AN EMPIRICAL STUDY OF THE RELATIONSHIP BETWEEN SCHOOL MANAGEMENT PATTERNS AND THE CHANGE TOWARD CLASSROOM OPENNESS

by

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CURRICULUM STUDIORUM

William S. MacKillican was born August 25, 1941,in Sudbury, Ontario. He graduated from Peterborough Teachers' College in 1961 and received a Bachelor of Arts degree with a major in Psychology from Queen's University at Kingston, Ontario,in 1966. In 1969 he received a Master of Education degree with specialization in Educational Administration from the Ontario Institute for Studies in Education of the University of Toronto. In 1973 he submitted his "Interim Report of Research" to the University of Ottawa. It was entitled, "A Preliminary Study of the Inservice Needs of Elementary School Principals in the English Schools of Northeastern Ontario".

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INTRODUCTION

A review of the literature concerning educational innovation leaves one with the conclusion that the subject is not well understood. Despite the vast number of studies that have addressed this issue over the past forty to fifty years, there remains such widespread disagreement about how the topic should be approached that practitioners can depend on little more than trial and error methods to implement their efforts of planned change. More recently, however, writers have tended to speculate that efforts to understand the change process have been studying the wrong elements. Instead of adhering to research about the innovation itself, the innovators concerned or the mechanisms used for the diffusion of innovations, it seems more reasonable to consider conditions within the social system where change is to occur. Such an approach to innovation would incorporate the interdependence of the cognitive and affective elements that contribute to the psycho-sociological make-up of any given social situation.

Likert has suggested that his management systems theory can be used as a predictor of innovation. Though evidence has already been collected to suggest that organizations which employ management patterns based on cooperation instead of authority will be more effective in attaining goals, there is little research to suggest that the

theory can be used as a basis for applied organizational change. This is especially true in the case of educational organizations. Consequently, the purpose of this study was to test the change aspect of Likert's theory by comparing its relationship to a complex innovation in Ontario elementary schools.

Classroom openness was chosen as the dependent variable of this study because it was considered to be a sufficiently complex type of innovation to provide a stringent test of the theory. This construct was measured using the "Classroom Openness Questionnaire" developed through the cooperation of the Education Development Center in Newton, Massachusetts. Openness scores were calculated for seventy-five Northern Ontario elementary schools based on responses received from 469 teachers.

Chapter one of the thesis outlines the development of the problem by identifying the underlying theoretical rationale, and by reviewing related literature. It describes the dependent variable, classroom openness,and shows why it can be considered an innovation in Ontario. It concludes with a summary of the problem that includes a statement of the hypotheses. Chapter two, "Research Design", describes the sample and the instruments that were used. It also explains how the data were collected and organized and gives a summary of findings based on preliminary

analyses. Since these preliminary analyses confirmed a possible weakness in the selection of the factors within the "Profile of a School" instrument, chapter three contained a test of the instrument's construct validity. Factor analysis procedures were used to analyse the original 469 responses to the "Profile of a School" and a second sample of 314 teachers was used to cross-validate the original findings. The combined results were used to reorganize the instrument before it was used to test the hypotheses. The results from testing the four hypotheses are presented and discussed in chapter four.

The timeliness of the study was supported by the fact that it was conducted in Ontario at a time when many educational officials of that province were placing a strong emphasis on both school management practices and open education. The importance attributed to the former is manifested by the increasing amount of inservice training that is being provided for school leaders throughout the province. A second emphasis in this area can be witnessed in the attempts of the Ministry of Education to improve the quality of courses that are offered as part of the certification process for school principals. At the same time that leadership practices are receiving increased attention, the construct open education is also at the forefront of the minds of many who are associated with Ontario elementary

schools. While this study was being conducted, for example, a new curriculum guideline for kindergarten to grade six, based very much on the principles of open education, was in its final stages of preparation. This study provided some insight into the relationship between school leadership and curriculum change.

CHAPTER I

REVIEW OF THE LITERATURE

This chapter summarizes Likert's management systems theory that was used to provide the theoretical rationale for the study. It then reviews theoretical writings and empirical studies that support the contention that the management pattern of an organization is related to its ability to be innovative. The dependent variable, classroom openness, is presented as an innovation in Ontario and a positive relationship between this variable and school management patterns is predicted in the four research hypotheses that are presented in the final section of the chapter.

1. Likert's Theory

Likert's management systems theory states that "the management patterns used by most organizations can be arrayed along a continuum from the most primitive to the most socially-evolved".[1] The former is characterized by authoritarian approaches while the latter employs more participative practices. The relative terminology used to

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1 Albert F. Siepert and Rensis Likert, "Organizing for the Successful Application of Educational Research and Development", a paper presented at the Conference of the Special Interest Group on Research Management, American Educational Research Association, Columbus, Ohio, Nov. 1972, p. 3.

describe the four systems of the theory is shown in Figure one.

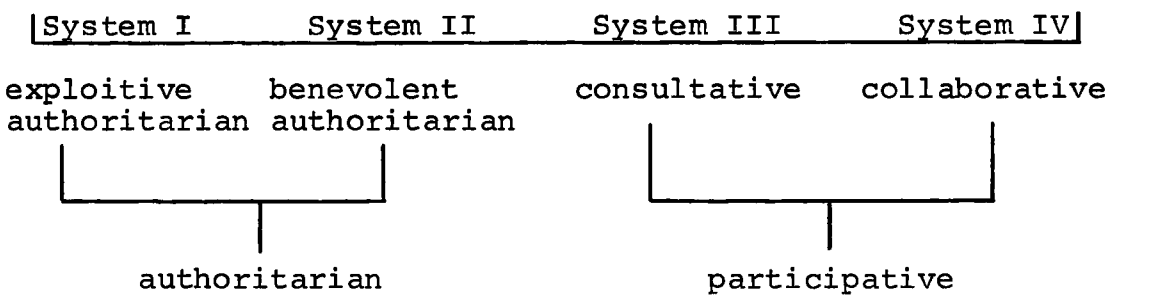
The exploitive-authoritarian approach to management concentrates on practices that place decision, direction and surveillance in the hands of management. Employees are considered to be a market commodity and their time and labour is thought to be purchased solely for the benefits of the organization. Decision-making is a prerogative of the senior management personnel who use downward communication to direct the activities of subordinates. Motivation is based on the external use of fear and punishment and performance tends to be mediocre.

The benevolent-authoritarian approach to management is much like the exploitive system in that its major assumptions still place most of the authority in the hands of the supervisors. Its means of motivation, however, are less coercive than the former because it rewards people with a system of incentives based on individual competition and isolation. Supervision is still done on an individual basis but some upward communication and consultation is accepted. While this method still expects employee subservience, it attempts to remove some of the aspects of the coercive system that subordinates find annoying.

Management in a system three organization still reserves the right to decision-making and directing of the

Figure 1

Descriptive Terminology for Likert's Management Systems Theory



Author's synthesis taken from Rensis Likert Associates, The Likert Profile of a School, New Survey Instruments for Public Schools to Improve Organizational Effectiveness, Manual for Questionnaire Use, Ann Arbor, Michigan, Rensis Likert Associates, November 1972, 77 p.

organization but it differs in a number of ways from the two previous typologies. Employees are no longer looked upon as market commodities, much of the surveillance is removed, little coercion exists and valid two-way communication is maintained by a man-to-man consultative relationship between subordinates and their immediate supervisors. Motivation emphasizes positive approaches, more responsibility is delegated to lower level managers and all individuals within the organization are encouraged to become accomplished specialists. This atmosphere encourages managers and their subordinates to be reasonably committed to the organizational purposes. Cost factors, performance levels and employee satisfaction tend to be good.

In the collaborative system employees and managers both exert control over the work situation. Based on an interaction-influence model, management views employees to be an important element in the decision-making process. The manager's function becomes one that facilitates the process more than one of actual decision-making. Overlapping organizational structures, multiple group memberships, team approaches to problem-solving, open communication, easy access to information, mutual trust and cooperation provide a climate of willing participation that capitalizes on the expertise of all concerned. This system is characterized by good labour relations and high performance outputs.

The management pattern of an organization can be operationally defined as the score obtained on the "Profile of Organizational Characteristics".[2] This instrument was developed by Likert to measure eight organizational concepts that had been theoretically derived from research in business organizations. They include

> (i) leadership processes, (ii) motivational factors, (iii) communication processes, (iv) interaction-influence processes, (v) decision-making processes, (vi) goal-setting mechanisms, (vii) control processes and (viii) performance goals and training.[3]

Likert has further defined his theory through the use of three broad categories of variables which he termed causal, intervening and end result. The causal variables are those independent variables which can be changed by the organization and its management. They include "the structure of the organization and management's policies, decisions, business and leadership strategies, skills and behavior".[4] The intervening variables include "the loyalties, attitudes, motivations, performance goals and perceptions of all members and their collective capacity for effective interaction, communication and decision-making".[5]

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2 Rensis Likert, The Human Organization: Its Management and Value, New York, McGraw-Hill, 1967, p. 196-211.

3 Ibid.

4 Ibid., p. 29.

5 Ibid.

The end result variables are composed of the various performance and financial variables, such as level of productivity and profits, that are of concern to business organizations.

Likert has demonstrated from his own research[6] and from the work of others who have applied his theory that the causal, intervening and end result variables are sequentially related. He has shown that, over a period of time, deliberate attempts to improve the causal variables will lead to corresponding modifications in the intervening variables. This latter change seems to occur when subordinates perceive a genuine desire on the part of management for them to participate in the affairs of the organization. As their perceptions are reinforced by the continued encouragement of supervisors the organization's work group climate (i.e. its intervening variables) begins to change in such a way that employees have more influence in organizational decisions, experience improved communication, witness more peer interaction, participate in team building exercises and become better motivated toward the attainment of organizational goals. Collectively, these intervening variables mediate between the causal inputs to the system and the outcomes that Likert refers to as end results. He

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6 Ibid., p. 13-46.

has drawn this conclusion from research in business organizations where high management pattern scores have been favourably related to such outcomes as productivity, employee earnings, employee turnover, time taken to retrain employees, sales, production costs, loss through waste, quality of products and customer relations.[7]

In 1968 Likert developed an instrument that was modelled after his "Profile of Organizational Characteristics" to measure the management patterns of educational organizations. Though the differences between business and educational organizations made it difficult to apply all of the former organizational concepts, many of them were utilized. After five minor revisions the "Profile of a School" was published in its present form in 1971. This instrument contained seventeen organizational variables that were based on concepts that had been found to be important components in successful business organizations. From a theoretical standpoint it seemed that they could also be applied to schools and school systems. These variables, or indices as they are frequently labelled, have been grouped into five clusters which Likert called factors. These are shown in the following list.

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7 These studies are reported in Rensis Likert, The Human Organization, p. 13-46.

1. Climate (causal)
   (i) goal commitment
   (ii) decision process
   (iii) team cooperation

2. Leadership (causal)
   (i) support by leader
   (ii) leader's receptivity to subordinates' ideas
   (iii) goal emphasis
   (iv) team-building
   (v) work facilitation
   (vi) decision-making

3. Trust (causal/intervening)
   (i) trust by and in leader

4. Other Intervening Variables
   (i) influence by subordinates
   (ii) communication
   (iii) peer team-building
   (iv) motivation of subordinates
   (v) student acceptance of goals

5. End Result Variables
   (i) attitudes of teachers toward school
   (ii) teacher frustration.[8]

The climate factor has been termed the "cumulative effect of leadership at all levels above the immediate supervisor".[9] As shown in the previous list, climate and leadership are causal variables while trust has been termed both causal and intervening. The intervening variables constitute factor four and the two indices dealing with teacher attitudes and teacher frustration have been termed end result variables.

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8 Likert Associates, Manual for Questionnaire Use, op. cit., appendix A-1, p. 1-5.

9 Ibid., appendix A-1, figure A.

Likert proposes that organizations with participative management patterns will be more effective than those with more authoritarian patterns. In terms of the previously mentioned variables, he maintains that ultimate school effectiveness is initially dependent on the type of input that would produce high ratings on the causal variables climate, leadership and trust. After a given period of time—probably one to three years—this causal input would cause corresponding favourable changes in the work group climate that is identified by the five indices subsumed within the other intervening variables factor. At this point in time, a measurement of the school organization should indicate high ratings for both of the causal and intervening variables. And finally, the effect of a change in the causal variables should be mediated by the intervening variables to provide an improvement in the end result variables so that high ratings would be expected for all three types of variables. This theoretical claim has been confirmed by a number of studies.[10] Likert has reported that school management patterns have been found to be directly related to such variables as school excellence, teacher and student satisfaction, student achievement, communication and decision-making, open school climate,

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10 Ibid., section VI, p. 1-10.

motivation of students and teachers and the setting of high performance goals. Inverse relationships have been found between school management pattern scores and such variables as student frustration, frequency of teacher strikes and the number of racial disruptions.

The substance of Likert's theory can also be described with an explanation of the instrument that he developed to measure the management pattern of schools. The "Profile of a School"[11] is composed of sixty-five items that are arranged in two parts. Part one, composed of the first twenty-five items, was designed to measure the teacher's perception of his own relationship with students and the relationships that he perceives to exist among students. Likert refers to this part of the instrument as the self-assessment (abbreviated SA) component. Part two of the instrument, subordinate perceptions (SP), is designed for teachers to rate the principal's behaviour, to provide a measure of their own influence in the decision-making processes of the school, to assess the general working relations among peers and to indicate the amount of goal emphasis that is characteristic of their school. The subordinate perception part of the instrument contains items to

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11 All references to the "Profile of a School" in this study refer to form three that has been designed for completion by teachers.

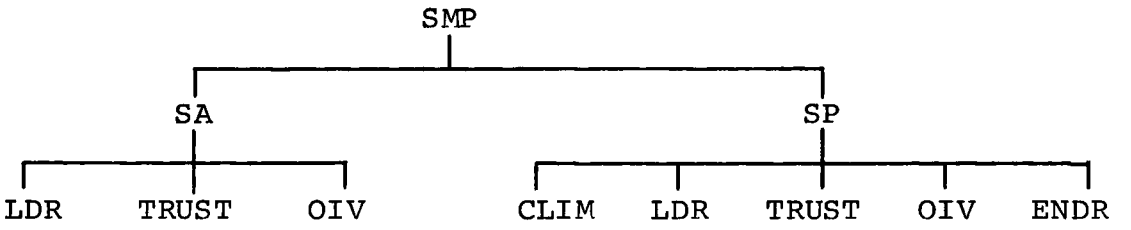
measure each of the five factors that were listed on page 8 while the self-assessment items are distributed throughout only three factors—leadership, trust and other intervening variables. The relationship between the global measure of a school's management pattern (SMP) and its sub-components is shown in Figure two. This organization of items was provided in a written communication from Likert Associates to concur with 1974 revisions.

Likert has explained that when the leadership of an organization employs participative practices the ratings from the "Profile of a School" given to the causal variables will be high. These, in turn, should then encourage a high degree of interaction-influence to occur within the work group climate causing high scores on the intervening variables. And finally, these two influences act upon the end result variables to produce improved organizational outcomes. In summary, it can be said that organizations which approach a system four type of management pattern should be characterized by high scores on all of the variables that Likert has identified.

Once an organization has attained a system four type of management pattern it must constantly strive to maintain this position if end results are to remain favourable. New technology, the need for employee retraining and changing client demands are but a few of the environmental elements necessitating continual attention for adaptability. Here,

Figure 2

An Organization[a] to Show the Relationship Among the Different Components of the "Profile of a School"



SMP = school management pattern, SA = self-assessment, SP = subordinate perception, LDR = leadership, TRUST = trust, OIV = other intervening variables, CLIM = climate and ENDR = end results.

a This figure is the investigator's organization based on the arrangement of items provided by Rensis Likert Associates in a private written communication.

again, Likert has suggested that his theory is applicable. As organizations approach a system four type of management they are not only more effective in achieving their intended objectives but they also tend to be more innovative in their response to environmental changes. Siepert and Likert have stated that

> [...] there is a marked relationship between the administration (or management) system of an organization and the extent to which it displays innovative characteristics. Organizations which use a highly developed and productive management system display stronger innovative characteristics than those using less productive management systems.[12]

This generalization is taken from studies of business organizations where the authors note that "characteristics which favour innovative behavior are found most often in system four organizations and least often in system one".[13] They go on to make the same claim for schools.

> Recent studies in schools reveal the same pattern of findings as those found in business organizations. [...] With such instruments, we can now measure accurately where along the system one to four spectrum a school organization really operates. From such data, we can predict rather well for a given school or school system the likelihood of its having the innovative characteristics essential for the successful demonstration and application of research findings.[14]

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12 Siepert and Likert, op. cit., p. 3.

13 Ibid., p. 4.

14 Ibid.

This latter claim, however, has not received the empirical support suggested by its authors. In a survey of the literature, including those studies cited by Siepert and Likert, it is evident that the relationship between a school's management pattern and its innovative characteristics has not been sufficiently tested to warrant such a generalization. The testing of this theoretical claim became the purpose of this study.

2. Support for Likert's Theory as a Theory of Innovation

Only one study could be found that directly attempted to test the relationship between Likert's theory and educational innovation. In this particular case Gehrman[15] studied five Massachusetts high schools that were selected by state officials as being innovative because they practised non-grading, team teaching, differentiated staffing, phasing (a system of grouping students according to their skills and knowledge) and independent study—a form of contract learning. These schools were then matched with five others that were considered to be non-innovative because they used

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15 T. H. Gehrman, "An Investigation of the Relationship between Participation and Organizational Climate: An Empirical Study of the Perception of High School Seniors, Teachers, Principals and District Superintendents in Innovative versus Non-innovative Schools", unpublished Ed.D. dissertation, University of Massachusetts, 1970, 119 p.

none of the above practices. The Profile of a School, 1969 version, was administered to a randomly selected sample of students and teachers in each school as well as to all of the principals and superintendents who had supervisory responsibilities in the schools concerned.

A test of difference between the means for teachers and students in the two groups of schools revealed no significant difference between the teacher scores. Students of the innovative schools, however, gave them a significantly ($p<.05$) higher rating. No statistical comparisons could be made between the scores of principals and superintendents because of the small numbers involved. Thus, this study suggested a trend between school management pattern and innovation, but its design rendered the findings somewhat inconclusive.

Though only one study could be found that directly tested the relationship between Likert's theory and innovation, considerable support for this relationship was found among theories and studies that related one or more of the seventeen indices to innovation. These are discussed in the next two subsections of this chapter.

2a. Theoretical Support

The theories of Lewin,[16] 1947; McGregor, 1960; Miles, 1965; Bennis, Benne and Chin, 1969; and Getzels, 1968, are summarized to illustrate how each supports the innovative aspect of Likert's theory.

Lewin[17] proposed a theory of change based upon a force-field analysis of the social context in which the innovation was set. He maintained that every social group functions in a state of quasi-stationary equilibrium that is characterized by a continual changing of group elements and by a constant direction of group behaviour and activity. This seemingly paradoxical statement is clarified by the use of the analogy of a flowing river. While the force of gravity acts as a driving force to continually push the water forward, the river's bed and banks restrain it from moving beyond the constancy of its flow. In a similar way, social groups are held in a state of constancy by sets of opposing forces. If change is to occur, an imbalance in these forces must be created so that the system can move to a new equilibrium.

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16 The reference for each of these writings will be given as it is presented.

17 Kurt Lewin, "Frontiers in Group Dynamics 1, Concept, Method and Reality in Social Science, Social Equilibria" Human Relations, Vol. 1, No. 1, June 1947, p. 5-41.

Lewin[18] applied his theory to findings that were taken from attempts to change food usage patterns of American housewives. When new information dealing with the advantages of using different foods was presented to the subjects in a number of different experimental situations it was found that small group discussion methods caused the women to make greater and more lasting changes than did either large group lectures or individual counselling. Lewin reasoned that the discussion created a norm for the group that was different from previously held individual habits. In this way a new state of equilibrium was established by reducing the strength of restraining forces. The lasting effect was explained by a difference in the tension that was created in the two situations. The lecture and counselling approaches tended to cause a change by increasing the driving forces. This increase, in turn, caused greater tension because there had not been any decrease in the counteracting forces of social habit. These studies supported the theory that change was dependent upon the social context (values, norms, behaviours) in which members existed, the ability to make suggested changes and the opportunities to reduce the effects of restraining

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18 Kurt Lewin, "Studies in Group Decision", in Dorwin Cartwright and Alvin Zander, Group Dynamics, Research and Theory, Evanston, Illinois, Row Peterson, 1953, p. 287-301.

forces. Group discussion was one method that could be used to reduce such resistance.

Likert also places an emphasis on the importance of the social system as a factor in any change effort. If it operates from a collaborative basis of team cooperation and open communication it creates the conditions necessary for change to occur. In this way it provides the opportunity for members to reduce the restraining forces, to use Lewin's terminology, that counteract innovation. The conditions of the social field of a group that Lewin found to be related to change are similar to some of the intervening variables noted by Likert. The theories also agree on the issue of ability. Both assume technical competence to be an essential ingredient of any successful organization. In these ways the theories are mutually supportive.

Additional support for Likert's theory as a predictor of the ability of an organization to effect change is provided by the work of McGregor.[19] While McGregor's theory does not specifically deal with the issue of change, it delineates the type of organizational climate that will best integrate individual goals with organizational purposes to provide the most efficacious outcomes. McGregor describes

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19 Douglas McGregor, The Human Side of Enterprise, New York, McGraw-Hill, 1960, x-246 p.

such a climate as one which is based on the managerial application of "theory Y"[20] assumptions. It is very similar to what Likert would describe as the group interactive-influence pattern that he labelled system four. Where change becomes a desirable outcome, both theories suggest climates that would facilitate its implementation.

McGregor observed that most American business organizations operated on the principles of classical management. Inherent were such beliefs that man was rational and could be best motivated by economic incentives. Because of his assumed inherent dislike for work, management was forced to use coercion, control and punishment in order to secure adequate efforts toward the achievement of organizational objectives. And finally, man was assumed to prefer direction, avoid responsibility and to have relatively little initiative and ambition. To this constellation of assumptions, McGregor gave the name "theory X".[21]

McGregor found the assumptions underlying theory X to be contrary to new knowledge that was continually being developed about the nature of man and his behaviour in organizations. Instead, it seemed more reasonable to believe that the expenditure of effort in work was as natural as

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20 Ibid., p. 45.

21 Ibid., p. 33.

play; that man was capable of self-direction and control in the achievement of objectives and that commitment to these objectives was a function of the fulfillment of esteem and self-actualization needs. New information also suggested that, under proper conditions, man would seek responsibility and apply his imagination, ingenuity and creativity toward the solution of organizational problems. In summary it could be said that

> Theory Y [...] leads to a preoccupation with the nature of relationships, with the creation of an environment which will encourage commitment to organizational objectives and which will provide opportunities for the maximum exercise of initiative, ingenuity and self-direction in achieving them.[22]

It seems logical to conclude that organizational environments which operate on theory Y assumptions are better equipped to cope with the solving of problems—including those that deal with innovation. In this way McGregor provides general support for all of the Likert factors.

The change aspect of Likert's theory has also been supported by Miles.[23] In his organizational health theory he has suggested that the internal conditions of

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22 Ibid., p. 232.

23 Matthew B. Miles, "Planned Change and Organizational Health, Figure and Ground", in Richard O. Carlson, et al., Change Process in the Public Schools, Eugene, Oregon, Center for the Advanced Study of Educational Administration, 1965, p. 11-34.

organizations account for the variance in their ability to make changes that are congruent with environmental demands. His concept of organizational health includes ideas that are similar to the Likert variables of goal commitment, goal emphasis, influence by subordinates, communication, motivation and teacher attitudes. Both theories view the relationships among the internal variables of the organization as key elements in that organization's ability to exercise change.

Miles based his organizational health theory on his analysis of the deficiencies in studies that had sought to explain the phenomenon of change. He maintained that previous studies either suffered from the great man theory or from an over emphasis on the thingness of the innovation. He believed that the emphasis of placing efforts for planned change on the figure instead of the ground was "practically and theoretically unfortunate".[24] He countered the general trend of studying change through an external focus with one of internal emphasis. He suggested that "efforts at planned change must take as a primary target the improvement of organization health".[25] The focus of his theory was on the dynamics of the organization. "The state of health of an

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24 Ibid., p. 12.

25 Ibid., p. 14.

educational organization can tell us more than anything else about the probable success of any particular change effort".[26] Healthy organizations, he maintained, attended to three types of variables, namely; task oriented activities, maintenance needs and organizational growth. The first set of variables dealt with getting the job done, the second was related to the effective use of resources and providing optimal working conditions while the third was concerned with the organization's ability to grow and to adapt to changing environmental conditions. He supported his theory by noting the similarity of his tripartite grouping with the concept of organizational effectiveness which Argyris[27] suggested was a function of (i) goal achievement, (ii) internal maintenance and (iii) the ability of the organization to adapt to environmental change.

Bennis, Benne and Chin[28] have suggested that considerations for planned change have not sufficiently attended to people variables. They report that past efforts to induce change have tended to emphasize either the rational elements or power influences. In the case of the former,

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26 Ibid.

27 Ibid., p. 18.

28 Warren G. Bennis, Kenneth D. Benne and Robert Chin, The Planning of Change, 2nd ed., New York, Holt, Rinehart and Winston, 1969, p. 11-59.

man was assumed to follow his own rational self-interest so that when the advantage of a given change was suggested by a credible expert it should be sufficient to cause a change in behaviour. In the case of power-coercive approaches, a massing of political and/or economic power behind a decided change effort was thought by many to be sufficient. But, as they have observed, both of these strategies have proven to be incomplete because they have failed to include the normative cultures of the individuals involved. The authors have categorized strategies which have tended to emerge in the 1960's to deal with these elements to be "normative re-educative".[29] This classification includes such elements as team training, improved problem-solving, techniques for human collaboration, and the use of feedback as a conscious effort to apply psycho-sociological principles. These approaches assume that man is capable of change and growth if the conditions thwarting these are sufficiently minimized. For this to occur, attention must be given to the cognitive elements, information and logic; to the affective elements, feelings and relationships and to the cultural elements, attitudes, values and norms.

The foregoing theories all lend support to the suggestion that Likert's construct of management pattern is

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29 Ibid., p. 34.

related to an organization's ability to change. Lewin's findings that group discussion facilitates change is included in the interactive idea of participative management styles. McGregor described an environment that was similar to the climate of a collaboratively managed organization where the potential of people could be released to solve whatever problems were necessary. This would include the difficulties that frequently surround innovation. Miles maintained that healthy organizations were more adaptable. Again, many of the concepts making up the health construct are also included in Likert's theory. And finally, the idea of changing the normative cultures that was suggested by Benne, Bennis and Chin is encompassed in the interaction-influence system that occurs when members collaborate to the mutual benefit of all concerned. On the basis of this theoretical evidence, Likert's claim is supported. Organizations with participative management patterns are likely to be more innovative than those with authoritarian styles.

Getzels[30] provides support for Likert's claim in a way that is slightly different from the previous theorists. He proposes that the lack of analysis, synthesis and

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30 J. W. Getzels, "Creative Administration and Organizational Change, An Essay in Theory", in Frontiers in School Leadership, A Synthesized Report of a Seminar, Santa Barbara, California, Centre for Coordinated Education, University of California, January 1968, p. 19-23.

conceptualization that has characterized research in organizations provides the clue to future investigations. If organizational research is to move beyond the existing frontiers it must be based on conceptual models of the organization, of administrative behaviour and of the nature of change itself. At the same time it must recognize the interdependence of the individual, the institution and the culture in which they both exist. Likert appears to have responded to at least some of these demands in his management systems theory by showing a sequential causality among causal, intervening and end result variables.

2b. Empirical Support

In addition to the previously cited theoretical evidence, a number of empirical studies has also supported a positive relationship between some of the Likert indices and school innovation. Research by Hughes, 1971; Johnson and Marcum, 1969. and Hall, 1970, examine climate factors related to school innovation. A study by Klineberg, 1967, compares administrator behaviours and innovation; Barakat and Chesler's study, 1967,,looks at change at the classroom level; Mahan's study demonstrates the principal's influence on curriculum change; Lieberman, 1973, studies the principal's effect on the school's social system and Jackson, 1974, compared the principal's executive professional

leadership with the school's organizational health. Each of these studies will be summarized in subsequent pages.

Hughes[31] observed that most studies of innovation appeared to neglect the organization in favour of the innovator, the innovation or the diffusion of innovations. On the other hand, he also observed ample theoretical evidence to suggest that conditions within the organization should account for at least part of the variance attributed to change. This apparent gap in the research led him to investigate the relationships between organizational climate and school innovation in Ohio school districts.

Data were used from a 1966 statewide survey of the number of educational changes that were being used to identify the twenty most innovative and twenty least innovative school districts in the state. From these two dichotomous groups those districts that had five central office supervisory personnel and the same superintendent as in 1966 were selected to participate in the study. This left a total sample of eleven "highly innovative" districts and thirteen "non-innovative" ones. The Organizational Climate Description Questionnaire[32] was administered to each of the central

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31 Larry W. Hughes, "Organizational Climate, Another Dimension to the Process of Innovation", speech delivered to the National Association of Elementary School Principals' Annual Meeting, April 1971, 38 p.

32 A description of this instrument is provided in Andrew W. Halpin, Theory and Research in Education, London, MacMillan, 1966, p. 131-249.

office staffs in the twenty-four districts.

The findings of the study confirmed the positive relationship that had been predicted between organizational climate and school innovation. This was done using a process of mathematical similarity that compared the absolute values of differences between scores on each of the OCDQ sub-scales for each type of school district with open and closed profile scores that had been reported by Halpin and Croft. Statistical comparisons ("t" tests) between the two types of school district were also made on each of the eight sub-scales. Innovative school districts were found to have less "disengagement" ($p<.05$) and greater "esprit" ($p<.01$). Of the four leader sub-scale scores, superintendents of the innovative school districts were found to exhibit greater "thrust" ($p<.01$). In summary, this study suggested that innovative school districts tended to have more open climates than non-innovative districts; that superintendents in innovative districts were more highly motivated and harder working than their counterparts and that the central office staffs of these districts were more enthusiastic about their work, had higher morale and demonstrated a greater sense of accomplishment in their work.

