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Educational research and educational policy making: A case study of local level utilization

LaCour, Marie Stafford, Ph.D.
The Louisiana State University and Agricultural and Mechanical Col., 1987
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EDUCATIONAL RESEARCH AND EDUCATIONAL POLICY MAKING:
A CASE STUDY OF LOCAL LEVEL UTILIZATION

A Dissertation

Submitted to The Graduate Faculty of the
Louisiana State University and
Agricultural and Mechanical College
in partial fulfillment of
the requirements for
the degree of
Doctor of Philosophy

in

The Department of Administrative and Foundational Services

by

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December, 1987
Acknowledgements

The pursuit of a doctoral degree is a long, arduous journey of discovery, determination, and, sometimes, despair. It could never be undertaken, much less sustained, without the encouragement and assistance of family and friends, both personal and professional. Although it is impossible to name all those who were a part of this endeavor, the recognition of those who played special roles is in order.

Dr. James W. Firnberg, Dr. J. Berton Gremillion, and Dr. Jerry W. Andrews provided the motivation to begin the graduate program. Without their outstanding instruction and leadership during the early years of graduate work, this author would never have attempted the doctoral program. Thank you, gentlemen, for being the models for those of us who followed you.

The development of this dissertation could not have proceeded without the assistance of many people. The information compiled during the study originated from such diverse sources as the Louisiana State Department of Education, the Board of Elementary and Secondary Education, Louisiana State University, and personnel from all levels of the Rapides Parish School System. All the individuals contacted for data requested from these sources were most gracious and generous in their cooperation. The author gratefully acknowledges their assistance.

The complete support of Mr. Allen Nichols and the support and
expertise of Mr. Eugene Millet, Mr. Tommy Smith, and Mrs. Linda Culpepper were instrumental to the design and implementation of the research study. Mr. Vernon Ventress, of Science Research Associates, generously supplied testing materials. Ms. Beatrice Baldwin and Ms. Gabie Church contributed the statistical expertise. Mrs. Pattie Killen spent countless hours typing and formatting the text. Their assistance has been invaluable and is duly noted.

Special thanks are rendered, also, to the members of the author's doctoral committee. The chairman of the committee, Dr. Jonathan Shapiro, shouldered the burden of guiding the completion of a project already originated, and has done so with infinite patience, sound advice and enormous dedication. His continuing support is deeply appreciated. Dr. Richard Lomax and Dr. Robert Mathews provided encouragement throughout the entire program. Their thoughtful suggestions and continued assurances are deeply appreciated. Dr. Joseph Licata and Dr. Chad Ellett contributed extensively to the amplitude of this dissertation. Their whole-hearted participation and enthusiasm will never be forgotten. Appreciation is also expressed to Dr. George Rogers, of the School of Music, who served as the outside committee member.

During the entire project, with all of its vicissitudes, I have received the complete support of my family. To my mother, my sisters and my children, I express my eternal gratitude. Thank you for your patience with my distractions and your confidence in my success. I never could have completed this work without you.
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Abstract

This study examined the relationship between evaluation of curriculum policies and utilization of evaluative results at the local level. The central question in the study concerned the influence of locally conducted evaluative research on the nature and extent of organizational policy decision making.

Public school decision makers from four levels of responsibility participated in the study. School board members, central office administrators, principals and teachers were asked to respond to a summary of the results from a study evaluating a local curriculum problem and to answer a questionnaire documenting respondent perception of the relevance of local research to policy decisions.

Descriptive statistics were generated to determine the respondents' views regarding the research data interpretation, policy change perceptions, evaluation information dissemination and evaluation information value to the school system. Analyses inspected these data holistically and by administrative level. Interviews were conducted with representative personnel selected from each group to further clarify the meaning of events to the participants and the context in which the events had occurred. A subsequent round of interviews further delineated these clarifications.

Data from both qualitative and quantitative sources indicated that utilization of the evaluation study had occurred. The nature of
the utilization was both conceptual and instrumental and consisted of
districtwide and school change. Utilization of the evaluation results
was not recognizable across all classrooms due to a lack of formal
dissemination of the evaluation results to the teachers. Factors
determining the degree of utilization were dependent on individual
role and experience. Research and utilization at the local level
assumed the role of educator in addition to the more widely recognized
role of decision or implementation.

The results of this research suggest that the study of utilization requires a more complex definition and measurement of the
concept of utilization. Also, research should regard the organization
rather than an individual decision maker as the proper unit of
analysis and should employ a participant-observation design in a real
utilization instance whenever possible.
Policy evaluation, as practiced with respect to education during the last two decades, has concentrated on the complexities encountered at federal or state levels. Little evidence of interest in policy decisions at the local level can be found (Cuban, 1984; Murphy & Hallinger, 1984). Yet a growing body of evidence indicates that attention to the local or district decision-making procedure could be productive. Expedited by a tradition of decentralization in American public education (Clark & Amiot, 1981; Kaplan, 1982; Schuster, 1982) and encouraged by research results focusing on effective schools (Brookover, Beamer, Efthim, Hathaway, Lezotte, Miller, Passalacqua, & Tornatzky, 1982; Rutter, Maughan, Mortimore, Ouston, & Smith, 1979; Stallings & Mohlman, 1981; Wellisch, MacQueen, Carriere, & Duck, 1978; Wynne, 1980), the local arena tends to be the site of policy decisions that can have the most significant impact on student achievement (Cuban, 1984; Murphy, Weil, Hallinger, & Mitman, 1982; Murphy & Hallinger, 1984). This study examines the effect of an evaluation of state-mandated curriculum reform upon subsequent local policy making. The background is presented below.

The decline of scholarship and achievement among adolescents in the United States during the last two decades has precipitated study into every facet of the teaching-learning process. As outlined by the National Commission on Excellence in Education in its report A Nation
at Risk: The Imperative for Educational Reform (1983), many of the major weaknesses in American education today involve the teaching and learning of mathematics. In response to the Commission, many states, upon reviewing their requirements for high school graduation, have revised these prerequisites. Such is the mandate by the Louisiana Board of Elementary and Secondary Education (1984) demanding a more stringent curriculum for the 1988 graduate. No guidelines were suggested by the Board to facilitate the implementation of these new requirements. The individual school systems were left to manage the circumstances as best they could, knowing that many adolescents would be assigned to courses that they had not expected to take. Because of inadequate planning and preparation, many of these students would fail. A means of identifying those most susceptible to failure would allow for corrective strategies and interventions, thus facilitating the transition to the higher standards, which include Algebra I and Algebra II or Geometry. Establishing the degree of preparedness of these students in terms of their emotional response to these new requirements, as well as their mathematical readiness, could be the first step toward the identification of this goal. Analysis of these findings could serve as a guide for local implementation policy.

This study describes the effects of evaluation on policy making in one Louisiana school district affected by the state reform mandate and the response of that district to the reforms. Several areas of uncertainty needed to be resolved by the district. Was there a single best way to implement the new reforms? Must all schools in the district follow the same plan or could variations in the
implementation structure be useful? Would the different school populations react differently to the requirements of the mandate? If answers to questions such as these could be ascertained, would the board act on the information and adopt policy accordingly? Could steps be taken to enhance board action?

Although research shows several factors that influence evaluation utilization, few models could be found for an investigation of "real" research use in a local policy setting. In a recent review of 65 empirical studies conducted during the past 15 years on the use of evaluation results, Cousins and Leithwood (1986) organized these factors into two general categories. One group focuses on implementation, including such variables as evaluation quality, credibility of the evaluator and/or the evaluation process, relevance of the evaluation to the information needs of the decision makers, communication quality of the reported results, the results themselves, and the timeliness of the results to the users. The other group is more oriented toward the policy setting and includes such variables as the information needs of the user, decision characteristics such as novelty and impact, political climate, competing information, personal characteristics of the decisionmakers, and the general attitude of the users toward evaluation. Cousins and Leithwood (1986) also classified these studies by the type design each employed, and identified three basic types, retrospective, longitudinal, and simulation. They assert that "retrospective studies focused on previous evaluations, relied for data mainly on the memories of decisionmakers, sponsors, and/or evaluators, and sometimes resorted to anecdotal accounts" (p. 333),
while "longitudinal studies examined the influence of data gathered prior to, during, and/or after evaluation implementation; although they sometimes involved the manipulation of independent variables, such studies failed to allow sufficient time to determine the impact of evaluation results" (p. 341). Simulation studies "usually employed contrived evaluation reports to test, under highly controlled conditions, for effects on anticipated uses " and "tended to lack important characteristics of actual decision settings" (p. 341). Of the 65 studies they had identified, Cousins and Leithwood (1986) designated 21 of them as simulations. A utilization study of an actual policy setting could contribute valuable insight into the contributions social science research can make to the policy process.

STATEMENT OF THE PROBLEM

The problem in this study is threefold; (1) to ascertain whether evaluation research information was utilized in policy decisions concerning mandated curriculum reform, specifically, in Algebra I; (2) to determine the nature of the utilization, that is, was it instrumental or conceptual; and, (3) to identify the conditions that contributed to the utilization. Since instrumental use is decision specific, while conceptual use affects the more comprehensive understanding of a situation (Weiss, 1982), knowledge of the nature of the utilization could facilitate future curriculum reform efforts.
LIMITATIONS OF THE STUDY

The study has several limitations. Most of these are due to a lack of standardization in the field of utilization study, encompassing a wide range of the analysis process. Limitations here exist due to conceptual nonuniformity, a lack of standard definitions as to what is being studied, and a lack of instruments with which to measure the relevant variables. Indeed, a lack of standardized methodology in the field of utilization poses difficulties in any utilization study. In their review of evaluation utilization, Cousins and Leithwood (1986) found a variety of theoretical orientations, such as communication, organizational behavior decision, or evaluation theories. No theoretical framework at all was mentioned in 27 (42%) of the 65 studies, which is consistent with the claim that evaluation utilization theory is poorly developed (Brown, Newman, & Rivers, 1985; Ripley, 1985, Williams, 1986a).

Other limitations exist due to the distinctiveness of the study. The relationship between evaluation and utilization was analyzed as it affected one district. The size of the sample and the use of a single interviewer and the subsequent perception of the data by the interviewer, as well as the perception of the evaluation results by the utilization study respondents, may limit the generalizability of the study.
RESEARCH QUESTIONS

The basic question raised in this study is:

Can evaluation research contribute to the policy-making process at the local level? Specifically:

1. Will utilization of research results occur, that is, does knowledge of students' characteristics impact curriculum decision?

2. What is the nature of the utilization, that is, is use instrumental or conceptual?

3. If this information is utilized, does use consist of district-wide changes only or of school-by-school changes?

4. Can use of this information be identified in changes in classroom practices?

5. What determines the degree of evaluation utilization?

6. What role can evaluation research information play in a political decision process?

SIGNIFICANCE OF THE STUDY

Can basic research impact on policy? More specifically, can policy instituted at the state governing level for implementation at the local level be facilitated by findings derived from a basic investigation at the implementation level?

The policy investigated by the social science research project was generated by the wave of curriculum reform that followed A Nation
at Risk (1983). The new minimum requirements for a Louisiana high school diploma, effective for the 1984-85 incoming freshmen, total 22 units, one of which is Algebra I. Two more units in mathematics, specifically (1) Algebra II and Geometry, or (2) Algebra II or Geometry and one of the following: Advanced Mathematics, Calculus, Consumer Mathematics, or Business Mathematics are also required. These courses and, effective for the 1985-86 incoming freshmen, a one-half unit course in Computer Literacy plus another half-unit elective, have raised the mandated credit total to 23 units for the Senior Class of 1988-89. Failure of more than one course during the usual four-year period will either deny graduation as planned or necessitate extraordinary procedures such as attendance at summer school or enrollment in courses by correspondence. The burden of such procedures, both emotionally and financially, could be enormous.

The amelioration of these potentially devastating circumstances is paramount. Louisiana already claims the dubious honor of being the nation's leader in the number of high school drop-outs. Policies which exacerbate this problem should be avoided or at least revised. If no changes can be allowed at the high school level, then perhaps policy change in the junior high, mandating a course or courses in pre-algebra should be considered. Understanding the conditions under which social science research can contribute to educational policy making and the nature of such contributions will clarify the potential cost and benefits of undertaking such an effort in specific educational policy situations.

But the evaluation literature generally concedes that little work
has been done under these conditions. Although a few studies of utilization have been executed, most of them have been simulation studies. Very few studies have been attempted using real data. Few of the researchers have had strong ties to the policy setting or the decision makers, a situation which could allow the significance of results, particularly in the affective domain, to be overlooked. A study conducted by such a researcher could illuminate many of the conditions, motives, and relationships unknown to someone unfamiliar with the setting, adding to the general knowledge base.
CHAPTER II
REVIEW OF THE RELATED LITERATURE

In light of the problem statement expressed in the study, the literature review focuses on evaluation utilization, how it is defined and identified, and what determines its implementation. As a background, the first section peruses educational policy analysis from historical, conceptual and methodological perspectives. The second section delves into the aspects of evaluation utilization relevant to the study. The third section examines briefly literature pertaining to mathematical learning theory, which provided the basis for the social science research example employed in this study. Emphasis is placed on that research which integrates components of cognition and affect. Finally, the review inspects the state policy which generated the interest in the study, its rationale, implementation, and the major conflicts it has produced.

Educational Policy Analysis

Policy: The Concept

Definitions of the term policy are numerous. Some are broad and vague, such as "what governments say and do" (Dubnick & Bardis, 1983, p. vii). Other writers prefer to summarize several definitions found in the literature and offer a revision of their
own (Rich, 1974). Still others, such as Iannaccone (1975), state no definition. Jones (1977) asserts that "policy is what the findings lead me to conclude in respect to the questions I have asked" (p. 4). Most writers, however, view the term "policy" as ambiguous and hasten to at least clarify its use (Frohock, 1979; Guba, 1984).

Guba (1984) offers eight definitions of policy, but argues that the eight imply three policy types. He labels these policy-in-intention, or statements about policy; policy-in-implementation, that is behaviors or activities exhibited during the process of implementation; and policy-in-experience, or that which is actually experienced by the recipient or client of the policy. Guba states four definitions of policy under his first type; namely, (1) goals or intents, (2) standing decisions, (3) guides to discretionary action, and (4) problem-solving strategies. Under his second classification, he sees policy as (5) sanctioned behavior, (6) norms of conduct or (7) output of the policy-making system. His last definition, the impact of the system as experienced by its recipient, is unique within its category. Guba stresses that no one definition of policy is more accurate than another, but that each demands its own data, sources and methods, and produces unique outcomes (Guba, 1984).

Frohock (1979) defines policy as a "patterned attempt either to resolve or manage political disputes or to provide rational incentives to secure agreed-upon goals" (p. 12). He lists five types of public policy, namely: (1) regulatory, which generally pertains to how people can act toward one another; (2) distributive, which grants goods and services to specific segments of the population; (3)
redistributive, which rearranges the basic schedules of social and economic rewards; (4) capitalization, which maximizes production goals of industry; and (5) ethical, which establishes correct practice for a moral issue (Frohock, 1979).

From these different perspectives, policy emerges as a broad term which is assigned to the activities of various governmental bodies authorized to disperse goods and/or services equitably. As a society develops, the functions of policy evolve and proliferate.

Policy origins. Mitchell (1984) asserts that two conditions, namely scarcity and conflict, are the origins of policy. He suggests that to develop strategies that control the effects of scarcity and conflict, it is necessary to adopt a socio-political theory which specifies methods for their amelioration.

Stating that theorists generally agree that there are four basic social studies paradigms (Brown & Goldin, 1973; Iannaccone, 1975; Kelly, 1974; Mitchell, 1982), Mitchell explains his structure in terms of their origin, which he traces to the four major social institutions that began developing during the Middle Ages. These institutions, the military, the church, the economic structure, and society or culture are the roots of the four paradigms; structuralism, functionalism, exchange theory, and interactionism (Mitchell, 1984).

Mitchell (1984) proposes an evolution of these paradigms as follows. The Military, whose efficiency is based on machine-like tactics derived from rigid discipline, gave rise to Structuralism, which posits that social order is maintained through a balance of power. The Church, characterized by a hierarchical order in which
some individuals, by virtue of their position within the hierarchy, have authority over others, is the progenitor of Functionalism, which explains social order through the stability of a hierarchy. Exchange theory, in which social order is thought to be maintained through negotiated contracts, has its roots in the developing economic framework of the market-place, with its creation of paper money, enforceable contracts, and concept of the corporation. Interactionism, which adheres to the concept of social order maintenance through bonding derived from shared knowledge, emerges from the university, in which the culture discovered a forum for formal expression.

From the structuralist and the exchange theory perspectives, scarcity is considered inevitable and conflict is assumed to be controllable through appropriate action. On the other hand, functionalism and interactionism see scarcity as the manageable variable, while regarding conflict as subordinate.

The structuralist policy-maker "emphasizes the reduction of conflict through direct regulation of social institutions" (Mitchell, 1984, p. 143), giving "prominence to equity as a primary social value and seeing destructive conflict as the result of an inequitable distribution of power" (Mitchell, 1984, p. 144). Functionalists are more interested in quality as a central public value, criticizing specific policies as being inadequate solutions to problems, rather than visualizing the institution itself as the problem. Freidrick (1963) offers a typical functionalist definition of policy: "A proposed course of action of a person, group or government within a
given environment providing obstacles and opportunities which the policy was proposed to utilize and overcome in an effort to reach a goal or realize an objective or a purpose" (p. 25).

Exchange theorists focus on liberty as the most important social value, regarding policy as the agency through which private choice is influenced. As stated by Ripley (1966), policy is concerned with the "regulation of private activity ... through governmental subsidies, regulations, and/or manipulation" (p. 41). From the interactionist perspective, competence is the pre-eminent social value, and quality is measured by the performance of the group or the individual, rather than achievement. From this perspective, policy is defined as "the conscious attempt of official, legislative, and interested publics to find constructive responses to the needs and pathologies which they observe in their surrounding culture" (National Academy of Education, 1969, p. 162).

Scribner and Englert (1977) visualize the basic paradigms somewhat differently from Mitchell. Their first stage begins with the ancient Greeks (Plato and Aristotle) and continues until the nineteenth century. They see the study of politics during this period as intertwined with knowledge of the moral world or the "good life" as they call it. Practical problems of the day provided the content of study, and the approach used was usually normative.

The second stage, which they call "legalism", developed during the nineteenth century. It began with traditional philosophic inquiry into the ends of the state and government and gradually evolved into legal study of the state. During this period investigations into the
nature and origin of the legally defined state, including its sovereign properties and the growth of the law were common.

The third stage, "realism", extended from the end of the nineteenth century until the 1930s. During this stage legalism was de-emphasized, and nonlegal and informal processes became concerns for investigation. Here, too, began the study of group activities, which ultimately evolved into the study of the struggle for power. Scribner and Englert applaud the break from a normative and legalistic past which occurred during this time, but decry its degeneration into empiricism and neglect of theory development.

The fourth stage, "behavioralism", evolved during the post-World War II era. Content became more diversified and included scrutiny of 'policy' itself and different kinds of political systems. Methods of investigation were rigorously constructed and examined, and nothing was taken for granted. With behavioralism came the application of the methods of modern science to the arena of politics (Scribner & Englert, 1977).

