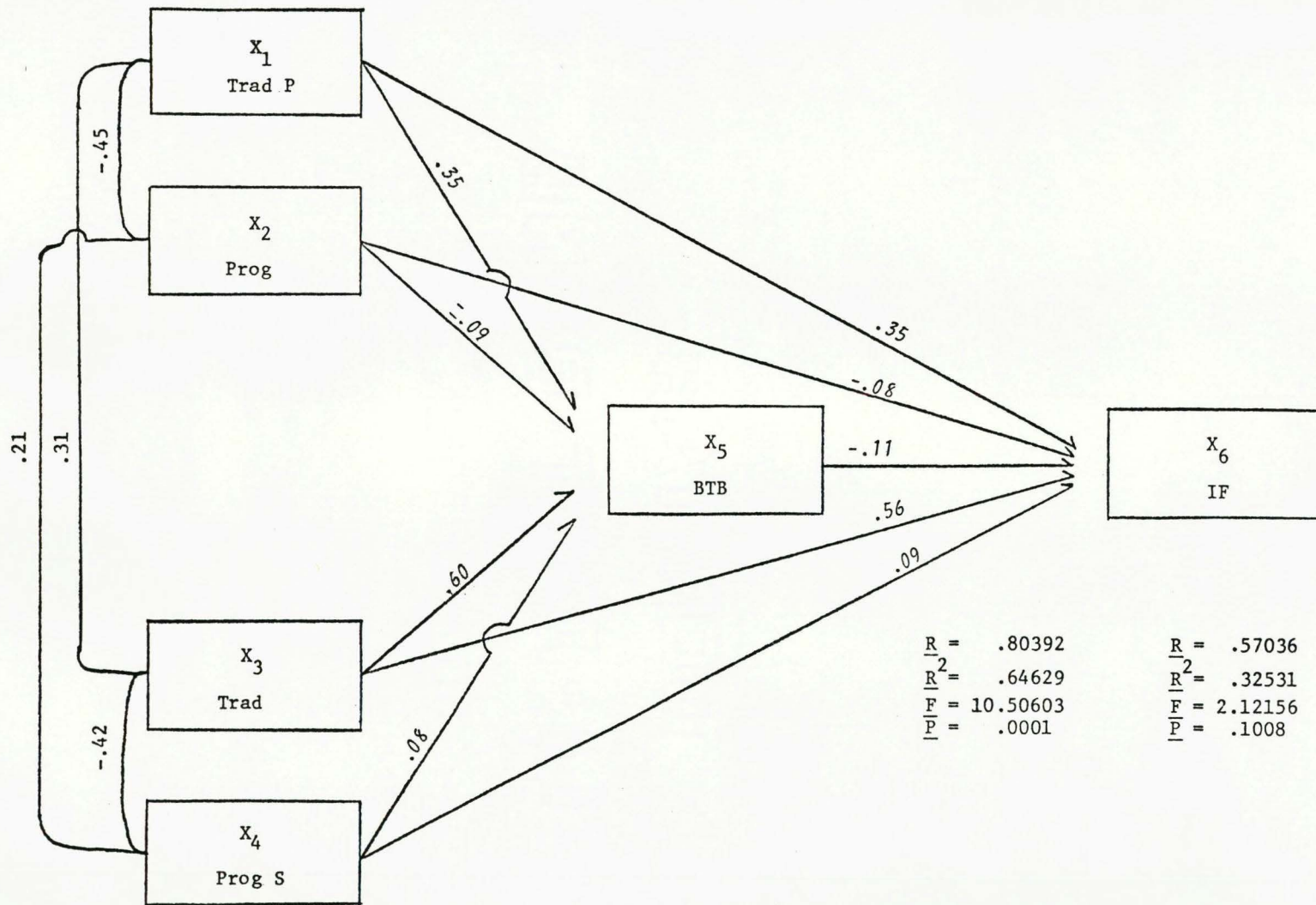


Figure 10.2 Model II: Zero-order correlation coefficients are shown in Roman type. Path coefficients are in italic type. N = 28 elementary schools.

Table 10.2

Decomposition of Bivariate Covariation for Model II

Bivariate Relationship	Total Covariance	Causal			Noncausal
		Direct	Indirect	Total	
X_5X_1 (BTB-Trad P)	$r_{51} = -.51772$	$r_{51} = .51772$	None	.51772	None
X_5X_2 (BTB-Prog P)	$r_{52} = -.56611$	$r_{52} = -.56611$	None	-.56611	None
X_5X_3 (BTB-Trad S)	$r_{53} = .69884$	$r_{53} = .69884$	None	.69884	None
X_5X_4 (BTB-Prog S)	$r_{54} = -.15545$	$r_{54} = -.15545$	None	-.15545	None
X_6X_1 (IF-Trad P)	$r_{61} = -.06834$	$p_{61} = .19919$	$(p_{65}) (p_{61}) = (-.21563) (.19919)$ $= -.04295$	.15624	-.22458
X_6X_2 (IF-Prog P)	$r_{62} = .40365$	$p_{62} = .21690$	$(p_{65}) (p_{62}) = (-.21563) (.21690)$ $= -.04677$	.170130	.23352
X_6X_3 (IF-Trad S)	$r_{63} = -.52207$	$p_{63} = -.28776$	$(p_{65}) (p_{63}) = (-.21563) (-.28776)$ $= .06205$	-.22571	-.29636
X_6X_4 (IF-Prog S)	$r_{64} = .22398$	$p_{64} = .02736$	$(p_{65}) (p_{64}) = (-.21563) (.02736)$ $= -.00590$	.02146	.20250
X_6X_5 (IF-BTB)	$r_{65} = -.44065$	$p_{65} = -.21563$	None	-.21563	-.22502

variables as arranged in Model II in terms of causal and noncausal sources of variance. This analysis of Model II revealed that the major causal sources of variance in bureaucratization of teacher behavior were staff traditionalism which was positively associated ($r = .699$; $r^2 = .488$), principal progressivism which was negatively related ($r = -.566$; $r^2 = .320$) and principal traditionalism which was positively related ($r = .517$); $r^2 = .268$). In terms of the sources of causal variance in instructional flexibility, the analysis revealed three attitude sources of approximately the same relatively low magnitude: staff traditionalism ($r = -.226$; $r^2 = .051$), principal progressivism ($r = .170$; $r^2 = .170$; $r^2 = .129$) and principal traditionalism ($r = .156$; $r^2 = .024$). Whereas approximately one-half of the covariation of these three variables with instructional flexibility was causal, almost all of the covariance of staff progressivism with instructional flexibility was noncausal.

The results of the path analysis of Model II thus demonstrated that the covariance of bureaucratization and instructional flexibility was approximately half causal and half noncausal. The analysis revealed that about 5% of the variance in instructional flexibility was dependent on bureaucratization of teacher behavior.

Model I and Model II Compared

A comparison of the multiple correlations in Models I and II resulted in the following observations and conclusions:

1. Sixty-four percent of the variance in BTB was accounted for by Principal and Staff general attitude orientations toward

education (Model II). The inclusion of IF as a predictor of BTB raised the accounted for variance in BTB by only two percent (Model I). Thus IF explained little (5.6%) of the variance in BTB that was not explained by Principal and Staff attitudes.

2. Thirty-one percent of the variance in IF was accounted for by Principal and Staff general attitude orientations toward education (Model I). The inclusion of BTB as a predictor of IF raised the total variance accounted for by seven percent. Thus BTB explained little (10.1%) of the variance in IF that was not explained by Principal and Staff attitudes.

CHAPTER 11
PREDICTORS OF BUREAUCRACY AND
INSTRUCTIONAL FLEXIBILITY

CHAPTER 11

PREDICTORS OF BUREAUCRACY AND
INSTRUCTIONAL FLEXIBILITYPREDICTION OF BUREAUCRACY

Research Question 3 asked what few variables compared with instructional flexibility best predicted bureaucratization of teacher behavior. In order to answer this question, instructional flexibility and variables in each of five sets (principal attitudes, principal background, staff attitudes, staff background, and school background) were analyzed simultaneously, set by set, and all together.