Some weaknesses of this study, however, require the findings to be accepted with a certain degree of tentativeness. The first weakness is encompassed in the design which

made use of 1966 data to determine categories for investigation in 1970. No acknowledgement is given for the possibility of leadership changes, even though the same superintendent remained, during this four year span. Is it not possible that the central office climate could have changed in the interim? This would explain the reason for non-significance in five of eight sub-scales. A second weakness is implied in the method of dichotomizing the school districts. Though not stated, it is implied that the 1966 survey was of the inventory type that was so popular during that era. A list of several items such as educational television, programmed instruction, nongrading (however it may have been interpreted) and so on was sent to schools asking them to check off the ones they were using. While it may be reasonable to expect that the use of some of these items would be related to climate variables it seems more reasonable to expect others to be dependent on economic factors and the availability of accompanying software.

Despite the criticisms in design that have been noted, this study has opened an area of investigation that is theoretically based. In doing so it has provided sound

suggestions for further inquiry into the causes of school innovation. The moderate support that it has given for a relationship between innovation and the three Likert variables of climate, leadership, and peer relations add support to the claim that Likert has made. The need for further investigation to compare organizational characteristics and innovation is evident.

Johnson and Marcum[33] attempted to investigate the relationship between organizational climate and innovation at the school level. The rationale for their hypothesis evolved from a study of personality characteristics of innovative leaders. Johnson and others found that "innovative superintendents were more outgoing, more assertive, more venturesome, more imaginative, more experimenting and more relaxed"[34] than their non-innovative peers. He assumed that the same should be true of innovative school principals. He also noted that Halpin and Croft had observed open climate schools to have principals and teachers who were more zestful and confident toward their work. "They find

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33 Homer M. Johnson and Laverne R. Marcum, "Organizational Climate and the Adoption of Educational Innovations", paper presented at the Annual Meeting of the American Educational Research Association, Feb. 1969, 9 p.

34 Homer M. Johnson et al., "Personality Characteristics of School Superintendents in Relation to Their Willingness to Accept Innovation in Education", Final Report, Project 6-8873, Logan, Utah, Utah State University, 1967.

pleasure in working with each other; this is transmitted to students. [...] school can be a happy experience."[35] Since climate for the school was described by Halpin and Croft as being what personality was to the individual, Johnson and his colleagues reasoned that schools with open climates had personalities that appeared similar to those of innovative leaders. Hence the suggestion that organizational climate would be related to school innovation.

An innovation checklist was used to identify the fifteen most innovative schools and the fifteen least innovative schools from the combined population of the states of Oregon, Washington, Idaho, Nevada and Utah. Analysis of variance techniques were used to show that the organizational climates (measured by the "OCDQ") of innovative schools were significantly more open than were those in the non-innovative schools. Since the conditions within an organization having an open climate are similar to those that Likert describes as being characteristic of participative management patterns, one is able to claim further support for the likelihood of finding a positive relationship between management patterns and innovation.

The two previous studies have shown a positive relationship between organizational climate and innovation at

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35 Halpin, op. cit., p. 131.

both the district and the school level. Because the "OCDQ" measures characteristics that are similar to those measured by the Likert "Profile of a School" it has been suggested that since innovation is related to climate it should also be related to the management pattern of an educational organization. Further support for this generalization was provided by Hall.[36] He used a sample of forty-three elementary schools from New York State to analyze the relationship between scores on the "OCDQ" with those from the 1968 version of the "Profile of a School". Using the thirty-two items from the Likert instrument that measured the teachers' description of the principal's behaviour he found a correlation with the climate instrument to reveal a coefficient of 0.59 ($p<.05$). No significance was found, however, when he compared the Likert items that measured the teachers' description of their own behaviour toward their students with the climate scores.

The previous studies dealing with climate allow a connection to be made between innovation and management patterns. Since innovation is related to school climate; and since school climate is related to the management

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36 John W. Hall, "A Comparison of Halpin and Croft's Organizational Climate and Likert's Organizational Systems", unpublished Ed.D. dissertation, University of Maryland, 1969, vii-140 p.

pattern that is measured by the Profile of a School, it is logical to conclude that at least part of the variance of a school's innovation should be explained by its management pattern. Climate has served as a link between innovation and school management patterns.

From a survey of the literature on innovation Klineberg[37] selected seven administrator qualities or behaviours that were frequently associated with organizational change. Since most of these had been generalized from business organizations he sought to test their relationship with innovations in educational settings. The sample was drawn from the total number of school districts in the state of Michigan. Selection was made on the basis of a measure of innovativeness that had been attributed to each district in a survey conducted by the Michigan State Department of Public Instruction. Those districts that were rated highly on the innovation inventory made greater use of such things as ungradedness, longer school day, educational television, programmed instruction, team teaching, staggered sessions and so on. Ten of the most innovative districts were chosen so that five had high composite cost factors and five had

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37 Allen Jay Klineberg, "A Study of Selected Administrative Behaviours Among Administrators from Innovative and Non-innovative School Districts", Lansing, Michigan, Michigan State Department of Public Instruction, May, 1967, 173 p.

low cost factors. Ten of the least innovative districts were also chosen so that cost factors were high in five and low in five. This selection method made it possible to test for the effects of cost factors as well as for administrative behaviours. The seven administrator variables that were tested are listed below:

1. administrator preparation (measured by the number of credits taken beyond the B.A. degree)
2. involvement of the administrator in activities of the school district
3. number of information sources used
4. years of experience as an administrator
5. amount of professional reading done
6. involvement of teachers in curricular changes
7. recognition of the teachers' worth and dignity.

Ninety-six principals and the twenty superintendents in charge of the school districts responded to a questionnaire that ascertained a measure on each of the first five variables of the previous list. A superintendent's rating for numbers six and seven was obtained through interviews. All information from school principals was collected by questionnaire.

Chi squared analysis and the Fisher exact probability test were used to test for a difference between innovative and non-innovative schools on each of the seven variables. At the five per cent significance level it was found that administrators of innovative schools used more information sources, had more experience as administrators, involved the teachers in curricular changes more than their

counterparts and showed a greater recognition of the worth and dignity of their teachers. The other three administrator variables were not significantly different and cost factors were of minimal importance.

On the basis of Klineberg's quantitative results—no attempt was made to control for qualitative measures—it is possible to relate innovation to some of the Likert variables. Involvement of teachers in curricular changes implies conditions that would be similar to the decision-making process typical of a participatively managed system. The recognition of the teachers' worth and dignity is similar to the variables dealing with the leader's receptivity and trust. The larger number of information sources and the greater experience may indicate a higher level of technical competence. This, too, is acknowledged by Likert.

Barakat and Chesler[38] studied classroom innovation and the sharing of teacher practices on the assumption that both were dependent on a number of conditions acting interdependently within the school environment. The study was based on a conceptual scheme that proposed teachers' innovativeness and willingness to share classroom practices

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38 Halim I. Barakat and Mark A. Chesler, "The Innovation and Sharing of Teaching Practices, A Study of Professional Roles and Social Structures in Schools", Ann Arbor, Michigan, Institute for Social Research, University of Michigan, July, 1967, 259 p.

(the two dependent variables) were related to (i) the personal characteristics of the teachers, (ii) the principal's behaviours that influenced principal-teacher relationships and (iii) the peer social structure within the school. It was suggested that these three independent variables would influence the teacher's perception of the roles of both the school and the teacher. It was therefore reasoned that these perceptions would, in turn, create feelings of alienation or integration with the school's social structure and in doing so regulate the teacher's role behaviour in terms of both innovativeness and sharing of classroom practices.

Teachers were classified as being innovative or non-innovative on the basis of questionnaire responses which collected self reports and reports from colleagues. They were asked if they were innovative and then asked to list colleagues that they considered to be innovative. The combined responses were used to identify the two groups of teachers.

Findings of the study revealed that teachers who perceived their own personal power and that of their colleagues to be influential in the school's decision-making processes were more innovative and more likely to share their classroom teaching practices. Those who were more involved in professional exchanges both within and beyond the school were also found to be innovative and more likely

to share. Innovation, however, was negatively related to perceived pressure to conform to school norms and positively related to the degree that teachers saw the principal as one who decreased environmental pressure by mediating external forces and minimizing internal stress.

This study suggests that classroom innovation is more likely to occur where teacher influence and collaboration are high and where the social structure of the school minimizes opposition to change. Both teacher behaviour and principal leadership are important influences. While the study suggests the need for replication under more closely controlled conditions of measurement, it gives tentative support to a relationship between innovation and the Likert variables of influence by subordinates, peer team building and work facilitation. A relationship between innovation and the independent variable, teacher characteristics (e.g. age, sex, experience, personality factors ...), was not confirmed.

Likert has emphasized that the leadership variables exert considerable causal effects on organizational outcomes. The next four studies are presented to illustrate the influence of the principal on innovation in schools. Each has been chosen for the different perspective that it has taken.

Mahan[39] observed that scholars have been unable to agree on the school principal's role in innovation. This lack of consensus, coupled with the ferment of educational change that evolved during the 1960's, led him to investigate the issue of who initiates school change. Teachers were chosen from fifty-three of the pilot elementary schools in the states of New York and Pennsylvania to determine who was responsible for the initiation of a new science program with which they were involved. The teachers were asked to rank eight different persons in terms of how important they perceived them to be in initiating innovations in their own districts. One hundred and thirteen teachers from twenty-eight schools represented a heterogeneous mixture of districts.

A mean ranking of importance revealed that the principal was the most influential initiator of change. He was followed in descending order by the subject supervisor, department head, other teachers, district superintendent, school board, other central office personnel and parents. Though the principal was not always first, he occupied one of the top three positions in twenty-five of the twenty-eight schools.

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39 James M. Mahan, "The Teacher's View of the Principal's Role in Innovation", Elementary School Journal, Vol. 70, No. 7, April 1970, p. 359-365.

Lieberman[40] sought to study the influence of the principal on the individual school as an independent social system. Data were collected in thirty-one California elementary schools from 704 teachers and 4821 fifth and sixth grade pupils. Questionnaires were administered to these participants to obtain a measure of the principals' leadership qualities, the teachers' leadership, teacher professionalism and teacher morale. The scores from each measure were then used to determine the extent of the principal's power over the school's social system.

The need for Lieberman's study was justified on the claimed deficiency of the literature, dealing with the role of the principal, to acknowledge its possible influence on the total school culture. To answer this question the researcher adapted the conceptualization of the teacher role developed by Gordon and Adler[41] for use with principals. This framework, consisting of three role orientations, is shown below.

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40 Ann Lieberman, "The Power of the Principal", in Carmen M. Culver and Gary J. Hoban, eds., The Power to Change, Issues for the Innovative Educator, New York, McGraw-Hill, 1973, p. 35-47.

41 C. Wayne Gordon and Lita McKinney Adler, Dimensions of Teacher Leadership in Classroom Social Systems, quoted in Lieberman, op. cit., p. 39.

1. Task orientation: the extent to which the principal organizes activities and resources to promote ideas and stimulation for teachers about changing school needs.

2. Authority orientation: the amount of decision-making power kept by the principal or delegated and shared with the teachers.

3. Expressive orientation: the extent to which the principal fosters a warm atmosphere in the school by taking into consideration the needs and interests of the teachers.[42]

It was hypothesized that the perceptions teachers held of their principals' leadership role would not only influence their own leadership style used with pupils but would also affect their professionalism and their morale.

The study showed that teacher professionalism was positively correlated with principals' task orientation and negatively correlated with authority orientation. Teacher morale was positively related to principal expressiveness. When the teacher leadership ratings for the entire sample were determined by their pupils and compared with those that they had given to their principals, there was no significant relationship between the orientation of teachers and principals toward either task or expressiveness behaviour. There was, however, a positive relationship between the amount of authority principals used with teachers and the amount teachers, in turn, used with pupils. The overall

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42 Lieberman, op. cit., p. 39.

findings of the study suggested that the principal influences the teachers' morale, professionalism and use of authority with pupils. When schools were categorized according to principals' leadership orientations it was found that where the principal scored high on all three, the teachers were also rated highly on all three by their pupils. These principals seemed to influence the greatest number of prototypes among their teachers by organizing their schools "around professionally oriented activities, (working on new curricula, goals [...], new grouping patterns, problem oriented activities, etc.), telling the teachers how to proceed and supporting them in the process".[43] At the other extreme—when principals scored low on all three—the schools were characterized by a depressing atmosphere and teachers were the least task-oriented toward their pupils.

If one can accept the basic assumption that the principal's leadership behaviour can be adequately conceptualized within the three orientations of task, authority and expressiveness that provide the framework for Lieberman's study, it must be accepted that his influence on the school's social system is at least one important factor in determining organizational outcomes.

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43 Ibid., p. 44.

Jackson[44] studied the relationship between leadership and organizational health in forty-one elementary schools of British Columbia. He used an adaptation of the Gross and Herriott scale[45] to measure the school's executive professional leadership (abbreviated as EPL) for comparison with a measure of organization health (OH). This latter construct was measured with a scale developed from seven organizational concepts outlined by Robinson.[46] They included,

> (i) an adequate goal focus, (ii) a coordinated communication system, (iii) an equitable decision-making structure, (iv) efficient utilization of human and material resources, (v) adaptability of a school to its environment, (vi) problem-solving mechanisms and (vii) maximum opportunities for self-actualization.[47]

The findings of the study, as predicted, showed a positive and significant correlation ($p<.001$) between EPL and OH. The study also replicated the findings of Gross and Herriott. The EPL scores of principals were positively

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44 George B. Jackson, "Executive Professional Leadership and Organizational Health", The Canadian Administrator, Vol. 13, No. 5, Feb. 1974, p. 23-27.

45 Neal Gross and Robert E. Herriott, Staff Leadership in Public Schools, A Sociological Inquiry, New York, Wiley, 1965, xi-247 p.

46 Norman Robinson, "Healthy Schools and Sick Schools, Aids to Diagnosis and Recovery", B.C. School Trustee, Fall 1969, p. 8-12.

47 Jackson, op. cit., p. 24.

correlated with measures of teachers' professional performance, teacher morale and pupil academic achievement.

Though Jackson's study was not investigating the issue of innovation it supports Likert's theoretical premise that leadership is one of the components within an organization that influences its ability to change. Direct support is given by virtue of the similarity between his construct of organizational health and the management pattern of Likert. The items of the Likert instrument include most of the ideas that describe organizational health as measured by Jackson's instrument. Indirect support is given to the link between leadership and innovation by Miles'[48] theory. He maintained that healthy organizations—which he described similarly to the construct used in this study—were more innovative. Since leadership is related to health, (the Jackson study), and since organizational health is related to innovation, (Miles' theory), it is probable that leadership, as Likert has suggested, is related to organizational innovation.

The influence of the school principal as a change agent has been summarized by Tye.[49] From a synthesis of

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48 Miles, op. cit.

49 Kenneth A. Tye, "The Principal as a Change Agent", The National Elementary Principal, Vol. 49, No. 4, Feb. 1970, p. 41-51.

studies and writings about leadership behaviour, the change process, group dynamics, administrative theory and from observations made in the "League of Cooperating Schools"[50] he has identified nine behavioural conditions that are necessary for principals to become agents of educational change. A summary of those conditions is listed below:

1. gain self-understanding
2. be able to deal with role conflict
3. understand the process of leadership
4. know about the change process
5. be cosmopolitan
6. have skills in group dynamics
7. undertake cooperative goal-setting
8. have a theory base
9. be research literate.

In addition to the above principal behaviours Tye has listed eleven school conditions that encourage change. One can see from the following list that these can be directly influenced by principal behaviour.

1. principal acts as exemplar to teachers
2. cooperative atmosphere in school
3. clear decision-making structures
4. minimal role conflict among teachers
5. problem-solving adequacy
6. atmosphere of scientific freedom
7. effective communication in school
8. opportunities for teachers to be influential
9. minimize resistance to change
10. assignment of equitable workloads
11. recognition of manageable amounts of change.

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50 For a description of the "League of Cooperating Schools" see John I. Goodlad, "Educational Change, A Strategy for Study and Action", The National Elementary Principal, Vol. 48, No. 3, January 1969, p. 6-13.

Thus, it can be seen that Tye considered the single school to be "the most strategic unit for educational change"[51] and the principal to be the key agent in bringing about innovation. He summarized his conclusions in a later article by suggesting that

> [...] meaningful innovation in the school has the greatest chance of success if the principal is capable of creating an appropriate climate for change by facilitating communication, sharing decision-making power, managing conflict situations and expediting problem-solving activities.[52]

The foregoing leadership studies have illustrated the pervasive potency of the principal as an influence on the social system of a school. Mahan's study demonstrated the principal's influence over a specific curriculum change; Lieberman illustrated how his input into the school's social culture affects outcomes; Jackson related leadership to organizational health and Tye provided a comprehensive overview of the change process to emphasize the interdependence of principal behaviours and school conditions as essential ingredients for educational innovation. Collectively they justify the strong emphasis that Likert has devoted to the effects of leadership.

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51 Tye, op. cit., p. 41.

52 Kenneth A. Tye, "The Elementary Principal, Key to Educational Change", in Carman M. Culver and Gary J. Hoban, The Power to Change, Issues for the Innovative Educator, New York, McGraw-Hill, 1973, p. 25-33.

3. Classroom Openness, the Dependent Variable

It has already been indicated that the purpose of this study was to test the innovative aspect of Likert's theory by comparing school management pattern scores with a measure of school innovation. Though no studies could be found to directly confirm this claimed relationship, indirect support was given by a number of studies that related innovation to one or more of the indices that constitute the management pattern construct. On the basis of these studies, combined with the theoretical support for the relationship that has been discussed, the need to test this relationship became evident. If the management pattern scores of schools could be used as predictors of innovation, it was reasoned, valuable information would be provided for administrators contemplating changes in schools or school systems.

Classroom openness was chosen as the dependent variable to be compared with school management patterns. This choice was made because the construct represents a complex innovation for which even partial implementation would require the consistent efforts of a number of people within any given school hierarchy. For this reason, it was considered a more stringent test of the theory than would have been provided by a less complex type of innovation that

might only have been dependent on isolated individuals, small groups or financial resources for its implementation. A second reason for choosing classroom openness is related to the fact that there has been official encouragement for the schools of Ontario to move in that direction. Since the study was conducted in that province it was expected that sufficient variation would exist among classroom openness scores to provide the necessary data to make comparisons with scores from the Profile of a School.

The next two sub-sections of this chapter will expand the classroom openness construct. The first will provide a description of the construct and the second will outline a historical chronology of curriculum events in Ontario to show why classroom openness can be considered to be an innovation in that province.

3a. Classroom Openness, a Description

Classroom openness can be described as an operational measure of an approach to the education of young children that has been most commonly called open education. This idea is viewed by some writers[53] as a construct that is neither child-centered, teacher-centered nor materials-

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53 For a series of selected articles on this topic see "Perspectives on Open Education", The National Elementary Principal, Vol. 52, No. 3, Nov. 1972, p. 10-81.

centered. It is, instead, a flexible mixture of all of these. It is based on the assumption that education which serves individual pupils must consider the interests and needs of the learner as he relates to his everyday environment. Basic principles of open education maintain that learning is maximized when the learner becomes an active agent in a learning environment where he shares the responsibility for planning experiences with the teacher. The proponents of the concept believe that this involvement fosters the initiative, curiosity and confidence that is inherent to each pupil.

Classrooms tending toward openness have a number of physical similarities. A diversity of work spaces is arranged to accommodate learning experiences where "hands-on-stuff" provides opportunities to manipulate, construct, act out, seek answers, and to share findings with peers. Children tend to move about freely seeking resources to answer their questions. At times they work as individuals and at times they work in groups of varying sizes. The problems may be teacher assigned or self-generated; there are many opportunities for choice and it is unusual to find all children working at the same type of activity or spending the same length of time on a given task. Diversification, humaneness, activity, experience and quality constitute some of the key elements.

Gross and Gross used four main operating principles to explain classroom openness.

> First, the room itself is decentralized: an open, flexible space divided into functional areas, rather than one fixed, homogeneous unit. Second, the children are free for much of the time to explore this room, individually or in groups, and to choose their own activities. Third, the environment is rich in learning resources, including plenty of concrete materials, as well as books and other media. Fourth, the teacher [...] works most of the time with individual children or two or three, hardly ever presenting the same material to the class as a whole.[54]

An extensive review of the literature on open education was completed by Walberg and Thomas.[55] In that review, they identified eight major dimensions or themes that described the qualities of the construct. These served as a framework to devise the instrument that was used to measure the dependent variable of this study. The summary of these dimensions is listed below to give a more concise description of the construct.

> 1. Provisioning for learning: flexibility in the organization of instruction and materials.
> 2. Diagnosis: less attention to goals, such as examination scores, and more attention to the child's thinking process.
> 3. Instruction: much individual attention rather than solely total class instruction, encouragement

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54 Beatrice and Ronald Gross, "The British Infant School, A Little Bit of Chaos", Saturday Review, May 16, 1970, p. 71.

55 Herbert J. Walberg and Susan Christie Thomas, Characteristics of Open Education, Toward an Operational Definition, Newton Massachusetts, Education Development Center, 1971, 115 p.

of children's initiative and choice, interdisciplinary emphases.
4. Evaluation: individual standards or goals preferred to comparing the child to standardized achievement norms. Record-keeping often done in order to evaluate growth rather than correctness.
5. Humaneness: teachers have characteristics such as respect for children, openness, and warmth.
6. Seeking opportunities to promote growth: extensive use of community, colleagues, advisors.
7. Assumptions: ideas about children and the process of learning. Many ideas are stressed such as children's innate curiosity and trust in children's ability to make decisions.
8. Self-perception of the teacher: a sensitive, adaptable, continual learner who sees himself as a resource for helping children reach their own potentials rather than seeing himself as a disseminator of a given body of knowledge.[56]

3b. Classroom Openness, an Innovation in Ontario

It has already been mentioned that classroom openness was chosen as a dependent variable because it represents a major innovation that Ontario elementary schools have been encouraged to adopt. This conclusion will be supported by ensuing comments that (i) describe the traditional elementary school practices in Ontario, (ii) cite the major historical influences that have encouraged classroom curricula to move toward openness and (iii) account observations indicating some transition toward classroom openness that has already occurred.

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56 Judith Evans, Characteristics of Open Education, Results from a Classroom Observation Rating Scale and Teacher Questionnaire, Newton, Massachusetts, Education Development Center, August 1971, p. 3.

Traditionally, the elementary schools of Ontario have operated from a base of uniformity and standardization.[57] Until recently, most considered the main function of the elementary school to be one of providing a grounding in the basic knowledge that would be required for further schooling or for employment. The content was subdivided into subject areas; most decisions were left to the producers of textbooks and teachers were expected to act as disseminators of skills and knowledge that had been predetermined and sequentially arranged. The pupils were the passive consumers in a system that was maintained by government employed inspectors who carried out centralized decisions. The content in each subject was subdivided into distinct grade levels; teachers were expected to cover the listed material; pupils were examined to ascertain how much progress had been made and those who satisfied the quantitative requirements were promoted to the next grade. Elementary schooling was thus formalized around a body of sequentially arranged subject matter that left little variability for the individual school or classroom by a plan which emerged during a period of rapid expansion of educational

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57 This statement is supported in the historical introduction to the Report of the Royal Commission on Education in Ontario, "Hope Commission", Toronto, Baptist Johnston, 1950, p. 1-22.

services between 1840 and 1870. Egerton Ryerson, the architect of the graded organization, provided the province with a system that was considered most appropriate to meet the environmental conditions that existed during his tenure as Chief Superintendent of Education from 1844 to 1875. In 1968, more than one hundred years later, the same basic approach to elementary education still prevailed. Members of the Hall-Dennis Commission observed that from the Ryerson era, "fragmentary changes have been made from time to time in the system but no vital or fundamental change has been made in the intervening century".[58]

Many educators in Ontario, however, have long realized a number of shortcomings in this traditional approach. All pupils do not progress at a uniform rate. This makes promotion by grade level more difficult. The relevance of content varies from pupil to pupil and from region to region making subject matter uniformity less acceptable and the interests of young children cannot be packaged meaningfully into the traditional subject matter areas. A recognition of these shortcomings has caused a gradual change in curriculum directives that have been

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58 Ontario Department of Education, Living and Learning, The Report of the Provincial Committee on Aims and Objectives in the Schools of Ontario, "Hall-Dennis Report", Toronto, Newton Publishing, 1968, p. 10.

prepared for the schools of the province.

There have been several official government publications in the period from 1937 to 1975 that have encouraged Ontario elementary schools to modify their curricular activities to be more congruent with the classroom openness construct. The "grey course of study"[59] in 1937 first suggested a move in this direction by introducing alternatives to the Ryersonian tradition. In 1950, the Hope Commission Report[60] kept these alternatives alive by giving some support to the same new ideas. The strongest break with tradition, however, began in the 1960's when the Kindergarten[61] guideline, the PIJI[62] curriculum guidelines and the Hall-Dennis Report, Living and Learning,[63] took a consistently strong position in favour of classroom openness. In 1975, the Ministry of Education gave further strength to this trend with the publication of a new official curriculum

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59 Ontario Department of Education, Programme of Studies for Grades 1 to 6 of the Public and Separate Schools, Toronto, Ontario, 1937, reprinted in 1955 and 1960, 122 p.

60 Hope Commission Report, op. cit.

61 Ontario Department of Education, Kindergarten, Toronto, Ontario, 1966, 93 p.

62 Ontario Department of Education, Curriculum Guidelines, Primary and Junior Divisions, Toronto, Ontario, 1966 to 1970, consolidated in 1971, 142 p.

63 Living and Learning, op. cit.

guideline[64] that is a consolidation of the ideas that emerged in the 1960's and 1970's. This guideline, more strongly than ever, advocates classroom openness to be the most efficacious mode of instruction for children in the five to twelve year age range. Each of these documents is discussed more fully. In addition, a table summarizing the support found for each of the eight dimensions of openness is presented at the end of this section in table one. It was prepared by using a frequency count of the number of times that a main idea from a given openness dimension was explicitly stated in the publication concerned.

As early as 1937 the "grey course of study"[65] gave an indication of the direction of future change. In its introduction it supported some of the ideas that were included in the eight dimensions of open education. This philosophical introduction, however, was overshadowed by the guide's general emphasis on the skills and knowledge that were thought to be essential for every pupil in this age range. Four-fifths of the book was devoted to a listing of content by subject area. It was this section to

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64 The analysis of this document was made from a prepublication, mimeographed copy.

65 Ontario Department of Education, Programme of Studies for Grades 1 to 6 of the Public and Separate Schools, Toronto, Ontario, 1937, reprinted in 1955 and 1960, 122 p.

which teachers directed most of their attention. Consequently, this new guide, despite it being "one of the most revolutionary that has taken place in our educational system",[66] did not bring the reduction in prescription, greater pupil freedom, increased creativity, aesthetic appreciation and social learning that the Hope Commission claimed was intended. It did, however, set the stage for continued changes in the direction of openness that were to come during the 1960's.

The Hope Commission report of 1950 provided another milestone in the development of Ontario education. In its massive examination of the province's educational practices it devoted a chapter[67] to a discussion of the aims of education in which some support was given to the openness construct. In fact, as shown in table one, weak support was given to seven of the eight dimensions. The effect of this document, however, appears to have had little impact on the educators of the province. In the first place, its sheer massiveness prevented it from being widely distributed and read. Secondly, it can be criticized more severely for its failure to clarify a direction. It presents viewpoints that range from a rigid authoritarian subject-centered schooling

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66 Hope Commission, op. cit., p. 19.

67 Ibid., p. 23-40.

to a problem-oriented multidisciplinary approach based on life's experiences. As far as school curriculum is concerned, the reader is left with the dilemma of sorting through a disarray of contradictions. The only consistent emphasis related to the school's role of inculcating the moral virtues to be a "good" citizen in a Christian, democratic society.

The kindergarten guideline,[68] published in 1966 by the Ministry of Education, was the first official publication that strongly supported classroom openness. It emphasized the importance of the teacher's role as being sensitive and humane in a setting that attended to the individual needs, interests and capabilities of pupils. Teachers were encouraged to make school a varied experience that related to the natural environment of the five year old child. A wide range of materials and resources was considered essential to meet the diversity of interests and abilities possessed by the children. Even the pictures portrayed a rich environment housed in an atmosphere of warmth and respect. All of the dimensions of openness, except one, were strongly supported.

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68 Kindergarten, op. cit.

The P1J1 curriculum guidelines[69] for grades one to six were presented to the schools in the form of eight separate booklets. Collectively, these gave the same strong support to classroom openness that was given by the kindergarten guide. Included were such themes as the importance of individualizing instruction, the self-worth and dignity of the person, the use of the natural environment as a centre for experiential learning and a flexible interdisciplinary approach to curriculum content. The Social Studies booklet of this series was published in 1970. All others were sent to the schools in either 1966 or 1967. Despite being subject guidelines, (one was a general introduction to the series), these booklets made a major break from the grey course that they were designed to replace. They were much more "philosophical" and presented each subject area as a group of suggested ideas or starting points that could lead to varied types of interdisciplinary pursuits. There was a minimal listing of content that could be construed as the essential knowledge to be covered. These guides were presented to the schools on an interim basis until they were bound as one volume and sanctioned as the official guideline in the spring of 1971.

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69 Curriculum Guidelines, Primary and Junior Divisions, op. cit.

The Hall-Dennis Report[70] in 1968 was the result of an intensive study of the aims and objectives for Ontario education. It saw learning as the unending search for truth in a society of rapidly changing social conditions. Since it also observed Ontario schools to be still adhering to the Ryersonian traditions it made a strong plea for changes that would result in practices more congruent with classroom openness. The controversy and widespread publicity that surrounded this document appeared to significantly gain attention for the open education movement in Ontario.

The new primary-junior curriculum guideline,[71] that was undergoing final revision in spring of 1975, has continued the encouragement of classroom openness. From the various types of widespread involvement during its preparation between 1971 and 1974 it has already created an impact of eager anticipation in several parts of the province. Some realize that it will very strongly support the classroom openness principles. This anticipation is already helping to accelerate change in that direction.

In addition to the written publications that have been described, the Ministry of Education has also provided

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70 Living and Learning, op. cit.

71 Ministry of Education, Ontario, Education in the Primary and Junior Divisions, prepublication mimeographed copy, 208 p.

human resources to work for the encouragement of open education principles. In 1968, 1969 and 1970 Program Consultants were hired to staff the regional offices of education that had been established. The function of these employees, especially those working in the primary and junior divisions, was to facilitate the implementation of the basic PlJl principles. The resources provided by the Ministry have been added to other learning opportunities available to educators in the province to give the idea of open education sufficient exposure to cause change in that direction.