The historical development of behavioralism occurred when the politics of education began to emerge. As educators studied the political activities of their field, they adopted the theory and methods developed by the political scientist. An understanding of past concepts and methods is essential to present conceptualizations and theorizing in the politics of education (Scribner & Englert, 1977).
Policy Analysis: The Concept

As with the definition of the word policy, divergent views exist as to the meaning of the term "policy analysis" (Dahl, 1976; Hawley, 1977; Jones, 1977; Lincoln & Guba, 1986; Lindblom, 1980; Nagel, 1980a). Nagel (1980a) defines policy analysis as "the how-to-fit-it methods associated with determining the nature, causes, and effects of governmental decisions or policies designed to cope with specific social problems" (p. 7). To Lincoln and Guba (1986),

POLICY ANALYSIS is a type of DISCIPLINED INQUIRY undertaken to GATHER and DISPLAY EVIDENCE (including CONTEXTUAL DATA) for and against ALTERNATIVE POLICY OPTIONS (INTENDED, ALREADY IMPLEMENTED, or EXPERIENCED) in order to INFORM NEGOTIATIONS OVER CHOICES in terms of the MULTIPLE VALUES of RELEVANT AUDIENCES (p. 557).

Lindblom (1980) prefers to organize policy analysis around those aspects of policy making common to all the steps involved in the process. He argues that the two overriding questions asked about governmental policy making focus on its efficacy in solving problems and on its responsiveness to popular control. In other words, he asserts that the two main components of policy making are analysis and politics, which conflict with each other, although they can be complementary (Lindblom, 1980).

Jones (1977) offers a framework for a policy process which he views as incremental rather than comprehensive. The major components of his framework are (1) Problem Identification, which involves Perception, Definition, Aggregation, Organization and Representation of the problem; (2) Program Development, which encompasses Formulation, Legitimation, and Appropriation; (3) Program
Implementation, incorporating Organization, Interpretation, and Application; (4) Program Evaluation, consisting of Specification, Measurement, and Analysis; and (5) Program Termination during which there is Resolution or Termination of the problem. Jones asserts that the process is ongoing and continuous for most programs. (Jones, 1977).

Dahl (1976) proposes four orientations toward the world, which he believes explain political analysis. The first, which he calls "empirical analysis", seeks to discover how things come about in the real world. The second, "normative analysis", seeks to discover norms or criteria to judge alternative policies. The next orientation, "semantic analysis", tries to clarify meaning, particularly of key concepts. The last, "policy analysis", attempts to find ways to alleviate the gap between extant conditions and a better future. Dahl contends that the essence of this orientation is a consideration of alternatives and their consequences (Dahl, 1976).

Hawley (1977) suggests that public policy research falls into four general categories: (1) formulation; (2) output; (3) implementation; and (4) impact. He asserts that many studies fit into the first or second groups, that several belong to the third, but that much more work needs to be done on the fourth. The first type, formulation, deals with legislative or executive processes that have public policies as their product. The second, output, focuses on variations in formal policies, usually in terms of taxation or expenditure levels and examines the correlation between various social and political characteristics of particular jurisdictions. The third
type, implementation, deals with how legislative and administrative policies are modified; seldom does it address its effect on those it is alleged to serve or regulate. The fourth type, impact, focuses on the effect of political actions on potential beneficiaries. Hawley separates this type into "allocation" studies which address the level of goods, services, and privileges received and "output" studies which assess the quality of life people experience. He insists that few political scientists have linked the political process to policy outcomes, giving as examples:

(1) We know a fair amount about voting behavior or turnout, but almost nothing about whether variations in behavior or turnout affect the substance and impact of public policy.

(2) We know something about the socialization of party activists and legislators and we can classify legislators by the dominant roles they play but we cannot say much about whether that socialization or these roles make any difference in terms of the policies they support or to the people the legislators allegedly serve.

(3) In thinking of the countless articles by political scientists on such topics as decentralization, metropolitan government, government reorganization, community power, party organizations, and judicial reform, it is hard to identify more than a handful that speak in other than speculative terms to the quality of life experienced by the citizenry (Hawley, 1977, p. 325-326).

Although the term policy analysis assumes different margins of meaning to different individuals, there seems to be a consensus that it implies choice and value. The need for value placement and choice intensifies as economic options narrow. A brief history of the development of this need as it applies to the education community is outlined.

Policy Analysis: History

Policy analysis, in education as in other areas, has only
recently become a formal component of the public policy-making domain (Dahl, 1976; Mitchell, 1984). The relationship between researchers and governmental policy makers in the United States has been recognized since 1862, when the Morrill Act of that year provided a major resource base for agricultural research (Mitchell, 1984). It was not until 1929, however, that the current pattern of formal involvement by social scientists in federal policy was initiated by President Hoover's commissioning of the Social Science Research Council to study systematically "recent social trends" (President's Research Committee on Social Trends, 1933). Formal involvement of the education profession began with the first Coleman study, *Equality of Educational Opportunity* in American schools (Coleman, Campbell, Hobson, McPartland, Mood, Weinfield, & York, 1966).

Coleman's study represents the first comprehensive study of the American educational system (Frohock, 1979). His conclusions regarding the differences between predominantly white and black schools were extremely controversial. His discoveries that the allocation of resources to schools was more nearly equal than commonly believed and that educational results were most strongly related to family background were unexpected. His team found few connections between expenditures and educational equality (Coleman et al., 1966; Frohock, 1979; Guthrie, 1979).

The Coleman study focused much attention on education in general and the educational opportunities afforded students of differing socio-economic backgrounds throughout the country. Wide-spread interest in these topics and the political impact generated by them
 contributed to the centralization of American public education which has dominated the last two decades (Murphy & Hallinger, 1984). Concern over inequities led to an increased role of the courts and the mandating of programs and practices to alleviate disparities (Cunningham, 1978). The financing of these new services, far too costly to be borne by the local establishment which was even then disengaging from the property tax as the primary source of revenue, fell to the federal and state governments (Adams, 1982; Murphy, 1983).

During this period policy analysis centered around educational finance. The shift in responsibility from local to state and federal funding was instrumental in the proliferation of studies conducted to assure the fiscal integrity of educational policy.

One of the studies receiving widespread publicity was conducted by Christopher Jencks and associates at the Harvard Center for Educational Policy Research. Published in 1972, Jencks' work proclaimed two notable conclusions: (1) resource allocations such as budgets or teachers have no appreciable effect on raising the test scores of minority or disadvantaged children; that is, a school's academic quality is a function of the quality of children who enter the school; and (2) neither the quality of education nor a student's background will have a significant effect on his/her future income level. Jencks claimed that 78% of the variance in income is due to factors other than education or family background, and speculated that "luck, personality, and competence" were more likely to decide income level (Jencks, 1972).

Critics of both the Coleman Study and the Harvard Study claimed
design flaws, weak data analysis and other methodological weaknesses as well as opposition to the interpretation of the data. Criticism usually revolved around the discrepancies found in the amount of monies available to a school district. During this period of time, conflicting viewpoints about finance equity led to several important legal battles. Two such cases with far-reaching effects are briefly summarized.

A landmark court case involving school finance, Serrano v Priest, occurred in 1974 when the California Supreme Court ruled unconstitutional an existing school finance system. The court held that any such system that makes the quality of a child's education a function of the wealth of his parents and neighbors violated the equal protection clause of both the state and federal Constitutions and therefore must be restructured.

Another precedent-setting case in 1973, San Antonio v Rodriguez was argued before the Supreme Court. Two standards for review were available to the Court in this case. One, "strict judicial scrutiny", requires that basic constitutional rights be maintained. The other, "rational relationship test", demands that the educational system be in accord with the purposes of state educational policy and law. The choice depended on the Court's belief as to whether or not education is a constitutional right. The Court ruled in favor of the San Antonio Board on two issues: (1) although the poor received a less expensive education than the more affluent, this did not prove that an entire class of people were being deprived of an education; and (2) since education is not a constitutional right, the school system had
only to prove that its financial base provided a basic education for every child. The decision, written for the majority by Justice Lewis Powell, established education as a state responsibility (Frohock, 1979; Sherman, 1979). The intrusion of the Courts into education policy making precipitated the need for program analysis and evaluation. Those areas of education which have been the more prominent targets of analysis and evaluation are discussed.

Major Topics in Education Policy Research

LaNoue (1982) asserts that educational policy researchers focus on just two basic issues: educational equity and school governance. Mitchell (1984), arguing that LaNoue's vision is somewhat myopic, expands the field to include teaching and learning policy and the economics of education. Mitchell further separates the research and analysis in each area into two categories, those concerned with the process of policy formation or implementation and those concerned with the content or the impact of particular policies.

Equity Research Topics. Mitchell's review of equity research topics notes the shift from race as the key concept to wealth. Among the reasons for the shift he cites as most important:

1. the need for documentation of large inter-district fiscal resource disparities;
2. a growing realization that physical desegregation was not possible for many minority children (hence, equity would have to be reconceptualized as equal resources rather than as integrated school attendance); and
3. the recognition that school achievement problems were more highly correlated with family and community socio-economic status than with race (Mitchell, 1984, p. 148).
Equity policy research has broadened to include neglected and oppressed population groups. Language and ethnic minorities such as Hispanics were recognized, along with sex discrimination and physical, emotional and/or learning handicapped. Legislation aimed at lessening these inequities was passed during the mid-1970's (See Title IX of the Education Amendments of 1972; PL 94-142 [The Education for All Handicapped Law] in 1975).

School Governance Topics. School governance problems have long been included in policy debates, usually highlighting the distribution of authority among the different agencies responsible for public education. The shift of power from federal to state to local (district-wide or site only) has provoked great controversy. Mitchell (1984) asserts that research into the centralization/decentralization issue "has identified a fundamental dilemma in governance. Decentralized control leads to the neglect of minority interests, but centralization produces serious alienation and resistance among school personnel and local leaders, leading to reduced effectiveness of both policy mandates and general school operations" (Mitchell, 1984, p. 149).

Recent research indicates three components of governance policy are salient: (1) collective bargaining for school personnel; (2) curriculum reform and innovation; and (3) the public/private (or parochial) school relationship. Although the economic impact of collective bargaining has received the most publicity, its influence on the reallocation of authority within school is becoming recognized as an important factor in work role definition (Mitchell, Kerchner,
Proponents of educational reform and innovation now recognize that providing appropriate incentives—rather than issuing mandates—enhances the effectiveness of the program (Berman & McLaughlin, 1975-1978; Porter, Warner, & Porter, 1973). Both the equity movement, which gave new impetus to "white flight" and the rise of private education, and the more recent curriculum innovation efforts, which have illuminated the fundamental organizational differences and educational outcomes inherent in the private sector, have altered the relationship between the two institutions (Coleman, Hoffer, & Kilgore, 1982; Heyns, 1981). Scrutiny of these differences and outcomes suggests that state decrees of unified standards and objectives, tempered with nonuniformity of strategy and appearance at the district level, could lead to real school improvement (Murphy, Mesa, & Hallinger, 1984; Odden & Odden, 1984).

**Teaching and Learning Topics.** The teaching and learning processes, although included in early research and analysis, have only lately been conceptualized as policy-related. This perception has influenced the direction of research, focusing attention on the politics involved in curriculum decisions and the effects of specific content on students (Boyd, 1979; Mitchell, 1984; Van Geel, 1976). There is now a shifting of emphasis from federal and state policies to the local level (Murphy & Hallinger, 1984). Based on studies of school effectiveness, indications point to significant impact of local decisions on student achievement (Brookover, et al., 1982; Edmonds, 1979; Rutter, et al., 1979; Stallings & Mohlman, 1981; Wellisch, et al., 1978; Wynne, 1980).
Economics of Education. Mitchell's fourth policy topic, the economics of education, is organized into three categories: (1) "manpower forecasting" and the effect of supply and demand on vocational choices; (2) "human capital formation" or the selection of candidates for specialized or advanced training; and (3) "education production functions" or the factors related to particular education goals or values (Mitchell, 1984, p. 150). As the financial crises of the 1980's deepen, this topic is assured of more attention in the policy setting arena.

Policy Analysis: Methodological Issues

The literature addressing the relationship between research methods and the use of social research by policy makers clusters around two viewpoints. One explores the difficulties associated with diverting practical policy issues into scientific research problems (Lerner & Lasswell, 1951; Nagel, 1980a). The other perspective is concerned with identifying various research methods, evaluating each as to possible assistance in the decision-making process (Mitchell, 1984).

Two problems affect both viewpoints. "Bias" is the most ubiquitous, since policy-makers tend to ignore unwanted research (See Coleman, 1976, regarding white flight data in early desegregation research). The other problem is the "personalization of authority", that is, the use of scientists, rather than scientific methods, in the adoption or defense of specific policy decisions (Bailey, 1962;
Mitchell further asserts that policy problems often are distorted when subjected to scientific analysis. Declaring that scientists tend to study what they know how to study rather than what policy makers need to be studied, he voices his concern about oversimplification of problems to accommodate research methods and the limited scope of many projects due to time and financial constraints.

Finally, to coordinate the work of the researcher and the policy maker in the cultivation of truly effective schools, Mitchell recommends that researchers: (1) document the alternative mechanisms available to policy makers; (2) determine the effects of each mechanism on school performance; and (3) link these efforts to alternative social goals or values (Mitchell, 1984, p. 154).

Murphy and Hallinger (1984) concur. They suggest that policy analysis at the local level should focus on two key areas--technology and goals. Potential topics needing further study include maximizing academic learning time (Denham & Lieberman, 1980; Ramey, Hillman & Matthews, 1982; Weil & Murphy, 1982); providing homework on a regular basis (Brookover et al, 1982; Wynne, 1980); using an incremental grading policy (Brookover et al, 1982; Wynne, 1980); using remediation policies, such as mastery learning, that allow slow learners to learn with the majority of the class on a regular basis (Brookover et al., 1982); and requiring students to master grade level expectations in order to be promoted (Wellisch et al., 1978).

Methodology Reviewed. The methods employed in policy research are varied and tailored to suit the occasion. Quantitative data
analyses, interviews, observations, questionnaire studies, documentary analyses, and hearings are all accepted means of assessing and evaluating policy decisions (Fetterman, 1986; Guba, 1984; Smith, 1986; Weiss, 1972a). Interviews, in which one person questions another, and hearings, in which several individuals make inquiries of a witness, are frequent tools of the researcher, as are questionnaire studies, in which participants are asked to respond in writing, rather than in person. Observations, which require no questioning, involve the counting of a particular recurring event, and are more reliable when recorded immediately. Documentary analyses may involve different kinds of reports, such as institutional records, diary records, financial records, or documents such as minutes of board meetings, newspaper accounts of policy actions, or transcripts of trials (Weiss, 1972a). Quantitative data analyses may employ varied statistical techniques. Cost/time effectiveness contributes to the selection of the method adopted.

Quantitative Techniques. The use of statistical methods to clarify policy explanation was authenticated by Fabricant's 1952 study of interstate variation in public spending (Foley, 1978). By employing multiple regression techniques on three key variables: per capita income, population density, and percent urbanization, Fabricant was able to account for 72 percent of the interstate variation in total public expenditures (Fabricant, 1952).

Encouraged by Fabricant's results, other researchers of public policy began to rely on statistical interpretations of their hypotheses. A 1969 study by Sharkasky and Hofferbert used factor
analyses on state-level political variables and on public policies. Two main dimensions emerged from the political factors: Political Professionalism-Local Reliance and Competition-Turnout. Public policies also extracted two major groups: Welfare-Education and Highways-Natural Resources. Sharkasky and Hofferbert related 59% of the variance in the Welfare-Education policy factor and 68% of the variance in the Highway-Natural Resources policy factor to socio-economic variables.

Dye's (1965) study of state legislative malapportionment employed partial correlations as the method of analysis. Although containing flaws in its design and methodology, its significance lay in the fact that it tested empirically a long-standing tenet of policy studies. Dye found that political system variables had little, if any, impact upon the policies adopted by the political unit under consideration - in this case, the state. The differences found could be attributed to socio-economic differences between states.

Gibson, Prather and Taylor (1973) used factor analysis and path models to test the relative importance of political system or socioeconomic system variables in predicting public policy outputs. Using the political competition-voter turnout and welfare-education measures developed by Sharkansky and Hofferbert, along with other measures they developed in the study to assess the rate of recidivism in a state's criminal justice system, they concluded there were no causal links between level of affluence, criminal justice system policies, and the recidivism rate. Instead, they found the rate of recidivism to be a positive function of welfare-education policies.
The public policy research reviewed here illustrates how statistical methodology was employed to explain theoretical hypotheses. Regardless of the technique used or the policy area under study, the level of socioeconomic affluence best explained the variance between the units of analysis (Foley, 1978).

In a review of research analyzing public policy during the sixties and seventies, Foley (1978) found that the most commonly investigated unit of analysis was American cities, followed by states and counties. Multivariate techniques included correlation, analysis of variance, multiple regression, and path analysis. The designs usually employed cross-sectional or time series analysis. Inter-relationships between cases or independent variables were ignored. Rarely were statistical tests of inference reported, nor were standard errors given (Foley, 1978).

Qualitative techniques. Although conventional statistical procedures have become a staple of the large federal study, the use of such techniques at the local level may not fully explain the processes at work within the local arena (Fetterman, 1986; Smith, 1986; Williams, 1986b). "Ethnographic educational evaluation" (Fetterman, 1986) or "naturalistic inquiry" (Lincoln & Guba, 1985), both of which are forms of qualitative evaluation, may be used to understand and describe the individual's perception of reality. Data reported from this perspective usually results from inquiries meant to be nonjudgmental, focusing on the processes by which outcomes are produced, rather than on the outcomes or products themselves (Williams, 1986b). Reports primarily are in the form of words,
pictures, and displays, rather than the formal models or statistical findings usually associated with the quantitative paradigm.

Attention is now being focused on a combination of the two paradigms or the use of both qualitative and quantitative methods to describe and evaluate programs (Cronbach, 1982; Guba & Lincoln, 1981; Reichardt & Cook, 1979; Smith, 1986). An approach such as this has been found to be helpful in improving a study's validity (Collins, 1981), in identifying program elements that need revision (Saxe & Fine, 1979), and in meeting the information needs of stakeholders with divergent backgrounds (Smith, 1986).

Review. In this section, educational policy analysis was examined from conceptual, historical, and methodological perspectives. The next section peruses the utilization of policy evaluation, primarily as it is applied to education and education policy and practices.

Evaluation Utilization

The need of policy-makers and the public to know the consequences of the efforts made toward planned social changes and innovations has been the impetus in the growth of the evolving field of evaluation research and program assessments (Bernstein & Freeman, 1975). Evaluation research, especially at the federal level, has become an accepted procedure. Since the 1960s and 1970s when huge sums of monies were spent to facilitate the implementation of federal policies, evaluation studies have been undertaken to assess program
impact. The value of such studies themselves has been controversial.

One viewpoint holds that evaluations are of little use since such studies are rarely completed in time to affect the policy-making process (Bernstein & Freeman, 1975; Guba & Lincoln, 1981; Patton, Grimes, Guthrie, Brennan, French, & Blyth, 1977; Wholey, Duffy, Fukumoto, Scanlon, Berlin, Copeland, & Zelinsky, 1970). The other (Alkin, Daillak & White, 1979; Weiss, 1972a, 1972b, 1972c, 1977, 1980) views utilization in a different light, contending that import hinges on an incremental conceptionalization. A closer look at these two schools of thought is in order.

Utilization Theories

Although arguments over evaluation utilization abound, there does seem to be a consensus about utilization as the goal of policy research. As expressed by Alkin (1979), research studies are "designed primarily to add to the body of knowledge" but evaluation studies are "designed primarily to provide information of decision-making" (Alkin et al., 1979, p. 13). Weiss (1972c) concurs, stating that the "basic rationale for evaluation is that it provides information for action" (Weiss, 1972c, p. 118).

Aside from general agreement that evaluations should refine program decision-making, disagreement remains as to whether it actually does. The literature is replete with articles propounding the failure or underutilization of evaluation (Caplan, 1977; Cohen & Garet, 1975; Guba & Lincoln, 1981; Heyns, 1981; Leviton & Boruch,
1984; Mann, 1972; Rossi, 1972; Shapiro, 1984; Weiss, 1982).