IF and Principal Attitudes

A summary of the results of using a standard forward stepwise regression procedure to analyze the variation in BTB accounted for by IF and the principal attitude variables is presented in Table 11.1. The default values governing the inclusion of variables were permitted to operate (SPSS, p. 346) and these placed little restriction on the regression. All of the independent variables were included in the final solution. The R was .79181 and it was statistically significant ($F = 3.99169$; $df = 8, 19$; $p = .006$). The variance in BTB accounted for by IF and the principal attitude variables as indicated by R^2 was 62.696%. An examination of the order in which the independent variables were selected into the regression equation revealed that IF ranked third in terms of proportional reduction in unexplained

Table 11.1

Summary of Forward (Stepwise) Regression Analysis for Bureaucratization of Teacher Behavior as the Dependent Variable and Instructional Flexibility and Principal Attitudes as Independent Variables

Step	Variable Entered	<u>R</u>	<u>df</u>	<u>F</u>	<u>B</u>	BETA	<u>R</u> ²	<u>R</u> ² Change	<u>r</u>
1	Progressivism	.566	1,26	12.262**	-.288*	-.477*	.321	.321	-.566
2	Consideration of Student Viewpoint	.703	1,25	12,197***	.108	.179	.494	.173	.423
3	Instructional Flexibility	.725	3,24	8.857***	-.190	.227	.525	.032	-.441
4	Traditionalism	.756	4,23	7.659***	.269*	.819	.571	.046	.518
5	Student Autonomy	.770	5,22	6.425***	.209	.432	.593	.022	-.468
6	Pupil Adjustment Ideology	.778	6,21	5.370**	.241	.310	.605	.012	.045
7	Classroom Order	.791	7,20	4,787**	-.096	-.234	.626	.021	.349
8	Subject Matter Emphasis	.792	8,19	3.990**	.023	.056	.627	.001	.488

* $p \leq .05$ ** $p \leq .01$ *** $p \leq .001$

variation of BTB, after the orientation of principals toward Progressivism and Consideration of Student Viewpoint respectively. Given the particular order in which the independent variables were selected into the equation, an examination of the absolute increment in the variation of BTB explained by each variable revealed that only the contributions of Progressivism and Traditionalism were statistically significant at the $p \leq .05$ level.

IF and Principal Background

A summary of the results of using a standard forward stepwise regression procedure to analyze the variation in BTB accounted for by IF and the principal background variables is presented in Table 11.2. The default values governing the inclusion of variables were permitted to operate (SPSS, p. 346) and these placed little restriction on the regression. Nevertheless, one of the principal background variables, Experience as Principal in District, did not meet the criteria for inclusion in the final solution. The R for the remaining variables was .69657 but it was not statistically significant at the $p \leq .05$ level ($F = 2.42371$; $df = 7, 18$; $p = .0617$). The variance in BTB accounted for by IF and the principal background variables included in the final solution as indicated by R^2 was 48.521%. An examination of the order in which the independent variables were selected into the equation, an examination of the absolute increment in the variation of BTB explained by each variable revealed that only the contributions of IF and Academic Background were statistically significant at the $p \leq .05$ level.

Table 11.2

Summary of Forward (Stepwise) Regression Analysis for Bureaucratization of Teacher Behavior as the Dependent Variable and Instructional Flexibility and Principal Background as Independent Variables

Step	Variable Entered	<u>R</u>	df	<u>F</u>	<u>B</u>	BETA	<u>R</u> ²	<u>R</u> ² Change	<u>r</u>
1	Instructional Flexibility	.445	1,24	5.937*	-.540*	-.660*	.198	.198	-.445
2	Academic Background	.626	2,23	7.418**	-.260*	-.509*	.392	.194	-.314
3	Recency of Training	.676	3,22	6.161**	.089	.277	.457	.064	.306
4	Tenure as Principal of Present School	.683	4,21	4,592**	.027	.074	.467	.010	.003
5	Experience as Principal	.686	5,20	3.563*	-.035	-.130	.471	.005	.305
6	Age	.692	6,19	2,907*	.122	.242	.479	.008	.074
7	Total Experience	.697	7,18	2.424	.121	-.175	.485	.007	.177

* p ≤ .05

** p ≤ .01

IF and Staff Attitudes

A summary of the results of using a standard forward stepwise regression procedure to analyze the variation in BTB accounted for by IF and the staff attitude variables is presented in Table 11.3. The default values governing the inclusion of variables were permitted to operate (SPSS, p. 346) and these placed little restriction on the regression. Nevertheless, one of the staff attitude variables, Pupil Adjustment Ideology, was not included in the final solution because it did not meet the criteria for inclusion. The R for the remaining variables was .73135 and it was statistically significant ($F = 3.28558$; $df = 7, 20$; $p = .0172$). The variance in BTB accounted for by IF and the staff attitude variables included in the final solution as indicated by R^2 was 53.487%. An examination of the order in which the independent variables were selected into the regression equation revealed that IF ranked fourth in terms of proportional reduction in unexplained variation in BTB, after the orientation of staffs toward Traditionalism, Student Autonomy, and Progressivism respectively. Given the particular order in which the independent variables were selected into the equation, an examination of the absolute increment in the variation of BTB explained by each variable revealed that only the contribution of Traditionalism was significant at the $p \leq .05$ level.

IF and Staff Background

A summary of the results of using a standard forward stepwise regression procedure to analyze the variation in BTB accounted for by

Table 11.3

Summary of Forward (Stepwise) Regression Analysis for Bureaucratization of Teacher Behavior as the Dependent Variable and Instructional Flexibility and Staff Attitudes as Independent Variables

Step	Variable Entered	<u>R</u>	<u>df</u>	<u>F</u>	<u>B</u>	BETA	<u>R</u> ²	<u>R</u> ² Change	<u>r</u>
1	Traditionalism	.699	1,26	24.819***	.994*	.891*	.488	.488	.699
2	Student Autonomy	.717	2,25	13.259***	.228	.175	.515	.026	-.361
3	Progressivism	.724	3,24	8.822***	.048	.029	.524	.010	-.156
4	Instructional Flexibility	.726	4,23	6.398**	-.066	-.078	.527	.002	-.441
5	Classroom Order	.728	5,22	4.960**	.103	-.135	.530	.003	.361
6	Consideration of Student Viewpoint	.731	6,21	4.017**	.084	.085	.534	.005	.096
7	Subject Matter Emphasis	.731	7,20	3.286*	.030	-.034	.535	.001	.421

* $p \leq .05$

** $p \leq .01$

*** $p \leq .001$

IF and the staff background variables is presented in Tables 11.4 and 11.5. Separate analyses were performed for both mean (M) and standard deviation (SD) scores. The default values governing the inclusion of variables were permitted to operate and these placed little restriction on the regression (SPSS, p. 346). Nevertheless, one of the staff background variables, Experience as a Teacher (M), was not included in a final solution because it did not meet the criteria for inclusion. The R for the remaining variables (M) was .57553 but it was not statistically significant. The variance in BTB accounted for by IF and the staff background variables (M) included in the final solution as indicated by R² was 33.123%. An examination of the order in which the independent variables (M) were selected into the regression equation revealed that IF ranked first in terms of proportional reduction in unexplained variation in BTB. Given the particular order in which the independent variables (M) were selected into the equation, an examination of the absolute increment in the variation of BTB explained by each variable revealed that none of the contributions were statistically significant at the p ≤ .05 level. All of the independent (SD) variables were included in the final solution. The R was .53930 but it was not statistically significant. The variance in BTB accounted for by IF and the staff background variables (SD) as indicated by R² was 29.084%. As for the analysis using mean scores, the use of standard deviation scores placed IF first in terms of proportional reduction in unexplained variation in BTB and none of the absolute increments in the variation of BTB were

Table 11.4

Summary of Forward (Stepwise) Regression Analysis for Bureaucratization of Teacher Behavior as the Dependent Variable and Instructional Flexibility and Staff Background (Mean Values) as Independent Variables

Step	Variable Entered	<u>R</u>	<u>df</u>	<u>F</u>	<u>B</u>	BETA	<u>R</u> ²	<u>R</u> ² Change	<u>r</u>
1	Instructional Flexibility	.441	1,26	6.265*	-.347	-.415	.194	.194	-.441
2	Age	.530	2,25	4.875*	-.540	-.494	.281	.086	-.262
3	Experience Present School	.537	3,24	3.249*	.246	.409	.289	.008	-.147
4	Academic Background	.554	4,23	2.548	-.171	-.144	.307	.018	-.017
5	Recency of Training	.566	5,22	2.072	-.137	-.141	.320	.013	-.226
6	Experience Present School with Present Principal	.575	6,21	1.726	-.089	-.193	.330	.010	-.223
7	Experience Present District	.576	7,20	-	.026	.045	.331	.001	.037

* p ≤ .05

Table 11.5

Summary of Forward (Stepwise) Regression Analysis for Bureaucratization of Teacher Behavior as the Dependent Variable and Instructional Flexibility and Staff Background (Standard Deviation Values) as Independent Variables

Step	Variable Entered	<u>R</u>	<u>df</u>	<u>F</u>	<u>B</u>	BETA	<u>R</u> ²	<u>R</u> ² Change	<u>r</u>
1	Instructional Flexibility	.433	1,25	5.762*	-.405	-.486	.187	.188	-.433
2	Experience Present School	.484	2,24	3.663*	-.140	-.172	.234	.047	-.079
3	Academic Background	.507	3,23	2.659	.244	.158	.258	.024	.125
4	Experience as Teacher	.516	4,22	1.997	-.153	-.185	.266	.009	-.069
5	Experience Present District	.521	5,21	1.567	.197	.215	.272	.005	-.124
6	Experience Present School with Present Principal	.525	6,20	1.270	-.074	-.094	.276	.004	-.227
7	Age	.530	7,19	1.059	-.226	-.172	.280	.005	-.172
8	Recency of Training	.539	8,18	0.923	-.138	-.133	.291	.010	-.079

* $p \leq .05$

statistically significant at the $p \leq .05$ level.