Since 1969 the author of this study has had an opportunity to observe classroom practices in many schools throughout various sections of Ontario. As recently as 1969, noticeable class openness was still restricted to occasional classrooms. Schools with an overall emphasis toward this construct were rare. During the early 1970's, however, one was able to observe an increase in the number of classrooms and schools that were moving in this direction. Some have made significant transitions; others are showing early signs of further change. The majority, however, still adhere to the principles of traditionalism that were earlier portrayed as the foundation of the Ryersonian era. Nevertheless, there is now a significant variation in the classroom openness to be found in the province to provide the comparative data used in this study.

Table I.

Support for Classroom Openness Found in Official Ontario Educational Publications from 1937 to 1975.

Dimensions of Classroom Openness	Grey Course 1937	Hope Report 1950	Kgtn[a] Guide 1966	Pl,Jl[b] 1966-70	Hall-Dennis 1968	Primary Junior 1975
1 Provisioning for Learning	W[c]	W	VS	VS	S	VS
2 Diagnosis[d]	W	W	S	S	S	S
3 Instruction	W	W	VS	S	S	VS
4 Evaluation	W	W	S	S	S	M
5 Humaneness	W	W	S	M	VS	VS
6 Seeking Growth Opportunities	O	O	O	W	S	S
7 Assumptions	W	W	S	S	VS	VS
8 Self-perception of Teacher Role	W	W	S	S	S	VS

a Kgtn = Kindergarten.

b Pl,Jl = Primary Interim, Junior Interim.

c O = no support, W = weak support, M = moderate support, S = strong support and VS = very strong support. These symbols were based on the number of times one of the openness dimensions was explicitly mentioned in the publication. Zero indicated no mention, W indicated a frequency of 1 to 3, M = 4 to 6, S = 7 to 10 and VS = 11 or more references.

d These openness dimensions have been defined on pages 48 and 49.

4. Summary of the Problem

Likert's management systems theory states that participative management patterns facilitate innovation[72] in social systems. Since a social system is considered to be a group of people assembled to cooperatively share their functional specialties in the coordinated pursuit of a common purpose, this theoretical claim should be applicable to schools. And since classroom openness has been described as an innovation in Ontario schools, it is possible to predict a positive relationship between a school's management pattern and the amount of classroom openness to be found within. The relationship that Likert has stated to exist among the causal, intervening and end result variables also enables one to predict a relationship between the parts of the global school management pattern score (SMP) and classroom openness. Hence, the basic question of the study was stated as follows: Is there a relationship between an elementary school's management pattern score and its ability to adopt the innovative practices of classroom openness; and, if so, what parts of the school's management pattern score can be used as the best predictors of classroom

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72 Innovation, for the purpose of this study, refers to a deliberate and conscious attempt to create a change thought to be more efficacious in meeting organizational purposes.

openness? This question led to the four research hypotheses that are listed below.

H1. There will be a positive correlation between the management pattern scores and the classroom openness scores of elementary schools.

H2. There will be a positive correlation between the self-assessment (SA) part of the management pattern scores and the classroom openness scores of elementary schools.

H3. There will be a positive correlation between the subordinate perception (SP) part of the management pattern scores and the classroom openness scores of elementary schools.

H4. There will be a positive correlation between each of the five management pattern factor scores and the classroom openness scores of elementary schools.

For the purpose of testing these hypotheses, classroom openness has been used as a measure of the extent to which a classroom manifests the principles of open education. It was operationally defined as the score obtained on the "Classroom Openness Questionnaire". This instrument, along with the "Profile of a School" and their respective scoring guides, is included in appendix two. The validity and reliability of each is discussed in the next chapter.

Chapter two, "Research Design",describes the samples that were used in the study, elaborates on the two instruments that were used, explains how the data were collected and organized and outlines the statistical procedures used to test the hypotheses. It then provides a description and discussion of the data and presents a problem based on a

preliminary analysis to indicate that the hypotheses cannot be tested with confidence using the items from the "Profile of a School" that were suggested by the authors of the instrument. This problem is resolved in chapter three entitled, "A Reorganization of the Profile of a School", and the hypotheses are tested and discussed in chapter four.

CHAPTER II

RESEARCH DESIGN

This chapter discusses the sample of the study by giving details of its selection and its size. It then reviews the two instruments that were used in the survey, explains how the data were collected and organized and outlines the statistical procedures used to conduct a preliminary analysis of the data.

1. The Sample

The sample for this study was chosen from among the schools situated in the Midnorthern and Northeastern educational regions of the province of Ontario. These regions represent two of the nine geographical areas into which the province has been divided for administrative purposes by the Ministry of Education. The Midnorthern area includes the cities of Sudbury and Sault Ste. Marie plus those communities within relative proximity to the trans-Canada highway between Verner in the east and Wawa in the west. The Northeastern region extends north and south along highway eleven from the city of North Bay. Gravenhurst marks the southern boundary and Hearst, approximately 480 miles away, is the northern extremity. The

Directory of Education 1974-75[1] shows these two regions to have a combined total of 491 elementary schools.

Schools were chosen to participate in the study if they satisfied four criteria. The first was size. Since one instrument measured leadership behaviours of the principal, it was necessary to utilize only schools where the size was sufficient to warrant having a principal relatively free from classroom teaching duties in order to provide leadership functions. A minimum of ten fulltime teachers was used as the cut-off for this criterion. A second criterion required the principal to have been in the school in that position since at least September of 1972. This would ensure sufficient time for a given individual to establish a leadership style that would be well known to teachers.[2] Thirdly, teachers were eligible for inclusion in the study only if they had been in the school since at least September 1973. This criterion was chosen to give sufficient time for them to be aware of both the leadership style of the principal and the peer relations to be found among staff

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1 Ministry of Education, Ontario, Directory of Education, 1974-75, Toronto, Ontario, 1974, 224 p.

2 Likert noted in The Human Organization: Its Management and Value, New York, McGraw-Hill, 1967, p. 87, that a change in management style was not likely to have noticeable effects until the second or third year of a new manager's term of office.

members—two variables measured by the "Profile of a School". The final criterion required the teachers to work in the kindergarten to grade six areas of English speaking schools. One hundred and fifty-four schools satisfied all of these criteria.

A letter was sent to the principal in each of the 154 qualifying schools on January 17, 1975, to request his school's participation in the study. The letter, shown at the beginning of appendix one, gave a brief explanation of the study, described what it would require of a school staff that agreed to participate and requested willing participants to supply an alphabetical list of the kindergarten to grade six teachers who had been in the school for at least one full year. The letter also agreed to provide each school principal with a copy of both questionnaires being used and promised to provide feedback after the results of the survey were analysed. A stamped, self-addressed envelope was included to facilitate the return of the "School Information Form", shown as item two of appendix one.

A second letter was sent to each principal who had not responded by February 5, nineteen days after the original letter had been mailed. This is shown as item three in appendix one. It served as a reminder and explained that a reply was needed within the next week so that sufficient

questionnaires could be ordered for distribution by the first of March, 1975.

The total number of responses to the two letters was 118. Eighty-seven schools agreed to participate and thirty-one declined. Thirty-six made no reply to either letter. Of the eighty-seven affirmative responses four schools had to be rejected. One of these placed time conditions on the receiving of the questionnaires that could not be accommodated, two had an insufficient number of teachers because of large staff turnovers and in a fourth school the principal had changed since the beginning of the school year. The remaining eighty-three schools, listed at the end of appendix one, represented approximately fifty-four percent of the target population.

2. The Instruments Used in the Study

Likert adapted the "Profile of a School" from a similar instrument that was used in business organizations to compare different variables with organizational effectiveness. As his theory evolved, he was able to construct a conceptual relationship among these variables that enabled him to get an accurate measurement of conditions within an organization from the "Profile of Organizational Characteristics". The validity of that instrument was obtained by empirically testing the instrument against such

organizational variables as productivity, employee turnover, cost factors, employee motivation, labour relations, profit margins and so on. The validity of the profile was concluded from its accurate ability to predict organizational outcomes or end results from a measure of internal conditions. This conclusion was drawn from more than 250 studies that involved 200,000 employees and 20,000 managers over a time period of twenty-five years. Reliability coefficients from these same studies in test, re-test situations ranged from .70 to .90.

Validity and reliability studies for the "Profile of a School" have been conducted since 1968. Though the number of studies in school situations has not been as great as those from business organizations, several[3] have confirmed the instrument's validity as an accurate predictor of such desirable school outcomes as high student achievement, teacher satisfaction, better communication, improved decision-making, high student satisfaction, decreased teacher strikes and less school vandalism. For widely different kinds of desirable outcomes, system four management patterns are superior to other types of school

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3 These are reported in Rensis Likert Associates, The Likert Profile of a School, New Survey Instruments for Public Schools to Improve Organizational Effectiveness, Manual for Questionnaire Use, Ann Arbor, Michigan, 1972, section VI, p. 2-10.

administration. These same studies have revealed split-half reliability coefficients ranging between .90 and .95.

Most of the studies that have used the "Profile of a School" have tended to use only global scores based on the entire sixty-five items. In 1972, however, when Likert Associates published a manual[4] to accompany the questionnaire it was proposed that the instrument could be subdivided into the components that were shown in Figure two of chapter one. In 1974 further revisions to the instrument indicated that the number of items should be reduced from sixty-five to fifty-one. Since these have not yet been published, they were provided in a written communication to the investigator of this study by Likert Associates in the spring of 1975. They are shown in the table presented as section two of appendix two. The grouping of items to form the different factors identified as climate, leadership, trust, other intervening variables and end results were based, according to an explanation given to this investigator by the president of Likert Associates, on inter-item correlations taken from data collected in secondary school surveys of 1974 and "rational, logical sequencing of variables based on experience with the industrial instrument".[5] No evidence could

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4 Ibid.

5 This information was provided in a telephone call with Mr. Albert Siepert on May first, 1975.

be provided to indicate that the factors had been identified by empirical methods.

The content validity of the "Classroom Openness Questionnaire" was determined in two ways. From an extensive review of the literature, Walberg and Thomas[6] summarized the writings on open education to serve as a knowledge base for the development of an instrument to measure the presence of that construct in classrooms. The preliminary instrument contained 106 items to represent the universe of related content. These items were then sent to forty open education experts for judgements on their representativeness. Several interviews were also conducted with experts to clarify perceptions and to reduce possible confusion over the wording of the items. From these two types of feedback, a revised instrument with fifty items was developed.

A further test of content validity was made using data from a sixty-two classroom sample selected in the United States and England. An item analysis showed that thirty-nine of the items were correlated with the overall openness score at the .01 significance level and four correlated at the .05 level. For the purpose of this study, teachers

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6 Herbert J. Walberg and Susan Christie Thomas, Characteristics of Open Education, Toward an Operational Definition, Newton, Massachussets, Education Development Center, May 1971, 115 p.

responded to all fifty items but scores were only used from the forty-three that were mentioned above. It was critical to use only those items that would discriminate between open and traditional classrooms.

Concurrent validity of the instrument was tested by comparing the results of trained observers' ratings from the same sixty-two classroom sample with the teachers' self-ratings. The inter-rater reliability coefficients of the thirteen trained observers were found to be .930, .864 and .876 when scores from three different groups of classrooms were compared. The correlation between the teachers' self-ratings and those made by the observers was .782. The reliability of the instrument, calculated from the data collected in the sixty-two classrooms using Cronback's alpha method, yielded an index of .916. A summary of these statistical procedures is reported by Evans.[7]

A copy of the "Classroom Openness Questionnaire" and its accompanying scoring guide are included in appendix two. The latter indicates how to score each item and identifies the seven questions that were not scored for the purposes of this study. Negative scores had to be given to some items

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7 Judith T. Evans, Characteristics of Open Education, Results from a Classroom Observation Rating Scale and Teacher Questionnaire, Newton Massachussets, Education Development Center, August 1971, 33 p.

because they were worded in such a way to indicate traditionalism instead of openness. The instrument was developed in that manner to reduce response bias. A second attempt to reduce bias was made by this researcher when the name of the instrument was changed to "Classroom Description Index". This was done to remove any connotations that might have been elicited by the word openness.

3. Collection and Organization of the Data

A package of data collection materials was mailed to the principal of each of the eighty-three participating schools on February 27. It contained a sample set of materials for himself, a second set for the "administering teacher" who had been chosen by the researcher and a set for each of the teachers involved in the completion of the questionnaires. These materials, containing the two instruments and all associated instructions, are included as appendix three.

The principal's materials included a covering letter that expressed appreciation for his cooperation and outlined what was to be done with the enclosed materials. The set also included a page of "Instructions for the School Principal", the "School Information Form" containing the names of the teachers that had been chosen to participate and a copy of each of the instruments being used.

It was essential for the principal not to be present when teachers assembled as a group to complete the questionnaires. This procedure was used to eliminate any influence that his presence might have had on the teachers' responses. Consequently, it was necessary to select a teacher to administer the questionnaires. This was done by the researcher who asked the principal (see principal's instruction number six) to select the first teacher listed on the "School Information Form" to be the "administering teacher". Two pages were attached to provide a separate package for this teacher. It included a page of instructions and a completed answer form to serve as a sample when the questionnaires were administered.

The teacher's package contained a page entitled "Teacher's Information and Instructions". This was stapled to a blank answer form and the two were attached with a paper clip to a copy of each of the questionnaires. The information part of the first page collected data about the grade level taught, years of teaching experience, level of qualifications, type of classroom (i.e. open pod or self-contained) and school size. The instructions part of the page listed the procedures that were to be followed during the completion of the questionnaires.

A minimum of four and a maximum of eight teacher respondents were used to give a measure of each school's

management pattern. Seventeen schools had 4 teachers who satisfied the criteria that were previously stated, six had 5 teachers, seven had 6 teachers, thirteen had 7 teachers and forty had 8 or more teachers. All teachers were surveyed in the schools that submitted four to eight names. In those schools that listed more than eight teachers random procedures were used by the researcher to select the eight that would complete the survey. Questionnaires were sent to a total of eighty-three schools for completion by 551 teachers.

The minimum and maximum number of teachers in each school chosen to complete the questionnaires was based on data presented by Halpin.[8] He found that a satisfactory index of a leader's score could be obtained on the "Leader Behaviour Description Questionnaire" using a minimum of four describers. Respondents beyond ten in number did not add to the "stability of the scores"[9] and six or seven provided a "good standard".[10] Because of the similarity of the LBDQ and the Profile of a School, coupled with the fact

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8 Andrew Halpin, quoted in Ralph M. Stogdill, Manual for the Leader Behaviour Description Questionnaire, Form XII, Columbus, Ohio, Bureau of Business Research, College of Commerce and Administration, The Ohio State University, 1963, 13 p.

9 Ibid., p. 12.

10 Ibid.

that no such reporting of satisfactory numbers could be found for the latter, the Halpin data served as a guide.

As noted in the instructions that have been previously discussed, the teachers were asked to assemble and complete the questionnaires under the supervision of the "administering teacher". They were then requested to remain until all had finished so that the responses could be sealed in the stamped, self-addressed return envelope while all observed. Since no identifying marks were placed on either the return envelope or the answer forms, this procedure assured the teachers of the confidentiality and anonymity required for completely candid responses.

Approximately three and one-half weeks after the questionnaires were mailed another reminder letter was sent to participating schools requesting the return of surveys. This was necessary despite instruction number four to school principals that had asked for all responses to be mailed by March 20. The letter, dated March 24, is also shown in appendix one.

April 7 was chosen as the cut-off date for receiving questionnaire returns so that analysis of the data could begin. By this time seventy-seven schools had returned their responses. One of these schools returned blank questionnaires and explained that since agreeing to participate they had become "too busy" to follow through with their

commitment. A second school had to be eliminated because it returned only two of the four questionnaires that had been forwarded. Thus, from a possible total of eighty-three, seventy-five schools and 469 teachers from twenty-two different school boards constituted the usable sample for the study. This represented approximately ninety percent of the schools and eighty-five percent of the teachers who had initially agreed to participate in the study. When the incomplete and late returns were added to these, the respective percentages were ninety-four and eighty-seven. Of the total number of schools that were initially asked, approximately fifty-one percent returned questionnaires.

When the returns were received each school was given an identification number. This information, along with the teacher data that included grade level taught, years of experience, level of qualifications, open space or self-contained classroom and school size, was coded onto the computerized answer form by the investigator.

The answer forms were scored using the optical scanning services provided by the University of Ottawa. They were first checked by preparing a program to reject any forms that had items left blank or items that had been scored more than once. Approximately thirty answer forms had to be corrected because one item—none had more than one—needed correction. When a score had to be added or

erased it was done so that the answer coincided with the pattern of responses that had been established by the other questions. Following this procedure, the responses from all 469 questionnaires were scored by the mechanical scanner and the results were then transferred to computer cards.

A final organization of the data involved a transformation of data from teacher scores to school scores. This was accomplished with the aid of the "SPSS subprogram aggregate"[11] that made the necessary calculations to reduce all the data to nine scores for each school. One school was manually scored so that the programming for the computer computations could be checked.

Since the school was the experimental unit of this study, it was practical to organize the data so that it could be placed on one card for each school. These contained the school identification number plus eight scores from the "Profile of a School Questionnaire" and one score from the "Classroom Description Index". The first score was a global measure of the school's management pattern. It was identified in the programming by the acronym SMP and calculated from the responses to fifty-one items from the "Profile of a School". These items were recommended

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11 Norman H. Nie, et al., Statistical Package for the Social Sciences, 2nd ed., New York, McGraw-Hill, 1975, p. 203-215.

by Rensis Likert Associates and are identified in appendix two in the "Scoring Guide for the Profile of a School". The other scores included the self-assessment scores (identified as SA), the subordinate perception scores (SP), a score for each of the five factors, namely, climate (CLIM), leadership (LDR), trust (TRUST), other intervening variables (OIV), end result variables (ENDR) and a classroom openness score for each school identified as CDI. This data appears as section one of appendix four.

4. Statistical Procedures

After the data had been transformed into school scores and placed on IBM cards a preliminary analysis was conducted using computer programs from the Statistical Packages for the Social Sciences.[12] The program "Condescriptive"[13] was used to calculate the mean, standard deviation, minimum and maximum scores as well as the range for each set of scores. A second program, "Stepwise Multiple Regression",[14] was used to test the relationships among the five factors that Likert had identified.

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12 Ibid., xxiv-675 p.

13 Ibid., p. 185-191.

14 Ibid., p. 320-360.

5. Description and Discussion of the Data

The data from the teacher responses were transformed into nine scores for each school. The first of these was a global measure of the school's management pattern. It gave a combined measure of each school's overall climate, a perception of the leadership processes as they were exercised by the principal and an indication of teacher-principal relationships. A summary of the school management pattern scores for each of the seventy-five schools in the sample is defined in table two by the acronym SMP. Since the Likert management theory designates a school having a score of five or six to be in system three, the mean SMP of 5.667 and the standard deviation of 0.508 indicates that most of the schools were characterized by a consultative type of management pattern common to that system. The minimum and maximum SMP scores indicated that the schools ranged from the upper limits of system two to the upper end of system three. No school scored in the system four category on this overall measure. These results coincide with those presented by Likert Associates.[15]

The global school management pattern score was subdivided into its two major components identified as the

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15 Rensis Likert Associates, Manual for Questionnaire Use, op. cit., figure 8, section X, p. 3.

Table II

A Description of the Data that Constituted Each of the Nine School Variables (N=75)

Variable	Mean	Standard Deviation	Minimum	Maximum	Range
SMP[a]	5.667	0.508	4.562	6.659	2.097
SA	5.878	0.335	5.188	6.550	1.362
SP	5.531	0.703	4.012	6.929	2.917
CLIM	4.828	0.655	3.190	6.400	3.210
LDR	5.650	0.577	4.417	6.738	2.321
TRUST	6.192	0.537	5.125	7.375	2.250
OIV	5.753	0.474	4.620	6.657	2.037
ENDR	6.275	0.882	4.000	7.750	3.750
CDI	2.636	0.178	2.273	3.413	1.140

a The variable abbreviation SMP stands for a global measure of school management pattern, SA is for self-assessment , SP for subordinate perception, CLIM for climate, LDR for leadership, TRUST for trust, OIV for other intervening variables, ENDR for end result variables and CDI for "Classroom Description Index".

self-assessment (SA) and subordinate perception (SP) scores. The former was measured by twenty items that dealt with the teacher's self-perception of his relationship with students and the latter was obtained from thirty-one items that asked teachers to rate such things as principal behaviour, peer relationships, teacher influence in the school's decision-making process and goal emphasis as viewed from a subordinate position. While the difference between the SA mean and the SP mean (5.878 - 5.531 = 0.347) does not appear great it was found to be significant when tested by the t-test ($p<.05$). This finding also concurs with the evidence produced by Likert. Respondents tend to rate themselves higher than they are rated by subordinates, especially if their organization's management pattern is less than system four.

Of the five management pattern factor scores, CLIM, LDR, TRUST, OIV and ENDR, also shown in table two, TRUST and ENDR note special mention. The former measures the trust that the teachers have for the principal and the trust he in return has for them. This was one of the two variables that had a mean score in the upper part of system three with a maximum score in system four. Similar results were found for the end result variable which measured the presence of positive attitudes among teachers toward school and a low level of teacher frustration. The high scores on these two

variables indicate favourable conditions among the human relations of schools that participated in the sample.

The classroom openness scores, identified in table two as CDI, were calculated from a four point scale. When Walberg and Thomas tested their classroom openness instrument they found the mean score for traditional classrooms in the United States to be 2.9104. The counterparts that had been selected because of their reputation for openness had a mean score of 3.5020 while the open classrooms that were surveyed in Britain had a mean score of 3.4110.[16] From a CDI mean of 2.636, one can conclude that the schools used in this sample were, on the whole, relatively traditional. While the range of 1.140 is large for a four point scale it is somewhat misleading because only two schools scored greater than 3.0.

In addition to the descriptive data that are presented in table two, the relationships among the five management pattern factors were also examined. These can be seen in table three. Because of their high intercorrelations, the factors that Likert had identified could not be considered sufficiently discreet to proceed with the

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16 These means are taken from Judith T. Evans, Characteristics of Open Education, Results from a Classroom Observation Rating Scale and Teacher Questionnaire, Newton, Massachusetts, Education Development Center, August 1971, p. 33.

Table III

Intercorrelation Matrix for the Scores of the Five Management Pattern Factors from the "Profile of a School"

	CLIM	LDR	TRUST	OIV	ENDR
CLIM	1.000	0.747	0.531	0.788	0.585
LDR	0.747	1.000	0.786	0.884	0.769
TRUST	0.531	0.786	1.000	0.778	0.767
OIV	0.788	0.884	0.778	1.000	0.776
ENDR	0.585	0.768	0.767	0.776	1.000

The items that make up each of these factors are identified in section two of appendix two. The data used in calculating this matrix came from the school scores obtained as part of this study (N=75).

testing of the hypotheses as had been planned. This information placed sufficient skepticism upon the instrument that one could not avoid having some doubts about its construct validity. Consequently, an analysis of the "Profile of a School" was conducted in an attempt to specify what it was actually measuring. A series of factor analyses was used to reorganize the "Profile of a School". This revision is explained in the next chapter and the hypotheses are tested, using the new findings, in chapter four.

CHAPTER III

A REORGANIZATION OF THE "PROFILE OF A SCHOOL"

The research reported in this chapter was prompted by the skepticism that accompanies the techniques used to validate the "Profile of a School". Though the instrument can be supported for the way that it has been developed from established theoretical organizational concepts, the empirical support for this validation seems incomplete. When this fact is combined with the results showing the high intercorrelations among the five factors presented in table three on page 82, further doubt was placed upon the organization of the items. Since the factors identified by Likert were not sufficiently discreet to be considered as separate constructs, it was necessary to analyse the instrument before proceeding with the research that had been planned. Section one reports the results of a series of factor analyses using the data that were collected from 469 teachers who participated in the main part of this study. Section two accounts the results of a cross-validation survey that was used to test the initial findings and section three provides a summary of the results and shows how they provide an accurate reflection of Likert's theory.

1. A Factor Analysis of the "Profile of a School"

The initial factor analysis of the "Profile of a School" was conducted using all responses of the 469 teachers mentioned above. The BMDX72[1] computer program was used for three separate analyses that specified oblique rotations. This decision was based on the theoretical fact that the factors should be correlated.

The first factor analysis was exploratory. It utilized all 469 cases, sixty-five items and specified an eigen-value of 1.00000 as the only restriction. Under these conditions, six factors were identified. The sixth, however, as can be seen from the copy of the computer printout in appendix four, (item two — "Rotated Factor Matrix for Factor Analysis One"), contained only one item that had a loading coefficient greater than 0.30000. The same item was also loaded in factor one with a coefficient of 0.60063. On the basis of this evidence, combined with the fact that factor six added only one percent to the cumulative proportion of the total variance, a second analysis was conducted using a five factor restriction.

The second factor analysis also specified an oblique rotation because the expected correlation among the factors

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1 W. J. Dixon, ed., BMD Biomedical Programs, X-series Supplement, Berkeley, California, University of California Press, 1970, p. 90-99.

was confirmed by the first analysis. The intercorrelation matrix for the initial analysis is shown in table four and the factor loadings for analysis two are included in appendix four.

The two factor analyses were examined for items which had high factor loading coefficients on only one factor. Item twenty-eight, for example, provided the best example of this condition. On the six factor analysis the respective loadings were 0.90632, -0.01105, 0.02457, -0.04883, -0.00238 and -0.04487 and on the five factor restricted analysis they were 0.91232, 0.00126, 0.01790, -0.07516 and -0.00251. Further examination indicated that more than forty of the sixty-five items were uniquely loaded on only one factor. A coefficient of 0.45000 was chosen as the minimum value for an item to be retained for a final analysis because it appeared as a natural cut-off point in both sets of data. This cut-off was selected because there were only three other items with coefficients between .30 and .45 that loaded uniquely on one factor. These were discarded for theoretical reasons. Items thirty-six and thirty-seven required the teachers to give opinions about the principal's influence—something that could not be totally observed as an in-school behaviour or condition. These two items had also been deleted by Likert in his 1974 revision. Item fifty-four was eliminated for a different reason. It

Table IV

Six Factor Correlation Matrix for an Oblique Rotation Using 469 Cases and 65 Items from the "Profile of a School, Form Three"

	1	2	3	4	5	6
1	1.0000	0.1989	0.2151	0.4029	0.4573	0.0333
2	0.1989	1.0000	0.3332	0.1227	0.2324	-0.0913
3	0.2151	0.3332	1.0000	0.2404	0.2236	0.1314
4	0.4030	0.1227	0.2404	1.0000	0.3500	0.1375
5	0.4573	0.2324	0.2236	0.3500	1.0000	0.0342
6	0.0333	-0.0913	0.1314	0.1375	0.0342	1.0000

referred to interactions among teachers but loaded on factor five with the goal emphasis items. The 0.4500 cut-off was combined with a second criterion that required an item to have a coefficient of less than 0.20000 on all factors except the one in which it was most highly loaded. When these two criteria were applied to both sets of data provided by the two factor analyses the same forty-six items were identified and distributed among five factors. Factor one had 17 items, two had 14, three had 7, four had 5 and five had 3.

A third factor analysis was conducted using only the forty-six items that had been previously identified. Once again, the same items loaded in the same factors (see appendix four). The factor one items dealt with leadership behaviours of the principal, factor two contained similar questions about teacher's leadership, three pertained to the amount of influence students had on school matters that affected them, factor four contained items dealing with teacher influence and the final factor included items that emphasized high goal performance. Consequently, the factors were given tentative names to serve as composite descriptors of the items contained within. The respective names were "principal leadership", "teacher leadership", "students' influence", "teachers' influence" and "goal emphasis". The items of these factors are listed below. The

number preceding each item is the actual item number by which it was identified in the "Profile of a School" questionnaire.

A List of Items for Each of the Five Factors Determined by a Factor Analysis of Likert's "Profile of a School, Form Three"

Factor One: Principal Leadership

26 How often do you see your principal's behavior as friendly and supportive?
27 How much confidence and trust does your principal have in you?
28 How much confidence and trust do you have in your principal?
29 How free do you feel to talk to your principal about academic and non-academic school matters?
30 How often do you try to be friendly and supportive to your principal?
32 How often are your ideas sought and used by the principal about academic and non-academic school matters?
42 How much do you feel that your principal is interested in your success?
43 How often does your principal use group meetings to solve school problems?
44 To what extent does your principal make sure that planning and the setting of priorities are done well?
45 To what extent does your principal try to provide you with the materials and space you need to do your job well?
46 To what extent does your principal give you useful information and ideas?
48 What is your general attitude toward your school?
50 How do you view communications from your principal?
51 How accurate is upward communication to the principal?
52 How well does your principal know the problems faced by teachers?
53 What is the character and amount of interaction in your school between the principal and teachers?
59 How much does your principal try to help you with your problems?

Factor Two: Teacher Leadership

1 How often is your behavior seen by your students as friendly and supportive?
2 How often do you seek to be friendly and supportive to your students?
3 How much confidence and trust do you have in your students?
4 How much confidence and trust do your students have in you?
5 How much interest do your students feel you have in their success as students?
10 How much do your students feel that you are trying to help them with their problems?
16 What is the general attitude of your students toward your school?
18 How do students view communications from you?
20 How well do you know the problems faced by your students in their school work?
21 What is the character and amount of interaction in your classes?
22 To what extent do your students help each other when they want to get something done?
23 To what extent do your students look with pleasure on coming to school?
24 To what extent do you look forward to your teaching day?
25 To what extent do your students feel excited about learning?

Factor Three: Students' Influence

8 How often do you seek and use your students' ideas about academic matters?
9 How often do you seek and use your students' ideas about non-academic school matters?
11 How much influence do you think students have on academic matters?
12 How much influence do you think students have on non-academic school matters?
13 How much influence do you think students should have on academic matters?
14 How much influence do you think students should have on non-academic school matters?
15 To what extent are students involved in major decisions affecting them?

Factor Four: Teachers' Influence

34 How much influence do you think teachers have on academic and non-academic school matters?
56 How are decisions made in your school system?
57 At what level are decisions made about academic school matters?
58 To what extent are you involved in major decisions related to your work?
61 To what extent are decision-makers aware of problems, particularly at lower levels?

Factor Five: Goal Emphasis

63 Who holds high performance goals for your school?
64 Who feels responsible for achieving high performance goals in your school?
65 To what extent is there student resistance to high performance goals in your school?[2]

2. Cross-validation of the Factor Analysis

The factor analyses described in section one of this chapter revealed five factors within the "Profile of a School" questionnaire that were quite different from those suggested by Likert. Since no evidence of a previous factor analysis of this instrument could be found within the literature an inquiry was made to Likert Associates. In a telephone conversation Mr. Albert Siepert, the president of the company, reported that he knew of no such data. Since no comparative information appeared to be available a similar

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2 Rensis Likert Associates, "Profile of a School, Form Three", Ann Arbor, Michigan, 1971, 10 p.

population was surveyed to determine whether or not the first set of findings could be replicated.