Investigations into evaluation utilization uncovered several interesting ideas. Alkin (1975) considered four sets of factors, namely (1) the decision-maker/decision process, (2) program and social context, (3) nature of the evaluator, and (4) the evaluation process evaluation report. Patton and his associates (1975) extracted three groups of influential factors: (1) characteristics of the organization, (2) characteristics of the evaluators and decision-makers, and (3) characteristics of the evaluation report itself. Davis and Salasin's (1975) "A-Victory" technique involved seven factors and a somewhat complicated assessment process. Each of these studies was more speculative in nature than empirical (Alkin et al., 1977) and tended to fall in the "failure-of-utilization" category.

Weiss (1972c) urged systematic study of the evaluation process to determine the kinds of evaluation that do impact on policy-making and under what conditions. She suggested that utilization is more likely when the intention is incremental rather than large-scale program modification (Weiss, 1972b). Arguing that research is used differently from a physical tool such as a hammer, Weiss (1982) considers the term "utilization" misleading. She asserts that utilization implies a clear-cut decision to implement the recommendations of the evaluator. This view is insufficient to capture the interactions which occur among the processes peculiar to organizational decision-making, namely "understanding, accepting, reorienting, adapting, and applying research results to the world of
practice" (Weiss, 1982, p. 130).

Weiss offers five examples to illustrate her point. First is the evaluation which produces inconclusive evidence to expand, modify, or terminate the program studied. Such a study poses a difficulty in ascertaining its use by client application of its results. In such cases (and Weiss states that there are many such studies) the evaluator or evaluation director will make recommendations based on his/her own standards, beliefs, and experience. This results in utilization of evaluator judgment, rather than utilization of the evaluation.

Weiss' second example involves two or more evaluation studies which discover conflicting evidence of program viability. Conflicts such as this will often result in no action by the decision-maker. A study of evaluation use in this situation would likely conclude "nonuse", although subsequent studies often reinforce one position or the other, resulting in implementation at a later date.

A third case exists when an evaluation of a functioning agency illuminates possible areas of improvement, but financial and/or staff limitations preclude their adoption. Again the study has produced no visible effects, although modifications may have been employed if the resources to do so were available.

The fourth example involves the situation in which a decision must be made. Although an evaluation clearly delineates desirable change, the decision-makers consider cost, staff limitations and other political ramifications to be more important and decide against implementation. Weiss contends that this kind of evaluation
"illuminated problems, clarified trade-offs, and evoked new understandings of the possibilities and limits of program action" (Weiss, 1982, p 133), which represent utilization. However, classification of utilization by use/nonuse would probably result in nonuse, since no changes were implemented.

Weiss offers a fifth illustration of utilization complexity. Here she presents the situation in which program managers decide to institute change to insure their agency survival and retain an evaluator to reinforce their position with a study. Even though the recommendations suggested by the evaluator are not exactly the changes desired by the client, there is enough similarity to give the appearance of legitimacy. Does the application of evaluation to a predetermined conclusion constitute utilization? (Weiss, 1982).

Weiss' arguments for utilization judged from an incremental rather than a global viewpoint emerged from a distinction made between "instrumental use," which applies to conclusions applicable to a specific decision, and "conceptual use," which influences concepts and ideas of decision makers (Pelz, 1978; Rich, 1977; Weiss, 1977). Empirical studies by Caplan (1977), Rich (1977) and Patton et al. (1977) have shown that conceptual use is usually more prevalent than instrumental use (Weiss, 1982).

Leviton and Boruch (1984) empirically studied the issue of use/nonuse in evaluations of federal programs. Selecting twenty-one studies from the Office of Education and a variety of other federal agencies dealing with education, they analyzed the types of contributions found in each study and the context in which specific
decisions were made. They classified contributions into three groups: those having impact on programs or policy, those influencing decisions without actually effecting change (at least during the investigation) and those for which no verifiable decision could be found. Contributions were also classified as implementation findings (local and state delivery of education programs), outcome information (causal inferences of the effects of programs on students and schools), federal administration (management, entitlement, and resource allocation by the federal agency in charge of the program), and the cost or cost effectiveness of the program. Contributions of each study were verified by interviews with project officers, Congressional staffers and independent observers. Verifications could be ascertained for 156 (out of the 180 possible instances) distinct contributions. Of these 156, 68 involved impact, 61 were classified as "decisions only" and the remaining 27 were grouped under "serious consideration".

From their findings, Leviton and Boruch (1984) were able to demonstrate the prevalence of contributions by implementation information. They attribute this to several factors:

1. a decentralized government allows local authorities great freedom in the interpretation of federal policy,

2. use of implementation findings in monitoring program operation is easier than assessing effects, and

3. poor implementation or insight into positive program effectiveness permits Congress to act.

The combination of implementation and outcome information was
found to be the most useful to policy makers as well as to evaluators. Assessment of current program projections about the future, and specific policy alternatives enhanced evaluation utilization (Leviton & Boruch, 1984). A recent review of utilization studies (Cousins & Leithwood, 1986) supports this conclusion, asserting that evaluation use is most likely to be strongly evident when:

1. evaluations were appropriate in approach, methodological sophistication, and intensity;
2. the decisions to be made were significant to users and of a sort considered appropriate for the application of formally collected data;
3. evaluation findings were consistent with the beliefs and expectations of the users;
4. users were involved in the evaluation process and had a prior commitment to the benefits of evaluation;
5. users considered the data reported in the evaluation to be relevant to their problems; and
6. a minimum amount of information from other sources conflicted with the results of the evaluation (Cousins & Leithwood, 1986, p. 360).

Review. In this section evaluation utilization was examined primarily in conjunction with education policy and practices. Recommendations for utilization enhancement were noted. The final section follows the genesis of the state policy responsible for the interest in the evaluation study.

Evolution of State Policy

The adoption or revision of policy affecting Public Education in the State of Louisiana must follow a rigid procedural route. First,
publication of the policy statement in the Louisiana Register is required by the Administrative Procedures Act, followed by public hearings and legislative oversight. The Louisiana State Board of Elementary and Secondary Education (SBESE) is the administrative policy agency for educational policy pertaining to the elementary and secondary levels. This designation does not preclude SBESE from initiating its own policy (LA R.S. 49: 951-968, 1951, amended 1980).

The Louisiana Register is published once a month and includes all policies of all state agencies. A Notice of Intent to Adopt, which must include a fiscal and economic impact statement signed by the Legislative Fiscal Officer, must be filed. By law the Notice is required to run 50 days before it can be acted on. Due to the schedule of meetings and publications, SBESE notices run 90 days.

Prior to final adoption by the SBESE the Joint Legislative Committee on Education must review the policy. This Committee has veto power over a proposed policy and has exercised this power in the past. The Governor can override a Legislative veto, but this has never happened. After approval from Legislative Oversight, the item is placed on the appropriate committee agenda for public hearing prior to final adoption by the Board. After public hearings are conducted, the item goes back to the Board for final adoption.

Upon receiving Board approval, the policy is published the next month in the Register as a Rule. At this point it is entered into the Policy and Procedure Manual of the Louisiana State Board of Elementary and Secondary Education. The final steps of this procedure are in the process of modification. All state policies are being transferred
into the Louisiana Administrative Code where all education policies will be listed under Title 28. The work being done on this is in conjunction with the Louisiana Handbook for School Administrators, Bulletin 741, revised 1984 (L. M. Michelli, personal communication, November 4, 1985).

Development of the Algebra I Requirement

The wave of educational reform which followed A Nation at Risk (1983) provided an impetus for the Louisiana State Board of Elementary and Secondary Education (SBESE) to enact higher standards for graduation. Discussions on this topic by more than one hundred reviewer groups interested in State Education Policies were held. Among the groups were teacher organizations, the PTA, superintendents, and the Louisiana Association of Business and Industry (LABI).

At a meeting of the Elementary and Secondary Education Committee of SBESE, December 8, 1983, a Special Order Agenda Item, Consideration of (proposed) revised Bulletin 741, LA Handbook for School Administrators, including the (proposed) revised Program of Studies, was discussed. Dr. Robert Gaston, Deputy Superintendent for Education, presented a departmental recommendation for High School Mathematics requirements: 3 units required for high school graduation with two of the three being Algebra I, Algebra II or Geometry. The Committee received the recommendation.

A lengthy discussion then ensued pertaining to the document entitled Draft: Program of Studies Changes Recommended by the
Bulletin 741 Advisory Ad Hoc Committee, Subsequent to Public Review, dated November 28, 1983 (This draft will be referred to as the "Ad Hoc Draft"). Among other recommendations the Committee advocated that the proposed High School Program of Studies be amended to read as follows:

"Beginning with the incoming Freshmen in the 1984-85 school year, three units of Mathematics shall be required for graduation: Algebra I, Algebra II and Geometry" (Ad Hoc Draft, p. 12).

At a Special Meeting on January 31, 1984, the Board, acting as a Committee of the Whole, met to consider the recommendations of the Elementary and Secondary Education Committee. The Committee recommended for inclusion into proposed Bulletin 741 the language as written above.

Recommendations were then heard from Superintendent-elect Dr. Thomas G. Clausen. The Superintendent-elect also proposed three units of mathematics:

"Algebra I and two units selected from either Algebra II, Geometry, Trigonometry, Calculus, General Math, or Business Math. The graduating class of 1990 will be required to take Algebra I, one unit from Algebra II or Geometry, and one unit selected from Trigonometry, Calculus, General Math or Business Math" (Minutes, SBESE Committee of the Whole/Special Meeting, January 31, 1984, Attachment 2).

After a presentation from State Department of Education personnel summarizing the High School Graduation requirements, along with an Implementation Schedule and Implementation Costs (Minutes, Attachment 3), discussion was opened to the public. Forty-seven people, some acting as representatives of organizations, addressed the Committee.
Re-convening as the Board of Elementary and Secondary Education, the Board voted on the issues discussed. The Board then "directed that the Program of Studies as recommended by the Elementary and Secondary Committee (12/8/83) and amended and just adopted by the Board be incorporated into revised Bulletin 741 Handbook for School Administrators and the entire document be advertised in the Louisiana Register as a Notice of Intent" (Minutes, January 31, 1984, p. 9).

The recommendation proved to be highly controversial. Public debate ensued, questioning the wisdom of the stringent decree with little warning to and preparation of the affected student population. Classroom teachers and principals were especially alarmed, fearing massive failure and increased dropout rates. A poll by the State Department of Education revealed:

<table>
<thead>
<tr>
<th>No</th>
<th>Approve</th>
<th>Oppose</th>
<th>Response</th>
</tr>
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<tbody>
<tr>
<td>(1) Reviewer Responses</td>
<td>13</td>
<td>47</td>
<td>7</td>
</tr>
<tr>
<td>(2) Graduation Requirements Committee</td>
<td>6</td>
<td>25</td>
<td>2</td>
</tr>
<tr>
<td>(3) Superintendents' Advisory Committee</td>
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<tr>
<td>(a) Single diploma (existing policy)</td>
<td>0</td>
<td>20</td>
<td>(unanimous)</td>
</tr>
<tr>
<td>(b) If provisions made for a multiple diploma</td>
<td>20</td>
<td>0</td>
<td>(unanimous)</td>
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The Board convened on April 26, 1984. After considerable debate and several substitute motions, the following amendment to the main
motion passed by an 8 - 2 vote, establishing "high school graduation requirements for MATHEMATICS as: Algebra I, Geometry or Algebra II, and one of the following: Advanced Math, Calculus, Business Math or Consumer Math:. It was noted that if a person chooses one of either Geometry or Algebra II, the other will still remain an option that he or she could take.

At its regular meeting of May 24, 1984, the Board accepted the amendments to Bulletin 741 as recommended by the Elementary-Secondary Education Committee and adopted the revised Bulletin as a Rule. On June 20, 1984, the Louisiana Register carried adoption of the revised Bulletin 741 as a Rule, establishing the effective date of its final adoption (Louisiana Register, June 20, 1984, p. 453).

Impact of the Standard

The incoming high school freshman class of 1984-85 immediately felt the impact of the new graduation requirements. In the 66 school systems of the state, 87% of these students enrolled in Algebra I. The failure rate state-wide for the year was 28%, although two systems reported 45 - 50% failure and two recorded 5 - 7% (See Inter-office Communication, from Dr. Jean Clement to Dr. P. Edward Cancienne, "Impact of Algebra I Requirement on Local Systems", October 14, 1985).

Due to continuous displeasure expressed from LEA's, the Board assembled a Multiple Curriculum Study Committee to investigate the feasibility of a multiple curriculum. Meeting during the fall and winter of 1985-86, the Committee heard testimony from various experts
and education groups addressing the problems exacerbated by the new requirements. At this writing, the Committee has drafted recommendations for a Core Curriculum and an Honors Curriculum. The Rationale for the Core Curriculum was established:

The core curriculum will reflect those disciplines every student will need for any future lifestyle as a productive member of our society. The courses of a core curriculum represent the minimum amount of knowledge all students should have. These courses prepare students for higher education, vocational education, or immediate entry into employment. (Summary Statement, Multiple Curriculum Study Committee, Interim Report, February 18, 1986, p. 1).

The Committee recommends that 3 units of Mathematics be required for graduation, with Algebra I as one of the units. Wisconsin is the only other state that requires Algebra for high school graduation (Minutes, SBESE, Multiple Curriculum Study Committee, January 7, 1986, p. 2).

Summary

This chapter examined the literature pertinent to this study. The literature review covered the history and conduct of policy analysis in general and program evaluation in particular. Of particular interest is the research literature concerning the conditions under which evaluation information is most likely to influence policy decisions.
CHAPTER III
DESIGN, PROCEDURES AND INSTRUMENTATION

This chapter describes the steps taken to assess the utilization of the evaluation findings. A description of the setting and reported results of the evaluation study are presented along with the design of the utilization study.

The Evaluation Study

The setting. The Rapides Parish Public School system is one of 66 school districts in Louisiana. The system served 23,794 students in grades kindergarten through twelve during the 1984-85 school year. At the ninth through twelfth grade level there were 7,066 students enrolled (Louisiana State Department of Education, 1985b, 1985c). Of these 7,066 students, 2,284 (32% of the students) enrolled in the Algebra I classes scheduled by the twelve high schools [School and Parish Failure Ratios for Algebra I, Rapides Parish School System, 1984-85]. In response to concerns about Algebra I, an evaluation study was conducted to help explain success and failure in the Algebra I course. What follows is a description of the evaluation information reported to the school district.
Reported Results of the Evaluation Study

A brief report describing the evaluation study and the results found by the study was compiled for the school system by the principal researcher of the study (See Appendix A). This report was distributed to the central office administrative personnel who were responsible for instruction. These instructional leaders made the report available to the members of the Education Committee of the School Board, a three-member group composed at this time of two women and one man. All three of these members were parents of children who were enrolled in the schools of the district and who had either just completed or were about to take the course in Algebra I. Accordingly, the committee members were personally as well as professionally interested in the evaluation study results.

The researcher was requested to present the report and discuss its major findings with interested personnel from the administrative offices and the board. Although all administrators and the entire nine-member board had been invited to participate, only the six central office administrators responsible for secondary instruction and the three members of the board committee attended. Apparently attendance of these nine at meetings pertaining to instruction was not new. Comments such as "They were all invited, but you know how it is" and "They've never bothered to come when instruction is the issue" were heard.

The presentation was held in one of the meeting rooms designed for that purpose at the district's Media Center. Comfortable and well
furbished for such occasions with chalkboard, podium, screen and electrical outlets for overhead projectors, indirect lighting, cushioned straight chairs and a large coffee urn, the room is conducive to discussion. This presentation was no different. The researcher followed the general outline of the report (See Appendix A), although more details of the study were included, and the audience was free to ask questions and comment as the afternoon progressed. During the two-hour meeting, the rationale for the evaluation study, its sample, procedures and instrumentation, and the results found were all discussed with the audience. The details that were presented and the immediate audience reaction to them are discussed in the following sections.

Rationale. The evaluation study was conducted to assess the effect of student attitude toward factors thought to affect student achievement in mathematics. The Algebra I population was selected for study since it included many students who had not expected to take the course but were now enrolled in it only because of the new graduation requirements.

Sample. In cooperation with the administrative and central office staff of the system, seven schools were selected to participate in the study. Among the criteria used for selection were (1) size of Algebra I enrollment at each school and (2) relative ease of test administration at each school. Those schools with smaller affected populations which were located at greater distances from the Central Office were omitted. The alternative school was not included since its enrollment was very small and fluctuates considerably during each
school year. Data reflecting the enrollment, number of failures, and percent failure by quarter and for the school year (1984-85) were compiled as shown in Appendix A, p.130.

**Procedures and Instrumentation.** The following procedures were used to gather and analyze the data collected for the study, with guidance counselors in each building serving as coordinators of the testing program. Administration of three SRA mathematical subtests was scheduled at each school over a three day period during the regularly scheduled Algebra I classes by the classroom teacher. Approximately two months later a locally developed attitude instrument (See Appendix A, p. 151-152) was administered to these same classes, following the same collection process.

**SRA Test.** The SRA tests were given to assess the mathematical readiness of the Rapides Parish students in comparison to a national sample, using the Concepts, Computation, and Problem Solving subtests of the Science Research Associates Achievement Series, Form 1, Level G, 1978 edition. These subtests were constructed to measure the skills considered necessary for mathematics achievement at this level. The Mathematics Concepts subtest emphasizes fractions, decimals, geometric measurement and pre-algebra items, the Mathematics Computation subtest emphasizes operations on decimals and signed numbers, and the Problem Solving subtest emphasizes problem solving skills. Each item of each subtest was classified under a global and a specific objective, as well as a particular skill area of the subtest. Alternate-form reliabilities of .93, .82, and .88, respectively were reported (SRA Achievement Series Technical Report #3, 1978) for the
three subtests. In a series of validation studies between the SRA Achievement Series and scores from other achievement tests the Mathematics Total reported a correlation of .73 with the appropriate National Educational Development Tests (NEDT), .71 with the Primary Scholastic Aptitude Tests (PSAI), and .74 with the College Entrance Examination Boards (CEEB). Based on the Spring 1978 National Samples, the national mean raw score by subtest for grade 9 for the SRA Achievement Form 1, Level G was 18 (Concepts), 22 (Computation), and 15 (problem solving) with a Math Total Mean of 55 (scores rounded to the nearest whole number) (SRA Achievement Series, Technical Report #1, 1978).

Proficiency Test. Students enrolled in the Rapides Parish School System during three school sessions (1982-83 to 1984-85) were required to pass (with a score of 70%) a proficiency test constructed at the local level by committees of selected classroom teachers. These tests were designed to assess minimum skills, according to the objectives set forth in the curriculum guides, for English and Mathematics and were written for each of the Grades 1-8 and English I and Mathematics I at the ninth grade level. Construction of the tests began during the 1980-81 school year and the first series were piloted during the next school session (1981-82). Using the results from this pilot study, revisions were made in which test items that had been found to be either too easy or too difficult were rewritten or discarded. These revised versions were the ones used in this study (See Appendix A, p. 154-159).

Although the scores from these tests were not stored in the
computer files until the 1983-84 school year, the scores from the 1982-83 testing could be located. Therefore, it was possible to obtain a proficiency test score for Algebra I students who had been enrolled in the system during their eighth grade year. This fact allowed present ninth and tenth grade students to constitute the sample used in the regression analysis. Although the other data were collected from those eleventh and twelfth grade students who were enrolled in the algebra classes, the lack of a proficiency test score prohibited their inclusion in the final sample. The proficiency test provided another measure of cognition from the perspective of local norms.