IF and School Background

A summary of the results of using a standard forward stepwise regression procedure to analyze the variation in BTB accounted for by IF and school background variables is presented in Table 11.6. The default values governing the inclusion of variables were permitted to operate and these placed little restriction on the regression (SPSS, p. 346). All of the variables were included in the final solution. The R was .58651 but it was not statistically significant. The variance in BTB accounted for by IF and the school background variables as indicated by R^2 was 34.40%. An examination of the order in which the independent variables were selected into the regression equation revealed that IF ranked first in terms of proportional reduction in unexplained variation in BTB. Given the particular order in which the independent variables were selected into the equation, an examination of the absolute increment in the variation of BTB explained by each variable revealed that none were statistically significant at the $p \leq .05$ level.

IF, Principal Attitudes, Principal Background, Staff Attitudes, Staff Background, and School Background

A summary of the results of using a standard forward stepwise regression procedure to analyze the variation in BTB accounted for by IF, the principal variables, the staff variables and school background variables is presented in Table 11.7. Ten steps were specified, otherwise the default values governing the

Table 11.6

Summary of Forward (Stepwise) Regression Analysis for Bureaucratization of Teacher Behavior as the Dependent Variable and Instructional Flexibility and School Background as Independent Variables

Step	Variable Entered	<u>R</u>	<u>df</u>	<u>F</u>	<u>B</u>	BETA	<u>R</u> ²	<u>R</u> ² Change	<u>r</u>
1	Instructional Flexibility	.453	1,25	6.468*	-.332	-.403	.206	.206	-.453
2	Student Socio-Economic Status	.570	2,24	5.687**	.190	.357	.325	.119	.390
3	Staffing Pattern	.582	3,23	3.937*	-.243	-.130	.339	.015	-.248
4	Teaching Space	.586	4,22	2.871*	.034	.063	.343	.004	-.251
5	School Size (Full Time Teachers)	.587	5,21	2.202	.002	.035	.344	.001	.167

* p ≤ .05

** p ≤ .01

Table 11.7

Summary of Forward (Stepwise) Regression Analysis for Bureaucratization of Teacher Behavior as the Dependent Variable and Instructional Flexibility, Principal Attitudes, Principal Background, Staff Attitudes, Staff Background, and School Background as Independent Variables

Step	Variable Entered	<u>R</u>	<u>df</u>	<u>F</u>	<u>B</u>	BETA	<u>R</u> ²	<u>R</u> ² Change	<u>r</u>
1	Staff Traditionalism	.682	1,24	20.923***	.832*	.699*	.466	.466	.683
2	Principal Traditionalism	.791	2,23	19.212***	.296*	.905*	.626	.160	.525
3	Principal Recency of Training	.836	3,22	17.066***	.138*	.431*	.699	.074	.306
4	Principal Student Autonomy	.850	4,21	13.659***	.362*	.761*	.722	.023	-.470
5	Staff Recency of Training (Standard Deviation Values)	.864	5,20	11.734***	.158	.149	.746	.023	-.129
6	Principal Consideration of Student Viewpoint	.878	6,19	10.603***	.156*	.261*	.770	.024	.466
7	Staff Student Autonomy	.893	7,18	10.126***	.284	.210	.780	.028	-.317
8	Experience Present School with Present Principal (Standard Deviation Values)	.909	8,17	10.082***	-.195*	-.249*	.826	.028	-.257
9	Principal Progressivism	.921	9,16	9.951***	-.147	-.240	.848	.023	-.546
10	Principal Classroom Order	.933	10,15	10.038***	-.097	-.245	.870	.022	.354

* $p \leq .05$

*** $p \leq .001$

inclusion of variables were permitted to operate and these placed little restriction on the regression (SPSS, p. 346). The 10 variables selected into the equation, ranked in terms of proportional reduction in unexplained variation in BTB were as follows: Staff orientation toward Traditionalism, Principal orientation toward Traditionalism, Principal Recency of Training, Principal orientation toward Student Autonomy, Staff Recency of Training (SD), Principal orientation toward Consideration of Student Viewpoint, Staff orientation toward Student Autonomy, Staff Experience in School with Principal (SD), Principal orientation toward Progressivism and Principal orientation toward Classroom Order. It was noteworthy that IF was not selected. The R for these 10 variables with BTB was .93273 and it was statistically significant ($F = 10.03746$; $df = 10, 15$; $p = .0001$). The variance in BTB accounted for by the 10 variables as indicated by R^2 was 86.999%. Given the particular order in which the independent variables were selected into the regression equation, an examination of the absolute increment in the variation of BTB explained by each independent variable revealed that the contributions of six of the variables were statistically significant at the $p \leq .05$ level. The six variables whose absolute contributions were statistically significant were Staff Traditionalism, Principal Traditionalism, Principal Recency of Training, Principal Student Autonomy, Principal Consideration of Student Viewpoint and Staff Experience in School with Principal (SD). The first three of these variables accounted for 69.944% of the variance in BTB or approximately

80% of the total variance accounted for by the 10 variables.

A summary of the results of using a standard forward stepwise regression procedure with a preestablished hierarchy among sets of variables to analyze the variation in BTB accounted for by IF, the principal variables, the staff variables and school background variables is presented in Table 11.8. The parameters governing the inclusion of variables were $n = 40$, which was not restrictive and $F = 1$ and $T = .6$, which were more restrictive than the default values (SPSS, p. 346). The specified hierarchy, from first to last, was as follows: IF, Principal Attitudes, Staff Attitudes, Principal Background, School Background, Staff Background (M) and (SD). The F and T specifications restricted the number of variables included in the final solution to nine. Ranked within sets according to the proportional reduction in unexplained variance were: IF, Principal Traditionalism, Principal Pupil Adjustment Ideology, Staff Student Autonomy, Principal Age, Principal Academic Background, Staff Recency of Training (SD), School Staffing Pattern, and School SES. The inclusion of IF was forced due to the specification of the hierarchy. The inclusion of the two School Background characteristics after the inclusion of the Staff Background variable was the result of the nature of the program which considers variables previously passed by at higher levels of the hierarchy even when lower levels are eligible for inclusion (SPSS, p. 346). The R for the nine variables with BTB was .89821 and it was statistically significant ($F = 7.42350$; $df = 9, 16$; $p = .0003$). The variance in BTB accounted for by the nine variables as indicated by R^2 was 80.679%. Given the particular order in which

Table 11.8

Summary of Results: Bureaucratization of Teacher Behavior Regressed on Instructional Flexibility, Principal Attitudes and Staff Attitudes (Stepwise with Hierarchical Inclusion) and Principal, Staff and School Background (Stepwise Inclusion)

Step	Variable Entered	<u>R</u>	<u>df</u>	<u>F</u>	<u>B</u>	BETA	<u>R</u> ²	<u>R</u> ² Change	<u>r</u>
1	Instructional Flexibility	.445	1,24	5.937*	-.301*	-.367*	.198	.198	-.445
2	Principal Traditionalism	.673	2,23	9.536***	.184*	.561*	.453	.255	.525
3	Principal Pupil Adjustment Ideology	.752	3,22	9.524***	.148	.179	.565	.112	.149
4	Principal Student Autonomy	.782	4,21	8.242***	-.288	-.214	.611	.046	-.317
5	Principal Age	.811	5,20	7.708***	.178*	.352*	.658	.048	.074
6	Principal Academic Background	.831	6,19	7.085***	-.194*	-.378*	.691	.033	-.314
7	Staff Recency of Training	.846	5,18	6.484***	.355*	.337*	.716	.025	-.129
8	School Staffing Pattern	.881	4,17	7.331***	-.606*	-.327*	.775	.059	-.245
9	Student Socio-Economic Status	.898	3,16	7.424***	.109	.198	.807	.032	.370

* $p \leq .05$ ** $p \leq .01$ *** $p \leq .001$

the independent variables were selected into the regression equation, an examination of the absolute increment in the variation of BTB explained by each independent variable revealed that the contributions of six of the variables were statistically significant at the $p \leq .05$ level. These were: IF, Principal Traditionalism, Principal Age, Principal Academic Background, Staff Recency of Training (SD) and School Staffing Pattern. The first two of these variables accounted for 45.331% of the variance in BTB or approximately 56% of the total variance accounted for by the nine variables in the regression equation.