A second set of responses to the "Profile of a School" questionnaire was collected in the public elementary schools of Peterborough County, Ontario. This was facilitated by one of the school superintendents who arranged for the questionnaires to be sent from the school board offices by way of the regular school courier service. Each school received a package of materials that contained a letter of introduction from the superintendent which indicated that he and the director of education had discussed the research project and were requesting that all schools participate as a favour to the researcher because he had previously provided the system with a series of leadership workshops. The package also contained a copy of the questionnaire booklet for each teacher. In addition to the instructions given on the questionnaire, four additional pages of information were inserted. The first explained the purpose of the research, the second provided additional instructions for the principal and the participating teachers, the third was a sample of a completed answer form and the fourth was a blank copy of the University of Ottawa optical coding form on which the answers were to be placed. The first three of these pages have been included as items nine, ten and eleven in appendix three. As before, the teachers were

asked to complete the questionnaires and seal them in the return envelope to the researcher so that no school could be identified.

Four hundred and thirty-five questionnaires were sent to thirty-three schools. From these, thirty schools returned a total of 314 responses. Thus, approximately ninety-one percent of the schools and seventy-two percent of the teachers that had been sent questionnaires returned them. The answer forms were scored by an optical scanner and the responses were mechanically punched onto IBM cards.

The results of a fourth factor analysis that used the data from the second survey are shown as item five in appendix four. When five factors were specified for rotation it can be seen that only item seven loaded sufficiently high to be retained in factor five. It met the criteria of having a coefficient of 0.45000 or greater on one factor while having scores lower than 0.20000 on all others. Since factor five contained only one item of sufficient magnitude for retention, the data suggested that the instrument, at least for the sample concerned, appeared to be measuring only four factors. Consequently, the data were reanalysed specifying an oblique rotation of four factors.

The results of the fifth factor analysis were subjected to the same item retention criteria that had been used with the previous analyses. This procedure resulted

in the retention of forty-two items, identified by the underlined coefficients in section six of appendix four. In addition to these items, three others were retained (also underlined) because they very nearly met the criteria and because they each deserved special consideration. Items seventeen and twenty were kept in factor two, despite not having coefficients of 0.45000 or greater, because of the extremely low coefficients on all other factors. Item nine was retained in factor three where it had a coefficient of 0.49483 despite its loading on factor two of 0.23075 because of the similarity of the item's content with that of number eight which met both criteria. These forty-five items were then compared with the forty-six that had been identified by the three factor analyses from the original set of data.

The findings from the second survey verified four of the five factors that were revealed during the initial analyses. The items constituting the factors that were identified as principal leadership, teacher leadership, and students' influence were the same for both samples. Factor four, teachers' influence, differed on only one item. In this instance question thirty-four did not meet the criterion of having a coefficient of 0.45000. Since it had also been a questionable item to retain during the first analyses—it was kept because of its content similarity

with the other items of that factor—it was deleted. This left four items that appeared to consistently measure teachers' influence in decision-making.

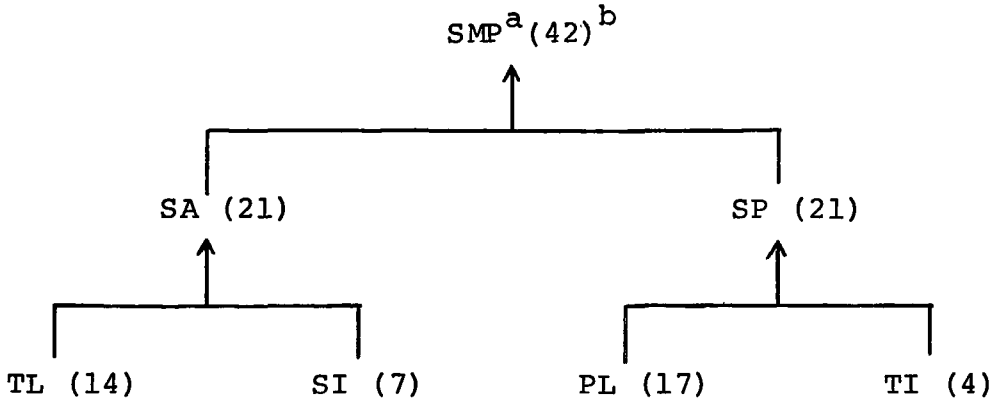
Factor five, goal emphasis, was not confirmed by the cross-validation study. As can be seen from section six of appendix four, items 63, 64 and 65 tended to load on factors two and four. From these two studies it was not possible to identify goal emphasis as a pure factor within the "Profile of a School". The other four factors, however, were identified with sufficient consistency to provide added confidence for future measurements based on that instrument.

3. Summary of Results

The results of the factor analyses reported in the previous two sections of this chapter have indicated the need for a reorganization of the "Profile of a School". The instrument appears to consistently measure four factors using forty-two of sixty-five items. An organization to show the relationship between these factors, identified as principal leadership, teacher leadership, students' influence and teachers' influence, and the SMP, SA and SP scores is shown in figure three. Table five includes the items that were identified to measure each of the management pattern variables.

Figure 3

An Organization to Show How the Items of the Four Newly Identified Factors Within the "Profile of a School" Contribute to the Global Management Pattern Score



a SMP = school management pattern, SA = self assessment, SP = subordinate perception, TL = teacher leadership, SI = students' influence, PL = principal leadership and TI = teachers' influence.

b The number after each variable acronym indicates the number of items used to calculate its score.

Table V

Items from the "Profile of a School, Form Three", that were Identified by Factor Analysis and Used to Calculate a Global Management Pattern Score and Six Sub-scores for Each of Seventy-five Schools

Variable[a]	Item Numbers[b]	N[c]
SMP	1 to 5, 8 to 16, 18, 20 to 30, 32, 42 to 46, 48, 50 to 53, 56 to 59, 61	42
SA	1 to 5, 8 to 16, 18, 20 to 25	21
SP	26 to 30, 32, 42 to 46, 48, 50 to 53, 56 to 59, 61	21
PL	26 to 30, 32, 42 to 46, 48, 50 to 53, 59	17
TL	1 to 5, 10, 16, 18, 20 to 25	14
SI	8, 9, 11 to 15	7
TI	56 to 58, 61	4

a These variable acronyms have been defined in figure three.

b The item numbers are those used on the 1971 version of the "Profile of a School, Form Three".

c Column N gives the number of items used to calculate a score for each variable.

These findings indicate that leadership and influence are being measured at two levels within the school. The factors teacher leadership and students' influence operate at the classroom level while principal leadership and teachers' influence are a measure of the same constructs at the school level. Since Likert has designated leadership to be a causal variable and subordinate influence to be an intervening variable these results confirm that his instrument, in this reorganized form, is an accurate reflection of his theory.

The measurements at the classroom and school levels can also be explained by Likert's theory. He maintains[3] that the intervening variables at one level in an organization act as the causal variables for the next lower level. In the case of the "Profile of a School" principal leadership would be causal to the intervening variable teachers' influence at the school level. Teachers' influence at the school level is then causal to teacher leadership (TL) at the classroom level which, in turn, is causal to students' influence. The relationship of these four variables to end result variables, as interpreted by the theory, is

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3 Rensis Likert Associates, The Likert Profile of a School, New Survey Instruments for Public Schools to Improve Organizational Effectiveness, Manual for Questionnaire Use, Ann Arbor, Michigan, Rensis Likert Associates, 1972, appendix A-1, figure B.

schematically illustrated in figure four.

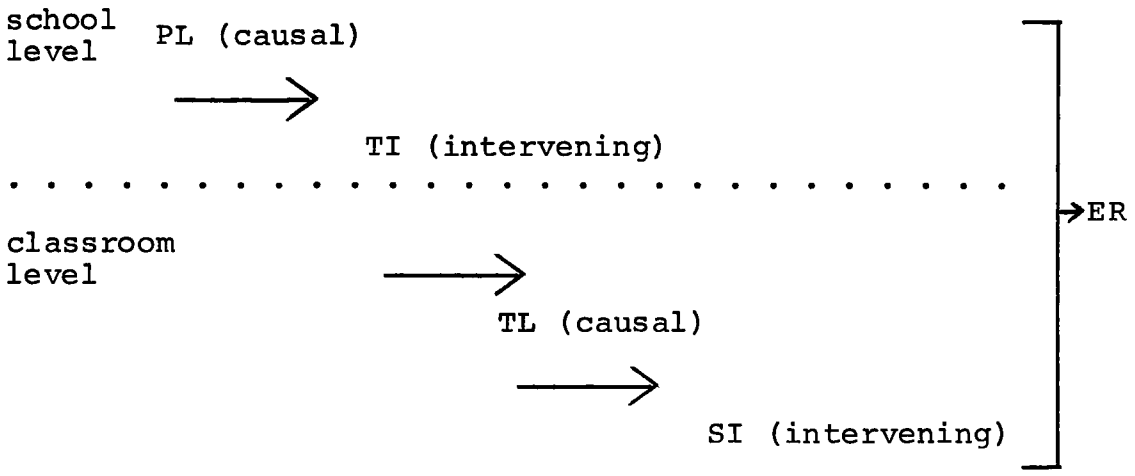
4. Suggestions for Additional Revisions

Though some revisions to the "Profile of a School" have been indicated by the analyses reported in this chapter, the instrument has shown a rather remarkable consistency in measuring four constructs. When the range of responses that can be produced by human variability is added to the fact that different samples were measured at different times during the school year, the construct validity of the instrument must be recognized by virtue of the fact that forty-two of the forty-six items initially identified were confirmed in the cross-validation study.

Two types of revision to the "Profile of a School" are suggested by these findings. The first would include the deletion of items that do not appear to consistently measure any of the factors identified. The second type of revision suggests the need for a rewording and retesting of some of the goal items. This is proposed because of the relative importance to organizational success that several theorists have placed upon goal emphasis. It can be speculated that the goal emphasis items tended to load on more than one factor because most of the items appeared to contain more than one question. Item sixty-three, for example, asked "Who holds high performance goals for your

Figure 4

A Relationship Among Causal, Intervening and End Result Variables[a]



PL = principal leadership, TI = teachers' influence, TL = teacher leadership, SI = students' influence, ER = end result.

a The relationships shown in this figure constitute the conceptualization of the findings of this study as they are interpreted by Likert's theory.

school?"[4] The possible responses included "(i) principal only, (ii) principal and some teachers, (iii) principal, most teachers, some students, some parents and (iv) principal, teachers, most students, many parents".[5] On the other hand, perhaps it is impossible for teachers to respond to goal emphasis questions with anything more than opinions unless the questions are restricted to the emphasis that they personally hold. Or perhaps the inconsistent responses to the goal items is a function of the confusion over this issue that appears to permeate many Ontario schools.

The findings of this study have also provided an empirical basis for future use of sub-scores from the "Profile of a School". As shown in Figure three, the global SMP score can be subdivided into the four factor scores, PL, TL, SI and TI. For some purposes, these scores may provide more useful information than would be given by a global score. And finally, the revisions suggested for form three of the "Profile of a School" pose the question about the need for similar revisions to the other forms of the instrument.

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4 Rensis Likert Associates, "Profile of a School, Teacher's Questionnaire, Form 3", Ann Arbor, Michigan, 1971, p. 10.

5 Ibid.

CHAPTER IV

PRESENTATION AND DISCUSSION OF RESULTS

This chapter restates the hypotheses of the study, describes the statistics that were used to test them and presents the results of the analyses. Section two then discusses the results and provides an interpretation of the findings by illustrating how they reflect Likert's theory. The summary relates the findings to the "Review of the Literature", indicates how the research has contributed to an extension of Likert's theory and discusses implications for practitioners.

1. Presentation of Results

The new information that was provided in chapter three required one minor modification to be made in the wording of the hypotheses as they were stated at the end of chapter one. Since the factor analyses identified four factors instead of five as Likert had stated, the fourth hypothesis had to be reworded to indicate that it was testing the relationship between each of the four factors and the criterion measure classroom openness. The hypotheses are restated as follows:

H1. There will be a positive correlation between the management pattern scores and the classroom openness scores of elementary schools.

H2. There will be a positive correlation between the self-assessment part of the management pattern scores and the classroom openness scores of elementary schools.

H3. There will be a positive correlation between the subordinate perception part of the management pattern scores and the classroom openness scores of elementary schools.

H4. There will be a positive correlation between each of the four management pattern factor scores and the classroom openness scores of elementary schools.

The data used to test these hypotheses was that collected from the seventy-five school sample that was described in chapter two. Once again, the "SPSS Subprogram Aggregate"[1] was used to reduce the teacher data to one score per school for each of the variables and the program "Condescriptive"[2] was used to produce the summary of the data that is presented in table six. The school scores for these variables are shown in section seven of appendix four.

Prior to testing the hypotheses the program "Scattergram"[3] was used to check for linearity of relationship between each of the school management pattern variables and the

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1 Norman H. Nie, et al., Statistical Package for the Social Sciences, 2nd ed., New York, McGraw-Hill, 1975, p. 203-215.

2 Ibid., p. 185-191.

3 Ibid., p. 293-300.

Table VI

A Description of the Data that Constituted the Eight School Variables Used to Test the Hypotheses

Variable	Mean	Standard Deviation	Minimum	Maximum	Range
SMP[a]	5.637	0.493	4.575	6.581	2.005
SA	5.815	0.353	5.088	6.559	1.471
SP	5.459	0.767	3.722	6.895	3.173
PL	5.758	0.868	3.872	7.186	3.314
TL	6.350	0.333	5.500	7.018	1.518
SI	4.745	0.609	2.982	6.179	3.196
TI	4.191	0.712	2.286	6.000	3.714
CDI	2.636	0.178	2.273	3.413	1.140

a SMP = school management pattern, SA = self-assessment, SP = subordinate perception, PL = principal leadership, TL = teacher leadership, SI = students' influence, TI = teachers' influence and CDI = classroom description index.

criterion, classroom openness. When the scattergrams confirmed this linearity, the "Pearson Corr"[4] program was used to test the relationship between each of the seven independent measures and classroom openness. These results are presented in table seven.

It will also be recalled that a question, secondary to the testing of the hypotheses, sought to determine which combination of factors could be used as the best predictor of classroom openness. This problem was approached using "Stepwise Multiple Regression"[5] procedures. The results of testing the different combinations of the four newly identified factors are presented in table eight. The intercorrelation matrix for these same factors, shown as table nine, was calculated using the same program.

2. Discussion of Results

The hypotheses predicted that all of the management pattern variables would be positively related to the dependent variable classroom openness. The results of these predictions, shown in table eight on page 107, were almost all confirmed. The global measure of the school management pattern ($p<.001$) satisfied the five percent confidence limit

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4 Ibid., p. 280-286.

5 Ibid., p. 320-360.

Table VII

Correlation Coefficients between Classroom Openness Scores and Scores from Seven Management Pattern Variables

Variable	"r"	Significance
SMP[a]	0.3409	0.001
SA	0.5403	0.001
SP	0.1896	0.052
PL	0.1600	0.085
TL	0.4555	0.001
SI	0.4408	0.001
TI	0.2410	0.019

a SMP = school management pattern, SA = self-assessment, SP = subordinate perception, PL = principal leadership, TL = Teacher leadership, SI = students' influence, TI = teachers' influence.

Table VIII

The Results of Eleven Step-wise Multiple Regression Analyses that Compared Different Combinations of Four Management Pattern Factor Scores with the Criterion Measure, Classroom Openness

Regression Equation	Variables Used	R	R^2	F
1	TL, SI, PL, TI[a]	0.552	0.305	7.666[b]
2	TL, SI, Pl	0.548	0.300	10.151
3	TL, TI, Pl	0.479	0.230	7.062
4	SI, TI, Pl	0.447	0.120	5.901
5	TL, SI, TI	0.541	0.293	9.803
6	TL, PL	0.455	0.207	9.417
7	SI, PL	0.441	0.194	17.570
8	TI, PL	0.251	0.063	2.421*
9	TL, SI	0.540	0.291	14.807
10	TL, TI	0.475	0.226	10.488
11	SI, TI	0.446	0.199	8.945

a PL = principal leadership, TL = teacher leadership, TI = teachers' influence, SI = students' influence.

b All F Values were significant ($p<.05$) except that marked with *.

Table IX

Intercorrelation Matrix for the Scores from Four Management Pattern Factors of the "Profile of a School"

	PL	TL	SI	TI
PL[a]	1.000	0.381	0.366	0.395
TL	0.381	1.000	0.377	0.240
SI	0.366	0.377	1.000	0.340
TI	0.395	0.240	0.340	1.000

a PL = principal leadership, TL = teacher leadership, SI = students' influence, TI = teachers' influence.

that has been predetermined as the level for accepting or rejecting the hypotheses. Hypothesis two stated that the self-assessment scores would be related to classroom openness. This hypothesis was also accepted at the .001 significance level. Hypothesis three, dealing with a relationship between the subordinate perception scores and classroom openness, was accepted because the significance level of .052, when rounded off to the nearest percentage level, is within the range for acceptance. The final hypothesis stated that each of the four factors that constituted the global management pattern score would also be related to classroom openness. Even though three of the factors were related within the confidence limit that had been set, the hypothesis had to be rejected on the basis of the PL factor's lower relationship ("r" = 0.1600 and $p < .085$)

Though principal leadership was not significantly related to classroom openness it cannot be interpreted to be an unimportant variable in determining such an end result. Likert, for instance, found from an examination of a number of studies in business organizations that the correlations among variables tended to increase as the time interval between them decreased. This meant "that the shorter the time interval between any two variables in the causal-intervening-end result sequence, the higher the correlations tend to be

between the variables".[6] This statement was supported with empirical evidence that indicated the correlations between causal managerial behaviour and end result productivity in a number of studies ranged between +.16 and +.22.[7] When the intervening variable, organizational development, was compared with the end result variable productivity, the corresponding range of the correlation coefficients was +.25 to +.46.[8] The increased time span between the causal and end result variables tended to account for their lower relationship. This same explanation is plausible to explain the relationship of the four factors tested in this study with the end result criterion classroom openness. Figure five, an extension of figure four on page 100, schematically portrays this reasoning. The teacher leadership and the student influence variables are shown to be operating at about the same time interval because a change in the former, which is causal to the latter, would have almost immediate effects because of the close proximity between teacher and student changes in the classroom. This suggestion is confirmed by the two negligibly different

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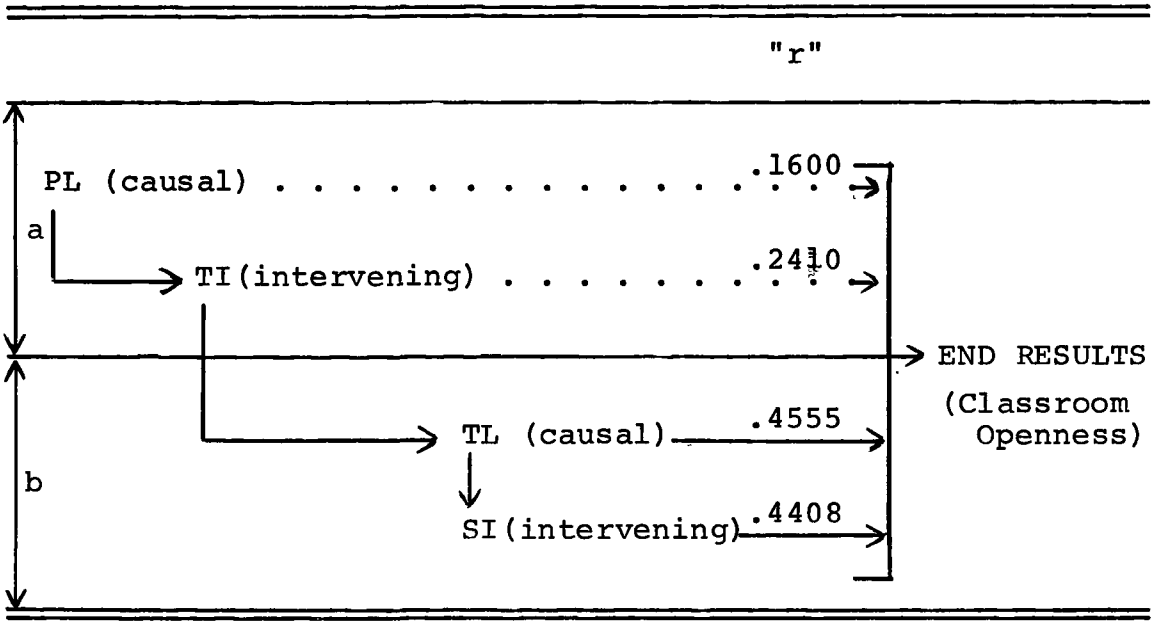
6 Rensis Likert, The Human Organization, Its Management and Value, New York, McGraw-Hill, 1967, p. 81.

7 Ibid., p. 82.

8 Ibid.

Figure 5

A Sequential Relationship of the Causal, Intervening and End Result Variables Used in this Study



The dotted lines are used to illustrate an indirect influence while the solid ones suggest a direct cause.

a = school level, b = classroom level.

PL = principal leadership, TI = teachers' influence, TL = teacher leadership, SI = students' influence.

correlation coefficients of .4555 and .4408.

Further support for the relationship between the principal leadership variable and classroom openness was accounted for in the multiple regression analysis. When all combinations of the four factors were tested to determine which set would produce the best predictor of classroom openness, it was found that the full regression equation produced the highest coefficient. This, as shown in table eight on page 107, had a significant F value of 7.666. As would be expected from the results of the correlation analysis, however, teacher leadership and student influence accounted for most of the variance within the regression equation.

The variance within the classroom openness scores that was accounted for by the management pattern variables was not great, even though most of them were positively and significantly related. In the case of the three that had the highest coefficients of correlation (i.e. SA, TL, and SI), the variance was 0.2919, 0.2075 and 0.1943 respectively. These findings can also be explained by Likert's theory. He maintained that there were three classifications of causal variables that influenced an organization's end results. These included the technical capabilities of the company and its employees, the organizational structure and the leadership processes. In the case of this study, the "Profile of

a School" only measured the leadership type of causal variables and the intervening variables which were dependent upon it. When one considers the importance of the technical competency of teachers to utilize the principles of open education, and the structures of the school boards in which they work that may or may not endorse such an innovation, especially during the current provincial mood that seems to be calling for a "return to the basics", (i.e. traditional schooling), it is quite significant that the causal variable leadership can indirectly account for twenty to thirty percent of the variance of classroom openness. Further research, dealing with the influence of school board structures and policies and teacher competence, is needed to provide additional answers concerning the change toward classroom openness.

3. Summary

This study has demonstrated that leadership and influence by subordinates are significant factors in a school's ability to adopt the innovation classroom openness. Such findings concur not only with the theory and research of Likert but also with the work of a number of others who have investigated related problems. Though no other study could be found that directly tested this same relationship, all of the theories and studies presented on pages fourteen

to forty-four in the "Review of the Literature" chapter give support to these findings. The findings that small group discussion procedures caused change by modifying individual's norms coincides with the idea that change is partly related to influence by subordinates. Organizational health, a construct involving such concepts as communication adequacy, optimal power equalization and employee cohesiveness—conditions necessary for change to occur—also support a relationship between leadership and subordinates' influence and school innovation. And finally, the theoretical suggestion that the introduction of teaming, collaboration, group problem-solving and feedback into the culture of a social system to produce change concurs with these findings because the measure of leadership and subordinates' influence used in this study include those very concepts.

The empirical studies cited in the "Review of the Literature" also endorse the findings of this study. Several studies suggested that open climates were related to innovation. The constructs such as esprit, thrust and consideration that are measured by the Organizational Climate Description Questionnaire to indicate open climates denotes organizational conditions that are similar to the concepts that were grouped to constitute the constructs of leadership and subordinate influence measured by the "Profile of a School". The various administrative behaviours that were

linked to innovation were not unlike the concepts making up the leadership construct from the "Profile of a School". Two of the empirical studies, however, were more closely related to findings of this study in that they produced almost parallel results. Lieberman[9] (see page thirty-eight) found that when principals displayed high task-orientation, high expressiveness and high authority with teachers, the teachers, in turn displayed the same behaviours to their students. In this way, the influence of leadership was mediated, in a type of causal, intervening end result sequence through the teachers to the students. Jackson's[10] study, reported on page forty-one, showed a similar type of sequential influence. Since executive professional leadership was related to teacher professionalism and teacher morale as well as to student achievement, one could reason that the influence of leadership was mediated through the teachers to influence student achievement. The indirect relationship between the theories and studies, cited earlier, and the results of this research,tend to add

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9 Ann Lieberman, "The Power of the Principal", in Carmen M. Culver and Gary J. Hoban, eds., The Power to Change, Issues for the Innovative Educator, New York, McGraw-Hill, 1973, p. 35-47.

10 George B. Jackson, "Executive Professional Leadership and Organizational Health", The Canadian Administrator, Vol. 13, No. 5, Feb. 1974, p. 23-27.

confidence to the acceptance of the latter.

This study has extended the work of Likert. The relationship shown between school management patterns and classroom openness has confirmed his speculation that the theory could be used as an indicator of the capacity for innovation in an educational organization. The study also reorganized the present "Profile of a School" to show that it measures four constructs within the school organization —two at the school level and two at the classroom level. The third contribution of the study is manifested in the suggestions that are implied for further research. These would include the need for revision of other forms of the "Profile of a School", as well as an examination of the effects of organizational structures and teacher competency on the development of open classrooms.

The relationship shown between school management pattern and the innovation classroom openness carries implications for practitioners contemplating changes in educational systems. It is clear that efforts to modify the causal variable leadership must precede attempts to make changes at the classroom level. But leadership training at the principal level is not sufficient. As the study has shown, teacher leadership is also a crucial factor in determining end results at the classroom level.

Consequently, educational change agents must seriously consider providing both principals and teachers with leadership training. If schools are to move beyond system three types of management where most appear to be presently situated, the skills that are implied for the operation of a system four must be stressed. Both principals and teachers are likely to benefit from the leadership training that will enhance cooperative problem-solving, team-building, decision-making, goal-setting and other process that form the essentials of the interaction-influence (system four) type of school management. In addition to the causal variable leadership, Likert would also maintain that educational managers need to give attention to organizational structures and technological competencies. Perhaps these suggestions will help to alleviate some of the despair that has accompanied many of the past efforts to make changes in educational organizations.

SUMMARY AND CONCLUSIONS

Educational innovation has long been a major concern among North American educators. Changing societal conditions, modified student attitudes toward the value of traditional schooling, the entrance of "big business" into the curriculum publishing industry, writings of critics, new knowledge about learning and a greater availability of research funds have all contributed to the ubiquitous search for better ways. A review of the literature on this topic, however, indicated that an abundance of the efforts at creating educational change have operated more from a trial and error approach than from a theoretical basis. More recent writings have criticized the plethora of earlier studies because of their overemphasis on the "thingness" of the innovation, too much attention to the "innovator" and preoccupation with the "diffusion of innovations".

The purpose of this study was to investigate the topic of innovation in elementary schools from a more theoretical basis. Instead of following the traditional approaches to the subject, it sought to examine innovation in terms of its relationship to psycho-sociological conditions within the structure of the individual school. In this way the study followed those suggestions from the literature that indicated conditions within a school's social system

would govern its ability to be innovative. Likert's management systems theory provided the theoretical framework to pursue the problem.

Likert's systems theory stated that the management pattern of an organization could be positioned on a continuum ranging from primitive approaches to management to more socially-evolved practices. Under the former conditions employees were exploited by authoritarian practices. In the latter they collaborated with management to play integral roles in the decision-making policies of the organization. His research has demonstrated that as the management patterns of organizations tend toward the consultative and collaborative end of the continuum—toward systems three and four—they become more effective in attaining their goals. In 1968 he adapted this theory of management practices in business organizations by designing an instrument to measure the management patterns of educational organizations. Subsequent research has suggested that the theory also holds for schools. Those organizations which have higher scores on the "Profile of a School" also tend to score higher on such typical end result variables as student achievement, student satisfaction and teacher motivation. Likert also maintained that schools with participative management patterns would be more innovative than those having more authoritarian patterns. The

lack of evidence to support this postulate provided the specific problem of the current investigation.

Classroom openness was selected as the criterion variable of the study because it represented a complex innovation for the schools of Ontario where the study was conducted. This was measured by the "Classroom Openness Questionnaire" that had been developed and validated by researchers at the Education Development Centre in Newton, Massachusetts.

The sample of the study consisted of 469 kindergarten to grade six teachers selected from seventy-five schools located among twenty-two different school boards in Midnorthern and Northeastern Ontario. All responded to Likert's "Profile of a School" questionnaire, form three, that was published in 1971 and to the classroom openness instrument.

The construct validity of the "Profile of a School" was checked by factor analysing all 469 responses to the sixty-five items. This was done because of skepticism created by the incompleteness of Likert's description of the method used to identify the five factors contained within the instrument. When a series of factor analyses identified factors that were clearly different from those proposed by the instrument's author, a second sample of 314 teachers was surveyed to cross-validate the initial findings. These

two series of analyses confirmed the instrument's construct validity by identifying four new factors that were measured by forty-two of the sixty-five items. This revision of the instrument made it possible to subdivide the global management pattern score into two sub-scores labelled self-assessment and subordinate perception. Each of these contained two of the newly identified factors. Teacher leadership and students' influence constituted the self-assessment component and measured conditions at the classroom level. The other two factors, principal leadership and teachers' influence, made up the subordinate perception component of the instrument and measured leadership and influence at the school level. Since these new factors provided a more accurate reflection of Likert's theory, they were used to test the four research hypotheses that are listed below.

H1. There will be a positive correlation between the management pattern scores and the classroom openness scores of elementary schools.

H2. There will be a positive correlation between the self-assessment (SA) part of the management pattern scores and the classroom openness scores of elementary schools.

H3. There will be a positive correlation between the subordinate perception (SP) part of the management pattern scores and the classroom openness scores of elementary schools.

H4. There will be a positive correlation between each of the four management pattern factor scores and the classroom openness scores of elementary schools.