**Attitude.** Investigations into several scales designed to measure mathematical attitude proved them to be undesirable for the study. Either they were created to measure only one construct such as math anxiety (MARS-A) (Suinn & Edwards, 1982) or self-concept (Gourgey, 1982), or they contained items measuring constructs not being considered in the study (Bowling, 1976; Sandman, 1979). A decision was made then to create an instrument which would measure the desired dimensions of interest. Extensive research into the attitudinal factors thought to influence student achievement in mathematics identified numerous studies ranging from general or broad theoretical models (Parkerson, Lomax, Schiller, & Walberg, 1984) to more specific components, such as aspects of motivation (Neale, Gill, & Tismer, 1970; Russell, 1969), usefulness of mathematics (Fennema & Sherman, 1977, 1978) and study and work habits (Cole, 1982; Khan, 1969; Khan & Roberts, 1969; Shepps & Shepps, 1971). Discussions with colleagues
ensued, examining those components which could feasibly be the most relevant to the population under study. The idea of the discussion was to achieve agreement on the constructs that seemed plausible, fit the students in the district, and were supported in the literature. The final constructs of affect selected by the principal researcher and her colleagues included mathematical self-concept (Fennema & Sherman, 1977, 1978; Gourgey, 1982; Junghans, 1980; Reyes, 1981; Uguroglu & Walberg, 1979), value of mathematics (Armstrong & Price, 1982; Junghans, 1980; Pedro, Wolleat, Fennema & Becker, 1981; Reyes, 1981; Wilhelm & Brooks, 1980), academic enjoyment (Brophy, 1983; Charry, 1981; Corno & Mandinach, 1981; Lall & Lall, 1983; Pedro et al., 1981), willingness to work (Cole, 1982; Dutrow & Houston, 1981; Gardner, 1978; Lall & Lall, 1983; Reyes, 1981; Weiner, 1972), parental involvement Aiken, 1970, 1972; Crandall, 1963; DeBronac-Meade & Brown, 1982; Junghans, 1980), acceptance of authority (Ames & Ames, 1984; Brophy, 1983; Walberg, 1981), study habits (Shepps & Shepps, 1971; Siedegler, 1983; Zarb, 1984) and the influence of peers (Koehler & Fennema, 1982; Kulm, 1980; Junghans, 1980). Items were constructed and assigned to each category. After further discussions with colleagues and supervisory personnel, many of the items were rewritten to provide a more suitable vocabulary for the students involved. Items were worded so that approximately half of them in each category were interpreted as positive; the remaining items were negative.

The Likert scale was chosen due to its ease of construction and use. The format used for this research included five response alternatives for each item: strongly agree, agree, undecided,
disagree, and strongly disagree. Although some researchers have omitted "undecided", hoping to encourage student choice (Sandman, 1973), this instrument included all five options to encourage a greater range of student responses. Scores were derived from each item by assigning a value of 5 to 1, respectively, to the responses for positively worded items and 1 to 5, respectively, for those which were negatively worded. An exploratory analysis was conducted on the beginning draft of the attitude instrument (See Appendix A, p. 142-148) during the second school quarter in five classes at one of the seven schools. One-hundred thirty-nine students participated in this phase of the study. Their answers were hand scored and a factor analysis was conducted on these results, extracting six constructs. A new attitude instrument was defined, using the strength of the factor loading (.50 or greater) and the variance to determine inclusion of an item. If an item loaded at this level on two factors, a difference of .15 was used to determine assignment to the higher loading factor; otherwise the item was excluded from the instrument. Some items were reworded to preserve an even distribution of positive and negative statements. This new, shorter form was the one used in the spring testing (See Appendix A, p. 151-152). Discriminant analysis, a statistical technique used to study the differences between two or more groups of objects with respect to several variables simultaneously, was used in the study to identify student characteristics which distinguish students who passed from those who failed. The results of this procedure suggested that attitude was a significant predictor of success/failure in Algebra. This appeared to
be especially true for those students who indicated an estrangement from adults, were unaware of the importance of mathematics to their futures, regarded themselves as poor math students, and expressed little desire to change this self concept. The audience expressed much interest in the regression formulas which had been developed in the evaluation study. They could all follow the example in the report which was used to illustrate the way one of the formulas worked (See Appendix A, p. 140). They were excited that the discriminant analysis had confirmed correct classification of student passing/failure in at least 78% of the cases. They listened intently to the evaluation recommendations which included the following: smaller class size and total teacher load, improved school/home communications, diversified mathematics curriculum in both the junior and senior high schools, and system-wide content and methodology seminars (See Appendix A, p. 160-163).

This evaluation study represented the first detailed analysis (descriptive and statistical) that had been conducted throughout the Rapides Parish System to investigate a systemwide problem. Reaction to the report and presentation was positive, and the recommendations made by the researcher (See Appendix A, p. 160-163), which encompassed long-and-short term goals, instructional procedures, inservice and community support, were well received.

Of particular interest to this audience was the attitude instrument. Most of them expressed a deep personal interest in the relationship between mathematics skills and attitudes, fostered by experiences with their own children. The idea that student
performance was affected by student attitude was new to them, and the importance of the attitudinal factor toward adults was a revelation to this audience. They expressed a desire for further indepth information. The interest of the group contributed to a second series of analyses, this time using the entire 1,543 sample rather than the 831 for whom all data had been known. The results from this last analysis were to be reported to the mathematics supervisor.

Following this presentation, as requested by the central staff/board audience, descriptive statistics for the entire sample were generated and frequencies of performance (pass/fail) by junior high school attended were found. This analysis was of particular interest to the mathematics supervisor. The breakdown by junior high provided her with more insight into personnel problems at this level, where teacher reassignments had already been requested. The data confirmed the need for these changes. Also of interest to the audience was the data from the within-parish nonpublic junior highs, which revealed that only 19% of these students had failed the algebra course (compared to the parish average of nearly 35% and the 53% failure rate from the least successful public junior high). Inspection of the ratios by type class (honors or regular) revealed a need to redefine the criteria for enrollment in an honors section as 12% of these students failed the course and another 14% earned a "D". Although more males (38%) than females (30%) failed, this statistic was not surprising to the staff. The ratios by race showed that fewer blacks (226) than nonblacks (296) failed, but the percent of black (45) to nonblack (30) failure was much greater. This data indicated a
need for study into the cultural and societal factors associated with racial achievement levels. The ratios by grade indicated a higher failure level (39%) for the ninth grade. This statistic again implied a need for changes in the junior highs, with deeper scrutiny into the curriculum and the student social structure, in addition to the teaching personnel and instruction. The comparisons by age indicated that the fifteen year old was at the greatest risk of failure, a statistic which paralleled the average age for dropouts in the state.

Design of the Utilization Study

There were two major purposes attached to the utilization study. One was to collect information describing school district personnel perceptions of the meaning of the evaluation study and how the results were utilized by the district in policy making. The second purpose, based on Cousins and Leithwood's (1986) analysis of factors related to utilization, was to explain why the utilization patterns occurred as they did.

Population. District personnel were divided into three subgroups: central office personnel (school board members and administrators), building principals and classroom teachers. Because school districts tend to be organized in hierarchic fashion, it was hypothesized that different perspectives on utilization might be due to position in the district. Drawing subsamples based on these hierarchies permitted two types of research analyses—perceptions of utilization by the district as a whole and perceptions of utilization
based on organizational position.

Sample. The sample from which data were collected, aside from central office personnel, was drawn from principals and mathematics teachers at the seven schools involved in the evaluation. The potential sample consisted of 39 classroom teachers, seven principals, six central office administrators and three board members. Table 1 indicates the participation rates by category, based on the return of survey questionnaires, and therefore the usable sample.

Data collection. Two types of data were collected by the author of the utilization study. Quantitative survey data were obtained on respondents' perception of what the findings of the evaluation study meant, their familiarity with the evaluation, policy changes concerning Algebra I that had taken place since the evaluation, and the particular policy changes that were influenced by the evaluation report.

Qualitative data from a subset of respondents were obtained through semi-structured interviews. The interviews began with the same questions asked on the utilization survey, but the researcher followed up on interviewee responses to develop a deeper description of the perception of utilization. Finally, the interview responses, as well as the author's own participant-observation role (as an employee of the district for ten years and principal investigator of the Algebra I evaluation) provided insight into why the patterns of utilization unfolded as they did.
Table 1
Profile of the Respondents

<table>
<thead>
<tr>
<th>Group</th>
<th>Number</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Population</td>
<td>Sample</td>
</tr>
<tr>
<td>Teachers</td>
<td>39</td>
<td>29</td>
</tr>
<tr>
<td>Principals</td>
<td>7</td>
<td>6</td>
</tr>
<tr>
<td>Central Office</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Administrators</td>
<td>6</td>
<td>6</td>
</tr>
<tr>
<td>Board Members</td>
<td>3</td>
<td>2</td>
</tr>
<tr>
<td><strong>TOTALS</strong></td>
<td><strong>55</strong></td>
<td><strong>43</strong></td>
</tr>
</tbody>
</table>
Instrumentation.

Two instruments were employed to collect data from respondents. One questionnaire asked respondents to interpret a portion of the evaluation results. The author of the evaluation study attempted to emphasize the relationship between student attitudes toward mathematics and their grades in Algebra I. A cover letter, explaining that individual items concerning attitude had been analyzed by factor analysis, was mailed out to the principals and mathematics teachers of the seven school participants of the evaluation study, the central staff instructional personnel and the board Education Committee members, along with a listing of the items that loaded highly on each factor. Respondents in the utilization study sample were sent these materials, along with a questionnaire asking them to label each factor composed of those items. The cover letter, factor analysis results identifying highly loaded items, and the interpretation of factors questionnaire are all contained in Appendix B.

The second survey instrument focused on respondents' perceptions of the evaluation study, Algebra I policy changes, and the possible linkage between the research report and policy decisions. This questionnaire is also located in Appendix B. This questionnaire also served as the protocol for the semi-structured interviews, where the author began each interview with questions based on interviewee responses. Using the survey and initial interview data, a second round of interviews was conducted with some respondents to clarify and enlarge upon certain research findings.
Instrument Development

The two survey instruments were developed in response to the specific characteristics of this case study. The multiple choices for factor interpretation were taken from interpretations suggested by the principal researcher and several colleagues, including a graduate school advisor.

The utilization survey also was based on the specific research setting. As indicated in the literature review, the analysis of utilization is not a well defined or standardized research activity (Cousins & Leithwood, 1986). One of the few quantitative studies of utilization was conducted by Duggan and her associates (Duggan, Talmage, & Rasher, 1983), who developed an Evaluation Utilization Assessment Instrument. Duggan's study focused on organizational researchers rather than decision makers, however, so the instrument in its entirety was not appropriate here. Her instrument did serve as a source for the types of items contained in the utilization survey employed in this study.

The survey items focused on several aspects of the process of utilization. Respondents were questioned about their familiarity with the evaluation, their interpretation of evaluation findings, their knowledge of policy changes influenced by the evaluation results, and their attitudes toward future local evaluation efforts. Each of these areas reflects Cousins and Leithwood's (1986) review of the literature on factors associated with utilization.
Data Analysis

The survey data were analyzed at both the whole sample and subsample level. Because this was a case study, descriptive statistics were considered an appropriate statistical approach to analyzing the quantitative data. Results from the entire sample were used to represent the district response to the evaluation, while subsample results were used to explore perceptions of utilization as a function of position in the organizational hierarchy.

The main purpose of the interview data was to provide a context for understanding the quantitative survey results. That is why the interviews, particularly the second round, followed the analysis of the quantitative data. Taken together, the quantitative and qualitative data were used to describe the utilization of evaluation findings by the district and, along with the author's participant-observation perspective, suggest why the pattern of utilization occurred in the way that it did.
CHAPTER IV
ANALYSIS OF DATA

This chapter presents the analysis of data. The quantitative survey data are analyzed for the entire sample as well as by subsamples of central office personnel, building principals and classroom teachers. This is followed by a presentation of the qualitative interview data obtained from a subset of the survey respondents.

Quantitative Data Results

The first data set analyzed by the author was the interpretation of the evaluation findings by the survey respondents. The next section will discuss these responses, by administrative level and total.

Interpretation of Factors

Included in the utilization study packet that was distributed to the respondents was a list of the highest loading items from each factor extracted by the factor analysis component of the evaluation study. This list summarized the attitude results of the research study. This section discusses the variables which were associated with knowledge of the research effort. The respondents were asked to select from several choices the label they felt best described the group items.

Although there is some difference among the interpretations, the
majority of the responses suggest a consensus of thought among the school personnel (Table 2). Factor 1 of the study had confounded items originally conceived as belonging to two separate categories involving teacher authority and parental involvement. This new "blend" of items was interpreted by the respondents as "Parental/Teacher Expectations" with 60% making this their choice. Inspection of preferences, by group, revealed slight differences, with 63% of the central staff choosing "Relationship to Adults." Half of the principals and 72% of the teachers selected the "Parental/Teacher Expectations" label.

Factor 2 did not appear quite as easy to interpret for the respondents. Twenty-one percent chose "Value of Mathematics," 44% selected "Usefulness of Mathematics", 16% preferred "Importance of Mathematics", and the remaining 19% selected "Job Expectations." The only pronounced choice, by group, occurred among the teachers, where 48% selected "Usefulness of Mathematics."

The most clear-cut choice appears with Factor 3. Ninety-three percent of the respondents selected "Self Concept as a Mathematics Student" as the best interpretation of the factor items. There was unanimity among the principals and central staff, while only 10% of the teachers selected other choices.

Most of the respondents (72%) felt that "Study Habits" best explained Factor 4, although 16% selected "Willingness to Work" as the best explanation. Nine percent preferred "Lifestyle", while only 2% chose "Distractions." No unusual patterns appeared from an inspection of the different groups.
Table 2
Interpretation of Factors by Percent

<table>
<thead>
<tr>
<th>Administrative Level</th>
<th>Staff</th>
<th>Principals</th>
<th>Teachers</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Factor 1:</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Acceptance of Authority</td>
<td>0</td>
<td>33</td>
<td>10</td>
<td>12</td>
</tr>
<tr>
<td>Relationship to Adults</td>
<td>63</td>
<td>0</td>
<td>7</td>
<td>16</td>
</tr>
<tr>
<td>Parental/Teacher Expectations</td>
<td>25</td>
<td>50</td>
<td>72</td>
<td>60</td>
</tr>
<tr>
<td>Importance of Mathematics</td>
<td>13</td>
<td>17</td>
<td>10</td>
<td>12</td>
</tr>
<tr>
<td>Factor 2:</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Value of Mathematics</td>
<td>13</td>
<td>17</td>
<td>24</td>
<td>21</td>
</tr>
<tr>
<td>Usefulness of Mathematics</td>
<td>38</td>
<td>33</td>
<td>48</td>
<td>44</td>
</tr>
<tr>
<td>Importance of Mathematics</td>
<td>38</td>
<td>17</td>
<td>10</td>
<td>16</td>
</tr>
<tr>
<td>Job Expectations</td>
<td>13</td>
<td>33</td>
<td>17</td>
<td>19</td>
</tr>
<tr>
<td>Factor 3:</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Self-Concept, Math Student</td>
<td>100</td>
<td>100</td>
<td>90</td>
<td>93</td>
</tr>
<tr>
<td>Difficulty of Mathematics</td>
<td>0</td>
<td>0</td>
<td>7</td>
<td>5</td>
</tr>
<tr>
<td>Peer Expections</td>
<td>0</td>
<td>0</td>
<td>3</td>
<td>2</td>
</tr>
<tr>
<td>Factor 4:</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Distractions</td>
<td>17</td>
<td>0</td>
<td>0</td>
<td>2</td>
</tr>
<tr>
<td>Study Habits</td>
<td>38</td>
<td>83</td>
<td>79</td>
<td>72</td>
</tr>
<tr>
<td>Willingness to Work</td>
<td>38</td>
<td>0</td>
<td>14</td>
<td>16</td>
</tr>
<tr>
<td>Lifestyle</td>
<td>17</td>
<td>17</td>
<td>7</td>
<td>9</td>
</tr>
</tbody>
</table>
Quantitative Survey Data. The survey examined four aspects of the evaluative study—awareness of the research effort, organizational change with respect to Algebra I, actual impact of the evaluation on specific policy changes, and the potential value of such research for educational policy making. The coding scheme for the key variables in the survey, shown in Table 3, is based on Duggan's (1983) utilization study. The responses to the survey were tabulated, and descriptive statistics were generated for the entire sample and by administrative group, as presented in Table 4 and Table 5. Question 1 of the survey, coded V6 for purposes of analysis, addressed the compatibility of the evaluation study results and the respondents' classroom and/or administrative experiences. Based on the survey data, a strong consensus emerged, with 93% of the total sample seeing the results as sensible. Group members showed little diversity of opinion, as 96% of the teachers, 83% of the principals and 89% of the central staff answered in the affirmative. The fact that the evaluation seemed reasonable across all groups of the sample implies some credibility to the research findings.