Relative Weights of Principal and Staff Attitudes

Do principal or staff attitudes account for the most variation in BTB when they are analyzed simultaneously with IF and Principal, staff and school background variables?

This question was addressed by utilizing hierarchical regression solutions which specified the order that sets of variables were entered into the equation in combination with the stepwise inclusion procedure. Four analyses were performed. The analyses and their results are presented below. Two analyses were conducted in which the hierarchical inclusion of the set of Principal Attitudes was specified as following IF and preceding Staff Attitudes. Both of these analyses used the stepwise inclusion procedure to determine whether any of the Principal, Staff, and School Background variables would be included in the final solution.

A summary of the results of the first analysis (denoted by

the superscript "a" is presented in Table 11.9. This analysis specified that five steps be taken with the default values of F and T allowed to operate. The specification of five steps permitted a maximum of two background variables to enter the final solution and these were Principal Recency of Training and School Size. The \underline{R} for the variables in the equation was .97499 and it was statistically significant ($\underline{F} = 9.05542$; $\underline{df} = 17, 8$; $\underline{p} = .0018$). The variance in BTB accounted for by the independent variables as indicated by \underline{R}^2 was 95.060%.

A summary of the results of the second analysis (denoted by the superscript "b" is also presented in Table 11.9. The analysis over-specified the number of steps and set $F = 1$ and $T = .6$. These specifications resulted in only one of the background variables, Principal Total Experience, being included in the final solution. The \underline{R} for the variables in the equation was .95618 and it was statistically significant ($\underline{F} = 5.99990$; $\underline{df} = 16, 9$; $\underline{p} = .0049$). The variance in BTB accounted for by the independent variables as indicated by \underline{R}^2 was 91.428%.

Two additional analyses were performed which were identical to those just described except that the hierarchy specified the inclusion of Staff Attitudes after IF and before Principal Attitudes. The results of these analyses are reported in Table 11.10.

A comparison of the amounts of variance in BTB accounted for by Principal and Staff Attitudes revealed that the inclusion of Principal Attitudes after IF and prior to Staff Attitudes explained

Table 11.9

Summary of Results: Bureaucratization of Teacher Behavior Regressed a, b on Instructional Flexibility, Staff Attitudes and Principal Attitudes (Hierarchical Inclusion of Sets) and Principal, Staff and School Background Variables (Stepwise Inclusion)

Step	Variable(s) Entered	<u>R</u>	<u>df</u>	<u>F</u>	<u>R</u> ²	<u>R</u> ² Change
1a, b	Instructional Flexibility	.445	1,24	5.937*	.198	.198
2a, b	Staff Attitudes	.721	8,17	2.296	.519	.321
3a, b	Principal Attitudes	.924	15,10	3.882*	.853	.334
4a	Principal Recency of Training	.967	16,9	8.081**	.935	.081
5a	School Size	.975	17,8	9.055**	.951	.016
4b	Principal Total Experience	.956	16,9	5.999**	.914	.061

* $\underline{p} \leq .05$

** $\underline{p} \leq .01$

a = Five steps specified.

b = Number of steps overspecified and $F = 1, T = .6$.

Table 11.10

Summary of Results: Bureaucratization of Teacher Behavior Regressed a, b on Instructional Flexibility, Principal Attitudes and Staff Attitudes (Hierarchical Inclusion of Sets) and Principal, Staff and School Background Variables (Stepwise Inclusion)

Step	Variable(s) Entered	R	df	F	R ²	R ² Change
1a, b	Instructional Flexibility	.445	1,24	5.937*	.198	.198
2a, b	Principal Attitudes	.841	8,17	5.113**	.706	.508
3a, b	Staff Attitudes	.924	15,10	3.882*	.853	.147
4a	Principal Recency of Training	.967	16,9	8.081**	.935	.082
5a	Teaching Space	.975	17,8	9.055**	.951	.016
4b	Principal Total Experience	.956	16,9	5,999**	.914	.061

* $p \leq .05$

** $p \leq .01$

a = Five steps specified.

b = Number of steps overspecified and $F = 1$, $T = .6$.

an additional 50.808% of the variance in BTB for a total of 70.639% whereas the inclusion of Staff Attitudes after IF and prior to Principal Attitudes explained approximately 19% less of the variance in BTB, i.e., an additional 32.100% for a total of 51.931%.

PREDICTION OF INSTRUCTIONAL FLEXIBILITY

A procedure similar to that used to predict BTB was employed to predict instructional flexibility (IF). The only difference in the procedure was to place IF as the dependent variable and include bureaucratization of teacher behavior (BTB) in the set of independent variables. A summary of the results of this procedure is presented in Table 11.11. (See also Table 11.7.)

The R was .92802 ($df = 10, 15$; $F = 9.30865$; $p = .0001$) and R^2 was .86122. Thus the 10 variables selected into the equation accounted for 86.1222% of the variance in IF.

An examination of the variables in the regression equation revealed that BTB was not included. Given the set of independent variables used in the analysis, 10 of them proved better predictors of IF than BTB. (IF had already been found to be a relatively poor predictor of BTB.)

The most influential predictor of IF was found to be the Traditionalism of the Staff which contributed (negatively) 30.735% of the variation in IF. Staff Traditionalism was followed by three characteristics of the Principal -- Academic Background (15.648%), Subject Matter Emphasis (13.099%) and Student Autonomy vs. Teacher

Table 11.11

Summary of Forward (Stepwise) Regression Analysis for Instructional Flexibility as the Dependent Variable and Bureaucratization of Teacher Behavior, Principal Attitudes, Principal Background, Staff Attitudes, Staff Background, and School Background as Independent Variables

Step	Variable Entered	<u>R</u>	<u>df</u>	<u>F</u>	<u>B</u>	BETA	<u>R</u> ²	<u>R</u> ² Change	<u>r</u>
1	Staff Traditionalism	.554	1,24	10.650**	-.133	-.780	.307	.307	-.554
2	Principal Academic Background	.681	2,23	9.949***	-.415	-.664	.464	.156	-.252
3	Principal Subject Matter Emphasis	.771	3,22	10.766***	-.453	-.903	.595	.131	-.476
4	Principal Student Autonomy	.836	4,21	12.160***	-.238	-.410	.699	.104	.161
5	Staff Recency of Training (Mean)	.867	5,20	12.052***	.276	.240	.751	-	-
6	School Size	.880	6,19	10.871***	-.012	-.145	.774	.052	.100
7	Staff Recency of Training (Standard Deviation)	.897	7,18	10.523***	.584	.454	.804	.029	-.135
8	Staff Academic Background	.906	8,17	9.756***	-.434	-.234	.821	.018	-.034
9	Principal Traditionalism	.921	9,16	9.916***	.185	.462	.848	.027	.024
10	Teaching Space	.928	10,15	9.309***	-.152	-.224	.861	0.13	-.046

* $\underline{p} \leq .05$

** $\underline{p} \leq .01$

*** $\underline{p} \leq .001$

Direction (10.363%) -- which contributed an additional total of 39.110% of the variance in IF.

PART IV
INTERPRETATION

CHAPTER 12

SUMMARY, DISCUSSION AND CONCLUSIONS

The first section of this chapter summarizes the major findings of the study. The summary section is organized according to the four research questions derived from the study's theoretical framework presented in Chapters 1 and 2. The second section discusses how future studies may improve upon certain weaknesses of this study and thus further our understanding of the nature of school organizations. The final section presents conclusions.

SUMMARY

RESEARCH QUESTION 1

Research Question 1 asked if there was evidence that the technological imperative operated in school organizations. Two major objectives (1.1 and 1.2) were formulated in order to gain information regarding this question.

Tests of the hypothesized bivariate relationships between the flexibility of instructional technology and selected structural characteristics of school organizations provided some empirical evidence which supported the author's application to school organizations of Perrow's theoretical notion of a technological imperative. The data revealed significant systematic relationships between instructional flexibility and the organizational structure of schools

as indicated by degree of bureaucratization of teacher behavior and the influence of various actors over school-wide and classroom matters. The results of simple and multiple correlation analyses tended to support the author's contention that the educational attitudes of principals and staffs play a significant role in affecting technological and structural characteristics of school organizations, especially in affecting the relationship between instructional flexibility and bureaucratization. These analyses demonstrated that the strength of the observed relationship between instructional flexibility and bureaucratization was significantly affected by several other variables. The academic background of principals, for example, tended to suppress the relationship, whereas certain principal and staff attitudes tended to inflate it.