The findings of the investigation confirmed hypotheses one and two ($p < .001$). Hypothesis three was accepted because the significance level of the relationship between SP and classroom openness was .052. This was considered to fall within the five percent confidence level. Hypothesis four [illegible] had to be rejected because one of the factors, principal leadership, failed to meet the criterion for acceptance. Even though principal leadership was not strongly related to classroom openness ("r" = .1600 and $p < .085$) its importance was established by the influence it had as a causal variable on the intervening variable teachers' influence, which, in turn, was described as being causal to teacher leadership that acted upon students' influence. Since these last two variables were very significantly related to the criterion measure, the sequential ordering of the causal, intervening, end result chaining effect established the importance of all four factor scores. Hence, the rejection of hypothesis four must be interpreted in the light of a technicality rather than in the failure of principal leadership to be an important factor.

While most of the relationships between the management pattern variables and classroom openness were positive and significant, the amount of variance accounted for by the different independent variables was not great. It ranged from a low of 0.0256 for the principal leadership scores to

a high of 0.2919 for the self-appraisal scores. This fact suggested that, though a school's management pattern was significantly related to classroom openness, there must be other factors which would cumulatively account for a greater proportion of a school's variance on that construct. Variables such as teachers' technical competence in developing open classrooms and the organizational structure of school boards are two variables that could constitute the elements of further research.

The positive correlations between the management pattern variables and classroom openness have suggested the need for follow-up studies. The most obvious of these would include a replication study. Though there is no valid reason for expecting other Ontario elementary schools to vary greatly from those that were surveyed, the findings cannot be generalized beyond the northern Ontario sample. The low correlations between the independent and dependent variables also suggest the need for testing the same variables under conditions that would produce a wider range of scores than was the case with the sample of this study. If, for instance, two dichotomous groups of classrooms were chosen so that one had high and the other had low openness scores, they would provide the greater variation needed to give a more powerful test of the relationship between the two variables. The positive correlations between the variables also

carry implications for further research concerning the implementation of the new 1975 Ontario curriculum guideline for the primary and junior divisions. Since this document very strongly advocates the principles of open education, its implementation will be, according to the findings of this study, at least partially dependent on the management patterns used within schools. This implication could be tested over a period of time using four treatment groups. One would be given training in the causal variables noted by Likert, a second would be given periodic training in the techniques of open education, a third would have training in both of these areas and a fourth would be selected to serve as a control and receive no training. Before and after measures of classroom openness would provide the means to determine the effectiveness of the different treatments. Classroom openness might also be linked to school achievement. Since previous studies quoted by Likert found achievement to be positively related to school management patterns, and since this study showed management patterns to be related to classroom openness, it can be deduced that openness and achievement should also be positively related. The relationships between various aspects of school achievement and classroom openness, as it was operationally defined in this study, provide the basis for numerous investigations. And finally, the results of the study have suggested the

need for a revision of the "Profile of a School". Further research could be aimed at testing the instrument with a reduced number of items as well as with a more delimited wording of the goal items so that they refer to one group or another.

The study contributed to educational theory and practice from a standpoint of both its findings and its questions. Likert's theory, though critically evaluated at times, has been extended by virtue of its demonstrated relationship with the innovation classroom openness. The measurement of leadership, a perennial question of school administrators, has been advanced by the findings concerning the construct validity of the "Profile of a School". This study also provided an empirical basis for examining subscores or factors within the global measure of a school's management pattern. And finally, the descriptive data for both instruments that was obtained from 469 Ontario teachers has provided comparative information to those wishing to use either of the two instruments for self-evaluative purposes. The findings of the study also revealed a number of questions that may encourage other investigators to further advance the topic that was undertaken.

BIBLIOGRAPHY

Barakat, Halim I., and Mark A. Chesler, "The Innovation and Sharing of Teaching Practices, A Study of Professional Roles and Social Structures in Schools", Ann Arbor, Michigan, Institute for Social Research, University of Michigan, July, 1967, 259 p.

This study sought to determine the personal and organizational conditions that were associated with innovation and the sharing of classroom teaching practices. Significance was found between these dependent variables and teachers' perception of influence, frequency of professional exchanges, pressure to conform to school norms and the amount of professional autonomy insured by the school principal.

Bennis, Warren G., Kenneth D. Benne and Robert Chin, The Planning of Change, 2nd. ed., New York, Holt Rinehart and Winston, 1969, vi-627 p.

The authors maintained, in chapter one, that past efforts at planned change had experienced little success because of an overemphasis on rational elements and power influences. They postulated that more attention must be given to the normative cultures of organizations in order to apply psycho-sociological principles to the change process.

Evans, Judith T., Characteristics of Open Education, Results from a Classroom Observation Rating Scale and Teacher Questionnaire, Newton, Massachusetts, Education Development Center, Aug., 1971, 33 p.

This booklet explained how the instrument used to measure the classroom openness variable of this study was developed. It also provided statistical data about results collected in sixty-two classrooms along with an assessment of the instrument's validity and reliability.

Gehrman, T.H., "An Investigation of the Relationship between Participation and Organizational Climate, An Empirical Study of the Perception of High School Seniors, Teachers, Principals and District Superintendents in Innovative Versus Non-innovative Schools", unpublished Ed. D. dissertation, University of Massachusetts, 1970, 119 p.

Gehrman reported the results of a comparison of scores from the 1969 "Profile of a School" in innovative and non-innovative high schools. Students in the innovative schools gave a significantly higher rating than their counterparts.

Getzels, J. W. "Creative Administration and Organizational Change, An Essay in Theory" in Frontiers in School Leadership, A Synthesized Report of a Seminar, Santa Barbara, California, Centre for Coordinated Education, University of California, January, 1968, 64 p.

This was one of a series of papers presented at an educational leadership seminar in which the author provided a very clear argument for the need for research to be guided by a theoretical rationale. He maintained that research in education suffers from an overemphasis on misguided data collection.

Hall, John W., "A Comparison of Halpin and Croft's Organizational Climate and Likert's Organizational Systems", unpublished Ed. D. dissertation, University of Maryland, 1969, vii-139 p.

Hall found a correlation of 0.59 ($p < .05$) between scores on the part two of 1968 "Profile of a School" and the "Organizational Climate Description Questionnaire".

Hughes, Larry W., "Organizational Climate, Another Dimension to the Process of Innovation", speech delivered to the National Association of Elementary School Principals' Annual Meeting, April, 1971, 38 p.

The speech reported research findings that indicated innovative school districts foster open climates whereas non-innovative areas are characterized by closed climates.

Jackson, George B., "Executive Professional Leadership and Organizational Health", The Canadian Administrator, Vol. 13, No. 5, Feb., 1974, p. 23-27.

A study of executive professional leadership in forty-three British Columbia elementary schools revealed its positive relationship with the school's organizational health, teachers' professional performance, teachers' morale and pupils' academic achievement.

Johnson, Homer M., and Laverne R. Marcum, "Organizational Climate and the Adoption of Educational Innovations", paper presented at the Annual Meeting of the American Educational Research Association, Feb., 1969, 9 p.

This research showed that the organizational climates of innovative schools were significantly more open than were those in non-innovative schools

Klineberg, Allen Jay, "A Study of Selected Administrators from Innovative and Non-innovative School Districts", Lansing Michigan, Michigan State Department of Public Instruction, May, 1967, 173 p.

This study found that principals and superintendents in innovative school districts differed from those in non-innovative districts. The former used a greater number of information sources, had more administrative and professional education experience, allowed greater teacher involvement in curriculum change and gave more recognition to the worth of their staffs..

Lewin, Kurt, "Frontiers in Group Dynamics 1, Concept, Method and Reality in Social Science, Social Equilibria", Human Relations, Vol. 1, No. 1, June, 1947, p. 5-41.

In this article Lewin presented his force-field theory of change in which he maintained that every social group is in a state of quasi-stationary equilibrium. Change in such a group could only occur if a stress was brought to bear upon the system so that its equilibrium would be disturbed by an imbalance in the driving and restraining forces.

_____ "Studies in Group Decision", in Dorwin Cartwright and Alvin Zander, Group Dynamics, Research and Theory, Evanston, Illinois, Row Peterson, 1953, p. 287-301.

In this article Lewin presented evidence to demonstrate how his theory applied to actual change efforts in social situations.

Lieberman, Ann, "The Power of the Principal", p. 35-47 in Carmen M. Culver and Gary J. Hoban, eds., The Power to Change, Issues for the Innovative Educator, New York, McGraw-Hill, 1973, xii-297 p.

Lieberman's research indicated that the principal's effect on the total school culture only occurred when he had high scores on each of task orientation, authority orientation and expressiveness. When principals had medium or low scores the only consistent principal/teacher, teacher/student behaviour pattern was the amount of authority that was used.

Likert, Rensis, The Human Organization: Its Management and Value, New York, McGraw-Hill, 1967, ix-258 p.

The author has described a theory of administration that evolved from a science-based approach to management using research and theory to integrate a number of organizational variables into a compatible set of management pattern systems. The theory places strong emphasis on the value of an organization's human assets for the successful operation and improvement of its performance.

Mahan, James M., "The Teacher's View of the Principal's Role in Innovation", Elementary School Journal, Vol. 70, No. 7, April, 1970, p. 359-365.

Mahan reported on a study of elementary school teacher perceptions regarding the most influential persons in causing curricular changes. The school principal was almost a unanimous choice.

McGregor, Douglas, The Human Side of Enterprise, New York, McGraw-Hill, 1960, x-246 p.

This book provided more than an exposition of theories "X" and "Y". It is first a social science based examination of assumptions underlying managerial practices. Secondly, it presents a series of chapters dealing with the application of theory "Y" assumptions and concludes with a section pertaining to "The Development of Managerial Talent.

Miles, Matthew B., "Planned Change and Organizational Health, Figure and Ground", p. 11-34 in Richard O. Carlson, et. al., Change Process in the Public Schools, Eugene, Oregon, Center for the Advanced Study of Educational Administration, 1965, vii-92 p.

Miles presented his change theory on the basis of the weaknesses he observed in previous studies dealing with the topic. He maintained that the internal dynamics of an organization — its goals, maintenance and adaptability — were more important than either the "thingness of the innovation" or the change agents involved.

Ministry of Education, Ontario, Directory of Education, 1974-75, Toronto, Ontario, 1974, 224 p.

This annual publication provided statistical data about each school, school board and educational region of the province of Ontario.

National Association of Elementary School Principals, "Perspectives on Open Education", The National Elementary Principal, Vol. 52, No. 3, Nov., 1972, 113 p.

This special issue of the journal featured thirteen articles that summarized a variety of perspectives on open education.

Ontario Department of Education, Programme of Studies for Grades 1 to 6 of the Public and Separate Schools, Toronto, Ontario, Ontario Department of Education, 1937, 3rd. ed., 1960, 122 p.

This guide for studies in the primary and junior divisions provided an overview of the official purposes of the elementary schools of Ontario from 1937 until 1971.

Ontario Department of Education, Kindergarten, Toronto, Ontario, Ontario Department of Education, 1966, 93 p.

Kindergarten was prepared as the official curriculum guideline to direct the teaching practices of kindergarten teachers throughout Ontario.

Ontario Department of Education, Living and Learning, The Report of the Provincial Committee on Aims and Objectives in the Schools of Ontario, Toronto, Newton Publishing, 1968, 221 p.

This report concluded that conditions in the province's schools were not congruent with the aims and objectives thought appropriate for the twentieth century societal conditions that existed in Ontario. It recommended that students needed greater opportunities for learning experiences that would lead to better self-understanding, more individualization of content and a greater emphasis on the skills required to live in a rapidly changing technological society.

Province of Ontario, Report of the Royal Commission on Education in Ontario, Toronto, Ontario, Baptist Johnston, 1950, xxiii-933 p.

Pages one to thirty-nine of this report provided a historical overview of education in Ontario and delineated a set of aims for education that summarized the viewpoints of laymen and professionals as they existed during the commission's tenure between 1945 and 1950.

Rensis Likert Associates, The Likert Profile of a School, New Survey Instruments for Public Schools to Improve Organizational Effectiveness, Manual for Questionnaire Use, Ann Arbor, Michigan, Rensis Likert Associates, November, 1972, 160 p.

This manual provided an educational translation of Likert's industrial theory. It identified the causal and intervening human variables which contribute to a school or school system's overall performance and then outlined the use that can be made of the different forms of the instruments that have been designed to measure these variables.

Siepert, Albert F. and Rensis Likert, "Organizing for the Successful Application of Educational Research and Development", a paper presented at the Conference of the Special Interest Group on Research Management, American Educational Research Association, Columbus, Ohio, Nov. 13, 1972, 17 p.

This paper emphasized that the ability to make the changes that are necessary for the application of research

findings is inherent in an organization's management pattern. If a school wished to develop more innovative practices , there must be first, a clear conceptual model of an effective administrative system. An operational measure of the organization's social system was the second step while retraining and involvement of senior officials were the other essential components.

Tye, Kenneth A., "The Principal as a Change Agent", The National Elementary Principal, Vol. 49, No. 4, Feb., 1970, p. 41-51.

Tye added his observations from change efforts in the "League of Cooperating Schools" to a synthesis of the literature on leadership, change process, group dynamics and administrative theory to summarize the school principal's position in creating educational change. He summarized his conclusions by identifying nine principal behaviours and eleven school conditions that were necessary for change to occur.

_____, "The Elementary Principal, Key to Educational Change", p. 25-33 in Carman M. Culver and Gary J. Hoban, The Power to Change, Issues for the Innovative Educator, New York, McGraw-Hill, 1973, xii-297 p.

This chapter recapitulated Tye's earlier conclusions with empirical evidence. The principal was reported to be the key to a school's successful adoption of innovative practices if he created a climate that was characterized by open communication, shared decision-making, cooperative problem solving and tactful management of conflict situations.

Walberg, Herbert J. and Susan Christie Thomas, Characteristics of Open Education, Toward an Operational Definition, Newton, Massachusetts, Education Development Center, May, 1971, 115 p.

The purpose of this book was to provide a systematic description of the concept of open education from a synthesis of the related literature. This led to the development of an analytical framework composed of eight dimensions that were used to select items for an instrument intended to give an operational measure of the openness concept.

APPENDICES

CONTENTS OF APPENDICES

136 Leopolds Dr.,
Ottawa, Ontario,
January, 17, 1975.

Dear .....,

I am writing to request your help with the gathering of some information that is necessary to complete a research study that I am doing at the University of Ottawa. This would involve the completion of two questionnaires by up to eight randomly selected primary-junior teachers from your school. The first questionnaire is a revised form of the Rensis Likert "Profile of a School" that asks general questions about the school environment and the second is a "Classroom Description Index" that asks teachers to rate each of the items according to how well they specifically describe their classrooms. The combined time required to complete both questionnaires is approximately forty minutes.

The main purpose of the research is to test the validity of Likert's theory in an Ontario elementary school setting. If it is confirmed, the study will suggest implications that should be helpful to teachers and principals contemplating program changes.

As you consider participation in this study, please be assured that all responses will be completely anonymous. If you indicate a willingness to help on the attached "School Information Form", the questionnaires will be mailed to you in a few weeks. When they are received it is recommended that you have all respondents complete them at the same time in one common location. These should then be placed in the large, stamped, return envelope and sealed while all are present. Since neither the questionnaires nor the envelope will contain any identifying marks, not even this researcher will be able to identify a given school. The design of the study only requires that the two questionnaires be matched for each teacher. Since the answers to both will be on the same answer form, no identifying marks will be necessary.

The two instruments being used in this research have been well developed with care being given to the statistical procedures that ensure reliability and validity. In addition to the way in which they are being utilized here, there are other ways that they can be used in schools. An extra copy of each questionnaire will be included for you to keep in the event that you may wish to make some future use of them.

When I return to my job in North Bay next September, I would be willing to provide additional information about any part of this study that might be of interest. You could write me at — Ministry of Education, P.O. Box 3020, North Bay, Ontario. In the meantime, may I express my appreciation for the time that you have already taken to consider this request and to return the attached "School Information Form".

Yours sincerely,

William MacKillican
Doctoral Candidate
University of Ottawa

SCHOOL INFORMATION FORM

(Please return this in the stamped, self-addressed envelope.)

Name of Principal .....

School Telephone .....

School Name and Address .....

.....

.....

Will your school be able to participate in the study that has been described?

Yes ☐ No ☐

If you have checked yes, please list, in alphabetical order by surname, the fulltime teachers who work at the junior kindergarten to grade six level. Include only those teachers who have taught in your school for at least one full year. This information will be used to randomly select a maximum of 8 teachers to complete the questionnaires. If you have checked no above, it will be unnecessary to provide the names of teachers.

1	11 .....
2	12 .....
3	13 .....
4	14 .....
5	15 .....
6	16 .....
7	17 .....
8	18 .....
9	19 .....
10.....	20 .....

(Use reverse side if necessary.)

136 Leopolds Dr.,
Ottawa, Ontario,
K1V 7E3
February 5, 1975.

Dear .....,

You will recall that I recently wrote to request your assistance with the gathering of some data that would be used to complete my doctoral thesis at the University of Ottawa. The questionnaires that were mentioned must be ordered very shortly in order to get them to the schools in time for completion before the March holiday. Consequently, I now write to ask for your reply by Tuesday, February 11th. This will leave just enough time for me to get the instruments out to the participating schools by March 1st.

I am sorry to rush you this way. Please understand, however, that I must be ready to process the data at the university computer centre during the time that has been reserved in the week of March 24th. Otherwise, there would be a delay of several weeks. If your response is already in the mail, please ignore this letter.

In my initial letter I mentioned that up to eight teachers would be chosen from larger schools. Please do not interpret this to mean that unless eight are available the school will not qualify. The design of the study calls for a minimum of four teachers and a maximum of eight.

Once again, many thanks!

Yours sincerely,

William MacKillican
Doctoral Candidate
University of Ottawa

136 Leopolds Dr.,
Ottawa, Ontario,
March 24, 1975.

Dear .....,

I am writing once again about the research project in which you agreed to participate. It may be of interest to you to know that 83 schools in the Midnorthern and Northeastern regions of the province agreed to take part. To date, 68 schools have returned completed questionnaires. Because of the large number of calculations that I will be doing, my thesis committee will not allow me to proceed until I have secured a minimum of 80 school returns. For this reason, I am sending this S.O.S. in case your school has not yet been able to return your results.

If you have already sent the returns please accept my appreciation. If you have not yet had a chance to do so, could you possibly help me by completing them within the next two or three days. If I am unable to proceed very shortly, I fear that I will not be able to complete my studies by the time my leave terminates in mid August.

Yours sincerely,

pcbe
P.O. Box 719 - Peterborough, Ont. — 310 Water St. — Phone 743-7431
peterborough county board of education

FILE NO. _____

May 9, 1975.

Memorandum to: Elementary Principals

From: I.A. Woolley, Superintendent of Instruction

Topic: Profile of a School

A request has been received by the Director of Education to ask for your assistance in providing data to Mr. Bill MacKillican for his doctoral study concerning educational leadership. Mr. MacKillican was a former teacher with our Board. You will recall that he provided some outstanding leadership last year for the Vice-Principals of this County in a series of three workshops. In return for this service and hopeful future association with him, the Director asked that you request teachers to complete the enclosed answer form based on the provided questionnaire.

In each bundle the following is provided:

1. Profile of a school teacher's questionnaire form 3
2. An answer sheet for computer print-out
3. An outline of the purpose of this questionnaire
4. General instructions sheet
5. A sample answer form
6. A self-addressed, stamped envelope for return of answer sheets to Mr. MacKillican

Teachers are asked to place their answers on the sheet provided AND NOT in the questionnaire booklet. The completion of this questionnaire should require approximately 15 - 20 minutes and it is suggested that the most efficient manner of handling it is to have the staff complete it at a staff meeting, then place the answer sheets in the self-addressed envelope. You are requested to mail this directly from the school.

The questionnaire booklets are to be returned to I.A. Woolley at the Board Office.

You will note on the sheet outlining the purpose of this questionnaire that all data collected from your school will be treated confidentially and anonymously; it is to cross-validate previous findings.

Since there is some urgency to this, you are requested to have this material completed with booklets returned by May 23rd.

Thank you for your co-operation in this endeavour. It is most appreciated.

APPENDIX 1

The following schools from Northern Ontario agreed to participate in the study:

1. Massey Public, Massey
2. Echo Bay Central, Echo Bay
3. St. Patrick, Azilda
4. St. Joseph, Sault Ste. Marie
5. Sacred Heart, Sault Ste. Marie
6. Grand View, Sault Ste. Marie
7. Alexander Public, Sudbury
8. Wanup Public, Sudbury
9. Eastview, Kapuskasing
10. Smooth Rock Falls Public, Smooth Rock Falls
11. Commando Senior Public, Cochrane
12. Calvert Centennial, Iroquois Falls
13. St. Jerome, Kirkland Lake
14. Whitney Public, Porcupine
15. English Catholic Central, New Liskeard
16. St. Anne's, Mattawa
17. Rosedale Public, Sault Ste. Marie
18. Wm. MacMillan, Sudbury
19. St. Hubert's, North Bay
20. E. W. Norman, North Bay
21. Dr. Carruthers, North Bay
22. Muskoka Falls Public, Bracebridge
23. Iron Bridge Public, Iron Bridge
24. Our Lady of Lourdes, Sault Ste. Marie
25. Sacred Heart, Kirkland Lake
26. Swastika Public, Swastika
27. Central Public, Kirkland Lake
28. Laurentian, North Bay
29. Our Lady of Fatima, North Bay
30. St. Paul, Sault Ste. Marie
31. East View, Sault Ste. Marie
32. R. L. Beattie, Sudbury
33. Churchill Public, Sudbury
34. Joseph H. Kennedy, Matheson
35. Cobalt Public, Cobalt
36. Haileybury Public, Haileybury
37. Kerns Public, New Liskeard
38. Paul Davoud, North Bay
39. Irwin Memorial, Huntsville
40. MacAuley Public, Bracebridge
41. Muskoka Beechgrove, Gravenhurst
42. Mountain View, Goulais River
43. Blind River Public, Blind River
44. Roman Avenue, Elliot Lake
45. Mindemoya Public, Mindemoya

46. Little Current Public, Little Current
47. Corpus Christie, Sault Ste. Marie
48. S.S.#1, Aweres, Sault Ste. Marie
49. St. Bernadette, Sault Ste. Marie
50. Manitou Park, Sault Ste. Marie
51. St. Anne, Hanmer
52. George Vanier, Lively
53. Redwood Acres, Hanmer
54. St. Anthony, Sudbury
55. Clayton Brown, Hearst
56. Diamond Jubilee, Kapuskasing
57. St. Patrick's, Kapuskasing
58. St. Paul, Timmins
59. Queen Elizabeth, Timmins
60. Flora MacDonald, Timmins
61. Schumacher Public, Schumacher
62. Englehart Public, Englehart
63. New Liskeard Public, New Liskeard
64. Burks Falls Junior Public, Burks Falls
65. William Beatty, Parry Sound
66. Victory Public, Parry Sound
67. Our Lady of Sorrows, Sturgeon Falls
68. Mattawa District Public, Mattawa
69. E. T. Carmichael, North Bay
70. Tweedsmuir, North Bay
71. Pinewood, North Bay
72. J. W. Trusler, North Bay
73. Marshall Park, North Bay
74. John XXIII, North Bay
75. St. Mary's, North Bay
76. Sacred Heart, North Bay
77. Spruce Glen, Huntsville
78. Monck Public, Bracebridge
79. Bracebridge Public, Bracebridge
80. Glen Orchard, Port Carling
81. Gravenhurst Public, Gravenhurst
82. Riverside Public, Huntsville
83. Francis H. Clerque Public, Sault Ste. Marie

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PROFILE OF A SCHOOL

TEACHER'S QUESTIONNAIRE

Form 3

This questionnaire is designed to learn more about how students, teachers, school principals, and others can best work together. The aim is to use the information to make your teaching more satisfying and productive.

If the results are to be helpful, it is important that you answer each question as thoughtfully and frankly as possible. This is not a test and there are no right or wrong answers.

The answers on the questionnaires are processed by computers which summarize the responses in statistical form so that individuals cannot be identified. To ensure COMPLETE CONFIDENTIALITY, please do not write your name anywhere on the questionnaire or answer sheet.

On the separate answer sheet, please indicate the name of your school and the length of time you have been teaching there. Your responses to these questions will not be used to identify you. They will be used only to consolidate responses of teachers in the same school.

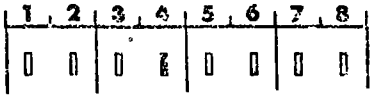
Permission to make seven copies of this instrument, photo-reduced to two-thirds its original size, was granted in writing by Rensis Likert Associates, May 2, 1975.

Instructions

(Teachers)

1. This questionnaire contains a set of alternative answers for each question. These alternative answers form a continuum from one extreme at the left end to the other extreme at the right. A series of descriptive terms is used to define, broadly, four positions along the continuum. Two boxes under each position give eight choices for each question. For example:

2. A separate answer sheet is provided to simplify the machine processing of your responses. On this answer sheet, the boxes are also numbered from 1 to 8. Please indicate your choices on this answer sheet by completely filling in *one* box in the category that best describes your view of that question. For example, suppose the question were this: "How often is your classroom uncomfortably warm?" And your choices: "Rarely," "Sometimes," "Frequently," "Very frequently." If this virtually never happens, you would fill in the first box under "Rarely." If, however, your classroom is sometimes too warm and with a recurrence somewhat closer to "Frequently" than to "Rarely" then the answer you mark on the separate answer sheet would look like this:



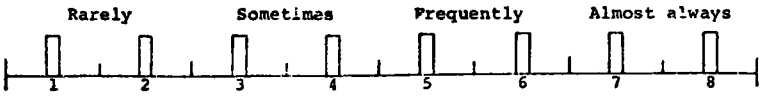
3. When questions are asked about teachers or students in general, answer the questions as a description of the average situation or reaction you have experienced.

4. Please use a soft, black lead pencil (a No. 2 or softer) and remember to fill in the box completely. Erase thoroughly any choice you wish to change. *Do not make any other marks.* Please use the answer sheet for your responses and NOT the questionnaire itself.

5. The questions begin on Page 1 to your right.

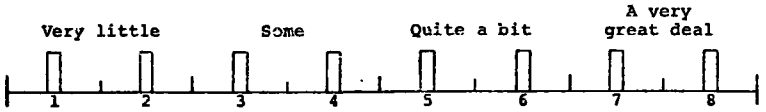
APPENDIX 2

1 How often is your behavior seen by your students as friendly and supportive?

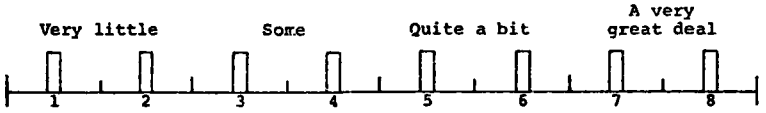


2 How often do you seek to be friendly and supportive to your students?

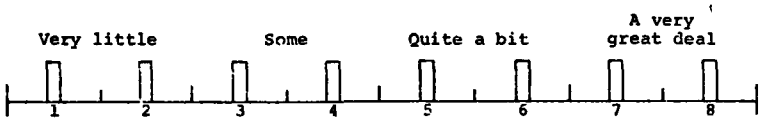
3 How much confidence and trust do you have in your students?



4 How much confidence and trust do your students have in you?

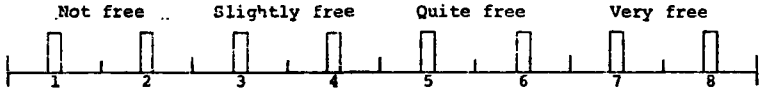


5 How much interest do your students feel you have in their success as students?

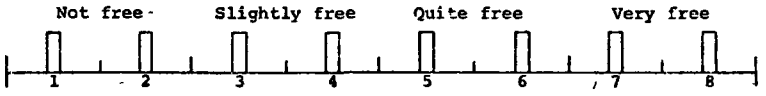


How free do your students feel to talk to you about:

6 a. academic matters such as their work, course content, teaching plans and methods?

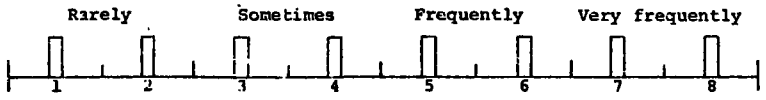


7 b. non-academic school matters such as student activities, rules of conduct, and discipline?

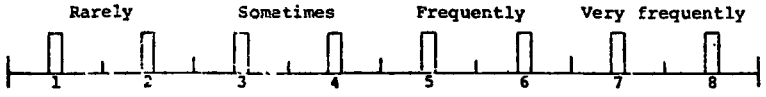


How often do you seek and use your students' ideas about:

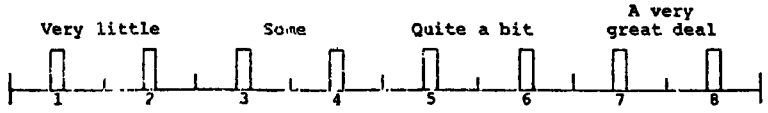
8. a. academic matters?



9 b. non-academic school matters?



10 How much do your students feel that you are trying to help them with their problems?



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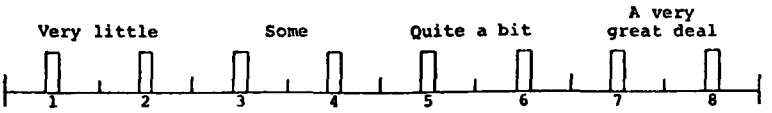
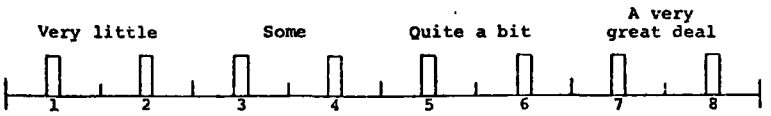
APPENDIX 2

How much influence do you think students *have* on:

11 a. academic matters?

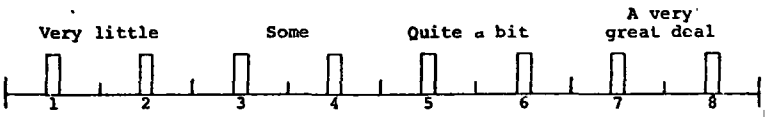


12 b. non-academic school matters?

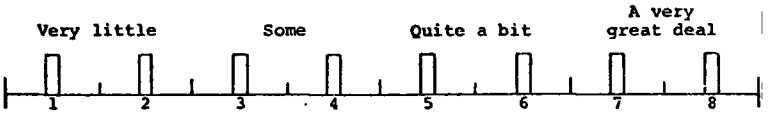


How much influence do you think students *should have* on:

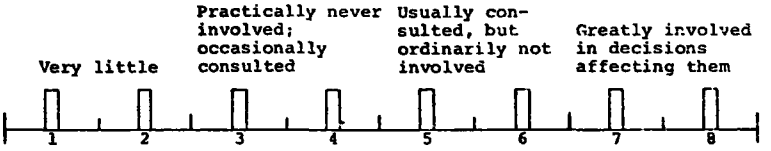
13 a. academic matters?