Awareness of the Evaluation Study

This section will discuss the variables in the study which are associated with respondent knowledge of the research results. The responses to the survey were coded as presented in Table 3. The variables pertinent to this section were coded V18 - V22. The respondents were asked if the factor interpretation summary was the
Table 3
Coding Scheme for Key Variables

<table>
<thead>
<tr>
<th>VARIABLE NUMBER</th>
<th>VARIABLE NAME</th>
<th>CODING SCHEME NUMBER</th>
</tr>
</thead>
<tbody>
<tr>
<td>V 6</td>
<td>Compatible results</td>
<td>A</td>
</tr>
<tr>
<td>V 7</td>
<td>Extent of change</td>
<td>B</td>
</tr>
<tr>
<td>V 8</td>
<td>Change area: instructional methods</td>
<td>A</td>
</tr>
<tr>
<td>V 9</td>
<td>Change area: reduced class load</td>
<td>A</td>
</tr>
<tr>
<td>V 10</td>
<td>Change area: teacher reassignment</td>
<td>A</td>
</tr>
<tr>
<td>V 11</td>
<td>Change area: new textbook adoption</td>
<td>A</td>
</tr>
<tr>
<td>V 12</td>
<td>Change area: freshmen placement</td>
<td>A</td>
</tr>
<tr>
<td>V 13</td>
<td>Change area: other (tutorial)</td>
<td>A</td>
</tr>
<tr>
<td>V 14</td>
<td>Research value to respondent</td>
<td>C</td>
</tr>
<tr>
<td>V 15</td>
<td>Need for further research</td>
<td>D</td>
</tr>
<tr>
<td>V 16</td>
<td>Local research expeditious</td>
<td>A</td>
</tr>
<tr>
<td>V 17</td>
<td>Personal support of local research</td>
<td>A</td>
</tr>
<tr>
<td>V 18</td>
<td>First information about study</td>
<td>A</td>
</tr>
<tr>
<td>V 19</td>
<td>Information source: informal conversations</td>
<td>A</td>
</tr>
<tr>
<td>V 20</td>
<td>Information source: formal presentation</td>
<td>A</td>
</tr>
<tr>
<td>V 21</td>
<td>Information source: administrators' meeting</td>
<td>A</td>
</tr>
<tr>
<td>V 22</td>
<td>Information source: central staff memo</td>
<td>A</td>
</tr>
<tr>
<td>V 25</td>
<td>Student attitude knowledge assists: Making out master schedule</td>
<td>A</td>
</tr>
</tbody>
</table>
Table 3 (cont'd)

Coding Scheme for Key Variables

<table>
<thead>
<tr>
<th>VARIABLE NUMBER</th>
<th>VARIABLE NAME</th>
<th>CODING SCHEME NUMBER</th>
</tr>
</thead>
<tbody>
<tr>
<td>V26</td>
<td>Student attitude knowledge assists: Assigning teachers to specific courses</td>
<td>A</td>
</tr>
<tr>
<td>V27</td>
<td>Student attitude knowledge assists: Purchasing textbooks</td>
<td>A</td>
</tr>
<tr>
<td>V28</td>
<td>Student attitude knowledge assists: Limiting class size</td>
<td>A</td>
</tr>
<tr>
<td>V29</td>
<td>Student attitude knowledge assists: Establishing/maintaining parent organization</td>
<td>A</td>
</tr>
<tr>
<td>V30</td>
<td>Student attitude knowledge assists: Enlisting community support for school</td>
<td>A</td>
</tr>
<tr>
<td>V33</td>
<td>Decisions Based on research</td>
<td>E</td>
</tr>
</tbody>
</table>

Key to Coding Scheme:

Coding Scheme A: 0 = No, 1 = Yes
Coding Scheme B: 0 = Extensively, 1 = Not at all, 2 = Moderately
Coding Scheme C: 0 = No, not at all, 1 = Somewhat valuable, 2 = Yes, very valuable
Coding Scheme D: 1 = Yes, on a periodic basis, 2 = Yes, but infrequently, 3 = No, further information is unnecessary
Coding Scheme E: 0 = I don't know, 1 = Yes, 2 = No
<table>
<thead>
<tr>
<th>VARIABLE</th>
<th>N</th>
<th>CODING SCHEME NUMBER</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>(See key below)</td>
</tr>
<tr>
<td>V 6</td>
<td>42</td>
<td>A</td>
</tr>
<tr>
<td>V 7</td>
<td>39</td>
<td>B</td>
</tr>
<tr>
<td>V 8</td>
<td>40</td>
<td>A</td>
</tr>
<tr>
<td>V 9</td>
<td>40</td>
<td>A</td>
</tr>
<tr>
<td>V10</td>
<td>40</td>
<td>A</td>
</tr>
<tr>
<td>V11</td>
<td>40</td>
<td>A</td>
</tr>
<tr>
<td>V12</td>
<td>39</td>
<td>A</td>
</tr>
<tr>
<td>V13</td>
<td>39</td>
<td>A</td>
</tr>
<tr>
<td>V14</td>
<td>40</td>
<td>C</td>
</tr>
<tr>
<td>V15</td>
<td>40</td>
<td>D</td>
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Key to Coding Scheme:

Coding Scheme A: 0 = No, 1 = Yes
Coding Scheme B: 0 = Extensively, 1 = Not at all, 2 = Moderately
Coding Scheme C: 0 = No, not at all, 1 = Somewhat valuable, 2 = Yes, very valuable
Coding Scheme D: 1 = Yes, on a periodic basis, 2 = Yes, but infrequently, 3 = No, further information is unnecessary
Coding Scheme E: 0 = I don't know, 1 = Yes, 2 = No
Table 5

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Table 5 (con't)

Variable Listing and Descriptive Statistics: By Group

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Table 5 (con't)

Variable Listing and Descriptive Statistics:  By Group

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Key to Group Coding:  1 = Teachers  
2 = Principals  
3 = Staff (including Board)

Key to Coding Scheme:

Coding Scheme A:  0 = No, 1 = Yes
Coding Scheme B:  0 = Extensively, 1 = Not at all, 2 = Moderately
Coding Scheme C:  0 = No, not at all, 1 = Somewhat valuable,  
2 = Yes, very valuable
Coding Scheme D:  1 = Yes, on a periodic basis, 2 = Yes, but infrequently,  
3 = No, further information is unnecessary
Coding Scheme E:  0 = I don't know, 1 = Yes, 2 = No
first information received about those results. Those having previous knowledge of the study findings were then asked to divulge their source(s) of information, given several possibilities.

According to the survey data, the information included in the packet was the first received by 62% of the teachers. However, only 17% of the principals had not received previous information and none of the staff were uninformed. The sources of information showed diversity by group, with the central staff indicating two major sources. Seventy-eight percent of the staff had had informal conversations with the researcher and 67% had also attended a formal presentation of the results to a Board committee. The principals seemed rather confused as to the source of their information although 33% indicated that they had been advised at an administrators' meeting. Equally shared as sources of information were the formal presentation to the Board committee, informal conversations with the researcher, and a memo from the central office (17%). The only sources of information indicated by the teachers were informal conversations with the researcher (27%) and a memo from the central office (8%).

Organizational Changes Regarding Algebra I

This section will discuss the variables associated with organization change with respect to Algebra I. These variables were coded V7-V12 and V25-V30 in the coding scheme (see Table 3). The issue of change was addressed by several of the questions, which approached different aspects of the concept. One of the questions, coded V7, attempted to assess the extent of any changes that had been
made to alleviate the failure rate in the Algebra I classes. Although four respondents declined to answer, the majority of those who did (87%) felt that change had been moderately initiated. Ten percent perceived no change and 3% believed that extensive changes had been made. All of the groups perceived changes, but the higher echelons of the hierarchy appeared to be slightly more inclined to recognize it than did the teachers.

The respondents were polled to establish the areas in which change was perceived. Greater diversity of opinion was found here. Twenty-eight percent of the respondents felt that instructional methods had changed, but only 12% perceived a reduction in class load. Teacher re-assignments were noted by 35% of the group, while 63% believed that new textbooks had been adopted. The placement of incoming freshmen into a pre-Algebra or an Algebra I course was recognized by most (74%). By administrative group, differences of opinion were more pronounced. Fewer teachers (22%) than principals (33%) and staff (43%) felt instructional methods had changed. None of the principals thought class loads had changed, but teachers (15%) and staff (29%) perceived a reduction in class load. The majority of the principals (67%) had reassigned teachers, while only 30% of the teachers and 43% of the central staff respondents were aware of change in this area. A majority of the teachers (63%) and staff (86%) cited new textbooks had been adopted, while only 33% of the principals were cognizant of changes made in this area. The placement of incoming freshmen into the appropriate course level was perceived by more teachers (81%) than
principals (67%) or central staff (57%). One other area of change was noted. The principal of one of the larger schools and two of his teachers had developed an innovative program, an after-school tutorial for the weaker students.

Another question addressing the issue of change was directed only to the principals and central staff and sought to discover whether the knowledge of student attitude would be useful to the performance of various administrative duties. Different perceptions of these relationships were found by group as revealed by the survey data. Only 33% of the principals felt knowledge of student attitude would assist them in making out the master schedule, but 63% of the central staff thought it would be helpful. Half the principals would see benefit in student attitude knowledge when assigning teachers to specific courses. Again, 63% of the central staff polled felt this could be beneficial. The greatest diversity of opinion arose over textbook purchases. Here only 17% of the principals felt student attitude knowledge would assist their choices, while 88% of the central staff felt this information was useful. A large difference of opinion between the two groups surfaced again regarding the relationship between knowledge about student attitude and the limiting of class size. Only 17% of the principals could see use of this insight, but 75% of the central staff felt this information was useful. The two groups were closer in their opinion of student attitude use to the establishing and/or maintaining of a parent organization. The results, 17% of the principals and 25% of the staff, still showed greater usefulness was perceived by the central staff.
Value to the Organization Regarding Change

This section will discuss the variables associated with the potential value of the research for educational policy making. These variables are coded V14-V17 and V33 (see Table 3). The fourth component addressed by the survey concerned the value of the evaluation study to the local decision making hierarchy. Several questions were used to collect this data. The first simply asked whether the information of the type researched by the study could be of value to the respondents' teaching or administrative duties. Twenty-five percent of the respondents to this question found the information very valuable, 63% thought it was somewhat valuable and 13% felt the research had no value for them. An inspection by group revealed that the staff assessed the most value to conducting further research. Seventy-five percent of the staff chose "Yes, very valuable" while the remaining 25% selected "Yes, somewhat valuable". The 13% who selected "No, not at all" as their response to the question were all teachers. All the principals felt further research could be useful, with 17% choosing "Yes, very valuable" and 83% selecting "Yes, somewhat valuable".

The results to this question were reinforced by the answers given to the next, which questioned whether the respondent believed that research conducted at the local level could expedite decision making. Again, 100% of the staff answered affirmatively, with 88% of the principals and 89% of the teachers agreeing. Respondents affirmed their support of local research efforts with 100% backing by staff and
principals, while 80% of the teachers pledged support. As a final assessment of value, the principals and staff (teachers were asked not to respond) were asked if any decisions affecting several administrative functions had been made as a result of the research. The answers here were mixed, with half of the staff respondents saying "Yes" while the other half said either "No" or "I don't know". The majority of the principals (80%) asserted that decisions based on the research had been made.

Interview Data

Two rounds of interviewing were conducted in the utilization study. The first round was intended to supplement, and provide a context for, the quantitative survey data. As the analysis of the survey and the initial interview data proceeded, certain questions and issues arose which required a second round of interviews with selected district personnel. Teachers, principals and central office personnel were all involved in the interviews. The following questions were addressed during these conversations.

1. What was your impression of the evaluation study?
2. How familiar were you with the study?
3. What policy changes concerning Algebra I are you familiar with?
4. Which of these policies have been influenced by the evaluation results? Explain how.
5. Would future local level evaluation efforts assist the
development of school district policy?

Open-ended, semi-structured interviews with the representative personnel were scheduled. The interviews were very informal. Those held with the teachers and principals took place at school, the interviewees homes, or by telephone. Notes were recorded after the conversations were completed. Central office administrators were interviewed in their offices, while the school board members preferred to be interviewed in their homes. Some notes were taken during these conversations; others were recorded shortly after the interviews. No tape recordings were made of any of the conversations. Although the survey questions were used as a guide during these conversations, no restrictions of content or time were imposed on those interviewed.

Teachers. Seven teachers were selected at random to be interviewed. The first one contacted, Teacher A, expressed ill-concealed irritation at the intrusion and some degree of hostility. She emphatically stated that the survey was a waste of time because "the school board doesn't listen to anyone, especially teachers." A veteran teacher, "A" revealed during the course of the interview that she was disillusioned with teaching in general and her position in particular. Responsible for teaching the advanced courses in one of the larger schools, she felt overworked, underpaid and little appreciated. She asserted that research conducted in the classroom wasted valuable teaching time, and that studies conducted for use in local decisions would just be ignored by the board. When asked about the results of the evaluation study, she admitted that they were compatible with her own classroom experiences. She also conceded that
moderate changes had been initiated at her school with student course placement. She concluded the interview with a contradiction by stating that further research should be conducted.

In contrast to Teacher A, Teacher B proved to be pleasant and cooperative. Although quite young, Teacher B had several years of teaching experience, enjoyed her work, and considered herself to be a successful teacher and an asset to her faculty. Although she had participated in the evaluation study she had not been previously informed of the results. She, too, found them to be compatible with her classroom experiences and felt that such research could be of value to the Board and Central Staff. She stated that changes in her school had been adopted in the area of teacher re-assignment and new textbooks, in addition to student course placement. She, too, was concerned about the inroads on teaching time that research procedures would make, but felt that infrequent research efforts were valuable. She stated that she would support local research efforts because "finding out why some of my students can't seem to learn is important to me."

Teacher C, another classroom veteran, voiced emphatic support for research at the local level. He responded enthusiastically to the queries of the interviewer. Teacher C was familiar with the evaluation study and had participated in it. He agreed with its results and felt that moderate changes had been made in the reduction of his teaching load, in new textbook adoptions and in the placement of incoming freshmen students at his school. He believed that information of the type researched in the study was very valuable to him as well as the
administration, felt that more studies should be conducted on a periodic basis, and was especially interested in learning more about student motivation. He endorsed local research efforts as a means of expediting decision-making.

Teacher D, employed in another of the larger schools, refused to answer any of the survey questions, although he did agree to give his interpretation of the evaluation study factors. Young and politically active, he appeared hesitant to be associated with any project that he thought could possibly affect his political ambitions.

The next teacher interviewed was employed in a third large school, one of the older and well established institutions in the state. Based on her comments, she appeared secure in her own ability to teach and enjoyed her work. Regarding the evaluation study, she believed that moderate changes had been initiated at her school due to its findings. She stated that instructional methods had been modified, and she felt that further research should be conducted to ascertain which methods would best engage her students. Teacher E was in complete accord with the Evaluation Study attitude instrument, saying that "as soon as I read it, I thought it could be my own description of my own students." She emphatically approved of research-backed decision-making by the local board, stating that it would "be more accurate than the opinions of those board members." Admittedly impatient with the "petty politics" of the board, she saw research as an impetus to the policy making process.

Teacher F, nearing retirement, was somewhat reticent to share his beliefs. An original faculty member at one of the larger schools, he
was "tired" and didn't "want to be bothered by any newfangled stuff. Besides, dumb kids will fail and smart ones will pass, no matter what you do." After some prodding, he stated that his teaching experiences were compatible with the results of the evaluation study research and that moderate changes had been made at his school because of them, primarily in course placement of freshmen. He gave a rather unenthusiastic endorsement to periodic research, stating that local decision-making needed some direction and research could "point the way to go." He would support local research projects, although he had reservations about the interruptions they might cause to his classroom routine.

Teacher G, the last interviewed, was also a veteran teacher, but had changed schools, grade levels, and teaching areas during her career. When interviewed, she had just returned to her current school after an absence of several years. She had not participated in the evaluation study and was uninformed of its results. She agreed, however, to the interview and willingly answered the questions she could. She was cognizant of some changes in teacher assignments, textbooks, and course placement of freshmen students at her school, but could not attribute them to the evaluation study. When given a copy of the Student Attitude Instrument to read, she nodded her head and stated that she "could see how it could separate the sheep from the goats." She supported periodic research and would back local efforts although she, too, expressed concern over classroom interruptions. But throughout the interview she seemed somewhat distracted and kept commenting about how hard she had to work. She complained of having
too many students and that the students she had been assigned were unprepared to do the amount and caliber of work she felt were necessary. She was preoccupied with the monetary problems the school system was experiencing and stated several times that she should have gone into a more lucrative and prestigious field of work. She gave the impression of being far more interested in her personal problems than in attempting to discover solutions for her professional problems.

The interactions with these seven teachers sketched a picture of various purpose and mood. The teachers who responded positively to the research effort, Teachers B, C, and E, appeared to see themselves as effective teachers and valued employees whose opinions could make a difference in the lives of their students. They seemed to feel a continuing responsibility to search for and find better ways to communicate with their students, not just the subject matter for which they were primarily responsible, but also something of themselves and their personal values. Teachers A, D, F and G did not exhibit these characteristics. They appeared to be marking time -- just waiting -- either for retirement or another (and better) job. They had shown little discernable concern for their students or the effect that they might have on these students. Research into the factors affecting classroom performance or achievement meant little; they had already emotionally detached themselves from the classroom.

**Principals.** The principals who were interviewed were somewhat more reserved about sharing their opinions of the evaluation study. The first, Principal A, was anticipating retirement and had lost some of his former enthusiasm for the project. He did take time to convey that
he thought the work had been useful to him and that he had considered the results of the study when he made teacher assignments. He also felt that knowledge of student attitude would continue to be helpful in such tasks as drawing up the master schedule, assigning teachers to specific courses, and scheduling incoming freshmen students to an introductory Algebra or Algebra I course. He felt further research was needed since he did not completely agree with the attitude research results. He supported local research efforts and believed research findings could expedite local decisions.

Principal B, who headed one of the smaller rural schools, gave guarded support to local research. He was not surprised by the evaluation study results and had made moderate changes in teacher re-assignment and textbook adoptions, but felt infrequent research was sufficient to supply any information he might use in his own decision making. He conceded a greater need for research in a larger school population and would participate in system-wide studies. As a veteran principal who knew his students and their families, he believed he had little need to engage in complex or long range research.

Principal C gave the most contradictory testimony of all the persons interviewed. Still new enough to his position to demonstrate some anxiety about his effectiveness, he had not yet determined his best course of action in decision-making. He decried local research as a facilitator of the policy process, yet vowed to support local research efforts. He stated emphatically that no decisions resulting from the research had been made at his school, but discussed at length the need to separate incoming freshmen into appropriate courses. He
explained how his mathematics faculty was undergoing an experimental procedure involving course content and instructional methodology. Although the experiment had not been completed, he was impatient to terminate it so he could draw conclusions and make plans for the next school year. Already he had several more ideas he wanted the faculty to try. Almost in the same breath he insisted that infrequent research studies were sufficient for his needs.

The interviews conducted during this study underscored the school-by-school interpretations of the evaluation study and implied differential utilization of the results. Each principal responded to the findings as his individual experiences dictated. The two veterans were more skeptical about the need for widespread research; they were confident in their own abilities to interpret the conditions existing in their schools and the underlying causes of those conditions. Principal C, however, who had less experience in the leadership role and a large, heterogeneous student body, was less secure and more open to valid information to help facilitate his decisions. The consensus among these men was a general, if not completely enthusiastic, acceptance of local research.

Central office administrators. The central office administrators were the easiest, and most cordial, group to interview. They were all familiar with the evaluation study since they had assisted in its design and implementation. They also expressed feelings of satisfaction in the research results. None gave any doubt about the utility of the study.

One of the interviewees, whose primary responsibilities lie within
the instructional domain, expressed great relief at the descriptive findings. She had already endorsed personnel changes; the research validated her judgment. She believed that local research not only was worthwhile, but was necessary, and favored frequent, if not continuous, research. She felt that the evaluation study had served as a catalyst to the System, particularly as a reinforcer of self-determination. "We will make improvements in our system, real improvements, only if we are the ones who analyze our problems and find solutions to them. We have waited too many years for others to solve our problems. We know better than anyone else what our strengths and weaknesses are. We just need to have more confidence in our ability to do the right thing. I think the (evaluation) study helped us see that."

Another of the administrators agreed that the evaluation study had been useful in directing his attention toward additional local research. He, too, was pleased that not only could the research result in viable decisions, but that its cost was minimal. As the agent responsible for the curricular and instructional decisions in the system, he was also accountable for their costs. Bolstered by the evaluation study, he had suggested that like studies be encouraged at the school building level, a suggestion which was later adopted by the School Board. He endorsed increased participation of individual schools and the whole system in competing for educational grants as means of implementing and funding change.

Board members. The nine Board members are elected from the various sections of the Parish to represent a specific area. This tradition of representation, the old ward system, has fostered
competition rather than cooperation among the members. Each member is responsible for and to his/her own district and historically has been deeply enmeshed in the political life of the district. This involvement has permeated all aspects of the educational milieu including the appointment and hiring of personnel to the varied jobs necessary for the operation of the schools within the district. These practices have been accepted, even condoned, by the administrative hierarchy. The right to continue such activities is vigorously defended and jealously guarded by several of the district members, since it is the primary source of the political power they possess. This view overshadows the concept of the "whole board" acting for the development, improvement, and advancement of the entire System. It, therefore, tends to be change resistant, especially in the political sense.

Clashing with this tradition is the more liberal philosophical view, espoused by other board members, which prefers a global concept of operation. This group would set the overall goals and procedural policies, but would leave the operational details, personnel selection, and other implementation to the professional administrative staff.

The Board's current nine member composition can be broken down as follows: five philosophically "conservative," four liberal; five veteran members, four novice; five men, four women; five urban-area representatives, four rural, and seven white, two black. Predicting how the members will align for a specific vote has been an exercise in futility but the outcome is usually favorable to the Superintendent.

Only three of the Board members had shown an interest in the
evaluation study as demonstrated by their attendance at its presentation. Two of them were defeated during the 1986 fall elections. The third, Member A, an eight year veteran member, remained interested in any activity which might enlighten her understanding of the teaching-learning process and her responsibility in policy-setting to enhance the process. At the time the interview was conducted, she was serving as president of the Board, although she anticipated being removed from the position at the next meeting (January, 1987). Her interest in the evaluation study was deeply personal. She had been educated in the public schools of Rapides Parish, receiving an excellent preparation for college. She "loved" math; her children hated it. She wanted to know why.