OBJECTIVE 1.1

Objective 1.1 involved determining the direction and degree of association of instructional flexibility with the following structural characteristics: (a) bureaucracy; (b) influence over school-wide matters; and (c) influence over classroom matters.

Instructional Flexibility and Bureaucracy

Objective 1.1a. This objective required an examination of the direction and degree of association between instructional flexibility and bureaucratization of teacher behavior. The theoretical framework hypothesized (H_1) that bureaucracy would vary negatively with instructional flexibility. The observed relationship was in the

expected direction and the size of the association was statistically significant ($p \leq .05$). It was thus found that the more flexible the instructional technology, the less the behavior of teachers was bureaucratized (H_1 : $r = -.441$, $p \leq .01$, $r^2 = 19\%$). Four additional observations were made regarding the relationship between instructional flexibility and bureaucracy. It was found that the more flexible the instructional technology -- the less the behavior of teachers was governed by a hierarchy ($r = -.498$, $p \leq .01$, $r^2 = 25\%$), rules ($r = -.276$, $p > .05$, $r^2 = 8\%$), procedural specifications ($r = -.419$, $p \leq .01$, $r^2 = 18\%$), and the less the behavior of teachers was characterized by impersonality ($r = -.544$, $p \leq .01$, $r^2 = 28\%$).

Instructional Flexibility and Influence over School-wide Matters

Objective 1.1b. This objective required an examination of the directions and degrees of association between instructional flexibility and the influence of various actors over school-wide matters. The theoretical framework specified four relationships regarding instructional flexibility and influence over school-wide matters. Instructional flexibility was hypothesized to vary (H_2) positively with the influence of individual teachers; (H_3) positively with the influence of teacher colleagues; (H_4) negatively with the degree to which principal influence exceeded that of teacher colleagues; and (H_5) negatively with the influence of external actors. All four of the observed relationships were in the expected direction and two were of sufficient size to be statistically significant

($p \leq .05$). It was thus found that --

H_2 was confirmed in direction and degree of association. The more flexible the instructional technology, the greater the influence of individual teachers over school-wide matters ($r = .611$, $p \leq .001$, $r^2 = 44\%$);

H_3 was confirmed in direction and degree of association. The more flexible the instructional technology, the greater the influence of teacher colleagues over school-wide matters ($r = .553$, $p \leq .001$, $r^2 = 31\%$);

H_4 was confirmed in direction but not in degree of association. The more flexible the instructional technology the less the influence of principals over school-wide matters exceeded that of teacher colleagues ($r = -.245$, $p > .05$, $r^2 = 6\%$); and

H_5 was confirmed in direction but not in degree of association. The more flexible the instructional technology, the less the influence of external actors over school-wide matters ($r = -.253$, $p > .05$, $r^2 = 6\%$).

Instructional Flexibility and Influence over Classroom Matters

Objective 1.1c. This objective required an examination of the directions and degrees of association between instructional flexibility and the influence of various actors over classroom matters. The theoretical framework specified four relationships regarding instructional flexibility and influence over classroom matters. Instructional flexibility was hypothesized to vary (H_6) positively with the influence of individual teachers; (H_7) positively

with the influence of teacher colleagues; (H_8) negatively with the degree to which the principal's influence exceeded that of teacher colleagues; and (H_9) negatively with the influence of external actors. All four observed relationships were in the expected direction and all were sufficiently large to be statistically significant ($p \leq .05$). It was thus found that --

H_6 was confirmed in direction and degree of association. The more flexible the instructional technology, the greater the influence of individual teachers over classroom matters ($r = .413$, $p \leq .05$, $r^2 = 17\%$);

H_7 was confirmed in direction and degree of association. The more flexible the instructional technology, the greater the influence of teacher colleagues over classroom matters ($r = .426$, $p \leq .01$, $r^2 = 18\%$);

H_8 was confirmed in direction and degree of association. The more flexible the instructional technology, the less the influence of principals over classroom matters exceeded that of teacher colleagues ($r = -.421$, $p \leq .05$, $r^2 = 18\%$); and

H_9 was confirmed in direction and degree of association. The more flexible the instructional technology, the less the influence of external actors over classroom matters ($r = -.430$, $p \leq .01$, $r^2 = 19\%$).

It was also observed that the more flexible the instructional technology, the less the influence of principals over classroom matters ($r = -.324$, $p \leq .05$, $r^2 = 11\%$).

OBJECTIVE 1.2

Effects of Control Variables

Objective 1.2 called for an exploration of the effects of selected control variables on the hypothesized causal relationship between instructional flexibility and bureaucratization of teacher behavior.

Principal Background Effects

Seven background characteristics of principals -- age, academic background, recency of training, total experience, experience as principal, experience as principal in present district, experience as principal in present school -- were examined to determine their effects on the relationship between instructional flexibility and bureaucratization. In general, the principal background characteristics tended to suppress the relationship. The academic background of principals had the greatest suppressor effect. When controlled for variance in the academic background of principals, the relationship between instructional flexibility and bureaucratization rose from $r = -.441$ to $r = -.567$, a 12% increase in common variance.

Staff Background Effects

Mean and standard deviation values for each of seven staff background variables -- age, academic background, recency of training, experience as teacher, experience as teacher in present district,

experience as teacher in present school, experience as teacher in present school with present principal -- were examined to determine their effects on the relationship between instructional flexibility and bureaucratization of teacher behavior. The relationship between instructional flexibility and bureaucratization remained relatively stable when controlled for the effects of both mean and standard deviation values of the staff background variables.

Principal Attitude Effects

Seven attitudes held by principals toward educational matters -- traditionalism, progressivism, subject matter emphasis, pupil adjustment ideology, student autonomy, consideration of student viewpoint and classroom order -- were examined to determine their effects on the relationship between instructional flexibility and bureaucratization of teacher behavior. Two of these (progressivism and subject matter emphasis) were particularly influential in inflating the relationship. When controlled separately for the confounding effects of progressivism and subject matter emphasis, the strength of the relationship between instructional flexibility and bureaucratization dropped from $r = -.441$ ($p \leq .05$) to nonsignificant ($p > .05$) partial r 's of $-.281$ and $-.268$, respectively. The simple relationship between instructional flexibility and bureaucratization was thus shown to be spurious.

Staff Attitude Effects

Seven attitudes held by staffs toward educational matters -- traditionalism, progressivism, subject matter emphasis, pupil adjustment

ideology, student autonomy, consideration of student viewpoint and classroom order -- were examined to determine their effects on the relationship between instructional flexibility and bureaucratization of teacher behavior. Three (traditionalism, subject matter emphasis, and classroom order) were particularly influential in inflating the relationship between instructional flexibility and bureaucratization. When controlled separately for the confounding effects of these staff attitudes variables, the strength of the relationship between instructional flexibility and bureaucratization dropped from $r = -.441$ ($p \leq .05$) to nonsignificant ($p > .05$) first order partial r 's of $-.124$, $-.291$ and $-.327$, respectively. The simple relationship between instructional flexibility and bureaucratization was thus shown to be spurious.

School Background Effects

Four school background variables -- school size, socio-economic status of students, staffing pattern and openness of teaching space -- were examined to determine their effects on the relationship between instructional flexibility and bureaucratization. These variables were found to have little effect on the relationship.

RESEARCH QUESTION 2

Research Question 2 asked what relative weights may be assigned to characteristics of supervisory and instructional personnel regarding their association, if any, with instructional flexibility and organizational structure.

Although not all of the bivariate hypotheses were confirmed, the data tended to support the contention that the educational attitudes of principals and staffs would be systematically associated with technological and structural characteristics of school organizations. Instructional flexibility was found to be significantly associated (positively) with principal progressivism and (negatively) with staff traditionalism, principal and staff subject matter emphasis, and staff classroom order. Bureaucratization was found to be significantly associated (positively) with principal and staff traditionalism, principal and staff subject matter emphasis, principal consideration of student viewpoint, and principal and staff classroom order, and (negatively) with principal student autonomy.

Path analyses of two models linking the educational attitudes of principals and staffs with instructional flexibility and bureaucratization also supported the contention that instructional flexibility and bureaucratization would be dependent on the educational attitudes of principals and staffs. Contrary to Perrow's theory, the covariance between instructional flexibility and bureaucratization was largely non-causal. The finding that the covariance between educational attitudes (principal and staff traditionalism) and bureaucratization was largely causal, further supported the present author's contention regarding the importance of educational attitudes in determining characteristics of school organizations.

OBJECTIVE 2.1

Objective 2.1 involved determining the directions and degrees to which educational attitudes of (a) principals and (b) staffs were associated with instructional flexibility.