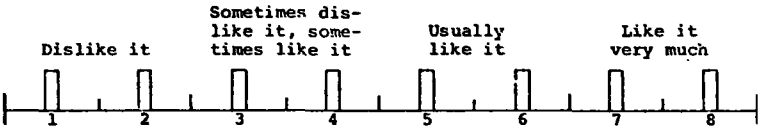
14 b. non-academic school matters?



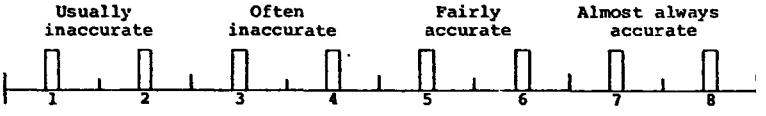
15 To what extent are students involved in major decisions affecting them?



16 What is the general attitude of your students toward your school?

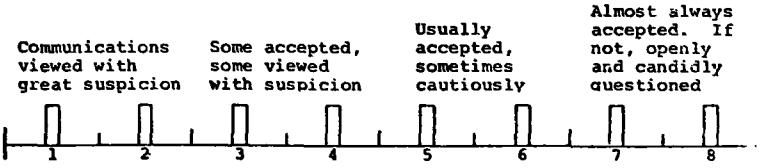


17 How accurate is information given to you by your students concerning class, school, or personal matters?

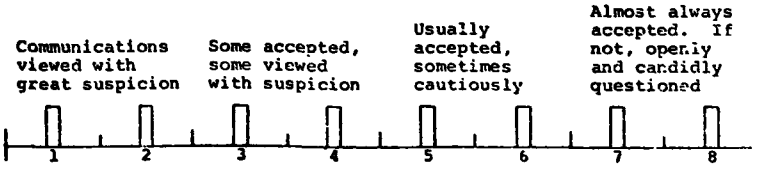


How do students view communications from:

18 a. you?



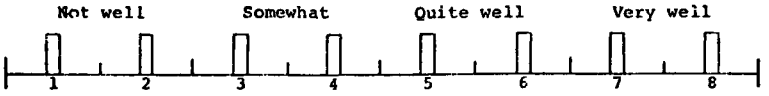
19 b. the principal?



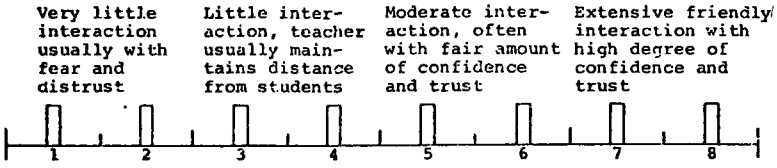
Please turn to Page

APPENDIX 2

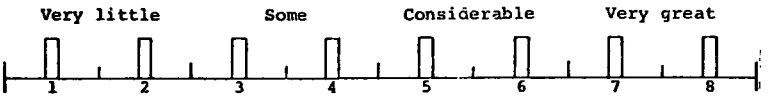
20 How well do you know the problems faced by your students in their school work?



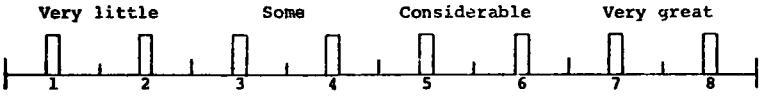
21 What is the character and amount of interaction in your classes?



22 To what extent do your students help each other when they want to get something done?



23 To what extent do your students look with pleasure on coming to school?



24 To what extent do you look forward to your teaching day?

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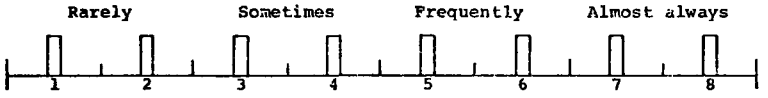
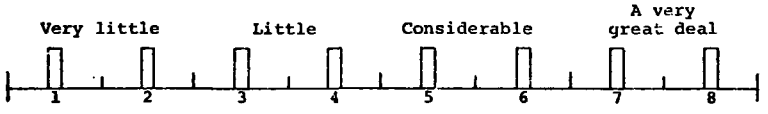
25 To what extent do your students feel excited about learning?

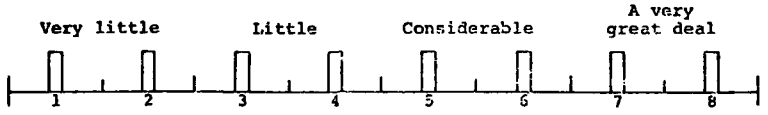
26 How often do you see your principal's behavior as friendly and supportive?



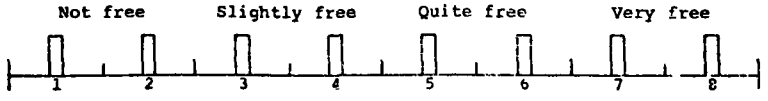
27 How much confidence and trust does your principal have in you?



28 How much confidence and trust do you have in your principal?



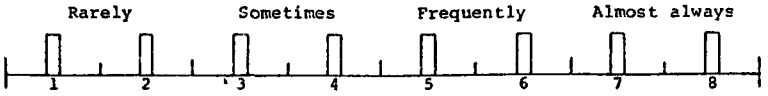
29 How free do you feel to talk to your principal about academic and non-academic school matters?



Please turn to Page 4

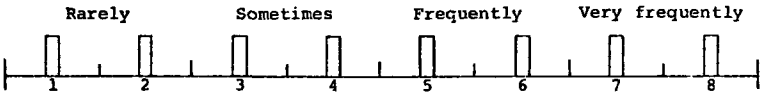
How often do you try to be friendly and supportive to:

30 a. your principal?

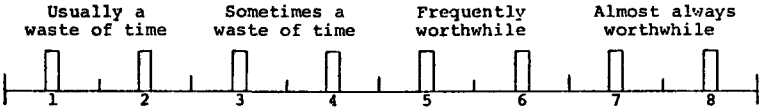


31 b. other teachers?

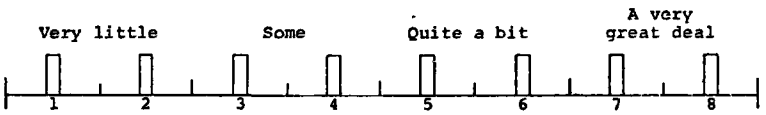
32 How often are your ideas sought and used by the principal about academic and non-academic school matters?



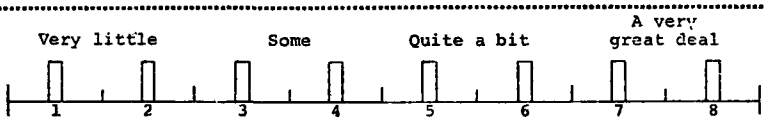
33 In your job, how often is it worthwhile or a waste of time for you to do your very best?



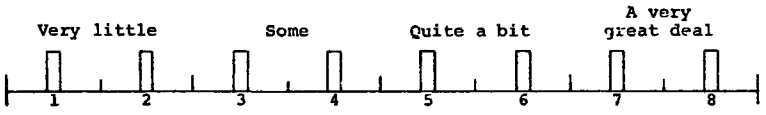
34 How much influence do you think teachers *have* on academic and non-academic school matters?



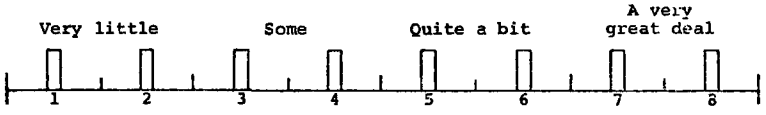
35 How much influence do you think teachers *should have* on academic and non-academic school matters?



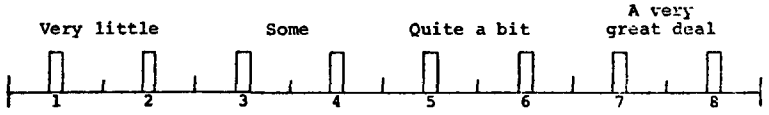
36 How much influence do you think principals *have* on academic and non-academic school matters?



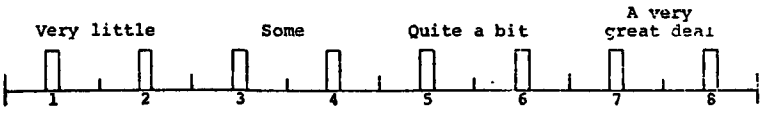
37 How much influence do you think principals *should have* on academic and non-academic school matters?



38 How much influence do you think the central staff *has* on academic and non-academic school matters?



39 How much influence do you think the central staff *should have* on academic and non-academic school matters?



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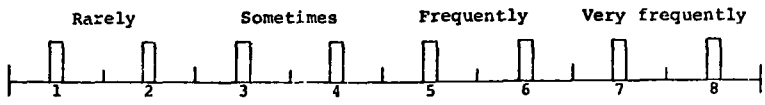
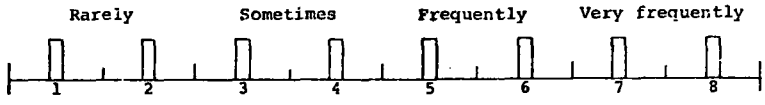
How often are students' ideas sought and used by the principal about:

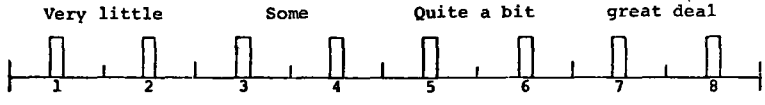
40 a. academic matters?



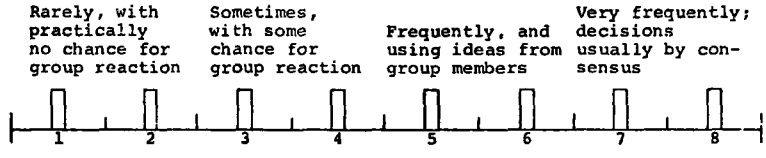
41 b. non-academic school matters?



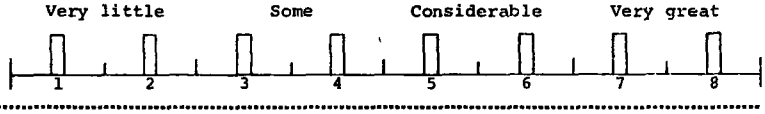
42 How much do you feel that your principal is interested in your success?



43 How often does your principal use group meetings to solve school problems?



44 To what extent does your principal make sure that planning and the setting of priorities are done well?

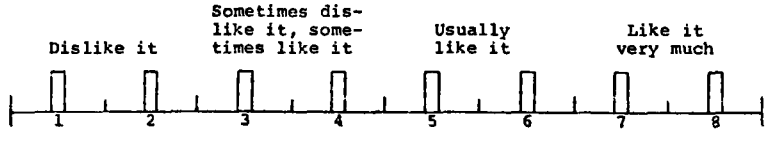


45 To what extent does your principal try to provide you with the materials and space you need to do your job well?

46 To what extent does your principal give you useful information and ideas?

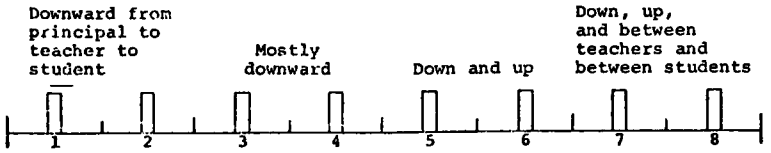
47 To what extent are you encouraged to be innovative in developing better educational practices and course content?

48 What is your general attitude toward your school?

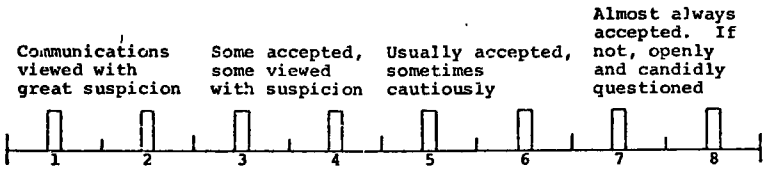


Please turn to Page 6

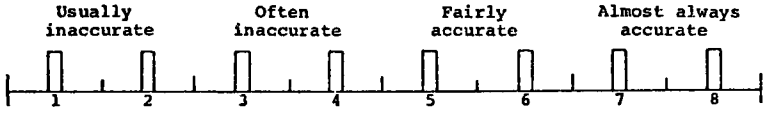
49 What is the direction of the flow of information about academic and non-academic school matters?



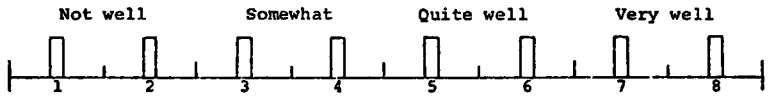
50 How do you view communications from your principal?



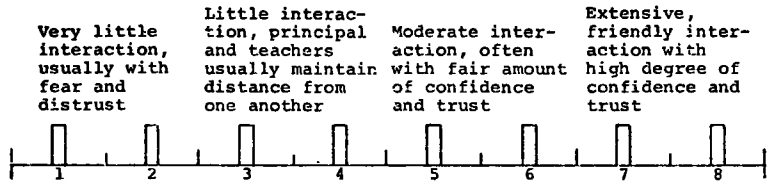
51 How accurate is upward communication to the principal?



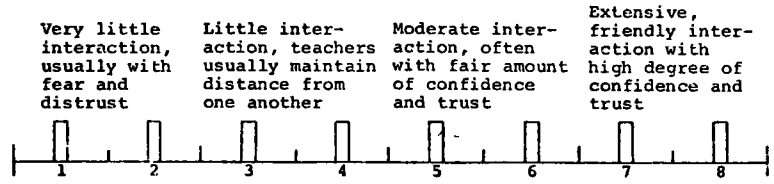
52 How well does your principal know the problems faced by teachers?



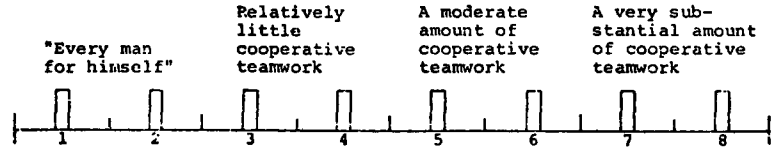
53 What is the character and amount of interaction in your school between the principal and teachers?



54 What is the character and amount of interaction in your school among teachers?



55 In your school, is it "every man for himself" or do principal, teachers, and students work as a team?



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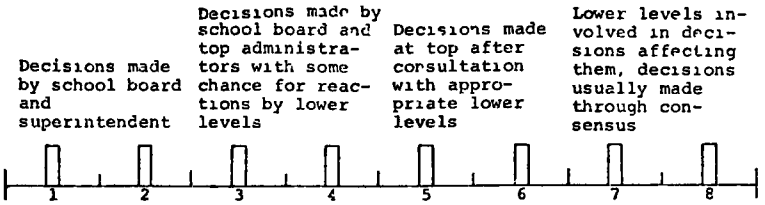
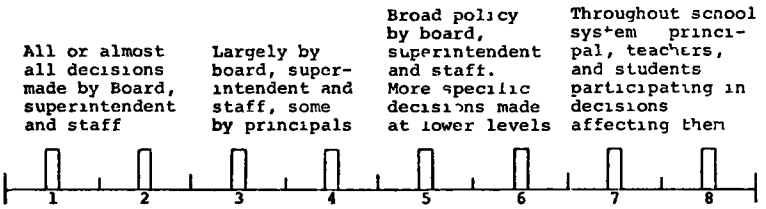
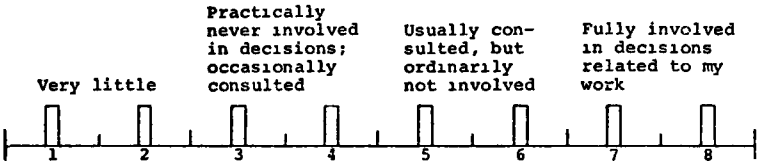
56 How are decisions made in your school system?



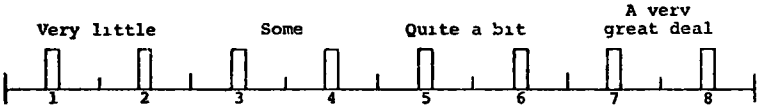
57 At what level are decisions made about academic school matters?



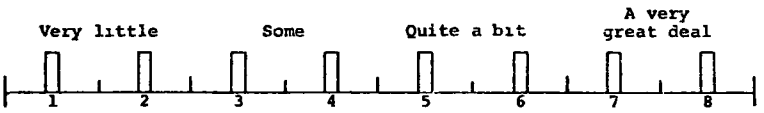
58 To what extent are you involved in major decisions related to your work?



59 How much does your principal try to help you with your problems?



60 How much help do you get from the central staff?



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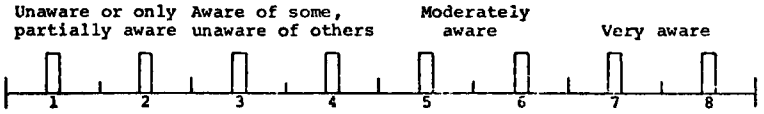
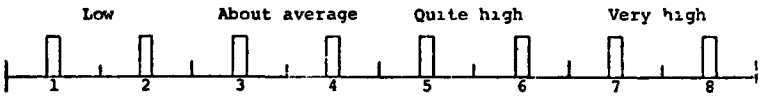
61 To what extent are decision-makers aware of problems, particularly at lower levels?



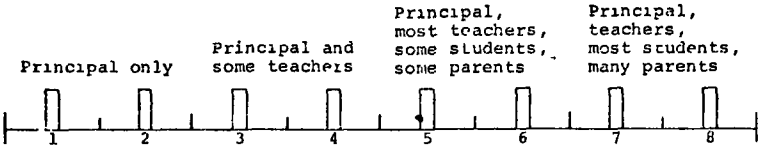
62 How high are your principal's goals for educational performance?



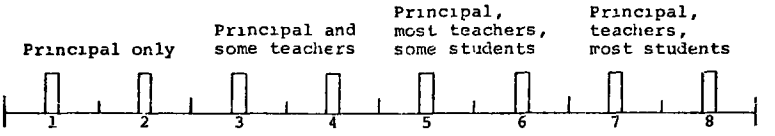
Please turn to Page 8

APPENDIX 2

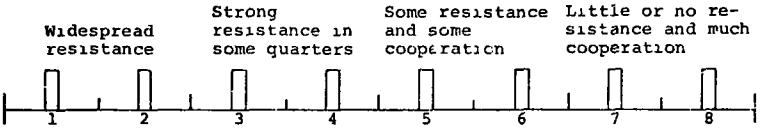
63 Who holds high performance goals for your school?



64 Who feels responsible for achieving high performance goals in your school?



65 To what extent is there student resistance to high performance goals in your school?



Please return this survey booklet with your answer sheet.

Thanks for your help.

Table X

Items from the "Profile of a School, Form Three", that were Used to Calculate the Global Management Pattern Score and Each of Its Sub-scores.

Acronyms[a]	Item Numbers[b]	N[c]
SMP	1, 3 to 12, 15, 17, 18, 20 to 29, 32 to 35, 42 to 59, 61 to 65	51
SA	1, 3, 4 to 12, 15, 17, 18, 20 to 25	20
SP	26 to 29, 32 to 35, 42 to 59, 61 to 65	31
CLIM	55, 56, 57, 61, 63, 64	6
LDR	1, 5 to 10, 15, 21, 26, 29, 32, 42 to 46, 53, 58, 59, 62	21
TRUST	3, 4, 27, 28	4
OIV	11, 12, 17, 18, 20, 22 to 25, 33, 34, 47, 49, 50, 51, 52, 54, 65	18
ENDR	48, [35 - (32+58) ÷ 2]	2

a The acronyms stand for school management pattern (SMP), self-appraisal (SA), subordinate perception (SP), climate (CLIM), leadership (LDR), trust (TRUST), other intervening variables (OIV) and end result variables (ENDR). The meanings of these variables are discussed in chapter one.

b The item numbers are those actually used on the "Profile of School", 1971, form three.

c N stands for the number of items used to calculate the score for each of the variables.

CLASSROOM DESCRIPTION INDEX

INSTRUCTION:

For each of the following statements, choose the number which most closely expresses your estimate of the extent to which the statement is true of your own classroom. If the statement is absolutely not true, choose 1; if it is minimally true, choose 2; if it is generally true, choose 3; if it is absolutely true choose 4. Do not write on the questionnaire. Instead, place your answers on the same answer sheet that was used for the 1st questionnaire. Use item numbers 71 to 120.

	absolutely not true	minimally true	generally true	absolutely true
71. Texts and materials are supplied in class sets so that all children may have their own.	1	2	3	4
72. Each child has a space for his personal storage and the major part of the classroom is organized for common use.	1	2	3	4
73. Materials are kept out of the way until they are distributed or used under my direction.	1	2	3	4
74. Many different activities go on simultaneously.	1	2	3	4
75. Children are expected to do their own work without getting help from other children.	1	2	3	4
76. Manipulative materials are supplied in great diversity and range, with little replication.	1	2	3	4
77. The day is divided into large blocks of time within which children, with my help, determine their own routine.	1	2	3	4

78. Children work individually and in small groups at various activities.	1	2	3	4
79. Books are supplied in diversity and profusion (including reference materials and children's literature).	1	2	3	4
80. Children are not supposed to move about the room without asking permission.	1	2	3	4
81. Desks are arranged so that every child can see the blackboard or teacher from his desk.	1	2	3	4
82. The environment includes materials I have developed.	1	2	3	4
83. Common environmental materials are provided.	1	2	3	4
84. Children may voluntarily use other areas of the building and schoolyard as part of their school time.	1	2	3	4
85. Our program includes use of the neighborhood.	1	2	3	4
86. Children use "books" written by their classmates as part of their reading and reference materials.	1	2	3	4
87. I prefer that children not talk when they are supposed to be working.	1	2	3	4
88. Children voluntarily group and regroup themselves.	1	2	3	4
89. The environment includes materials developed or supplied by the children.	1	2	3	4
90. I plan and schedule the children's activities through the day.	1	2	3	4
91. I make sure children use materials only as instructed.	1	2	3	4
92. I group children for lessons directed at specific needs.	1	2	3	4

93. Children work directly with manipulative materials.	1	2	3	4
94. Materials are readily accessible to children.	1	2	3	4
95. I promote a purposeful atmosphere by expecting and enabling children to use time productively and to value their work and learning.	1	2	3	4
96. I use test results to group children in reading and/or math.	1	2	3	4
97. Children expect me to correct all their work.	1	2	3	4
98. I base my instruction on each individual child and his interaction with materials and equipment.	1	2	3	4
99. I give children tests to find out what they know.	1	2	3	4
100. The emotional climate is warm and accepting.	1	2	3	4
101. The work children do is divided into subject matter areas.	1	2	3	4
102. My lessons and assignments are given to the class as a whole.	1	2	3	4
103. To obtain diagnostic information, I observe the specific work or concern of a child closely and ask immediate, experience-based questions.	1	2	3	4
104. I base my instruction on curriculum guides or the textbooks for the grade level I teach.	1	2	3	4
105. I keep notes and write individual histories of each child's intellectual, emotional, and physical development.	1	2	3	4
106. I have children for just one year.	1	2	3	4
107. The class operates within clear guidelines, made explicit.	1	2	3	4

108. I take care of dealing with conflicts and disruptive behavior without involving the group.	1	2	3	4
109. Children's activities, products, and ideas are reflected abundantly about the classroom.	1	2	3	4
110. I am in charge.	1	2	3	4
111. Before suggesting any extension or redirection of activity, I give diagnostic attention to the particular child and his particular activity.	1	2	3	4
112. The children spontaneously look at and discuss each other's work.	1	2	3	4
113. I use tests to evaluate children and rate them in comparison to their peers.	1	2	3	4
114. I use the assistance of someone in a supportive advisory capacity.	1	2	3	4
115. I try to keep all children within my sight so that I can be sure they are doing what they are supposed to do.	1	2	3	4
116. I have helpful colleagues with whom I discuss teaching ideas.	1	2	3	4
117. I keep a collection of each child's work for use in evaluating his development.	1	2	3	4
118. Evaluation provides information to guide my instruction and provisioning for the classroom.	1	2	3	4
119. Academic achievement is my top priority for the children.	1	2	3	4
120. Children are deeply involved in what they are doing through the day.	1	2	3	4

Table X1

Scoring Guide for Classroom Description Index

ITEM	POSITION (weighted score) 1	2	3	4	ITEM	POSITION (weighted score) 1	2	3	4
1[a]	4	3	2	1	26	4	3	2	1
2	1	2	3	4	27	4	3	2	1
3	4	3	2	1	28	1	2	3	4
4	1	2	3	4	29	4	3	2	1
5	4	3	2	1	30	1	2	3	4
6	1	2	3	4	31	4	3	2	1
7	1	2	3	4	32	4	3	2	1
8	1	2	3	4	33	1	2	3	4
9	1	2	3	4	34	4	3	2	1
10	4	3	2	1	(35)[b]	1	2	3	4
11	4	3	2	1	36	1	2	3	4
(12)[b]	1	2	3	4	37	1	2	3	4
13	1	2	3	4	38	4	3	2	1
14	1	2	3	4	39	1	2	3	4
(15)[b]	1	2	3	4	(40)[b]	1	2	3	4
16	1	2	3	4	41	1	2	3	4
17	4	3	2	1	42	1	2	3	4
18	1	2	3	4	43	4	3	2	1
19	1	2	3	4	(44)[b]	1	2	3	4
20	4	3	2	1	45	4	3	2	1
21	4	3	2	1	46	1	2	3	4
(22)[b]	1	2	3	4	(47)[b]	1	2	3	4
23	1	2	3	4	48	1	2	3	4
24	1	2	3	4	49	4	3	2	1
25	1	2	3	4	50	1	2	3	4

a Item one on this scoring guide corresponds to the item numbered seventy-one on the actual instrument. Two corresponds to seventy-two, and so on.

b The circled numbers indicate those items that were not used in calculating the classroom openness score.

136 Leopolds Drive,
Ottawa, Ontario,
K1V 7E3
February 27, 1975.

Dear .....,

I am most appreciative of the fact that you have agreed to participate in my research project. I am also aware of the inconvenience that it causes both you and your teachers at a time when the workload of all educators is very heavy. Nevertheless, I hope that you will take some consolation in knowing that Dr. Likert (the author of one of the instruments) feels that this study should make a significant contribution to an area of educational research that has been neglected. Because of this potential contribution and the use that may be made of the study, it is even more important that all participants complete the questionnaires under the same conditions. I therefore ask that you rigorously adhere to the instructions, even if some seem unnecessary. It is only from such conditions of likeness that one can draw conclusions about data collected from a large number of schools.

Thank you for your continuing assistance. Perhaps I will be able to return this favour at some future time.

Sincerely,

Bill MacKillican

P.S. The dates mentioned in instruction number 5 are based on the assumption of no serious mail delay caused by prolonged strikes.

APPENDIX 3

INSTRUCTIONS FOR THE SCHOOL PRINCIPAL

1. The two instruments that are attached to this page are for your information only. Please keep them, if you wish.

2. A sufficient number of questionnaires has been included for each teacher listed on the attached "School Information Form". Those names that are crossed off (only applicable if you submitted more than eight names) were removed on a random basis. Both questionnaires should be completed by each teacher appearing on the list, (i.e. by those that have not been crossed off). No principal should return a completed questionnaire. If one of the teachers on the list cannot complete the questionnaires because of prolonged absence, proceed without him/her. Try to get all that are listed but do not delay the completion unduly. No substitutes are allowed.

3. If one of the teachers on the attached list should work in a specialized capacity (e.g. art, music, etc.) where he/she does not have a "home class" for at least part of the day it will be necessary for you to remove him/her as a participant in this study.

4. Arrange for the questionnaires to be completed by all teachers at the same time and in the same place. Please accommodate the teachers so that they will not be interrupted during the 40 minutes (approximately) that they will need to complete both questionnaires.

5. The sooner the questionnaires can be completed, the better. Please ensure, however, that your arrangements allow for them to be mailed back to me no later than March 20th. I have made reservations to begin the analysis at the university computer centre during the week of March 24th.

6. It is essential that the principal not be present when teachers are completing the questionnaires. For this reason select the first teacher on the list to administer the questionnaires. Ask him/her to examine the materials ahead of time to ensure that all procedures are understood. He/she should not discuss the content of the questionnaires with fellow teachers until all have completed them.

7. Once you have turned over all of the materials to the administering teacher your involvement with the data collection is completed.

SCHOOL INFORMATION FORM

(Please return this in the stamped, self-addressed envelope.)

Name of Principal .....
School Telephone .....
School Name and Address .....
.....
.....

Will your school be able to participate in the study that has been described?

Yes ☐ No ☐

If you have checked yes, please list, in alphabetical order by surname, the fulltime teachers who work at the junior kindergarten to grade six level. Include only those teachers who have taught in your school for at least one full year. This information will be used to randomly select a maximum of eight teachers to complete the questionnaires. If you have checked no above, it will be unnecessary to provide the names of teachers.

1	11 .....
2	12 .....
3	13 .....
4	14 .....
5	15 .....
6	16 .....
7	17 .....
8	18 .....
9	19 .....
10.....	20 .....

(Use reverse side if necessary.)

ADMINISTERING TEACHER - GENERAL INSTRUCTIONS

It is essential that the school principal not be present when the teachers are completing the questionnaires. For this reason you have been selected to administer them to your colleagues. As well, please complete one yourself. If you need any assistance please check with your principal. He has a set of detailed instructions. Administration of the questionnaires will involve the following:

1. Review the instructions before meeting the teachers so that you are thoroughly familiar with all procedures.

2. Distribute a package of materials to each teacher that includes the following:

   (i) "Teachers' Information and Instructions" with attached answer sheet
   (ii) "Profile of a School" questionnaire
   (iii) "Classroom Description Index" questionnaire.