Her comments then led to the behavior of the Board in reference to instruction. She felt that little attempt was being made, on a regular basis, to identify problem areas such as mathematics so that improvements could be planned and implemented. She felt that the majority of the elected officials did not even know that problem areas existed, nor, in her opinion, did they care. She stated that "the Board is uncomfortable discussing instructional matters. The Superintendent has not been willing to in-service the Board on the importance of instructional business." Continuing, she said that "insecure principals are the ones who reject alternatives. Narrow-thinking leaders are the less able; they are not comfortable with their own judgment." She believes this is part of the problem with incompetent teachers; insecure principals are afraid to dismiss the teachers they think are incompetent. She mentioned one of the
elementary teachers her son had had, saying that "the teacher was unable to correctly pronounce even simple words, like mountainous. She said 'moun-tain-ous,' with the accent on the second syllable. We had difficulty understanding, at first, what she was saying. Then we had to re-teach our child."

She felt it is possible for the Board to "adopt policy that is compatible with organized change", but she did not expect it to happen "unless the grass-roots teacher can convince his/her member that it should." She attributed part of the problem to "the Southern perspective. It is part of our culture to take care of our own, with no outside help. We send the troublemaker or incompetent (to a position) where little harm can be done."

She also cited the influence of a depressed economy on the area, "we depend too much on government for jobs. The largest employer in our area is England Air Force Base. The second largest is the School Board." Continuing, she noted that the voters were gradually becoming better informed and "more people are interested in education outcomes. The public is becoming more involved and feels that need to improve schools. We cannot ignore the influence of the media" toward this end. Education can "no longer be isolated from other facets of life. Business expects a good eighth-grade level work force and, in the future, business, not government will dictate policy (to education). Employees must be able to read, write, and compute."

She closed the interview with this lament: "There is not one cent in the budget for staff development."

Member A was correct with her analysis of her position. She was
removed from the Presidency of the Board by a 5-4 vote. The alignment of the Board in this case was due to gender. Her tenure had lasted only two years; her predecessor was reinstated to the post.

Since the other members who were cognizant of the evaluation study had been defeated in the Fall election and attempts to communicate with them were ignored, a new Board member was contacted and agreed to an interview. A retired English teacher, she reviewed the evaluation study and answered the questionnaire prior to the conversation.

Member B expressed deep interest in the evaluation study. Newly retired, she had spent many years in the classroom and was highly respected in the community. Many of her former students, upon hearing of her entry into the political arena, actively campaigned for her. Her victory was somewhat of a surprise to her; she had not expected to win her first venture into political life. Now adjusted to the reality of her election, she was eager to learn the intricacies of her new work.

Member B strongly believed that the key to school improvement was the classroom. As such she supported policy that would strengthen the teaching profession over support personnel. "We need good support people -- aides, secretaries, bus drivers, lunch room workers -- but more than anything else we need good teachers. Without good teachers, our schools can not improve. Our veteran teachers should be rewarded for the good work they do. Better salaries and better working conditions are mandatory. We must reduce our class load. And our salaries must be adequate enough to attract and keep new teachers."

Turning her attention back to the evaluation study she commented
that she was in full agreement with the research, that she was pleased to see evidence of the strength of student attitude and would like to see the study repeated, perhaps in English rather than mathematics. She pledged her support to local research, again emphasizing her wish to assist the classroom teacher improve instruction and student achievement. There was no doubt about the priority of issues with Member B.

Second Interviews

A re-examination of the interview notes showed a somewhat puzzling situation. Not all of the interviewees appeared to be knowledgeable about the evaluation study results, although most of them knew about the study. This situation was more pronounced among the teachers and principals. Therefore, several questions were formulated, and some of the interviewees were re-contacted. Most of these conversations were conducted by phone, although a few involved meeting.

Teachers. Teachers B, C, E, and F were contacted for further questioning. All expressed agreement with the evaluation study results, but the time of their learning these results varied. Teacher B knew nothing of the outcomes until she received the utilization survey questionnaires, while Teachers C, E and F professed familiarity with the results at a much earlier date. Although none of them could recall specifically when they had learned the outcomes, they answered "About a year or so ago" or "last school year." Teacher B was most aware of policy change in the areas of teacher re-assignment, new textbooks, and student course placement at her school. She said she
"felt that these changes had resulted from the evaluation study since the changes began occurring the year after the study," but admitted she had "never been specifically informed" that this was true. Teacher C saw policy change in his teaching load reduction, new textbooks and student placement. He, too, attributed the changes to the evaluation study because of the sequence of the study and the changes. Teacher E stated that policy changes at her school (these four teachers were assigned to three different schools) involved instructional methods and attributed the change to the evaluation study. Teacher F cited course placement as the policy change he felt had occurred due to the evaluation study. All four of these teachers endorsed future local evaluation efforts to assist district policy development.

On the whole, the teachers were in agreement with the evaluation study results. Of the seven contacted five strongly agreed with the findings, one reluctantly expressed approval, and one declined to express an opinion. Only one was unfamiliar with the study, but was willing to be informed and then express an opinion.

There was diversity of opinion among these teachers concerning policy change as related to the Algebra I course taught in the district. The most universally recognized policy change dealt with the placement of incoming freshmen into the Algebra or pre-Algebra courses. Five of the seven teachers identified this change. The adoption of new textbooks was cited by three teachers, while a reduced teaching load, teacher re-assignment and modified instructional methods were each cited by only one person. The teachers expressed
varying opinions as to which of the policies had been influenced by the research results, although four expressed the belief that the changes occurring at their schools resulted from the study due to the timing of the changes. Since the policy changes began occurring the year after the study, all felt that it was reasonable to assume that the study had been the impetus of the changes. They strongly recommended future local evaluation efforts to assist in the development of district policy.

**Principals.** Two of the three principals, B and C, were re-contacted. Both professed policy changes had occurred at their schools, but C denied that the evaluation study precipitated the changes, while B asserted that it had. Both expressed knowledge of the results before receiving the utilization survey, but could not pinpoint the time or source of the information. Both had discussed the evaluation study and its results with the other principals since the first interviews. They now expressed a more positive view toward similar studies, with B stating that "at least the larger schools should use such studies to help make decisions" and C conceding that he "could find some merit" in having statistical data to back some administrative decisions.

On the whole, the principals were supportive of the evaluation study. The time that had lapsed between the first and second interviews had allowed the principals to discuss the study and its results among themselves. Time had also enabled the principals to accept the idea of future studies. Although there was no consensus as to specific policy changes or to the exact influence of this first
study, there was general acceptance that future local studies would be conducted to assist in the development of district policy.

Central office administrators. Although the central office administrators had been consulted on numerous occasions regarding the evaluation study and its results, the three who had been most closely involved in the study were again contacted. All three were asked specifically if the evaluation study had influenced policy within the school system in general and in relation to Algebra I in particular. The answers were emphatically "yes" from all three. In the words of Administrator A, "we had never considered how important student attitude toward adults was. From now on, the central office staff will be influenced by this factor when we need to recommend personnel for particular projects. We'll remember to look for teachers who can communicate well with the students at that particular level."

Administrator B also cited the influence of the study and reiterated the wish to implement another attitude study in the sixth grade centers located in the metro area. He was interested in gaining greater parental involvement for these students, the need for which had been uncovered by the evaluation study. He felt that the influence of the evaluation study would be more strongly felt in the future when the utilization study had been completed. He firmly stated that he did not believe it was appropriate to launch new studies until the utilization study and the dissertation of which it was such an integral part were completed. In expressing this belief, he revealed why so many of the teachers and principals were uninformed or unsure about the evaluation study results. He had not deemed it
necessary to disseminate the evaluation study results until the dissertation was complete, not realizing that utilization of the results was to be included in the dissertation. This explained why teacher/principal knowledge of the evaluation results was so sparse. Those who were knowledgeable had gained their information from the researcher or from others who had talked with her, but not from the central office. Information from the central office to the teachers and principals had not been dispensed. Although the conversation with Administrator B had clarified most of the questions concerning the dissemination of the evaluation study results, Administrator C was also contacted and asked his opinion about the influence of the evaluation study. He stated that although he was not as knowledgeable about the specifics of the study as other members of the staff, he found that it had influenced his general outlook on the ability of the system to undertake such projects. He expected to support future research conducted in the system.

Board members. Neither board member could answer the question about policy changes affecting Algebra I. Both stated that such issues were left to the instructional personnel. However, Member A cited influence from the evaluation study on her idea to survey area residents about the school system and the goals citizens wished the system to achieve. This survey, conducted during the 1985-86 school year, involved over 14,000 respondents from different groups and served as a guide in the board's strategy to pass a sales tax in 1986. Member B, on the other hand, felt the evaluation study was more influential in the drafting of a five-year plan the board had designed
based on additional funding from these tax revenues. As an example, she pointed to the provision in the plan to hire additional teachers for the specific purpose of reducing class size and teacher load, a recommendation made at the evaluation study presentation the previous year.

Both members expressed general support of the evaluation study and endorsed the use of future evaluation efforts to assist in the formulation of district policy. As stated by member B, "It is extremely difficult to make intelligent decisions that affect so many people. We need all the help we can get. A study like this helps."
CHAPTER V

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

This chapter presents the summary and conclusions of the study. Recommendations for further research were drawn from these discussions.

Summary

This study examined the relationship between evaluation of curriculum policies and utilization of evaluative results at the local level. The central question in the study concerned the influence of locally conducted evaluative research on the nature and extent of organizational policy decision making. A principal focus was the relationship between evaluation and utilization at different levels of decision making. The basic questions addressed in this study were:

1. Did utilization of research results occur, that is, did knowledge of the relationship between student characteristics and success in Algebra I impact policy decisions?

2. What was the nature of the utilization, that is, was it instrumental or conceptual?

3. If utilization occurred, did it consist of comprehensive or incremental change, that is, did use consist of district-wide changes only or of school-by-school changes?

4. Could utilization be identified in the classroom, that is, was the use of research information by the classroom teacher recognizable?

5. What determined the degree of evaluation utilization?
6. What roles can social science research information play in a political decision process?

An ex post facto research design was employed in this study of public school decision makers from four levels of responsibility. A hierarchy of school board members, central office staff, principals, and teachers participated in the study. Each was asked to respond to a summary of the results from a study evaluating a local curriculum problem and to answer a questionnaire documenting respondent perception of the relevance of local research to policy decisions.

Descriptive statistics were generated to determine the respondents' views regarding the research data interpretation, policy change perceptions, evaluation information dissemination and evaluation information value to the school system. Analyses inspected these data holistically and by administrative level. Interviews were conducted with representative personnel selected from each group to further clarify the meaning of events to the participants and the context in which the events had occurred. A subsequent round of interviews further delineated these clarifications.

The data for the research questions were analyzed by individual and by group. Forty-three individuals were analyzed at three levels of the organization.

Conclusions

Six basic conclusions were drawn in response to the study's research questions and subsequent interviews concerning the utilization of evaluation. These conclusions are stated in the following discussions.

1. Did utilization of research results occur, that is, did
knowledge of the relationship between student characteristics and success in Algebra I impact policy decisions? Utilization did occur, that is, knowledge of the relationship between student characteristics and success in Algebra I did impact policy decisions. Data from both qualitative and quantitative sources indicated utilization of the evaluative study. The last question in the survey specifically addressed the respondents' perception of utilization in particular policy areas. Fifty percent of the respondents answered "Yes", 29% said "No" and 21% reported they did not know if the study results did been used in decision making. Perceived use differed by group with 63% of the staff saying "Yes" and 38% stating "I don't know". Only one-third of the principals said "Yes", while two-thirds said "No". The teachers did not respond to this question.

Statements made during interviews amplified the meaning of utilization to each group of respondents. Teachers said, "Instructional methods have been modified at my school" and "Freshmen have been advised to take a particular course, Algebra I or pre-Algebra, at my school."

Principals "considered" the research results when assigning teachers and adopting textbooks. One of them said, "I'll spend more time on teacher assignment when I'm drafting the master schedule."

Central office staff utilized the research study to legitimize personnel changes, reinforce personal confidence in decision-making, plan for future curriculum policies, and clarify current political climate. One administrator expressed this opinion, "We just need to have more confidence in our ability to do the right thing."

The interviews suggested two types of utilization. One concerned
specific decisions about Algebra I policy, such as course offerings, instructional methods, textbooks, class load and teacher assignment. The other influence was much broader in nature, concerning the use of research to assist in policy decisions. This was revealed by a statement from one administrator who said, "We can institute more effective policy if we base our decisions on our research."

2. What was the nature of the utilization, that is, was it instrumental or conceptual? The nature of the utilization was both instrumental and conceptual. As revealed in the survey data and the interviews, the evaluation study demonstrated the feasibility of conducting locally designed exploratory investigations into problem areas. On the conceptual level, the idea that student performance was affected by student attitudes was suggested by the differences between mean attitude scores of those who passed and those who failed the Algebra I course. This finding appeared to be surprising to the respondents. This new knowledge about the attitude-performance link filtered into the thinking of decisionmakers toward policy. This point was mentioned by each central office staff member interviewed. As expressed by one administrator, the evaluation study "was an eye-opener; we had never considered how important student attitude toward adults was". Still on the conceptual level, board members are now considering the possibility of securing release-time for subject area teachers to meet and discuss common problems. Central staff administrators and principals are paying more attention to teacher assignment and overload. In a more instrumental vein, different textbooks, exploring the value of particular math concepts to future careers, have been adopted for the seventh and
eighth grades. Teacher personality and skill in working with young adolescents are now being considered in teacher assignments. As one principal explained, "I'm looking at my teaching personnel in a different way, now. Some people just do a better job with a particular age group than others." Plans for better communication with parents concerning specific responsibilities of the students in the Algebra I classes are being drafted at one school. A proposal based on the evaluation study has been written to attract funds for implementation at the four sixth grade centers. Plans are to implement this project as funding becomes available.

3. If utilization occurred, did it consist of comprehensive or incremental change, that is did use consist of district-wide changes only or of school-by-school changes? Utilization consisted of district-wide and of school-by-school change. Influence of the study upon the entire district is reflected by policy involving the teaching of a pre-Algebra course which is now being taught in the larger high schools. Prior to the study, some of the teachers had expressed a need for a pre-Algebra course at their schools. The results of the study supported this position. Plans are underway to introduce a pre-Algebra course into the larger junior high schools for those students who demonstrate readiness for this level work. In the past, few pre-Algebra concepts have been covered during the junior high years. As explained by the mathematics supervisor, the textbooks for these classes were chosen with care in the expectation that student self-confidence could be strengthened by successful exposure to pre-Algebra concepts and skills. The various schools, particularly the larger ones, have already implemented some
changes. One school experimented with different instructional methods as promoted by the authors of different textbooks. The results of that study showed no significant differences in performance could be attributed to the methods used. Another school executed an after-school tutorial during which slower students were assisted by the more successful students. This study has shown promise and a follow-up to it is being conducted at this school during the current school year. The perception of change as being districtwide or peculiar to a specific school is dependent to a large extent on the administrative level of the respondent. Since most of the teachers (62%) had no prior knowledge of the evaluation study results, they perceived little change, and the changes they did perceive were usually confined to their own schools. As a teacher from one of the smaller schools explained during his interview, "I don't really know what anyone else is doing, but I know too many of the students at my school are failing. We need to do something for them—quick." The principals apparently agreed with that statement, as all of them asserted that changes had been initiated in their schools. But the types of changes perceived (67% had re-assigned teachers and recommended course placement of incoming freshmen, but only 33% had adopted new textbooks and instructional methods) suggest school-by-school changes rather than district policies. On the other hand, several of the staff mentioned district criteria in textbook adoption and teacher assignment. The mathematics supervisor asserted that "special attention was given to the selection of new textbooks for the junior high students. We looked for books that emphasized the value of math concepts to future careers as well as to the Algebra I course."
4. Could utilization be identified in the classroom, that is, was the use of research information by the classroom teacher recognizable? Utilization could not be identified in the classroom, that is use of the research information by the classroom teacher was not recognizable. As demonstrated by the survey and interview data, fewer of the teachers were aware of the research results than any other group (38% of the teachers had knowledge of the evaluation study results compared to 83% of the principals and 100% of the staff) even though the teachers attributed the most value to this knowledge. In the survey, only 13% saw "No value" to the evaluation study. Twenty-five percent chose "Yes, very valuable", while 63% felt it was somewhat valuable. By group, all the principals felt more research would be valuable with 17% choosing "Yes, very valuable" and 83% choosing "Yes somewhat valuable". The staff also unanimously endorsed "value". The 13% saying "no value" were all teachers, but still the majority of the classroom employees subscribed to at least some value. Interview questions revealed that the evaluation study results had not been formally disseminated to this group (teachers). As explained by Cousins and Leithwood (1986) communication is one of the most significant aspects of the decision to utilize. This breakdown in communication was the primary factor in nonutilization in the classroom. According to an assistant superintendent, the failure to disseminate completely was because "the district is still learning how to utilize evaluation information."

5. What determined the degree of evaluation utilization? The factors which determined the degree of utilization are dependent on individual role and experience. As expressed in the interviews, the
evaluation study focused the attention of the respondents on the student attitude-performance link as never before. The realization that this relationship was so strong in this sample of students served as an impetus in utilization. Teachers reacted to the knowledge by questioning their instructional methodology and procedures. Principals considered teacher personality and skill in interacting with the young adolescent when making teacher course assignments. Central staff administrators, too, reflected on teacher personality when recommending personnel changes. Board members meditated on the possibility of affording release time for teacher deliberation and exploration of common-area problems. Materials of instruction were reappraised. Possible ways to assess student attitude at an even earlier stage of development were perused and a proposal to implement such a program at the sixth grade centers was written.

The evaluation study had incorporated several of the characteristics found by Cousins and Leithwood (1986) to facilitate overall evaluation use. According to their framework, twelve factors, six of which tend to be implementation oriented, and six which revolve around decision or policy setting, are the most significant in determining utilization. The evaluation implementation factors (and major characteristics) include:

1. evaluation quality (methodological sophistication or type approach to problem),
2. credibility (appropriateness of evaluation criteria),
3. relevance (extent to which evaluation was geared to audience and organizational location of evaluator),
4. communication quality (communication style, activities and
dissemination),

5. findings (congruence with decisionmaker expectations), and
6. timeliness.

Of these six factors the evaluation study incorporated five. The study was both timely and relevant, focusing on a problem that had been intensified by the new graduation requirements. The approach of the study was believable and credible to the audience, 93% of whom felt the findings were consistent with their expectations. But the dissemination of the results to the teachers was informal and inefficient as already noted. The district needs to learn how to utilize its information more skillfully and effectively.

The six decision or policy setting factors enumerated by Cousins and Leithwood (1986) include:

1. information needs (intensity of need and/or type information required),
2. decision characteristics (area, context, and significance of decision),
3. political climate (existing staff views, organizational arrangements, and rewards),
4. competing information (alternative sources of information),
5. personal characteristics (organizational role, training, experience, and leadership of decisionmaker), and
6. user commitment and/or receptiveness to evaluation.

For the evaluation study, the optimum quantity of these components were involved. The commitment of key personnel to the findings of the study greatly contributed to its general acceptance. The audience had
welcomed the information imparted by the study, since the evaluation problem was significant to all administrative levels. The evaluation data was congruent with client experiences and personal observations, enhancing their receptiveness to the study.