Principal Attitudes and Instructional Flexibility

Objective 2.1a. This objective called for an examination of the directions and degrees of association between educational attitudes held by principals and the degree to which the principals' schools were characterized by instructional flexibility. The theoretical framework specified seven relationships regarding instructional flexibility and educational attitudes held by principals. Instructional flexibility was hypothesized to vary (H_{10}) negatively with the traditionalism of principals; (H_{11}) positively with the progressivism of principals; (H_{12}) negatively with the subject matter emphasis of principals; (H_{13}) positively with the pupil adjustment ideology of principals; (H_{14}) positively with the student autonomy orientation of principals; (H_{15}) positively with the consideration of student viewpoint orientation of principals; and (H_{16}) negatively with the classroom order orientation of principals. Six of the observed relationships were in the expected direction and the sizes of two of these were statistically significant ($p \leq .05$). The size of the observed relationship which was not in the direction hypothesized was not statistically significant. It was found that --

H_{10} was confirmed in direction but not in degree of association.

The more flexible the instructional technology, the weaker the principal's traditionalism ($\underline{r} = -.068$, $\underline{p} > .05$, $\underline{r}^2 < 1\%$);

H_{11} was confirmed in direction and degree of association. The more flexible the instructional technology, the stronger the principal's progressivism ($\underline{r} = .404$, $\underline{p} \leq .05$, $\underline{r}^2 = 16\%$);

H_{12} was confirmed in direction and degree of association. The more flexible the instructional technology, the weaker the principal's subject-matter emphasis ($\underline{r} = -.483$, $\underline{p} \leq .01$, $\underline{r}^2 = 23\%$);

H_{13} was confirmed in direction but not in degree of association. The more flexible the instructional technology, the stronger the principal's pupil adjustment ideology ($\underline{r} = .012$, $\underline{p} > .05$, $\underline{r}^2 < 1\%$);

H_{14} was confirmed in direction but not in degree of association. The more flexible the instructional technology, the weaker the principal's student autonomy orientation ($\underline{r} = .173$, $\underline{p} > .05$, $\underline{r}^2 = 3\%$);

H_{15} was disconfirmed in direction and not confirmed in degree of association. Contrary to the hypothesis, the more flexible the instructional technology, the weaker the principal's consideration of student viewpoint orientation ($\underline{r} = -.128$, $\underline{p} > .05$, $\underline{r}^2 = 2\%$); and

H_{16} was confirmed in direction but not in degree of association. The more flexible the instructional technology, the weaker the principal's classroom order orientation ($\underline{r} = -.026$, $\underline{p} > .05$, $\underline{r}^2 < 1\%$).

Staff Attitudes and Instructional Flexibility

Objective 2.1b. This objective called for an examination of the directions and degrees of association between educational attitudes

held by staffs and the degree to which their schools were characterized by instructional flexibility. The theoretical framework specified seven relationships regarding instructional flexibility and educational attitudes held by instructional staffs. The hypotheses paralleled those specified for principals. Instructional flexibility was hypothesized to vary (H_{17}) negatively with the traditionalism of staffs; (H_{18}) positively with the progressivism of staffs; (H_{19}) negatively with the subject matter emphasis of staffs; (H_{20}) positively with the pupil adjustment ideology of staffs; (H_{21}) positively with the student autonomy orientation of staffs; (H_{22}) positively with the consideration of student viewpoint orientations of staffs; and (H_{23}) negatively with the classroom order orientation of principals. Six of the seven observed relationships were in the expected direction and the sizes of three of these were statistically significant ($p \leq .05$). It was thus found that --

H_{17} was confirmed in direction and degree of association. The more flexible the instructional technology, the weaker the staff's traditionalism ($r = -.522$, $p \leq .27\%$);

H_{18} was confirmed in direction but not in degree of association. The more flexible the instructional technology, the stronger the staff's progressivism ($r = .224$, $p > .05$, $r^2 = 5\%$);

H_{19} was confirmed in direction and degree of association. The more flexible the instructional technology, the weaker the staff's subject matter emphasis ($r = -.506$, $p \leq .01$, $r^2 = 26\%$);

H_{20} was confirmed in direction but not in degree of association. The more flexible the instructional technology, the stronger the staff's

pupil adjustment ideology ($r = .189$, $p > .05$, $r^2 = 4\%$);

H_{21} was confirmed in direction but not in degree of association. The more flexible the instructional technology, the stronger the staff's student autonomy orientation ($r = .130$, $p > .05$, $r^2 = 2\%$);

H_{22} was disconfirmed in direction and not confirmed in degree of association. Contrary to the hypothesis, the more flexible the instructional technology, the weaker the staff's consideration of student viewpoint orientation ($r = .096$, $p > .05$, $r^2 = 1\%$); and

H_{23} was confirmed in direction and degree of association. The more flexible the instructional technology, the weaker the staff's classroom order orientation ($r = -.480$, $p \leq .01$, $r^2 = 23\%$)

Principal and Staff Attitudes with Instructional Flexibility Compared

Objective 2.1 Comparisons. A comparison of the directions and sizes of associations of principal and staff attitudes with instructional flexibility revealed common directions for all of the observed relationships. A comparison of the extent to which principal and staff attitudes were associated with instructional flexibility revealed four pairs of relationships where at least one of the relationships was statistically significant ($p \leq .05$). Thus it was found that instructional flexibility was more strongly associated with -- staff than principal traditionalism (27% vs. < 1%; negative); principal than staff progressivism (16% vs. 5%; positive); staff than principal subject matter emphasis (26% vs. 23%; negative); and staff than principal classroom order orientation (23% vs. < 1%; negative).

OBJECTIVE 2.2

Objective 2.2 involved determining and comparing the directions and degrees to which educational attitudes held by (a) principals and (b) staffs were associated with bureaucratization of teacher behavior.

Principal Attitudes and Bureaucracy

Objective 2.2a. This objective called for an examination of the directions and degrees of association between educational attitudes held by principals and the degree to which the principals' schools were characterized by bureaucratization of teacher behavior. The theoretical framework specified seven relationships regarding bureaucracy and educational attitudes of principals. Bureaucratization of teacher behavior was hypothesized to vary (H_{24}) positively with the traditionalism of principals; (H_{25}) negatively with the progressivism of principals; (H_{26}) positively with the subject matter emphasis of principals; (H_{27}) negatively with the pupil adjustment ideology of principals; (H_{28}) negatively with the student autonomy orientation of principals; (H_{29}) negatively with the consideration of student viewpoint orientation of principals; and (H_{30}) positively with the classroom order orientation of principals. Five of the observed relationships were in the expected direction and the sizes of six relationships were statistically significant ($p \leq .05$). It was thus found that --

H_{24} was confirmed in direction and degree of association. The stronger the principal's traditionalism, the more bureaucratic the

behavior of teachers ($\underline{r} = .518$, $\underline{p} \leq .01$, $\underline{r}^2 = 27\%$);

H₂₅ was confirmed in direction and degree of association.

The stronger the principal's progressivism, the less bureaucratic the behavior of teachers ($\underline{r} = -.566$, $\underline{p} \leq .001$, $\underline{r}^2 = 32\%$);

H₂₆ was confirmed in direction and degree of association. The stronger the principal's subject matter emphasis, the more bureaucratic the behavior of teachers ($\underline{r} = .488$, $\underline{p} \leq .01$, $\underline{r}^2 = 24\%$);

H₂₇ was not confirmed nor disconfirmed in direction or in degree of association. Contrary to the hypothesis, but not statistically significant, the stronger the principal's pupil adjustment ideology, the more bureaucratic the behavior of teachers ($\underline{r} = .045$, $\underline{p} > .05$, $\underline{r}^2 < 1\%$);

H₂₈ was confirmed in direction and degree of association. The stronger the principal's student autonomy orientation, the less bureaucratized the behavior of teachers ($\underline{r} = -.468$, $\underline{p} \leq .01$, $\underline{r}^2 = 22\%$);

H₂₉ was disconfirmed. Contrary to the hypothesis and statistically significant, the stronger the principal's consideration of student viewpoint, the more bureaucratized the behavior of teachers ($\underline{r} = .423$, $\underline{p} \leq .01$, $\underline{r}^2 = 18\%$);

H₃₀ was confirmed in direction and degree of association. The stronger the principal's classroom order orientation, the more bureaucratized the behavior of teachers ($\underline{r} = .349$, $\underline{p} \leq .05$, $\underline{r}^2 = 12\%$).