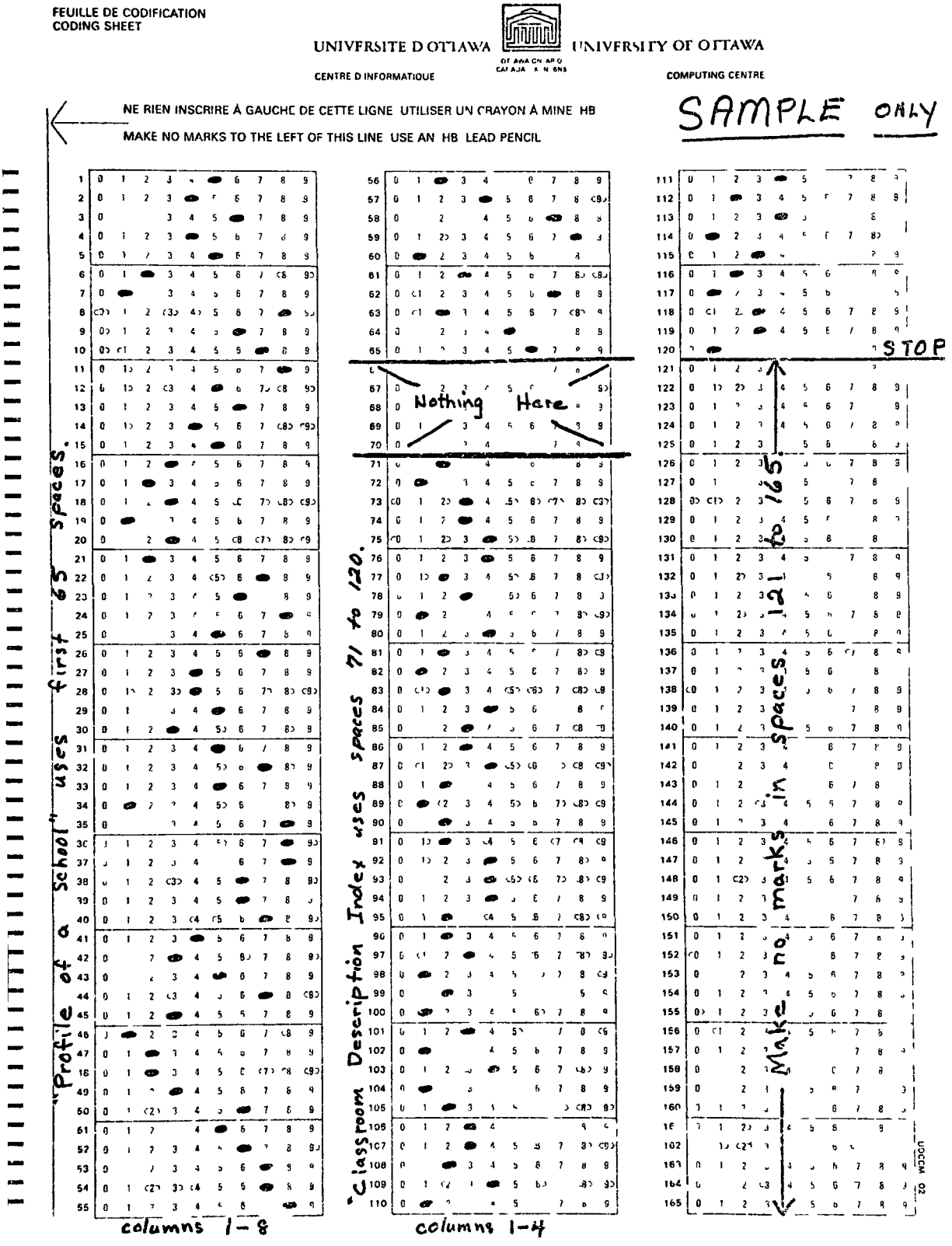
3. Make sure that each teacher understands that the answers are to be placed on the answer form and not on the questionnaires. Show them the sample if necessary.

4. Ask the teachers not to discuss the answers until after they have completed the questionnaires. Then collect the following materials and place them in the return envelope.

   (i) "Teachers' Information and Instructions" with the attached answer form
   (ii) "Profile of a School" questionnaire

   Do not return the "Classroom Description Index" questionnaire.

Many thanks for your assistance.


FEUILLE DE CODIFICATION
CODING SHEET
UNIVERSITE D'OTTAWA
UNIVERSITY OF OTTAWA
CENTRE D'INFORMATIQUE
COMPUTING CENTRE
NE RIEN INSCRIRE À GAUCHE DE CETTE LIGNE UTILISER UN CRAYON À MINE HB
MAKE NO MARKS TO THE LEFT OF THIS LINE USE AN HB LEAD PENCIL
SAMPLE ONLY
"Profile of a School" uses first 65 spaces.
columns 1-8
"Classroom Description" Index uses spaces 71 to 120.
columns 1-4
Nothing Here
Make no marks in spaces 121 to 165.
STOP
UOCCM 02

A. TEACHER'S INFORMATION

1. What grade level do you teach? (mark one with an "X")

   (i) kindergarten (or junior kdgtn.) ☐, (ii) primary (grades 1,2,3) ☐,

   (iii) junior (grades 4,5,6) ☐

2. To the nearest full year, how much teaching experience do you have?

   (i) 1 or 2 - years ☐, (ii) 3-5 - years ☐, (iii) 6-10 - years ☐,

   (iv) 11 or more - years ☐

3. In which salary category do your qualifications place you? (mark X)

   ☐ 1, ☐ 2, ☐ 3, ☐ 4, ☐ 5, ☐ 6, ☐ 7

4. In what type of classroom do you work?

   (i) single classroom (self-contained) ☐, (ii) open space area with at least 1 other teacher ☐

5. How many fulltime teachers are these in your school?

   (i) 1 to 5 ☐, (ii) 6-10 ☐, (iii) 11-15 ☐

   (iv) 16 or more ☐

B. TEACHER'S INSTRUCTIONS

1. Do NOT separate this INFORMATION and INSTRUCTIONS page from the attached computerized answer form. Return them attached so that the information you have provided about your grade level, etc. can be coded onto the answer sheet.

2. Do NOT fold the answer sheet.

3. Complete the PROFILE of a SCHOOL questionnaire FIRST. Follow the directions that are included on the first two introductory pages. Ignore the part referring to name of school, etc. that has been crossed out. Place your answers on the attached answer sheet using SPACES 1 to 65. You will note that the 0 column and the 9 column will never be used. Only those boxes numbered 1 to 8 will be needed.

4. Use SPACES 71 to 120 to answer the CLASSROOM DESCRIPTION INDEX. In this case you will not use the 0 column or any of those above 4.

5. Use a soft HB lead pencil and make no other marks on the answer form.

6. Do not identify either yourself or your school in any way.

7. Please be sure that you use spaces 1 to 65 for the PROFILE of a SCHOOL and spaces 71 to 120 for the CLASSROOM DESCRIPTION INDEX. This is essential for machine scoring. Please answer all questions.

8. Check to see that your information and instructions sheet is still firmly attached to your answer form. Place them in the envelope addressed to Wm. MacKillican and wait until it has been sealed in the presence of all participants after the questionnaires have been completed. This will assure you the anonymity that is required to answer all items as candidly as possible.

Thank you for your contribution to this "research in education" project.

APPENDIX 3

FEUILLE DE CODIFICATION
CODING SHEET

UNIVERSITÉ D'OTTAWA — UNIVERSITY OF OTTAWA

OTTAWA ONTARIO CANADA K1N 6N5

CENTRE D'INFORMATIQUE — COMPUTING CENTRE

NE RIEN INSCRIRE A GAUCHE DE CETTE LIGNE. UTILISER UN CRAYON À MINE HB

MAKE NO MARKS TO THE LEFT OF THIS LINE. USE AN HB LEAD PENCIL

1	0	1	2	3	4	5	6	7	8	9
2	0	1	2	3	4	5	6	7	8	9
3	0	1	2	3	4	5	6	7	8	9
4	0	1	2	3	4	5	6	7	8	9
5	0	1	2	3	4	5	6	7	8	9
6	0	1	2	3	4	5	6	7	8	9
7	0	1	2	3	4	5	6	7	8	9
8	0	1	2	3	4	5	6	7	8	9
9	0	1	2	3	4	5	6	7	8	9
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54	0	1	2	3	4	5	6	7	8	9
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56	0	1	2	3	4	5	6	7	8	9
57	0	1	2	3	4	5	6	7	8	9
58	0	1	2	3	4	5	6	7	8	9
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61	0	1	2	3	4	5	6	7	8	9
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64	0	1	2	3	4	5	6	7	8	9
65	0	1	2	3	4	5	6	7	8	9
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93	0	1	2	3	4	5	6	7	8	9
94	0	1	2	3	4	5	6	7	8	9
95	0	1	2	3	4	5	6	7	8	9
96	0	1	2	3	4	5	6	7	8	9
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112	0	1	2	3	4	5	6	7	8	9
113	0	1	2	3	4	5	6	7	8	9
114	0	1	2	3	4	5	6	7	8	9
115	0	1	2	3	4	5	6	7	8	9
116	0	1	2	3	4	5	6	7	8	9
117	0	1	2	3	4	5	6	7	8	9
118	0	1	2	3	4	5	6	7	8	9
119	0	1	2	3	4	5	6	7	8	9
120	0	1	2	3	4	5	6	7	8	9
121	0	1	2	3	4	5	6	7	8	9
122	0	1	2	3	4	5	6	7	8	9
123	0	1	2	3	4	5	6	7	8	9
124	0	1	2	3	4	5	6	7	8	9
125	0	1	2	3	4	5	6	7	8	9
126	0	1	2	3	4	5	6	7	8	9
127	0	1	2	3	4	5	6	7	8	9
128	0	1	2	3	4	5	6	7	8	9
129	0	1	2	3	4	5	6	7	8	9
130	0	1	2	3	4	5	6	7	8	9
131	0	1	2	3	4	5	6	7	8	9
132	0	1	2	3	4	5	6	7	8	9
133	0	1	2	3	4	5	6	7	8	9
134	0	1	2	3	4	5	6	7	8	9
135	0	1	2	3	4	5	6	7	8	9
136	0	1	2	3	4	5	6	7	8	9
137	0	1	2	3	4	5	6	7	8	9
138	0	1	2	3	4	5	6	7	8	9
139	0	1	2	3	4	5	6	7	8	9
140	0	1	2	3	4	5	6	7	8	9
141	0	1	2	3	4	5	6	7	8	9
142	0	1	2	3	4	5	6	7	8	9
143	0	1	2	3	4	5	6	7	8	9
144	0	1	2	3	4	5	6	7	8	9
145	0	1	2	3	4	5	6	7	8	9
146	0	1	2	3	4	5	6	7	8	9
147	0	1	2	3	4	5	6	7	8	9
148	0	1	2	3	4	5	6	7	8	9
149	0	1	2	3	4	5	6	7	8	9
150	0	1	2	3	4	5	6	7	8	9
151	0	1	2	3	4	5	6	7	8	9
152	0	1	2	3	4	5	6	7	8	9
153	0	1	2	3	4	5	6	7	8	9
154	0	1	2	3	4	5	6	7	8	9
155	0	1	2	3	4	5	6	7	8	9
156	0	1	2	3	4	5	6	7	8	9
157	0	1	2	3	4	5	6	7	8	9
158	0	1	2	3	4	5	6	7	8	9
159	0	1	2	3	4	5	6	7	8	9
160	0	1	2	3	4	5	6	7	8	9
161	0	1	2	3	4	5	6	7	8	9
162	0	1	2	3	4	5	6	7	8	9
163	0	1	2	3	4	5	6	7	8	9
164	0	1	2	3	4	5	6	7	8	9
165	0	1	2	3	4	5	6	7	8	9

UO-CM 02

Purpose of this Questionnaire

This questionnaire is part of a larger study that sought to compare the leadership styles of teachers and principals with their combined effect on classroom practices. When the data of that study was analysed, however, it was found that the "Profile of a School" questionnaire was not measuring what its authors had suggested. As a result of this unexpected finding, I am now compelled to survey another large group of Ontario elementary school teachers to either confirm or reject the previous results in order to complete my doctoral thesis. Needless to say, your help is most appreciated.

The data that is collected from your school will be treated confidentially and anonymously. As you will see from the attached instructions, the responses will be mailed to me in Ottawa so that there will be no way of identifying any school. When the results are returned they will be combined with those from the other schools of your county so that the information can be analysed as one sample. The purpose of this research is to test for relationships among different questions so that items can be grouped to facilitate the statistical analysis in my original study. In this way, you are providing me with information to "cross-validate" (or reject) previous findings. Many thanks for your help.

Bill MacKillican

General Instructions for Cross-validation Study

A. To the School Principal

1. Please ensure that the following instructions are followed as closely as possible so that the data collection procedures will be identical for each school.
2. Distribute the questionnaires to your teachers on the first school day after they are received.
3. Allow three school days to pass and then arrange to have all teachers assemble at a given time to deposit their completed answer forms (but NOT THE QUESTIONNAIRES) in the enclosed envelope that is addressed to Wm. MacKillican.
4. Seal the envelope in the presence of all concerned and give it to the teacher who's surname places him/her at the first of your alphabetical staff list and ask him/her to drop it in the mail. This procedure assures your teachers the anonymity that is required for completely open responses.
5. Do not complete a questionnaire yourself. This form is intended for teachers only.
6. Collect the questionnaires and return them to Ivan Woolley.

B. To the Participating Teachers

1. Use the green computer answer form that is provided

inside each booklet. Do not write on the questionnaire.

2. Make sure your answers are placed in spaces 1 to 65 on the answer form as shown in the sample that is provided.
3. Answer every question, even if some may seem inappropriate for your grade level.
4. Mark the number of your choice for each question with an HB, lead pencil so that the space within the brackets surrounding the number is distinctly blackened — see sample.
5. When you have finished please check to see that each question has been answered and that no item has been marked twice.
6. No marks should appear in columns 0 or 9 of the answer form.
7. Follow all other instructions that are given in the "Profile of a School" booklet.
8. Return your answer form and the unused questionnaire according to the procedures established by instructions 3 and 4 to the school principal.
9. Do not discuss the questionnaire with other teachers before your responses have been sealed in the return envelope.

APPENDIX 3

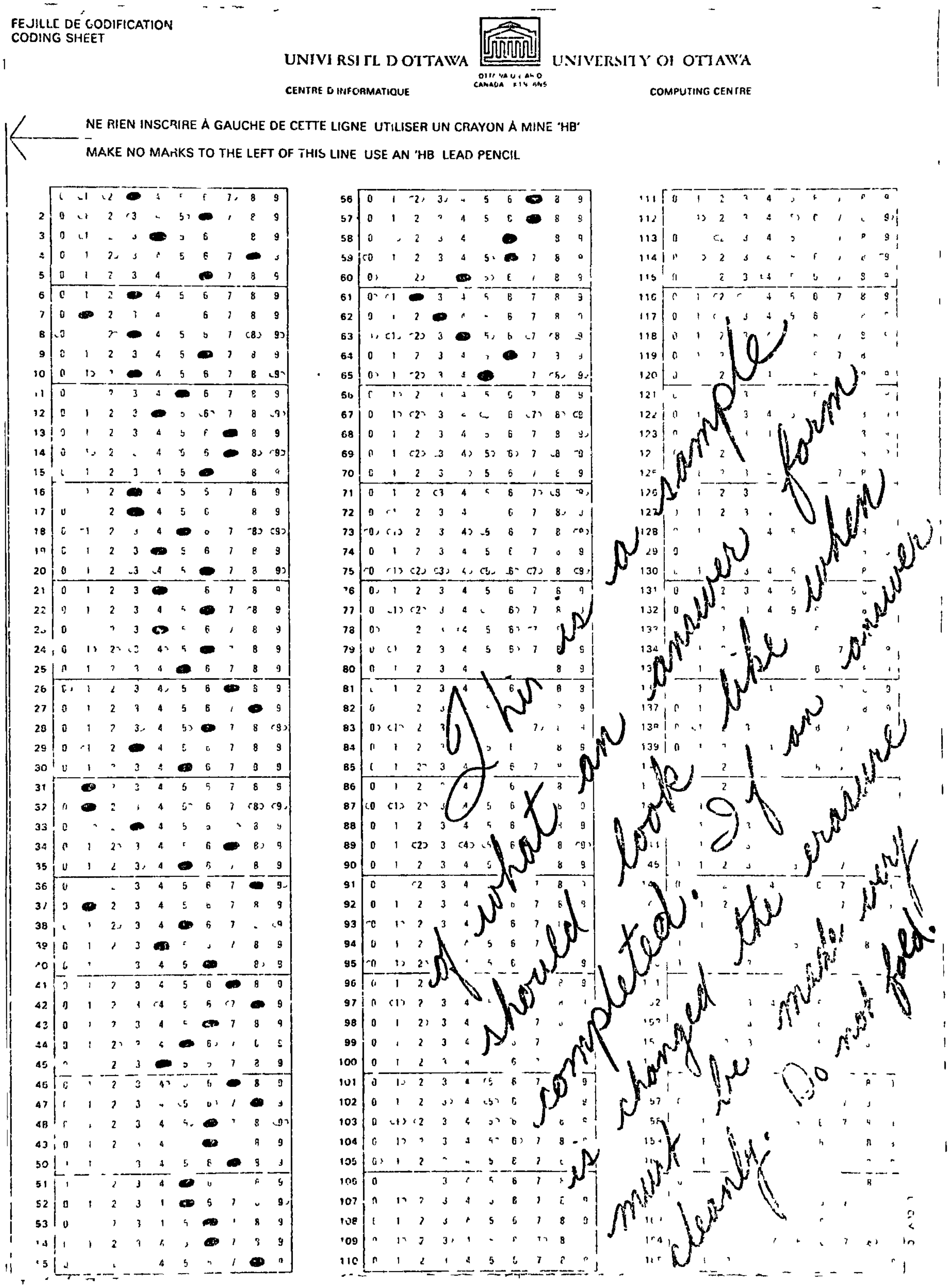
FEUILLE DE CODIFICATION
CODING SHEET
UNIVERSITÉ D'OTTAWA
UNIVERSITY OF OTTAWA
CENTRE D'INFORMATIQUE
COMPUTING CENTRE
NE RIEN INSCRIRE À GAUCHE DE CETTE LIGNE. UTILISER UN CRAYON À MINE 'HB'
MAKE NO MARKS TO THE LEFT OF THIS LINE. USE AN 'HB' LEAD PENCIL
This is a sample of what an answer form should look like when completed. If an answer is changed the erasure must be made very clearly. Do not fold.

Table XII

School Scores for Each of the Variables Based on Likert's Items

School Number	SMP	SA	SP	CLIM	LDR	TRUST	OIV	ENDR	CDI
01	5.0457	6.1833	4.3118	4.1111	4.9206	5.1250	5.3426	5.5000	2.6783
02	6.2157	6.3071	6.1567	5.2857	6.1837	6.8214	6.3254	7.1429	2.6146
03	5.3946	6.1437	4.9113	4.4375	5.4107	5.7188	5.4861	6.3750	2.6308
04	6.1961	6.1786	6.2074	5.5952	6.1020	6.6429	6.3175	6.8571	2.6445
05	5.6274	5.6187	5.6331	4.5833	5.6667	6.0625	5.7014	6.7500	2.3198
06	5.2647	5.4750	5.1290	4.5625	5.0952	5.8125	5.4097	6.6250	2.4855
07	4.5621	5.2417	4.1237	3.9722	4.4762	5.3333	4.6204	4.0000	2.5426
08	5.9176	6.0000	5.8645	5.0667	5.8952	6.5000	6.0111	6.8000	2.7628
09	6.0686	6.0250	6.0968	5.0000	5.9921	6.9583	6.1759	7.3333	2.8140
10	6.2868	6.0625	6.4314	5.1667	6.4345	6.7188	6.2639	7.7500	2.5669
11	6.2778	5.9750	6.4731	5.7500	6.3095	6.5417	6.2870	6.8333	2.7132
12	5.5322	5.9143	5.2857	5.0476	5.6735	5.9643	5.3889	5.4286	2.5681
13	5.8889	5.9333	5.8602	5.0000	6.0397	6.5833	5.7870	6.1667	2.7326
14	5.8291	5.7786	5.8617	4.8333	6.0340	6.3571	5.7222	6.4286	2.8837

Table XII continued

School Scores for Each of the Variables Based on Likert's Items

School Number	SMP	SA	SP	CLIM	LDR	TRUST	OIV	ENDR	CDI
15	4.6274	5.1875	4.2661	3.5833	4.6548	5.3750	4.7917	4.2500	2.4419
16	5.5343	6.0562	5.1976	4.6042	5.3393	6.0313	5.8333	6.6250	2.6744
17	6.4869	6.2333	6.6505	5.7500	6.5000	7.3750	6.4722	7.1667	2.5349
18	5.8431	6.0625	5.7016	4.8958	5.6012	6.4688	6.1875	7.0000	2.6657
19	6.6111	6.2500	6.8441	5.8333	6.7381	6.7083	6.6574	7.6667	2.6938
20	5.9244	6.0500	5.8433	4.4762	6.0612	6.6786	5.9841	6.5714	2.7110
21	5.6634	5.9583	5.4731	5.1111	5.6032	6.0833	5.7407	6.5000	2.4729
22	6.1814	6.3187	6.0927	5.3125	6.0952	7.1875	6.2500	7.0000	2.5610
23	5.5784	6.1250	5.2258	5.5625	5.3155	6.0313	5.6736	6.1250	2.7006
24	5.6078	6.5500	5.0000	4.4167	5.7500	6.1250	5.5139	7.0000	3.4128
25	6.2059	6.0000	6.3387	5.2500	6.0833	6.6250	6.5000	6.7500	2.6919
26	5.9069	6.5250	5.5081	5.3333	5.7262	6.4375	6.1389	6.2500	2.5872
27	5.2297	5.9357	4.7742	4.2619	5.0816	5.7857	5.5079	5.8571	2.7276
28	4.5711	5.4375	4.0121	3.8958	4.4167	5.1250	4.7500	4.6250	2.2733

Table XII continued

School Scores for Each of the Variables Based on Likert's Items

School Number	SMP	SA	SP	CLIM	LDR	TRUST	OIV	ENDR	CDI
29	6.4461	6.1812	6.6169	5.2917	6.6012	6.8438	6.4514	7.5000	2.5959
30	5.4146	5.6571	5.2581	3.8333	5.4830	6.4286	5.5476	5.5714	2.4551
31	5.5686	5.4250	5.6613	3.0167	5.7619	6.1875	5.6250	6.5000	2.5000
32	4.6235	5.2900	4.1935	4.2000	4.4952	5.1500	4.7333	4.4000	2.5442
33	5.1372	5.3625	4.9919	4.3750	4.9643	6.4688	5.1181	6.5000	2.5756
34	6.2516	6.2583	6.2473	5.8055	6.4206	6.5417	6.0741	6.3333	2.8295
35	6.0588	5.9000	6.1613	5.4667	6.2190	5.8000	6.0556	6.0000	2.5860
36	5.8824	5.9500	5.8387	4.5000	5.9405	6.9375	5.9444	7.5000	2.4419
37	5.7395	5.6000	5.8295	4.4286	6.0408	6.5714	5.5476	6.1429	2.5880
38	5.1209	5.6250	4.7057	4.4167	4.8413	6.1250	5.3426	5.8333	2.5581
39	6.3987	5.9667	6.6774	5.3056	6.5159	6.7917	6.4259	7.5000	2.4070
40	6.6588	6.2400	6.9290	6.4000	6.6476	6.8000	6.6556	7.4000	3.0698
41	5.9265	6.2750	5.7016	4.7083	5.7500	6.8750	6.2083	7.7500	2.6047
42	5.3137	5.6500	5.0968	4.3055	5.2302	6.2500	5.4167	6.0000	2.5349

Table XXI continued

School Scores for Each of the Variables Based on Likert's Items

School Number	SMP	SA	SP	CLIM	LDR	TRUST	OIV	ENDR	CDI
43	4.9860	5.7357	4.5023	3.4048	5.0068	5.7500	5.1905	4.7143	2.7841
44	5.7320	6.0917	5.5000	4.6389	5.7222	6.2917	5.8518	6.3333	2.7868
45	6.3165	6.3286	6.3088	5.9286	6.3197	6.6071	6.3333	6.5714	2.9635
46	5.0028	5.3500	4.7788	3.1905	5.0544	5.8571	5.2222	5.8571	2.4252
47	6.1863	6.0750	6.2581	5.7917	6.3333	6.1875	6.0278	6.7500	2.5291
48	4.6863	5.2143	4.3456	3.9524	4.5034	5.1429	4.9127	5.2857	2.5349
49	5.6000	5.7300	5.5161	5.2667	5.4762	6.2500	5.5778	6.4000	2.6186
50	5.8431	5.5786	6.0138	5.3333	5.9932	6.4286	5.6270	6.2857	2.4950
51	5.6723	5.9500	5.4931	5.0952	5.5238	6.5357	5.7619	6.7143	2.6744
52	5.7549	6.0125	5.5887	5.2500	5.7381	5.8750	5.9167	5.0000	2.6686
53	6.2843	5.8750	6.5484	5.7083	6.2619	6.3750	6.3958	7.0000	2.7645
54	5.2969	5.7143	5.0276	4.4048	5.1837	5.8929	5.5476	4.8571	2.5149
55	5.2418	5.7417	4.9194	4.1944	5.3254	5.3750	5.3426	6.1667	2.6783
56	5.4146	5.8571	5.1290	4.6667	5.3673	5.7143	5.5476	6.1429	2.5581

Table XII continued

School Scores for Each of the Variables Based on Likert's Items

School Number	SMP	SA	SP	CLIM	LDR	TRUST	OIV	ENDR	CDI
57	5.6118	5.8800	5.4387	4.5000	5.5143	6.6500	5.7333	6.4000	2.5116
58	5.8946	5.6250	6.0685	5.0625	5.9286	6.7813	5.8264	7.1250	2.6744
59	5.7311	6.0143	5.5484	5.0476	5.5986	6.3214	5.8651	6.7143	2.7375
60	5.1618	5.5312	4.9234	4.8958	4.7738	5.7188	5.4722	4.7500	2.6424
61	5.4902	5.9667	5.1828	4.3611	5.4206	6.0417	5.7037	5.8333	2.5543
62	5.6157	5.5800	5.6387	4.8000	5.7333	6.1500	5.4889	7.0000	2.8744
63	5.5826	6.3500	5.0876	5.0714	5.5102	6.0000	5.6270	6.0000	2.9302
64	5.5294	6.0625	5.1855	4.5417	5.4226	5.8750	5.8611	5.3750	2.9186
65	5.2627	5.8600	4.8774	4.6667	5.2095	5.5500	5.4222	4.8000	2.5907
66	5.7124	5.7000	5.7204	5.3611	5.8730	5.3750	5.6296	6.0000	2.3992
67	5.2892	5.4875	5.1613	4.0833	5.5357	5.8750	5.1944	5.2500	2.4419
68	4.9853	5.3000	4.7823	4.3750	5.0000	5.1250	5.0417	5.7500	2.5640
69	4.8799	5.7562	4.3145	4.0833	4.5059	5.1563	5.4236	4.7500	2.5494
70	5.9730	5.9750	5.9718	4.9792	5.9345	6.6250	6.1111	6.8750	2.8314

Table XII continued

School Scores for Each of the Variables Based on Likert's Items

School Number	SMP	SA	SP	CLIM	LDR	TRUST	OIV	ENDR	CDI
71	6.4874	6.4071	6.5392	6.0952	6.4150	6.4286	6.6111	7.1429	2.8472
72	5.6569	5.7375	5.6048	4.1250	5.8333	6.7500	5.5972	6.0000	2.6686
73	5.5343	5.5500	5.5242	5.4583	5.2738	5.9375	5.6667	6.7500	2.4884
74	5.8407	5.3812	6.1371	4.8333	5.9762	6.1250	5.8264	7.2500	2.3750
75	6.1765	6.5250	5.9516	5.2917	6.3333	6.6875	6.1528	6.5000	2.7151

Rotated Factor Matrix for Factor Analysis One

VARIABLE	FACTOR 1	2	3	4	5	6
1	0.03652	0.60945	-0.05857	0.03343	-0.00950	-0.06084
2	0.00984	0.59900	-0.01671	0.03565	0.00045	-0.01786
3	-0.04448	0.49909	0.01959	0.02014	0.09882	-0.03415
4	0.02630	0.71845	-0.11190	0.01473	-0.05536	0.04719
5	-0.09766	0.71070	-0.04673	0.05040	-0.08950	0.16525
6	-0.04880	0.37574	0.29516	-0.04336	-0.01066	0.24918
7	-0.05021	0.41075	0.29978	-0.00872	-0.02726	0.20758
8	0.07464	0.12020	0.49845	-0.10541	-0.04501	0.18394
9	-0.01237	0.24685	0.48816	0.00120	-0.12604	0.15755
10	0.00156	0.25054	0.11320	0.06152	-0.10655	0.18156
11	-0.01513	-0.15142	0.77165	0.05344	0.07542	-0.04964
12	0.03224	-0.04274	0.77913	0.05399	0.00950	-0.05699
13	-0.03060	-0.04710	0.72515	-0.00630	0.03447	-0.07504
14	-0.03003	0.16392	0.67630	0.00494	-0.01456	-0.02246
15	0.02029	-0.01387	0.53950	0.13840	0.08095	-0.00911
16	0.11749	0.47449	0.10906	-0.02355	0.17362	-0.14980
17	0.00827	0.18173	0.23456	0.02216	0.14757	-0.15369
18	0.02298	0.45961	0.02413	0.02154	0.04407	-0.17941
19	0.40996	0.21124	-0.04647	0.03017	-0.01975	-0.13341
20	0.10836	0.44438	-0.03976	-0.04695	0.04630	-0.04603
21	0.07713	0.54784	0.03916	-0.04397	0.06289	-0.02556
22	-0.00596	0.48798	0.14699	-0.03639	0.17042	0.05797
23	0.00311	0.59732	0.06476	-0.00010	0.12760	-0.09228
24	0.09340	0.46458	0.05752	0.09693	0.15950	-0.14942
25	0.01343	0.53568	0.14536	-0.06348	0.19112	-0.09824
26	0.87436	0.08678	0.03506	-0.10131	0.01396	-0.04484
27	0.77718	0.07922	0.03431	-0.08994	-0.03269	-0.21863
28	0.90432	0.03105	0.02457	-0.04844	-0.00234	-0.04487
[illegible]	[illegible]	0.04108	0.04470	-0.07781	-0.13022	-0.09772
[illegible]	[illegible]	0.20543	-0.00524	0.01715	-0.12471	-0.14164
[illegible]	[illegible]	-0.24330	0.04106	-0.01369	0.20331	-0.15967
32	0.67091	0.00904	0.09775	0.03890	-0.05718	0.04640
33	0.35985	0.33502	0.00926	0.24159	0.00504	-0.13603
34	0.21695	0.03793	0.09745	0.60522	-0.12235	-0.07352
35	0.08719	0.14678	0.12947	0.12775	-0.03562	-0.09851
36	-0.04137	0.14525	-0.04943	0.44450	-0.01048	-0.02832
37	0.32338	0.03110	0.00122	0.13540	0.05641	-0.01943
38	0.19738	-0.04556	-0.00083	0.29254	0.04837	-0.03124
39	-0.03789	0.12183	0.04041	0.22853	0.04726	0.15907
40	0.35700	-0.12672	0.27647	0.21857	0.00708	0.26059
41	0.34630	-0.12778	0.26609	0.16274	0.01746	0.27798
42	0.76031	-0.01352	-0.01524	0.04653	0.06280	0.08252
43	0.53694	-0.12464	-0.01544	0.12957	0.08709	0.23102
44	0.57110	0.06504	-0.11541	0.02494	0.23873	0.29911
45	0.60630	0.03817	-0.02349	0.03274	0.15912	0.15912
46	0.60064	-0.02932	0.00216	0.09441	0.14946	0.35793
47	0.40173	0.01786	0.04072	0.13611	0.19134	0.24927
48	0.62465	0.05534	0.01251	0.02351	0.22414	-0.06390
49	0.35113	-0.11903	0.17491	0.13666	0.12341	0.14149
50	0.69537	0.03075	-0.04805	0.14676	0.01540	-0.01536
51	0.51621	0.02754	-0.01938	0.07771	0.15314	-0.11932
52	0.71659	-0.04383	-0.02038	0.06904	0.10486	0.05069
53	0.76434	-0.06299	0.01360	-0.00610	0.15685	-0.03466
54	0.15786	0.00749	0.05310	0.00267	0.42234	-0.14311
55	0.37348	0.02156	0.05547	0.08741	0.39931	-0.02061
56	-0.10349	-0.10050	0.04243	0.63079	0.08775	0.04266
57	-0.09771	-0.04572	0.03691	0.67951	0.04292	-0.01593
58	0.15260	-0.03089	0.06788	0.52082	-0.00678	-0.06997
59	0.76376	-0.05315	-0.00054	0.04923	0.11067	0.20787
60	0.07299	-0.01948	0.04746	0.16960	0.24904	0.16537
61	0.09672	-0.04730	-0.01221	0.48562	0.12178	0.17660
62	0.09146	0.06920	0.02884	0.06001	0.34478	0.14014
63	0.04263	0.02337	0.02136	-0.03115	0.70460	0.04473
64	-0.00940	0.06371	0.00584	0.04317	0.74366	0.06434
65	-0.06623	0.13194	0.00012	0.11592	0.58849	-0.05483