6. What roles can social science research information play in a political decision process? Social science research information can play several roles in a political decision process. First, social science research can serve to evoke an awareness of conditions not perceived by decisionmakers. In this sense then, research and utilization play the role of educator. Cognizance of existing conditions, in turn, further sensitizes the individual, as well as each group, to other possible effects of the research. Regarded in this sense, utilization is conceptualized by Cousins and Leithwood (1986) as processing and allows the client use by "thinking about". Utilization in the role of decision or implementation is the view most widely recognized outside the field of utilization. This "go nogo" concept of a decision to endorse full implementation of a study is giving way to the multifaceted dimensionality of utilization demonstrated by this study. The role is heavily influenced by the organizational context, that is, how the evaluation was incorporated into the organizational context and processed (Rich, 1981; Shapiro, 1985).

Recommendations for Future Utilization Research

The findings in this dissertation appear to have implications for future research on utilization. Three major areas of concern are the conceptualization of utilization, the unit of analysis in utilization studies, and appropriate methodologies to employ in the analysis of
utilization. Cousins and Leithwood's (1986) review of 65 utilization studies indicated that a great deal of time was spent carefully defining independent variables, but no mention is made of what characterized use or nonuse. In general, use appears to be treated dichotomously; it did or did not occur. Yet, the variation in response to the evaluation results in this study suggests that utilization is a highly complex phenomena, and understanding of the response of clients to evaluations must be specified carefully. The high emphasis on factors associated with use in previous studies has, by default, resulted in little attention to the measurement of utilization itself, and understanding what utilization means will require greater conceptual development of the term.

The second implication is related to the first. Utilization became a complex phenomena to study because the dissertation attempted to track utilization through the levels of an organization. Most research on use has examined a small subset of individuals designated as "decision makers". None of the 65 studies reported in Cousins and Leithwood (1986) examined utilization on an organization wide basis. Consequently, the literature on utilization tends to focus on utilization by a client, and does not consider the organizational context in analyzing responses to utilization. In this case, using the organization as the unit of analysis led to two interesting outcomes that could not have been identified otherwise. One was the deliberate keeping of information on study results from the classroom teacher level as the organization dealt with the uncertainty of what to do with the evaluation. The second was the idea of organizational learning utilization, reflected in the
district's decision to use study results to guide policy in the future. Since decisions filter through organizations, the organization as the unit of analysis should be included in future utilization studies.

Finally, this study, utilizing a participant-observation approach in a real utilization setting, appears to be highly unique in the literature on research utilization. None of the 65 studies reported in Cousins and Leithwood (1986) used this research style. Among the benefits of participant-observation of a real situation were: 1. willingness of participants to discuss sensitive aspects of the situation with the researcher, 2. insider and historical knowledge of the district which assisted the researcher in interpreting the situation, and 3. authenticity of the respondent reactions to the reality of the situation. In sum, the results of this dissertation suggest that the study of utilization requires a more complex definition and measurement of the concept of utilization, should regard the organization rather than individuals as the proper unit of analysis, and should employ a participant-observation design in a real utilization instance whenever possible.
REFERENCES


108


TO: All Board Members  
Assistant Superintendents  
Associate Superintendent  
Instructional Directors  
Supervisor of Mathematics and Science  

FROM: E. A. Nichols, Superintendent  

Mrs. Marie LaCour, a mathematics teacher at Alexandria Senior High School, will present a special mathematics study which she developed while on sabbatical leave during the 1984-1985 school year. The study concentrates on the math program in Grades 7 through 12.

This meeting will be held in Room 4 of the Media Center on Friday, March 21, 1986, at 1:30 p.m.

All board members are invited to attend this presentation.

EAN/pmnw
Description of the Report of the Evaluation Results to the Central Office Administrators of Rapides Parish on March 21, 1986

The report began with a brief history and rationale for the study, followed by a description of the sample and the procedure that was followed to collect the data. Enrollment and failure ratios for the schools included in the sample were presented in table format. A description of the data collected concluded the discussion concerning the background of the study.

Next, an explanation of the construction of the attitude survey instrument was given. An exploratory analysis of the 80-item instrument, which had been administered to 139 students at one of the targeted schools, extracted seven factors, as shown in Table A-1. The seventh factor was dropped and the highest loading factors of the remaining six factors were used to construct a new 30-item instrument. Only those items loading at .50 or greater were considered for inclusion in the new instrument. Although 39 items met this criteria, only 30 were retained to facilitate ease of administration. The shorter version was the instrument used in the evaluation study, the results of which are shown in Table A-2. [Note: Factors 5 and 6 of this second analysis could each explain less than 10% of the variance. They have been omitted from a third version of the instrument, currently being used in a new study of the attitude/performance relationship in Rapides Parish mathematics students.]

The report then focused on the results of several regression and discriminant analyses (see Tables A-3, A-4 and A-5). Regardless of
Table A-1

Rotated Factor Pattern (Seven-Factor Varimax Solution) on Algebra I Attitudes: Item Numbers and Loadings for Exploratory Sample (n = 139)

<table>
<thead>
<tr>
<th>Factor</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>42 (.62)</td>
<td>5 (.74)</td>
<td>52 (.64)</td>
<td>80 (.66)</td>
<td>78 (.61)</td>
<td>10 (.57)</td>
<td>22 (-.53)</td>
</tr>
<tr>
<td></td>
<td>44 (.61)</td>
<td>9 (.73)</td>
<td>53 (.61)</td>
<td>73 (.59)</td>
<td>76 (.57)</td>
<td>13 (.54)</td>
<td></td>
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<tr>
<td></td>
<td>72 (.60)</td>
<td>2 (.62)</td>
<td>55 (.56)</td>
<td>66 (.57)</td>
<td>46 (.54)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>39 (.59)</td>
<td>1 (.59)</td>
<td>51 (.51)</td>
<td>65 (.56)</td>
<td>30 (.51)</td>
<td></td>
<td></td>
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<tr>
<td></td>
<td>47 (.58)</td>
<td>7 (.59)</td>
<td>59 (.51)</td>
<td>71 (.55)</td>
<td>26 (.51)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>41 (.55)</td>
<td>26 (.58)</td>
<td>75 (.52)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>43 (.55)</td>
<td>4 (.56)</td>
<td>25 (.50)</td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td></td>
<td>63 (.53)</td>
<td>8 (.52)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>40 (.51)</td>
<td>62 (.50)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Variance Explained By Each Factor

| .19 | .18 | .15 | .15 | .14 | .11 | .08 |

Note. Items load .50 or greater.
Table A-2
Rotated Factor Pattern (Six-Factor Varimax Solution) on Algebra I Attitudes: Item Numbers and Loadings for Evaluation Sample (n = 831)

<table>
<thead>
<tr>
<th>Factor</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>.72</td>
<td>.72</td>
<td>.81</td>
<td>.70</td>
<td>.67</td>
<td>.72</td>
</tr>
<tr>
<td>22</td>
<td>.70</td>
<td>.69</td>
<td>.76</td>
<td>.65</td>
<td>-.43</td>
<td>.55</td>
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<tr>
<td>15</td>
<td>.70</td>
<td>.65</td>
<td>.62</td>
<td>.62</td>
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<td></td>
</tr>
<tr>
<td>2</td>
<td>.65</td>
<td>.63</td>
<td>.54</td>
<td>.51</td>
<td></td>
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<td>.47</td>
<td>.44</td>
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<td>.39</td>
<td>.37</td>
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</tr>
<tr>
<td>4</td>
<td>.59</td>
<td>.40</td>
<td>.37</td>
<td>.36</td>
<td></td>
<td></td>
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<td>19</td>
<td>.42</td>
<td>.38</td>
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<td>8</td>
<td>.42</td>
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</tr>
<tr>
<td>29</td>
<td>.39</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>17</td>
<td>.33</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>21</td>
<td>.31</td>
<td></td>
<td></td>
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<td></td>
</tr>
</tbody>
</table>

Variance Explained By Each Factor

.27   .21   .20   .17   .08   .07

Note. Items load .30 or greater.
the method used to derive the regression equations, the "best fit" combined a mixture of attitudinal, demographic and cognitive measures as the independent variables. These included four measures of cognitive ability (the SRA subtests, namely, concepts, computation and problem solving, and the parish 8th grade proficiency test), two attitudinal scales (self concept and academic enjoyment) and two demographic facts (age and sex). The dependent variable, called performance, was interpreted as passing (a grade of D or better) or failing (a grade of F) the Algebra I course. The discriminant analysis, which "checks" classifications into groups, confirmed that the use of these same variables could predict passing or failing in at least 78% of the cases inspected. (The example shown in Table A-4 confirmed nearly 82% correct classification. A second example, using a grade of C as passing, confirmed 84% of the inspected cases. The data for this example is shown in Table A-5).

Discussions of the descriptive statistics inspected the mean scores of students by performance (pass/fail) for the various cognitive and attitudinal measures. Break-downs by school, grade, sex and age were also noted.
Table A-3

Stepwise Regression Analysis on Evaluation Study Sample (n = 891)

<table>
<thead>
<tr>
<th>Independent Variable</th>
<th>B-value</th>
<th>Standard Error</th>
<th>Prob &gt; f</th>
</tr>
</thead>
<tbody>
<tr>
<td>Self Concept</td>
<td>0.094</td>
<td>0.008</td>
<td>0.0001</td>
</tr>
<tr>
<td>Academic Enjoyment</td>
<td>0.018</td>
<td>0.009</td>
<td>0.0432</td>
</tr>
<tr>
<td>Age</td>
<td>-0.111</td>
<td>0.037</td>
<td>0.0025</td>
</tr>
<tr>
<td>Sex</td>
<td>-0.310</td>
<td>0.056</td>
<td>0.0001</td>
</tr>
<tr>
<td>SRA Subtests</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Concepts</td>
<td>0.030</td>
<td>0.008</td>
<td>0.0001</td>
</tr>
<tr>
<td>Computation</td>
<td>0.040</td>
<td>0.005</td>
<td>0.0001</td>
</tr>
<tr>
<td>Problem Solving</td>
<td>0.015</td>
<td>0.006</td>
<td>0.0070</td>
</tr>
<tr>
<td>Proficiency Test</td>
<td>0.012</td>
<td>0.003</td>
<td>0.0002</td>
</tr>
</tbody>
</table>

Dependent Variable = Performance  \[ R^2 = .59 \]
Table A-4

Discriminant Analysis of Scores on Predictor Variables for Algebra I Students (n = 831) with "D" = Pass

<table>
<thead>
<tr>
<th>Variable</th>
<th>Pass (n = 532)</th>
<th></th>
<th>Fail (n = 299)</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>M</td>
<td>SD</td>
<td>M</td>
<td>SD</td>
</tr>
<tr>
<td>Self Concept</td>
<td>17.36</td>
<td>3.77</td>
<td>13.27</td>
<td>3.49</td>
</tr>
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<td>14.70</td>
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</tr>
<tr>
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</tr>
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<td>0.46</td>
<td>0.50</td>
<td>0.56</td>
<td>0.50</td>
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<tr>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Concepts</td>
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<td>4.50</td>
<td>16.06</td>
<td>4.69</td>
</tr>
<tr>
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<td>7.25</td>
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<td>6.60</td>
</tr>
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<td>5.42</td>
</tr>
<tr>
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<td>78.52</td>
<td>12.04</td>
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</table>

Note. Percent correctly classified: 81.95
Table A-5

Discriminant Analysis of Scores on Predictor Variables for Algebra I Students (n = 831) with "C" = Pass

<table>
<thead>
<tr>
<th>Variable</th>
<th>Pass (n = 343)</th>
<th>Fail (n = 488)</th>
</tr>
</thead>
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<td></td>
<td>M</td>
<td>SD</td>
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<tr>
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<tr>
<td>Academic Enjoyment</td>
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<tr>
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<td>0.68</td>
</tr>
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<td>SRA Subtests</td>
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<td></td>
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<tr>
<td>Concepts</td>
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<td>Computation</td>
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<tr>
<td>Proficiency Test</td>
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<td>7.61</td>
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</table>

Note. Percent correctly classified: 84.24
IDENTIFYING THE MATHEMATICALLY-AT-RISK ADOLESCENT;
A MULTIVARIATE VALIDATION STUDY

Compiled by
Marie S. LaCour

for the
Rapides Parish School System
Identifying the Mathematically-At-Risk Adolescent:

A Multivariate Validation Study

Concern over the results of the mandate by the Louisiana Board of Elementary and Secondary Education (1984) requiring a more stringent curriculum for the 1988 high school graduate served as the impetus for this study. In it an attempt is made to investigate the relationships between the cognitive and affective components associated with variation in learning.

Sample and Procedure

During the 1984-85 school year, 2,123 students were enrolled in Algebra I classes in Rapides Parish Schools. Of these, 747 or 35% failed the course.

A study involving 1,543 of these students from seven of the twelve high schools was designed to examine the relationships existing between specific student attitudes and ability and student performance. The schools were selected on the basis of accessibility to the researcher and size of enrollment.
### Rapides Parish Algebra I Failure Ratios

Enrollment, Failures, Percent*

<table>
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<tr>
<th>School ID</th>
<th>Quarter 1</th>
<th>Quarter 2</th>
<th>Quarter 3</th>
<th>Quarter 4</th>
<th>Year</th>
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<td>Enrl. Fail. %</td>
<td>Enrl. Fail. %</td>
<td>Enrl. Fail. %</td>
<td>Enrl. Fail. %</td>
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<td>392 138 35</td>
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<td>39 16 41</td>
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<tr>
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<td>294 57 19 238 58 24</td>
<td>219 51 23</td>
<td>228 70 31</td>
<td>228 63 28</td>
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<td>5</td>
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<td>415 89 21</td>
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<td>408 98 24</td>
<td></td>
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<tr>
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<td>113 25 22 112 47 42</td>
<td>104 31 30</td>
<td>105 33 31</td>
<td>105 28 27</td>
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</tr>
<tr>
<td>7</td>
<td>413 174 42 397 145 37</td>
<td>403 220 55</td>
<td>398 227 57</td>
<td>398 237 60</td>
<td></td>
</tr>
</tbody>
</table>

**Sample Total**

|           | 1930 | 497 | 26 | 1807 | 508 | 28 | 1787 | 602 | 34 | 1779 | 677 | 38 | 1779 | 637 | 36 |

**Untested School Total**

|           | 354 | 85 | 24 | 347 | 128 | 37 | 350 | 104 | 30 | 344 | 146 | 42 | 344 | 110 | 32 |

**Parish Total**

|           | 2284 | 582 | 25 | 2154 | 636 | 30 | 2137 | 706 | 33 | 2123 | 823 | 39 | 2123 | 747 | 35 |

*Rounded to Nearest Whole Number*
The final sample (831) represents 54% of the students tested and 47% of the students enrolled in the target schools. This number (831) also represents 39% of the entire System Algebra I population.

To be included in the sample used in the analysis, the following data were collected: name, school, sex, race, grade, age, teacher, class period, school attended in the eighth grade, a 30-question attitude instrument, 3 subtests from an SRA mathematics test, and the parish proficiency test score from the eighth grade. Incomplete data caused the exclusion of a student's information from the final analysis.

Pilot Study

An 80-item instrument was administered to 139 students in five sections of Algebra I (both regular and honors) in one of the high schools. A factor analysis of the responses
was conducted, and a refined instrument consisting of 30 items was constructed using the results. The shorter instrument was used in the larger study.

Main Study

The 30-item instrument used in the main study was designed to determine student attitudes about various feelings believed to affect student learning of mathematics. These six factors were named as follows:

1. Acceptance of Authority (AA) or "teachability" (I do not need to pay attention in math class; I know all the math I need already).

2. Self Concept (SC) or student perception of self as a learner of mathematics (I am a very good math student).

3. Value of Mathematics (VM) or student perception of the importance of mathematics to his/her future (Math is necessary in the kind of work I will be doing).

4. Willingness to Work (WW) or student determination or resolve to complete a task (I could make better grades in math, but I do not feel like working that hard).

5. Academic Enjoyment (AE) or satisfaction derived from academic stimulation and achievement (I regularly do my algebra homework).

6. Parental Involvement (PI) or student perception of parents' interest and expectations (My parents expect me to always do my best in my schoolwork).
A factor analysis on this instrument revealed that the strongest factor combined feelings toward teachers and parents alike— in other words an attitude about adults. Second was the Value of Math, followed by Self Concept and Willingness to Work.

In summary, the students feel an estrangement from adults, have little knowledge of the importance of mathematics in their future, regard themselves as poor math students, and have little desire to change this self concept.

The mean score (N=831) for each variable is shown, followed by a break-down by school:

<table>
<thead>
<tr>
<th>N</th>
<th>School</th>
<th>AA</th>
<th>SC</th>
<th>VM</th>
<th>WW</th>
<th>AE</th>
<th>PI</th>
<th>ATotal</th>
</tr>
</thead>
<tbody>
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<td>15.7</td>
<td>18.8</td>
<td>15.0</td>
<td>15.7</td>
<td>19.2</td>
<td>105.6</td>
</tr>
<tr>
<td>76</td>
<td>2</td>
<td>21.9</td>
<td>15.7</td>
<td>18.8</td>
<td>15.6</td>
<td>16.0</td>
<td>18.8</td>
<td>106.7</td>
</tr>
<tr>
<td>29</td>
<td>3</td>
<td>21.3</td>
<td>15.4</td>
<td>18.1</td>
<td>15.2</td>
<td>15.6</td>
<td>17.6</td>
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<td>20.6</td>
<td>16.0</td>
<td>17.5</td>
<td>19.8</td>
<td>114.0</td>
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<tr>
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<td>5</td>
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<td>16.5</td>
<td>19.6</td>
<td>15.7</td>
<td>16.3</td>
<td>19.3</td>
<td>109.1</td>
</tr>
<tr>
<td>39</td>
<td>6</td>
<td>22.5</td>
<td>17.2</td>
<td>19.8</td>
<td>13.8</td>
<td>15.5</td>
<td>19.1</td>
<td>107.9</td>
</tr>
<tr>
<td>181</td>
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<td>20.8</td>
<td>14.2</td>
<td>18.1</td>
<td>14.7</td>
<td>15.3</td>
<td>19.1</td>
<td>102.2</td>
</tr>
</tbody>
</table>

The mean scores by performance (pass or fail) for the total sample (N=831) are:

<table>
<thead>
<tr>
<th>Perf</th>
<th>AA</th>
<th>SC</th>
<th>VM</th>
<th>WW</th>
<th>AE</th>
<th>PI</th>
<th>ATotal</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fail</td>
<td>20.8</td>
<td>13.3</td>
<td>17.9</td>
<td>14.2</td>
<td>14.7</td>
<td>19.1</td>
<td>100.0</td>
</tr>
<tr>
<td>Pass</td>
<td>21.8</td>
<td>17.4</td>
<td>19.8</td>
<td>15.7</td>
<td>16.7</td>
<td>19.8</td>
<td>110.7</td>
</tr>
</tbody>
</table>
SRA Mathematics

To ascertain the cognitive level on which the student could function mathematically, the concepts, computation and problem solving subtests of the Science Research Associates Achievement Series, Form 1, Level G, 1978 edition was administered. These subtests were constructed to measure the skills considered necessary for mathematics achievement at this level.

The concepts subtest emphasizes fractions, decimals, geometric measurement and pre-algebra items. The computation subtest emphasizes operations on decimals and signed numbers, while the problem solving subtest emphasizes problem solving skills. Based on the Spring 1978 National Samples (N=1895), the national mean raw score by subtest for grade 9 was 18.3 (concepts), 21.5 (computation) and 15.3 (problem solving) with a math total mean of 55.2 (SRA Achievement Series, Technical Report #1, 1978).

The parish sample (N=831) showed mean scores of 19.7 (concepts), 24.5 (computation) and 15.2 (problem solving) with a total mathematics mean of 59.3.