Staff Attitudes and Bureaucracy

Objective 2.2b. This objective called for an examination of the directions and strengths of relationships between the educational

attitudes and bureaucratic behavior of instructional staffs. The theoretical framework specified seven relationships regarding bureaucracy and educational attitudes of staffs. Bureaucratization of teacher behavior was hypothesized to vary (H_{31}) positively with the traditionalism of staffs; (H_{32}) negatively with the progressivism of staffs; (H_{33}) positively with the subject matter emphasis of staffs; (H_{34}) negatively with the pupil adjustment ideology of staffs; (H_{35}) negatively with the student autonomy orientation of staffs; (H_{36}) negatively with the consideration of student viewpoint orientations of staffs; and (H_{37}) positively with the classroom order orientation of staffs. Six of the observed relationships were in the expected direction and the sizes of four of these were statistically significant ($p \leq .05$). It was thus found that --

H_{31} was confirmed in direction and degree of association. The stronger the staff's traditionalism, the more bureaucratic the behavior of teachers ($r = .699$, $p \leq .001$, $r^2 = 49\%$);

H_{32} was confirmed in direction but not degree of association. The stronger the staff's progressivism, the less bureaucratic the behavior of teachers ($r = -.156$, $p > .05$, $r^2 = 2\%$);

H_{33} was confirmed in direction and degree of association. The stronger the staff's subject matter emphasis, the more bureaucratic the behavior of teachers ($r = .421$, $p \leq .01$, $r^2 = 18\%$);

H_{34} was confirmed in direction but not degree of association. The stronger the staff's pupil adjustment ideology, the less bureaucratic the behavior of teachers ($r = -.168$, $p > .05$, $r^2 = 3\%$);

H₃₅ was confirmed in direction and degree of association. The stronger the staff's student autonomy orientation, the less bureaucratic the behavior of teachers ($r = -.361$, $p < .05$, $r^2 = 13\%$);

H₃₆ was disconfirmed in direction and degree of association. The stronger the staff's consideration of student viewpoint orientation, the more bureaucratic the behavior of teachers ($r = .096$, $p > .05$, $r^2 = 1\%$); and

H₃₇ was confirmed. The stronger the staff's classroom order orientation, the more bureaucratic the behavior of teachers ($r = .361$, $p < .05$, $r^2 = 13\%$).

Principal and Staff Attitudes with Bureaucracy Compared

Objective 2.2 Comparisons. A comparison of the directions and sizes of associations of principal and staff attitudes with bureaucratization of teacher behavior revealed common directions for six of the seven pairs of relationships. Whereas, the pupil adjustment ideology of principals was positively related to bureaucracy, for staffs it was negatively related. Neither association was statistically significant. A comparison of the extent to which principal and staff attitudes were associated with bureaucratization of teacher behavior revealed six pairs of relationships where at least one of the relationships was statistically significant ($p \leq .05$) and that both relationships were significant in three of the pairs. It was thus found that bureaucratization of teacher behavior was more strongly associated with -- staff than principal traditionalism (49% vs. 27%; negative); principal than staff progressivism (32% vs.

2%; negative); principal than staff subject matter emphasis (24% vs. 18%; positive); principal than staff student autonomy (22% vs. 13%); principal than staff consideration of student viewpoint (18% vs. 1%; positive); staff than principal classroom order orientation (13% vs. 12%; positive).

OBJECTIVE 2.3

Path Analyses of Models I and II

Objective 2.3. This objective called for an examination of causal relationships among the educational attitudes of school personnel, the instructional flexibility of schools and the bureaucratization of teacher behavior by determining and comparing the powers of two models to describe the data.

Model I

Model I was based on two theoretical notions. The first of these stemmed from Perrow's work which implied that bureaucratization of teacher behavior would be negatively dependent on instructional flexibility. The second was this author's suggestion that instructional flexibility would likely be dependent on the educational attitude orientations of principals and staffs. A path analysis of data arranged in accordance with Model I revealed that the orientations of principals and staffs toward traditionalism and progressivism accounted for 31% of the variance in instructional flexibility. These attitude orientations combined with instructional flexibility

accounted for 66% of the variance in bureaucratization of teacher behavior. Using Model I, the major causal sources of variance in instructional flexibility were staff traditionalism (27%; negative) and principal progressivism (16%; positive). The major causal sources of variance in bureaucratization were staff traditionalism (37%; positive) and principal traditionalism (11%; positive). The path analysis of Model I revealed that only about 1% of the variation in bureaucratization was causally dependent on instructional flexibility. Thus the author's suggestion that instructional flexibility and bureaucratization would be dependent on the educational attitudes of principals and staffs was supported by the data. Contrary to expectations, however, was the finding that the covariance between instructional flexibility and bureaucratization was largely non-causal.

Model II

Model II utilized the same variables as Model I but held that instructional flexibility would be dependent on bureaucratization and the educational attitudes of principals and staffs. The direction of causality between instructional flexibility and bureaucracy as posited in Model II was thus the reverse of that suggested by Perrow's technological imperative. A path analysis of the data arranged in accordance with Model II revealed that the attitude orientations of principals and staffs toward traditionalism and progressivism accounted for 64% of the variance in bureaucratization. These attitude orientations combined with bureaucratization of teacher behavior accounted for 38% of the variance in instructional flexibility.

Using Model II, the major causal sources of variance in bureaucratization were staff traditionalism (49%; positive), principal progressivism (32%; negative), and principal traditionalism (27%; positive). Each individual variable accounted for less than 6% of the causal variance in instructional flexibility. Only about 5% of the variance in instructional flexibility was found to be causally dependent on bureaucratization of teacher behavior.

RESEARCH QUESTION 3

Research Question 3 asked what few variables compared with instructional flexibility best predicted bureaucratization of teacher behavior. In order to answer this question, instructional flexibility and variables in each of five sets were analyzed simultaneously. Furthermore, instructional flexibility and all of the variables were analyzed simultaneously.

Instructional flexibility was the best predictor of bureaucratization when compared with the principal background, staff background and school background variables. However, when compared with the principal and staff attitude variables, instructional flexibility ranked second and third, respectively, in terms of proportional reduction in the variance of bureaucratization. Furthermore, instructional flexibility failed to be selected as one of the 10 best predictors of bureaucratization selected from the variables.

Prediction of Bureaucracy by Instructional Flexibility and Principal Attitudes

The prediction of bureaucratization of teacher behavior simultaneously by instructional flexibility and the seven principal attitudes toward education -- traditionalism, progressivism, subject matter emphasis, pupil adjustment ideology, student autonomy, consideration of student viewpoint and classroom order -- resulted in $R = .792$, $p \leq .01$. Sixty-three percent of the variance was explained. The orientations of principals toward progressivism and consideration of student viewpoint were better predictors of bureaucratization in terms of proportional reduction in variance than instructional flexibility. Furthermore, only progressivism and traditionalism contributed statistically significant absolute reductions in the variance of bureaucratization.

Prediction of Bureaucracy by Instructional Flexibility and Principal Background

The prediction of bureaucratization of teacher behavior simultaneously by instructional flexibility and the seven principal background variables -- age, academic background, recency of training, total experience, experience as principal, tenure as principal in present district, and tenure as principal in present school -- resulted in $R = .697$, $p > .05$. Forty-nine percent of the variance was explained. Instructional flexibility was the best predictor in terms of proportional reduction in variance. Furthermore, only instructional flexibility and the academic background of principals contributed

statistically significant absolute reductions in the variance of bureaucratization.

Prediction of Bureaucracy by Instructional Flexibility and Staff Attitudes

The prediction of bureaucratization of teacher behavior simultaneously by instructional flexibility and the seven staff attitudes toward education -- traditionalism, progressivism, subject matter emphasis, pupil adjustment ideology, student autonomy, consideration of student viewpoint and classroom order -- resulted in $R = .731$, $p \leq .05$. Fifty-four percent of the variance was explained. The orientations of staffs toward traditionalism, student autonomy and progressivism were better predictors of bureaucratization in terms of proportional reduction in variance than instructional flexibility. Only staff traditionalism contributed a statistically significant absolute reduction in the variance of bureaucratization.

Prediction of Bureaucracy by Instructional Flexibility and Staff Background

The prediction of bureaucratization of teacher behavior simultaneously by instructional flexibility and the seven staff background variables -- age, academic background, recency of training, experience as teacher, experience as teacher in present district, experience as teacher in present school, and experience as teacher in present school with present principal -- was analyzed separately for mean and standard deviation values of the variables. The R 's

were .576, $p > .05$, and .539, $p > .05$, respectively. The mean values accounted for 33% and the standard deviation values for 29% of the variance of bureaucratization. IF ranked first in terms of proportional reduction in variance. None of the variables contributed statistically significant absolute reductions in the variance of bureaucratization.

Prediction of Bureaucracy by Instructional Flexibility and School Background

The prediction of bureaucratization of teacher behavior simultaneously by instructional flexibility and the four school background variables -- size, socio-economic status of pupils, staffing pattern, and teaching space -- resulted in $R = .587$, $p > .05$. Thirty-four percent of the variance was explained. Instructional flexibility was the best predictor in terms of proportional reduction in variance. None of the variables contributed statistically significant absolute reductions in the variance of bureaucratization.