Rotated Factor Matrix for Factor Analysis Two

VARIABLE	FACTOR 1	2	3	4	5
1	0.03560	0.62204	-0.03435	0.02293	-0.01792
2	0.00641	0.60037	-0.06265	0.04224	-0.01069
3	-0.04661	0.50702	0.08520	0.01748	0.09127
4	0.01390	0.68343	-0.05452	0.06036	-0.07199
5	-0.10391	0.65119	0.01241	0.11905	-0.10483
6	-0.07126	0.29718	0.36643	0.00882	-0.02377
7	-0.06805	0.34603	0.35241	0.06438	-0.03879
8	0.05753	0.06207	0.55064	-0.05021	-0.05105
9	-0.02617	0.19635	0.53797	0.04258	-0.13061
10	-0.01571	0.61839	0.17973	0.12912	-0.12005
11	-0.00480	-0.11555	0.73176	-0.00785	0.08900
12	0.03763	-0.02461	0.76047	0.00530	0.02109
13	-0.02610	-0.02621	0.70405	-0.05622	0.04626
14	-0.03003	0.06669	0.67675	-0.02604	-0.00694
15	0.02645	-0.00289	0.53114	0.13388	0.08569
16	0.12263	0.51004	0.08974	-0.06447	0.16992
17	0.01827	0.32536	0.20626	-0.03547	0.15217
18	0.04158	0.50425	-0.00380	-0.03695	0.04482
19	0.41892	0.24651	-0.07131	-0.01997	-0.01730
20	0.10631	0.49294	-0.03409	-0.04999	0.08831
21	0.07273	0.54876	0.11382	-0.04950	0.05412
22	-0.01680	0.46056	0.18493	-0.01144	0.15393
23	0.00380	0.61992	0.06551	-0.02200	0.12095
24	0.10301	0.50829	0.03209	0.04993	0.15635
25	0.01331	0.55900	0.14000	-0.08728	0.18563
26	0.97847	0.01669	0.03087	-0.12516	0.01345
27	0.78526	0.13322	-0.00874	-0.17408	-0.02035
28	0.97241	0.00123	0.01767	-0.07526	-0.00263
29	0.91053	0.01460	0.03912	-0.12115	-0.12550
30	0.89757	0.23937	-0.02855	-0.04401	-0.11703
31	0.10139	0.29067	0.04696	-0.05806	0.20490
32	0.67223	-0.00170	0.11082	0.04260	-0.06087
33	0.27415	0.37804	-0.01973	0.18430	0.00789
34	0.24194	0.07919	0.06290	0.53464	-0.10698
35	0.09574	0.21552	0.10919	0.08352	-0.03101
36	-0.02621	0.17102	-0.03870	0.42247	-0.01047
37	0.33077	0.04594	-0.01911	0.14436	0.05468
38	0.21073	-0.01107	-0.02182	0.27050	0.04929
39	-0.04228	0.08948	0.07290	0.28422	0.03578
40	0.34956	-0.18313	0.32569	0.29385	-0.00445
41	0.37572	-0.19069	0.32104	0.24604	0.00536
42	0.76083	-0.02920	0.00287	0.07041	0.05370
43	0.52970	-0.17401	0.03016	0.20628	0.07207
44	0.55393	-0.00442	-0.04373	0.14338	0.20801
45	0.54967	0.00332	0.01353	0.09159	0.14275
46	0.58082	-0.11002	0.08106	0.22068	0.12431
47	0.39437	-0.03319	0.04129	0.27304	0.17143
48	0.63285	0.09097	-0.00320	0.00038	0.22125
49	0.35953	-0.14523	0.19852	0.17776	0.11580
50	0.70447	0.04383	-0.05540	0.13138	0.01259
51	0.52884	0.06895	-0.05104	0.03313	0.16367
52	0.72035	-0.04871	-0.01271	0.08205	0.04753
53	0.77176	-0.04642	0.00251	-0.02300	0.16436
54	0.18105	0.05851	0.01332	-0.03889	0.41973
55	0.38131	0.04334	0.05297	0.08503	0.39225
56	0.04659	-0.09020	0.03185	0.64814	0.08497
57	-0.05273	0.00480	-0.00542	0.60808	0.05216
58	0.20677	0.01122	0.03246	0.46318	0.00164
59	0.75457	-0.09966	0.04512	0.12056	0.09510
60	0.06960	-0.04837	0.01571	0.23194	0.23537
61	0.10173	-0.06786	0.00640	0.54064	0.11030
62	0.28450	0.03140	0.01231	0.13921	0.32274
63	0.04077	0.02961	0.02263	0.00882	0.69336
64	-0.01041	0.06878	0.00936	0.09153	0.72945
65	-0.05807	0.16724	-0.02287	0.11462	0.58077

Rotated Factor Matrix for Factor Analysis Three

VARIABLE	FACTOR 1	2	3	4	5
1	0.02003	**0.63090**	-0.00794	-0.00451	-0.01321
2	0.00418	**0.62366**	-0.00227	0.04094	-0.02873
3	0.06023	**0.53771**	0.05248	0.02425	0.08252
4	0.00512	**0.70847**	-0.04323	0.03163	-0.07177
5	0.04724	**0.64022**	0.00160	0.03473	-0.09355
6	0.04150	0.07722	**0.50604**	-0.01028	-0.04707
7	0.04855	0.20455	**0.49671**	0.07109	-0.11997
8	0.02748	0.22545	0.13843	0.07892	-0.09447
9	0.00200	-0.12581	**0.77065**	0.01287	0.07432
10	0.05357	-0.02298	**0.77042**	0.00758	-0.02459
11	0.02331	-0.04872	**0.74975**	-0.05765	0.06331
12	0.02165	0.04318	**0.70100**	-0.03781	-0.00659
13	0.03899	0.03390	**0.52952**	0.15653	0.04525
14	0.12549	**0.53184**	0.07960	-0.03812	0.11340
15	0.01058	**0.48663**	0.01739	0.00467	0.00162
16	0.12166	**0.48017**	-0.03305	-0.05527	0.06980
17	0.05067	**0.37684**	0.08374	-0.03306	0.02936
18	0.00201	**0.49292**	0.16562	-0.03910	0.11489
19	-0.02062	**0.57006**	0.03709	-0.00369	0.11692
20	0.12429	**0.53617**	0.04558	0.02019	0.10463
21	0.00873	**0.59714**	0.13040	-0.06747	0.15987
22	**0.87995**	0.00911	0.01733	-0.10569	0.00058
23	**0.77569**	0.11929	-0.00267	-0.12755	-0.06388
24	**0.91766**	-0.02320	0.02546	-0.06543	-0.01293
25	**0.89618**	-0.00334	0.02202	-0.07485	-0.15302
26	**0.65604**	0.20497	-0.04135	-0.01216	-0.14567
27	**0.60971**	0.01940	0.08099	0.03803	-0.06262
28	**0.26010**	0.05124	0.11519	**0.45661**	-0.08696
29	**0.78257**	-0.02722	0.01389	0.03339	0.02967
30	**0.55376**	-0.15704	0.02120	0.17032	0.08733
31	**0.60124**	0.00211	-0.03842	0.08120	0.21054
32	**0.63463**	0.09513	0.02140	0.08385	0.12609
33	**0.62412**	-0.10226	0.08797	0.11349	0.16429
34	**0.67124**	0.09165	0.00343	0.02155	0.15549
35	**0.70723**	0.02901	-0.04654	0.14312	0.00438
36	**0.58079**	0.05542	-0.03202	0.04135	0.10876
37	**0.74844**	-0.05007	-0.00391	0.05455	0.05626
38	**0.79830**	-0.03668	-0.00357	0.01357	0.08047
39	-0.04290	-0.04544	0.00954	**0.72918**	0.07735
40	-0.07501	0.03648	-0.00655	**0.72439**	0.00764
41	0.20940	0.04953	0.03523	**0.53155**	-0.05809
42	**0.74362**	-0.07748	-0.03603	0.04365	-0.05564
43	**0.13494**	-0.02655	0.00689	**0.53016**	-0.10725
44	**0.11334**	0.04708	-0.03388	-0.01816	**0.70413**
45	0.06280	-0.09038	0.01431	0.06015	**0.75710**
46	0.01269	-0.19674	-0.00159	0.13782	**0.50984**

Rotated Factor Matrix for Factor Analysis Four

VARIABLE	FACTOR 1	2	3	4	5
1	0.00866	0.52305	-0.00907	0.01050	0.32040
2	-0.00819	0.34097	0.06868	0.04729	0.37632
3	-0.04633	0.48874	0.08922	-0.01362	0.08621
4	-0.01020	0.52905	0.04690	0.00088	0.32070
5	-0.00718	0.46567	-0.00854	0.07985	0.30571
6	0.06173	0.11013	0.12921	0.08316	0.37916
7	0.06199	0.15028	0.15645	0.04471	0.51101
8	-0.03234	0.05243	0.53287	0.07739	0.25903
9	0.00219	0.03885	0.49450	0.03895	0.35659
10	0.05500	0.35108	0.13360	0.07739	0.41777
11	0.01033	0.03191	0.64893	-0.09057	0.02843
12	-0.05131	-0.00662	0.72042	0.05361	0.01431
13	-0.04221	0.13273	0.71725	-0.08059	0.00134
14	-0.02598	0.02562	0.66008	0.01770	0.05307
15	-0.00179	0.07202	0.57508	0.11400	-0.08205
16	-0.00174	0.64104	0.00707	0.08744	-0.06221
17	0.07104	0.47580	0.10842	-0.05998	-0.03033
18	-0.05061	0.63620	-0.06094	0.01156	0.01375
19	0.39036	0.36705	-0.09146	0.06446	0.05612
20	0.07945	0.29275	0.08[illegible]4	0.09447	0.20803
21	0.00952	0.63906	-0.03[illegible]4	-0.02736	0.21221
22	-0.00616	0.53988	0.08494	-0.02155	0.01410
23	-0.01150	0.73698	0.02882	0.02346	-0.02386
24	0.21449	0.59247	0.11857	-0.08054	-0.11053
25	0.11349	0.68686	0.08685	-0.00990	0.02363
26	0.89660	-0.01062	-0.01735	-0.05977	0.03020
27	0.67363	0.18116	0.02789	-0.09017	0.03892
28	0.95265	-0.02120	-0.00836	-0.10657	-0.02890
29	0.84868	-0.06907	0.02165	-0.06878	0.03851
30	0.79395	0.05168	0.09300	-0.17924	0.02797
31	0.39723	0.20492	0.14751	-0.06144	-0.06095
32	0.51240	-0.04954	0.20312	0.00441	-0.07100
33	0.27048	0.48551	0.06278	0.02763	-0.22758
34	0.05674	0.29648	0.11081	0.36618	-0.30418
35	-0.00749	0.30254	0.20888	0.02230	-0.04574
36	-0.04008	0.21939	0.08539	0.35140	-0.30008
37	0.18095	0.22574	0.22029	0.06847	-0.22275
38	0.20255	0.07483	-0.00068	0.19416	-0.11318
39	0.07816	0.15260	0.18973	0.11022	-0.08870
40	0.28370	-0.14644	0.45714	0.29555	-0.10096
41	0.27762	-0.17027	0.40193	0.32580	-0.05545
42	0.80656	-0.08938	0.04093	-0.00532	-0.03186
43	0.65606	-0.02246	0.02665	0.07085	0.05377
44	0.63430	0.04183	-0.06424	0.18423	0.01007
45	0.62694	0.04383	-0.05208	0.17844	0.03855
46	0.69147	-0.10672	0.09523	0.15585	-0.03656
47	0.54634	-0.05184	0.04778	0.23442	0.05033
48	0.59386	0.27125	-0.00116	0.01318	-0.12890
49	0.35212	-0.01183	0.14860	0.21362	0.00966
50	0.81153	-0.00786	-0.08712	-0.02610	-0.05173
51	0.58889	0.13515	-0.09463	0.09107	0.00650
52	0.82217	-0.04705	-0.08207	0.06819	-0.03647
53	0.89775	-0.07058	-0.11616	-0.01871	0.00553
54	0.48210	0.17638	-0.05511	0.06613	0.04558
55	0.60167	0.06844	-0.07722	0.13317	0.05174
56	0.00748	-0.13659	0.10577	0.74496	0.02591
57	-0.01415	-0.07017	0.00578	0.71151	0.08967
58	0.02270	-0.06904	0.10317	0.60051	0.05083
59	0.84936	-0.12125	0.06273	0.04291	0.02429
60	0.17603	-0.01249	0.17564	0.41717	0.08324
61	0.05079	-0.03581	0.02742	0.69815	-0.04882
62	0.51753	0.04981	-0.07996	0.23188	0.06204
63	0.13332	0.24044	-0.14277	0.47369	0.05609
64	0.23453	0.20188	-0.16371	0.43637	0.03742
65	0.08063	0.35776	-0.12829	0.39236	0.04174

Rotated Factor Matrix for Factor Analysis Five

VARIABLE	FACTOR 1	2	3	4
1	-0.02796	0.67517	-0.01340	-0.02381
2	-0.05000	0.52655	0.07481	0.00577
3	-0.04005	0.52089	0.05439	-0.01550
4	-0.04416	0.68143	0.04130	-0.03282
5	-0.04513	0.61245	-0.01145	0.04594
6	0.00024	0.30579	0.14254	0.04085
7	-0.01771	0.40857	0.17371	-0.01098
8	-0.06563	0.19325	0.53082	0.06203
9	-0.04842	0.23075	0.49483	0.01172
10	-0.00274	0.55721	0.13969	0.03301
11	0.02793	0.04835	0.67021	-0.07692
12	-0.03715	0.00575	0.70945	0.07105
13	-0.01501	0.13264	0.69870	-0.05069
14	-0.01723	0.05666	0.65227	0.02796
15	0.02503	0.03216	0.55174	0.14458
16	0.03180	0.58638	-0.02897	0.10586
17	0.04960	0.44425	0.03074	-0.04542
18	-0.02867	0.62272	-0.08979	0.01531
19	0.34769	0.38652	-0.10600	0.06400
20	0.04998	0.34494	0.01092	0.07404
21	-0.00235	0.73284	-0.03004	-0.04864
22	0.01610	0.53086	0.05725	-0.01420
23	0.02243	0.69805	-0.00493	0.03831
24	0.26250	0.51101	0.03053	-0.05247
25	0.13917	0.67726	0.05274	0.00063
26	0.89164	0.00383	-0.01301	-0.03097
27	0.67815	0.19492	[illegible]	-0.07234
28	0.95923	-0.03808	[illegible]	-0.10051
29	0.84071	-0.04797	[illegible]	-0.07165
30	0.80021	[illegible]	[illegible]	-0.18003
31	0.40010	[illegible]	[illegible]	-0.06196
32	0.52536	-0.13359	0.20057	0.01976
33	0.32797	0.34655	0.02323	0.05954
34	0.11895	0.13136	0.07152	0.40116
35	0.01890	0.27054	0.18640	0.03600
36	0.01811	0.05977	0.04944	0.34517
37	0.23264	0.10391	0.13665	0.10598
38	0.21773	0.01515	-0.01430	0.21224
39	0.10064	0.10343	0.17024	0.13027
40	0.29111	-0.14884	0.44453	0.33043
41	0.27366	-0.14795	0.39412	0.35302
42	0.80671	-0.10387	0.04237	0.00472
43	0.63945	0.00778	0.02889	0.07167
44	0.61991	0.04824	-0.05905	0.19269
45	0.60940	0.06507	-0.03398	0.18109
46	0.68483	-0.12024	0.09261	0.17250
47	0.52133	-0.01972	0.04757	0.24040
48	0.62143	0.19489	-0.02437	0.04101
49	0.34169	-0.00246	0.14344	0.22460
50	0.81656	-0.03632	-0.08853	-0.01698
51	0.58380	0.13543	-0.10149	0.04596
52	0.81720	-0.05471	-0.08294	0.07914
53	0.88787	-0.06682	-0.11032	-0.01717
54	0.47421	0.19610	-0.06160	0.06628
55	0.58315	0.09542	-0.07919	0.13439
56	-0.03367	-0.10729	-0.10119	0.75716
57	-0.06216	-0.01002	0.00549	0.70794
58	-0.01326	-0.03079	0.09948	0.60683
59	0.83520	-0.10385	0.06769	0.04830
60	0.14331	0.03958	0.17038	0.42403
61	0.02391	-0.05046	0.01353	0.72394
62	0.49104	0.08424	-0.08242	0.24455
63	0.10284	0.27001	-0.15878	0.48268
64	0.20608	0.22200	-0.17837	0.44752
65	0.06191	0.37526	-0.14990	0.40261

Table XIII

School Scores Used in the Modified Analysis

School	SMP	SA	SP	PL	TL	SI	TI	CDI
1	4.9643	6.2063	3.7222	3.8725	6.4286	5.7619	3.0833	2.6783
2	6.1939	6.2381	6.1497	6.5294	6.7551	5.2041	4.5357	2.6146
3	5.3839	6.0119	4.7559	5.0588	6.5714	4.8929	3.4688	2.6308
4	6.1463	6.1429	6.1497	6.6302	6.7551	4.9184	4.1071	2.6445
5	5.6220	5.6429	5.6012	6.0441	6.3036	4.3214	3.7188	2.3198
6	5.1607	5.3631	4.9583	5.1765	5.9554	4.1786	4.0313	2.4855
7	4.5754	5.1825	3.9683	3.9902	5.9762	3.5952	3.8750	2.5426
8	5.9714	6.0000	5.9429	6.3294	6.5714	4.8571	4.3000	2.7628
9	5.9563	5.9127	6.0000	6.4706	6.8690	4.0000	4.0000	2.8140
10	6.2202	5.9702	6.4702	7.1250	6.5804	4.7500	3.6875	2.5669
11	6.2063	6.0317	6.3809	6.8333	6.4286	5.2381	4.4583	2.7132
12	5.5136	5.7755	5.2517	5.4538	6.3775	4.5714	4.3929	2.5681
13	5.9563	5.9444	5.9682	6.3333	6.3929	5.0476	4.4167	2.7326
14	5.8197	5.7075	5.9320	6.3025	6.1224	4.8775	4.3571	2.8837

Table XIII continued

School Scores Used in the Modified Analysis

School	SMP	SA	SP	PL	TL	SI	TI	CDI
15	4.6667	5.1071	4.2262	4.5000	5.8929	3.5357	3.0625	2.4419
16	5.4554	5.9762	4.9345	5.2573	6.4554	5.0179	3.5625	2.6744
17	6.3809	6.0952	6.6667	7.1471	6.6548	4.9762	4.6250	2.5349
18	5.8482	6.0238	5.6726	6.1103	6.4018	5.2679	3.8125	2.6657
19	6.4921	6.1984	6.7857	7.1863	6.6905	5.2143	5.0833	2.6938
20	5.9728	6.0000	5.9456	6.2857	6.5612	4.8775	4.5000	2.7110
21	5.6389	5.9206	5.3571	5.5294	6.2976	5.1667	4.6250	2.4729
22	6.1696	6.3095	6.0298	6.3603	6.9643	5.0000	4.6250	2.5610
23	5.4167	5.9286	4.9048	4.9044	6.5179	4.7500	4.9063	2.7006
24	5.7917	6.5595	5.0238	5.4412	6.7500	6.1786	3.2500	3.4128
25	6.1131	5.9286	6.2976	6.7941	6.4286	4.9286	4.1875	2.6919
26	5.8512	6.5119	5.1905	5.2794	7.0179	5.5000	4.8125	2.5872
27	5.2279	5.8571	4.5986	4.7227	6.4694	4.6326	4.0714	2.7276
28	4.5982	5.3512	3.8452	3.9706	5.7768	4.5000	3.3125	2.2733

Table XIII continued

School Scores Used in the Modified Analysis

School	SMP	SA	SP	PL	TL	SI	TI	CDI
29	6.3988	6.0655	6.7321	7.1838	6.5536	5.0893	4.8125	2.5959
30	5.5102	5.6667	5.3537	5.8823	6.3878	4.2245	3.1071	2.4551
31	5.6012	5.4048	5.7976	6.3088	6.2321	3.7500	3.6250	2.5000
32	4.6000	5.1714	4.0286	4.0588	5.6714	4.1714	3.9000	2.5442
33	5.1101	5.3155	4.9048	5.2426	6.4821	2.9821	3.4688	2.5756
34	6.1786	6.1587	6.1984	6.4216	6.5238	5.4286	5.2500	2.8295
35	5.9333	5.8571	6.0095	6.2471	6.2571	5.0571	5.0000	2.5860
36	6.0298	5.9643	6.0952	6.6176	6.4107	5.0714	3.8750	2.4419
37	5.7449	5.4898	6.0000	6.4370	5.9898	4.4898	4.1429	2.5880
38	5.0000	5.3730	4.6270	4.8431	6.0595	4.0000	3.7083	2.5581
39	6.2540	6.0000	6.5079	7.0588	6.3809	5.2381	4.1667	2.4070
40	6.5809	6.2667	6.8952	7.1059	6.4286	5.9429	6.0000	3.0698
41	6.0059	6.4286	5.5833	6.1176	6.9286	5.4286	3.3125	2.6047
42	5.3532	5.5556	5.1508	5.4902	6.2619	4.1429	3.7083	2.5349

Table XIII continued

School Scores Used in the Modified Analysis

School	SMP	SA	SP	PL	TL	SI	TI	CDI
43	5.0204	5.6122	4.4286	4.7311	6.1429	4.5510	3.1429	2.7841
44	5.6905	5.9682	5.4127	5.8235	6.3452	5.2143	3.6667	2.7868
45	6.2517	6.3333	6.1701	6.3529	6.8571	5.2857	5.3929	2.9635
46	4.9422	5.2857	4.5986	5.1429	5.8163	4.2245	2.2857	2.4252
47	6.1012	6.0119	6.1905	6.3235	6.1964	5.6429	5.6250	2.5291
48	4.6020	5.0884	4.1156	4.2101	5.8877	3.4898	3.7143	2.5349
49	5.5809	5.7619	5.4000	5.5412	6.1857	4.9143	4.8000	2.6186
50	5.7211	5.4694	5.9728	6.2185	6.0204	4.3673	4.9286	2.4950
51	5.6531	5.8843	5.4218	5.7143	6.8367	3.9796	4.1786	2.6744
52	5.8393	6.0595	5.6190	5.7059	6.3929	5.3929	5.2500	2.6686
53	6.1101	5.7917	6.4286	6.8603	6.0714	5.2321	4.5938	2.7645
54	5.3095	5.6939	4.9252	5.1933	6.4388	4.2041	3.7857	2.5149
55	5.2936	5.6190	4.9682	5.2549	6.1667	4.5238	3.7500	2.6783
56	5.3946	5.7823	5.0068	5.2269	6.2551	4.8367	4.0714	2.5581

Table XIII continued

School Scores Used in the Modified Analysis

School	SMP	SA	SP	PL	TL	SI	TI	CDI
57	5.6381	5.6857	5.5905	5.9059	6.5714	3.9143	4.2500	2.5116
58	5.8065	5.5476	6.0655	6.4706	6.1696	4.3036	4.3438	2.6744
59	5.7177	5.9864	5.4490	5.6471	6.6326	4.6939	4.6071	2.7375
60	5.1131	5.5536	4.6726	4.7206	6.2500	4.1607	4.4688	2.6424
61	5.4048	5.8730	4.9365	5.3431	6.4048	4.8095	3.2083	2.5543
62	5.5333	5.4667	5.6000	5.9647	6.1857	4.0286	4.0500	2.8744
63	5.5306	6.1837	4.8775	4.8319	6.7755	5.0000	5.0714	2.9302
64	5.4792	5.9345	5.0238	5.1103	6.4554	4.8929	4.6563	2.9186
65	5.1952	5.7143	4.6762	4.8000	6.1714	4.8000	4.1500	2.5907
66	5.5198	5.5000	5.5397	5.6372	6.0952	4.3095	5.1250	2.3992
67	5.4643	5.5000	5.4286	5.7500	5.6071	5.2857	4.0625	2.4419
68	4.9821	5.2500	4.7143	4.8235	5.5000	4.7500	4.2500	2.5640
69	4.8184	5.6488	3.9881	4.1397	6.2589	4.4286	3.3438	2.5494
70	5.9077	5.9107	5.9048	6.4118	6.6339	4.4643	3.7500	2.8314

Table XIII continued

School Scores Used in the Modified Analysis

School	SMP	SA	SP	PL	TL	SI	TI	CDI
71	6.3673	6.3673	6.3673	6.6302	6.8469	5.4082	5.2500	2.8472
72	5.7798	5.8333	5.7262	6.3235	6.1786	5.1429	3.1875	2.6686
73	5.4821	5.5476	5.4167	5.3824	5.9464	4.7500	5.5625	2.4884
74	5.7470	5.2500	6.2440	6.8015	5.7589	4.2321	3.8750	2.3750
75	6.1964	6.4286	5.9643	6.1912	6.6964	5.8929	5.0000	2.7151

APPENDIX 5

ABSTRACT OF

"An Empirical Study of the Relationship between School Management Patterns and the Change Toward Classroom Openness"[1]

The purpose of this study was to test the innovative aspect of Likert's management systems theory which stated that schools with more participative management patterns would be more innovative. Classroom openness, a complex innovation for Ontario elementary schools, was chosen as the criterion variable to test this theoretical claim.

A sample of 469 teachers from seventy-five schools located in twenty-two different school boards in Midnorthern and Northeastern Ontario replied to two questionnaires. The first was the 1971 "Profile of a School, Form Three" and the second was the "Classroom Openness Questionnaire".

A preliminary analysis of the data, however, indicated that the factors which were supposedly being measured by the "Profile of a School" were somewhat questionable. This problem was studied using a series of factor analyses from the initial 469 sets of responses and cross-validated by a survey from a second sample of 314 Ontario teachers.

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1 William S. MacKillican, doctoral thesis presented to the Graduate School of Education of the University of Ottawa, Ontario, 1975, xii-191 p.

The results produced a reorganization of the instrument that involved the use of forty-two of the sixty-five items to measure four newly identified factors that accurately reflected Likert's theory from which they had been derived. An overall management pattern score and six sub-scores were then calculated for each school and used to test the following hypotheses.

H1. There will be a positive correlation between the management pattern scores and the classroom openness scores of elementary schools.

H2. There will be a positive correlation between the self-assessment (SA) part of the management pattern scores and the classroom openness scores of elementary schools.

H3. There will be a positive correlation between the subordinate perception (SP) part of the management pattern scores and the classroom openness scores of elementary schools.

H4. There will be a positive correlation between each of the four management pattern factor scores and the classroom openness scores of elementary schools.

Pearson "r" coefficients of correlations were used to calculate the relationship between each of the seven management pattern variables and the criterion measure classroom openness. All were positively related with coefficients ranging frlm 0.1600 to 0.5403 with corresponding levels of significance from 0.085 to 0.001. Hypotheses one, two and three were accepted at the five percent level. Hypothesis four had to be rejected because one of the factors, principal

leadership, was not significant at the stated confidence level. The importance of this causal factor, however, is explained by the theory in which Likert maintains that the effects of the causal variables are mediated by the intervening variables to influence such end result variables as the criterion used in this study. For this reason, principal leadership could not be expected to be as closely related to classroom openness as the other variables. Nevertheless, its importance cannot be underestimated.

The research extended Likert's theory by demonstrating that the management patterns of schools are related to their ability to adopt such innovations as classroom openness. It also provided a revision to the "Profile of a School" and suggested some insight into the dilemma that frequently surrounds attempts to effect educational change.

Further research suggested by the study would include (i) a replication, (ii) a study involving training in the management pattern variables as an experimental treatment, (iii) comparing the effects of organizational structure and technical competence on the implementation of classroom openness, (iv) a comparison of school management patterns with schools' ability to implement specific curriculum guidelines that are considered to be innovative, (v) a testing of the theory under conditions where schools or

classrooms were preselected to be either very open or very traditional and (vi) an examination of the other forms of the "Profile of a School" to determine if they also need revision.