Prediction of Bureaucracy by Instructional Flexibility, Principal Attitudes, Principal Background, Staff Attitudes, Staff Background, and School Background

A multiple regression analysis was conducted to determine the best 10 predictors of bureaucratization of teacher behavior in a set composed of instructional flexibility and all of the variables mentioned in the preceding sections. Instructional flexibility was not selected in terms of proportional reduction in variance. The 10 best predictors in terms of proportional reduction in variance were

staff traditionalism, principal traditionalism, principal recency of training, principal student autonomy, staff recency of training (standard deviation value), principal consideration of student viewpoint, staff student autonomy, staff experience in school with the principal (standard deviation value), principal progressivism, and principal classroom order. The R was .933, $p \leq .001$. Eighty-seven percent of the variance was explained. Statistically significant absolute increments in variance explained were contributed by six of the variables. Three variables -- staff traditionalism, principal traditionalism, and principal recency of training -- accounted for 70% of the explained variance in bureaucratization and 80% of the variance accounted for by the 10 best predictors.

An analysis utilizing a pre-established hierarchy among the sets of variables was also conducted to determine predictors of bureaucratization. The hierarchy, from first to last, was: instructional flexibility, principal attitudes, staff attitudes, principal background and school background, staff background (mean and standard deviation values). This analysis "forced" each set to be considered in the above order. Nine variables were selected, $R = .898$, $p \leq .001$. Eighty-one percent of the variance in bureaucratization was accounted for. Instructional flexibility and principal traditionalism were found to contribute 45% of the variance in bureaucratization or 56% of the total variance accounted for by the nine variables.

Relative Weights of Principal and Staff Attitudes

Four analyses were conducted to determine whether the

educational attitudes of principals or staffs accounted for more variation in bureaucratization when analyzed simultaneously with instructional flexibility and the background variables of principals, staffs and schools. The inclusion of principal attitudes after instructional flexibility and prior to staff attitudes revealed that 20% more of the variance in bureaucratization was accounted for than when staff attitudes were included after instructional flexibility and prior to principal attitudes.

RESEARCH QUESTION 4

Research Question 4 asked what few variables (from among the principal attitude, principal background, staff attitude, staff background and school background variables) compared with bureaucratization of teacher behavior best predicted instructional flexibility.

Bureaucratization was not selected as one of the ten best predictors of instructional flexibility. The single best predictor when all the variables were considered simultaneously was staff traditionalism, followed by three characteristics of principals.

Prediction of Instructional Flexibility by Bureaucracy, Principal Attitudes, Principal Background, Staff Attitudes, Staff Background and School Background

A multiple regression analysis was conducted to determine the best 10 predictors of instructional flexibility in a set composed of bureaucratization and all of the variables mentioned in the preceding sections. Bureaucratization was not selected in terms of

proportional reduction in variance. The most influential predictor of instructional flexibility was staff traditionalism (31%, negative) which was followed by the academic background subject matter emphasis and student autonomy of principals.

DISCUSSION:

SUGGESTIONS FOR FURTHER RESEARCH

The study reported in this document was essentially exploratory in nature. The findings should be considered tentative and received with caution. Nevertheless, the results just summarized and the weaknesses pointed out in this section may serve to stimulate further inquiry into relationships between characteristics of the educational personnel, instructional technology and the organizational structure of schools.

Future studies should employ a stronger design than this study. The ex post facto design employed in this study did not permit a conclusive examination of the causal relationship between technology and structure hypothesized by Perrow, nor did it provide objective evidence regarding the causal ordering of effects among characteristics of the attitudes of staffs and principals, instructional technology and organizational structure. Future studies should attempt to employ experimental or quasi-experimental designs.

Future studies should proceed with a more detailed explication of the theoretical framework. The theoretical framework of this study, given its exploratory nature, was developed with broad strokes.

Future studies should attempt to identify linkages between variables based on this and other research, as well as possible alternative explanations for the relationships reported here. For example, Perrow's theory relies on a consideration of the nature of the material processed by an organization. How might his concepts regarding the nature of the material be applied to school organizations, and what implications do they have for relationships between personnel attitudes, technology and structure?

Future studies should attempt to improve the conceptualizations and measurements of the variables employed in this study. Although the conceptualizations and measurements used in this study were based on the results of previous studies, there is a need for further improvement. For example, future studies should clearly differentiate between and employ multiple objective measures of technological and structural characteristics. There is also a need to improve upon the reliability of some of the measures of attitudes used in this study. Future studies should also ensure that measurements of key variables are taken in such a way as to be clearly independent of each other.

Future studies of the technological imperative, whether in educational or other organizations, should be guided by Davis and Taylor's recent review of the literature on technology, organization and job structure. The issue of technological determinism is central to their review and they conclude the notion is "dangerously simplistic" (1976:380). The results of this study tend to support their conclusion.

The findings of this study also indicate that future inquiries into the nature of school organizations should include the educational attitudes of school personnel as variables likely to have significant relationships with other characteristics of school organizations.

CONCLUSIONS

Given the results of this study, the answer to the general research problem stated at the outset appears to be: "Yes, public elementary school organizations are characterized by systematic variation in relationships among properties of personnel attitudes, instructional technology and organizational structure."

On the other hand, the findings also suggest that such a positive response to the research question requires qualification and elaboration.

Does the technological imperative operate in educational organizations? We don't know. The path analyses of the two models tested in this study revealed only small amounts of causal variance. We need a better understanding of the instructional process and of the organizational structure of schools before causal relationships between these two variables can be assessed with greater confidence. Furthermore, the partial correlation analyses reported in this study indicate that observed simple relationships between properties of instructional technology and structure may be spurious.

Several of the study's findings bear on issues related to the distribution of power in the decision-making structure of schools.

Instructional flexibility was higher in schools where teachers as individuals and as school staffs had greater influence over school-wide and classroom matters. Furthermore, instructional flexibility decreased as the influence of principals over classroom matters exceeded that of teachers. These findings suggest that the flexibility of instructional programs may be increased by developing greater participation and decision-making on the part of teachers with regard to classroom matters and with regard to school-wide matters inasmuch as they affect the instructional process.

Likewise the finding that instructional flexibility was lower in schools where central office officials, trustees and parents exercised greater influence over classroom matters suggests a need to buffer the classroom from such influence. This notion, of course, runs contrary to the ideology of community schools which advocates greater openness.

Do principals or staffs have a greater effect on the flexibility of instructional programs? The results of this study indicate that this question is more complex than it appears on the surface. Simple selection of principals or staffs in answer to the question is therefore not satisfactory.

Two educational attitude orientations of principals were found to be significantly related to instructional flexibility. The progressivism of principals was positively related and the subject matter orientation of principals was negatively related to instructional flexibility. Three educational attitude orientations of staffs were

significantly related to instructional flexibility. The traditionalism, subject matter emphasis and classroom order orientations of staffs were negatively related to instructional flexibility. Furthermore, schools with higher degrees of instructional flexibility were schools in which teachers had higher degrees of influence over classroom and school-wide matters than in schools with lower degrees of instructional flexibility. In addition, instructional flexibility was found to increase as the influence of principals over that of staffs with regard to classroom matters decreased.

Given these and other findings reported earlier in this study regarding the comparative effects of principals and staffs on the flexibility of instructional programs, it seems reasonable to conclude that the question is too broad and can only be satisfactorily answered when made more specific.

Do principals or staffs have a greater effect on the bureaucratization of organizational structure? As for the previous question, an appropriate answer is more complex than a simple selection of principals or staffs.

Both general educational attitude orientations of principals were significantly related to the bureaucratization of school structure: the more traditional the principal, the greater the bureaucratization; the more progressive the principal, the less the bureaucratization. Staff progressivism was not significantly related to bureaucratization; however, staff traditionalism was: the more traditional the staff, the more bureaucratized the school

organizational structure. Four of the five teaching process orientations of principals were significantly related to bureaucratization: the principal's subject matter emphasis, consideration of student viewpoint and classroom order orientations were positively related and the student autonomy orientation of principals was negatively related. Three teaching process orientations of staffs were significantly related to bureaucratization: the subject matter emphasis and the classroom order orientations of staffs were positively related and the student autonomy orientation of staffs was negatively related to bureaucratization.

Given these and other findings reported earlier in this study, we may safely conclude that a satisfactory answer requires further refinement of the question.

In conclusion, this study demonstrates that future studies of the technology and structure of school organizations should utilize a more complex theoretical framework than the simplistic concept of technological determinism inherent in Perrow's formulation of the technological imperative. Furthermore, this study clearly indicates that the educational attitudes of both principals and staffs should be included in such studies as significant variables likely to affect properties of the technology and structure of school organizations.

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