The parish proficiency test scores (eighth grade) are also listed. The mean scores by performance (also pass or fail) for the total sample (N=831) are:

<table>
<thead>
<tr>
<th>Perf</th>
<th>Conc</th>
<th>Comp</th>
<th>Prob Sol</th>
<th>SRA Tot</th>
<th>Prof</th>
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<td>89.6</td>
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</table>
Mean Scores (Cognitive)

### By School

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<th>Prof</th>
<th>Perf</th>
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</thead>
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<td>23.0</td>
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<td>85.8</td>
<td>1.16</td>
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<tr>
<td>76</td>
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<td>21.9</td>
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<td>14.8</td>
<td>65.3</td>
<td>88.4</td>
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<td>3</td>
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<td>87.8</td>
<td>1.56</td>
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<td>16.2</td>
<td>61.8</td>
<td>85.8</td>
<td>1.66</td>
</tr>
<tr>
<td>39</td>
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<td>22.0</td>
<td>28.2</td>
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<td>1.49</td>
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### By Grade

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- N=158
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<td>20.7</td>
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<td>15.7</td>
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</table>

The results of this break-down support the developmentalists' theories asserting that readiness is a function of time.

### By Sex

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</table>

These results support the research which has found the male to better understand mathematical concepts than the female and to excel in problem solving. Also supported is the superior female attention to details and carefulness in computation.
At first glance these results seem to refute the research linking readiness and age. However, it must be remembered that these subjects are enrolled in only the ninth and tenth grades. The older students, therefore, have failed at least one year of school.
### By School, Grade

<table>
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By School, Sex

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<th>SRA Tot</th>
<th>Prof</th>
<th>Perf</th>
</tr>
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<td>2</td>
<td>Girls (44)</td>
<td>22.6</td>
<td>30.5</td>
<td>15.5</td>
<td>68.5</td>
<td>90.0</td>
</tr>
<tr>
<td></td>
<td>Boys (32)</td>
<td>20.8</td>
<td>26.5</td>
<td>13.9</td>
<td>61.0</td>
<td>86.3</td>
</tr>
<tr>
<td>3</td>
<td>Girls (20)</td>
<td>21.7</td>
<td>26.8</td>
<td>15.8</td>
<td>64.2</td>
<td>92.7</td>
</tr>
<tr>
<td></td>
<td>Boys (9)</td>
<td>22.8</td>
<td>25.9</td>
<td>18.0</td>
<td>66.7</td>
<td>92.9</td>
</tr>
<tr>
<td>4</td>
<td>Girls (49)</td>
<td>18.6</td>
<td>25.8</td>
<td>13.4</td>
<td>57.8</td>
<td>88.2</td>
</tr>
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<td></td>
<td>Boys (55)</td>
<td>20.6</td>
<td>25.2</td>
<td>14.2</td>
<td>59.7</td>
<td>87.5</td>
</tr>
<tr>
<td>5</td>
<td>Girls (111)</td>
<td>19.4</td>
<td>26.3</td>
<td>15.2</td>
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<td>20.8</td>
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<td>87.6</td>
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<tr>
<td>6</td>
<td>Girls (22)</td>
<td>21.5</td>
<td>27.9</td>
<td>12.1</td>
<td>61.5</td>
<td>91.1</td>
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<td>64.6</td>
<td>91.5</td>
</tr>
<tr>
<td>7</td>
<td>Girls (91)</td>
<td>17.4</td>
<td>22.0</td>
<td>14.3</td>
<td>53.4</td>
<td>81.2</td>
</tr>
<tr>
<td></td>
<td>Boys (90)</td>
<td>19.0</td>
<td>21.1</td>
<td>14.9</td>
<td>54.7</td>
<td>79.3</td>
</tr>
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</table>

Final Analysis
The results of regression analyses and discriminant analyses are shown. Regression analysis fits an equation to a set of values. The equation predicts a response variable from a function of regressor variables and parameters. Two procedures were used, namely GLM and Stepwise. GLM performs an analysis of general linear models. Stepwise is a modification of the forward selection technique and differs in that variables already in the model do not necessarily stay there. After a variable is added, Stepwise checks it against variables already in the model and deletes any variable that does not produce a significant F statistic.

Discriminant analysis is a procedure that computes linear or quadratic functions which classify observations into two or more groups on the basis of one or more numeric variables. The classification criterion is based on either the individual within-group covariance matrices or the pooled covariance matrix.

**GLM (General Linear Models)**

1. With 6 variables \( R^2 = 0.585530 \)
   
   \[
   \text{Perf} = 0.10 \text{ SC} - 0.11 \text{ Age} - 0.31 \text{ Sex} + 0.04 \text{ Conc} \\
   + 0.04 \text{ Comp} + 0.01 \text{ Prof} - 1.33
   \]

2. With 8 variables \( R^2 = 0.591051 \)
   
   \[
   \text{Perf} = 0.09 \text{ SC} + 0.02 \text{ AE} - 0.11 \text{ Age} - 0.31 \text{ Sex} \\
   + 0.03 \text{ Conc} + 0.04 \text{ Comp} + 0.02 \text{ Probsol} \\
   + 0.01 \text{ Prof} - 1.53
   \]
Stepwise Regression

\[ R^2 = 0.59105100 \]

Perf = 0.09 SC + 0.02 AE - 0.11 Age - 0.31 Sex
+ 0.03 Conc + 0.04 Comp + 0.02 ProbSol
+ 0.01 Prof - 1.53

Example: Observation 201 (selected at random)
Perf = 0.09 (17) + 0.02 (14) - 0.11 (15) - 0.31 (1)
+ 0.03 (20) + 0.04 (19) + 0.02 (14)
+ 0.01 (84) - 1.53
Perf = 1.53 + 0.28 - 1.65 - 0.31
+ 0.60 + 0.76 + 0.28
+ 0.84 - 1.53
= 0.80
**Discriminant Analysis**

<table>
<thead>
<tr>
<th>Predicted</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>&quot;D&quot; Pass - Sample:</td>
<td>Fail: 215/299 = 71.9%</td>
</tr>
<tr>
<td></td>
<td>Pass: 466/532 = 87.6%</td>
</tr>
<tr>
<td>Total Percent</td>
<td>Correctly Classified = 81.95</td>
</tr>
<tr>
<td>&quot;C&quot; Pass - Sample:</td>
<td>Fail: 415/488 = 85.0%</td>
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<tr>
<td></td>
<td>Pass: 285/343 = 83.1%</td>
</tr>
<tr>
<td>Total Percent</td>
<td>Correctly Classified = 84.24</td>
</tr>
</tbody>
</table>

**Validation Sample**

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>&quot;D&quot; Pass</td>
<td>Fail: 173/226 = 76.55%</td>
</tr>
<tr>
<td></td>
<td>Pass: 350/392 = 89.29%</td>
</tr>
<tr>
<td>Total Percent</td>
<td>523/618 = 84.63%</td>
</tr>
<tr>
<td>Fail: 51/73</td>
<td>69.86%</td>
</tr>
<tr>
<td>Pass: 115/140</td>
<td>82.14%</td>
</tr>
<tr>
<td>Total Percent</td>
<td>166/213 = 77.93%</td>
</tr>
</tbody>
</table>

The regression analyses used accounted for approximately 59% of the variation in learning. The discriminant analyses confirmed correct classification in at least 78% of the cases.

These results lead this researcher to believe that further in-depth study of student attitudes and skill-readiness can successfully identify those most susceptible to failure. A similar procedure should be useful to educators at all levels, for any subjects.
TO MY ALGEBRA STUDENTS:

Please read carefully each of the following statements. Then circle the response on your answer sheet that most nearly matches your feelings or beliefs.

Answer honestly as your own answers are needed and will in no way influence your grade average.

Thank you.
1. I am not a very good math student.
2. I never quite understand what I am expected to do in math.
3. I can work any math problem if I have a good teacher.
4. I do not like to work math problems.
5. Math is too hard.
6. I feel good when I can work a problem by myself.
7. I can work math as well as anyone in my class.
8. Getting the right answer to an algebra problem is easy for me.
9. I will never be able to work math problems easily.
10. I feel good when I understand how to work a math problem.
11. My parents think homework is important for me to learn math.
12. My mother was a good math student.
13. My father expects me to be good at math.
14. My parents believe I have a good math teacher this year.
15. My parents think I am better at math than I really am.
16. I wish I could do as well in algebra as my father did.
17. My parents expect me to always do my best in my schoolwork.
18. My mother does not think I will need to know much math.
19. My father does not care what my grades are.
20. My parents feel that being popular is more important than making good grades.
21. My friends and I like to work our math homework together.
22. It is more important to be with my friends than it is to work homework problems.
23. I enjoy my friends in algebra class but I do not like to listen to my teacher.
24. "Cruising" is more important than what I learn in math class.
25. What my friends think about me is more important than studying.
26. I wish my friends enjoyed math class as much as I do.
27. I would like to make better grades, but my friends would make fun of me if I studied.
28. Helping my friends get the right answers on an algebra test really is not cheating; friends should help each other any time they can.
29. I feel comfortable phoning my friends for help if I am uncertain of how to work a homework problem.
30. My friends and I regularly do our algebra homework.
31. It does not matter how hard I work; I will fail algebra anyhow.
32. If I fail math this year, it will be because my teacher does not like me.
33. I do well in math because I am lucky.
34. I could do better in math if I studied.
35. Studying math is dumb; I will fail anyhow.
36. Everyone in my family failed math; so will I.
37. My family does well in math.
38. Every time I study my math, I do better on tests.
39. I never bother to study math; my grades are the same whether I study or not.
40. It is better for me to study some each day so I will not have to "cram" the night before a test.
41. My math teacher has no right to tell me how to behave.
42. I know more than my math teacher does.
43. My math teacher does not know what he/she is talking about.
44. I do not need to pay attention in math class; I know all the math I need already.
45. Adults have no right to "boss" children.

46. I listen to my math teacher so I can learn "short cuts" in working my problems.

47. Since my teacher knows more about math than I do, I should listen to his/her explanations attentively.

48. I find it easier to learn math when I like my teacher.

49. I get along well with my math teacher because he/she understands me and my classmates.

50. My teacher understands that I have other things to do besides math.

51. I do not need to worry about learning a lot of math; I will not use it in my life when I get out of high school.

52. We do not study the kind of math I will need in the job I will have when I go to work.

53. Math is necessary in the kind of work I will be doing.

54. I believe I need all the math I can schedule.

55. Math is unnecessary in my life.

56. Understanding algebra is a key to better jobs.

57. I will understand my science classes better if I know math.

58. Most jobs require some knowledge of math.

59. I need to know more than just arithmetic if I am to succeed in my chosen profession.

60. I see no need to study algebra.

61. I like to work math, but I find it difficult to get started.

62. Algebra is a bore.

63. Working math problems is a waste of time.

64. I would rather work math problems than just sit and do nothing in class.
65. I could make better grades, but I do not feel like working that hard.
66. When I get interested in watching TV I forget I have algebra homework to do.
67. I prefer to do my homework first so I do not have to think about it later.
68. Some algebra problems take too long to work.
69. I try to work every problem, even if I am not sure I know how.
70. I never give up until I complete an assignment.
71. I like to watch TV while I am doing my algebra homework.
72. It is important to study for a math test.
73. I really do mean to study, but somehow I never have time.
74. I talk to my friends on the phone while I am working my math homework.
75. I find it difficult to concentrate on my studies unless I am listening to music, too.
76. It is better for me to do my homework as soon as I get home from school.
77. I can not stay uplate to study for a math test because I have a regular bedtime.
78. I do not mind getting up early to study for a math test.
79. I remember my math better when I rework my assignment at home.
80. I study just enough to pass a math test; after the test I forget how to work the problems.
<table>
<thead>
<tr>
<th>Response</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>a</td>
<td>I strongly agree</td>
</tr>
<tr>
<td>b</td>
<td>I agree</td>
</tr>
<tr>
<td>c</td>
<td>I am undecided</td>
</tr>
<tr>
<td>d</td>
<td>I disagree</td>
</tr>
<tr>
<td>e</td>
<td>I strongly disagree</td>
</tr>
</tbody>
</table>

1. a b c d e
2. a b c d e
3. a b c d e
4. a b c d e
5. a b c d e
6. a b c d e
7. a b c d e
8. a b c d e
9. a b c d e
10. a b c d e
11. a b c d e
12. a b c d e
13. a b c d e
14. a b c d e
15. a b c d e
16. a b c d e
17. a b c d e
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28. a b c d e
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<thead>
<tr>
<th>Response</th>
<th>Meaning</th>
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<tbody>
<tr>
<td>a</td>
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<tr>
<td>d</td>
<td>I disagree</td>
</tr>
<tr>
<td>e</td>
<td>I strongly disagree</td>
</tr>
</tbody>
</table>

29. a b c d e 46. a b c d e 63. a b c d e
30. a b c d e 47. a b c d e 64. a b c d e
31. a b c d e 48. a b c d e 65. a b c d e
32. a b c d e 49. a b c d e 66. a b c d e
33. a b c d e 50. a b c d e 67. a b c d e
34. a b c d e 51. a b c d e 68. a b c d e
35. a b c d e 52. a b c d e 69. a b c d e
36. a b c d e 53. a b c d e 70. a b c d e
37. a b c d e 54. a b c d e 71. a b c d e
38. a b c d e 55. a b c d e 72. a b c d e
39. a b c d e 56. a b c d e 73. a b c d e
40. a b c d e 57. a b c d e 74. a b c d e
41. a b c d e 58. a b c d e 75. a b c d e
42. a b c d e 59. a b c d e 76. a b c d e
43. a b c d e 60. a b c d e 77. a b c d e
44. a b c d e 61. a b c d e 78. a b c d e
45. a b c d e 62. a b c d e 79. a b c d e
80. a b c d e
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<tr>
<td>Factor2</td>
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<td>Factor3</td>
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<td>Factor4</td>
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<td>Factor5</td>
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<tr>
<td>Factor6</td>
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</table>

**22 June Tuesday, July**
Please circle the one response which best expresses your feelings about each of the following sentences:

<table>
<thead>
<tr>
<th>Sentence</th>
<th>SA</th>
<th>A</th>
<th>U</th>
<th>D</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Math is necessary in the kind of work I will be doing.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. My parents expect me to always do my best in my schoolwork.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. When I get interested in watching TV, I forget I have algebra homework to do.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. I know more than my math teacher does.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5. I do not get up early to study for a math test.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6. I do not watch TV while I am doing my algebra homework.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7. I need to know more than just arithmetic if I am to succeed in my chosen profession.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8. I listen to my math teacher so I can learn &quot;short cuts&quot; in working my problems.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>9. I really do mean to study, but somehow I never have time.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10. Math is too hard.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
11. I do not enjoy math class. SA A U D SD
12. My parents think I am better at math than I really am. SA A U D SD
13. Math is unnecessary in my life. SA A U D SD
14. I could make better grades in math, but I do not feel like working that hard. SA A U D SD
15. It is important to study for a math test. SA A U D SD
16. I can work math as well as anyone in my class. SA A U D SD
17. My mother was a good math student. SA A U D SD
18. I do not need to pay attention in math class; I know all the math I need already. SA A U D SD
19. Someday I will be able to work math problems easily. SA A U D SD
20. I regularly do my algebra homework. SA A U D SD
21. I do not need to worry about learning a lot of math; I will not use it when I get out of high school. SA A U D SD
22. Since my teacher knows more about math than I do, I should listen to his/her explanations. SA A U D SD
23. My father expects me to be good at math. SA A U D SD
24. I never quite understand what I am expected to do in math. SA A U D SD
25. I study just enough to pass a math test; after the test I forget how to work the problems. SA A U D SD
26. It is better for me to do my homework as soon as I get home from school. SA A U D SD
27. We do not study the kind of math I will use in my future job. SA A U D SD
28. I am a very good math student. SA A U D SD
29. I never bother to study math anymore; my grades will be the same whether I study or not. SA A U D SD
30. My parents and I feel good when I understand how to work a math problem. SA A U D SD
31. I have a quiet place to study at home. YES NO
## ORTHOGONAL TRANSFORMATION MATRIX

<table>
<thead>
<tr>
<th></th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
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<td>1</td>
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<td>0.52477</td>
<td>0.43343</td>
<td>0.38372</td>
<td>0.11833</td>
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<td>0.66535</td>
<td>0.39129</td>
<td>0.71343</td>
<td>0.09051</td>
<td>0.15362</td>
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<tr>
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<td>0.02651</td>
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<td>0.73106</td>
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## ROTATED FACTOR PATTERN

<table>
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<tr>
<th></th>
<th>FACTOR1</th>
<th>FACTOR2</th>
<th>FACTOR3</th>
<th>FACTOR4</th>
<th>FACTOR5</th>
<th>FACTOR6</th>
</tr>
</thead>
<tbody>
<tr>
<td>FACTOR1</td>
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<td>0.72151</td>
<td>0.19674</td>
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<tr>
<td>FACTOR2</td>
<td>0.61569</td>
<td>0.32159</td>
<td>0.07346</td>
<td>0.02239</td>
<td>-0.12617</td>
<td>0.10265</td>
</tr>
<tr>
<td>FACTOR3</td>
<td>-0.8631</td>
<td>0.21054</td>
<td>-0.12939</td>
<td>0.23457</td>
<td>-0.26220</td>
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<tr>
<td>FACTOR4</td>
<td>0.04374</td>
<td>0.09651</td>
<td>-0.01387</td>
<td>0.27934</td>
<td>0.00375</td>
<td>0.71197</td>
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<tr>
<td>FACTOR5</td>
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<td>0.37330</td>
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<tr>
<td>FACTOR6</td>
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<td>-0.14557</td>
<td>-0.35262</td>
<td>0.35521</td>
<td>0.63642</td>
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</tbody>
</table>

20:00 THURSDAY, JUNE
DIRECTIONS: Read each test item carefully and decide which one of the four suggested answers is correct. Find the row of spaces on your answer sheet that has the same number as the question on which you are working. In this row mark the space having the same letter as the answer you have chosen.

1. The place value of the 3 in 3,841 is:
   A. tens  B. thousands  C. hundreds  D. ten thousands

2. The standard numeral for twenty-five thousand, seven hundred four is:
   A. 25,740  B. 2,574  C. 2,570.4  D. 25,704

3. 5227 rounded to the nearest thousand is:
   A. 6,000  B. 5,200  C. 5,000  D. 5,230

4. $9 \times 10,000 =$
   A. 9,000  B. 90,000  C. 900,000  D. 9,600,000

5. Add: $8,458 + 1,572$
   A. 10,030  B. 9,920  C. 9,930  D. 9,030

6. Subtract: $10,675 - 4,988$
   A. 6,797  B. 5,687  C. 5,787  D. 6,697

7. Multiply: $6,432 \times 123$
   A. 771,036  B. 770,036  C. 791,136  D. 790,136

8. Divide: $79 \div 3,563$
   A. 45  B. 45 r 8  C. 46  D. 44 r 87

9. $\frac{15}{4}$ renamed as a mixed number in simplest form is:
   A. $3 \frac{3}{4}$  B. $4 \frac{1}{4}$  C. $2 \frac{7}{4}$  D. $\frac{4}{15}$
10. $8\frac{1}{4}$ renamed as an improper fraction is:
   A. $\frac{32}{4}$  B. $\frac{13}{4}$  C. $\frac{33}{4}$  D. $\frac{4}{32}$

Simplify the answer when possible for problems 11 through 21.

11. Add: $\frac{7}{10} + \frac{2}{10} =$
   A. $\frac{9}{20}$  B. $\frac{14}{10}$  C. $\frac{14}{20}$  D. $\frac{9}{10}$

12. Add: $2\frac{3}{4} + 3\frac{1}{2} =$
   A. $5\frac{2}{3}$  B. $5\frac{5}{8}$  C. $6\frac{1}{2}$  D. $6\frac{1}{4}$

13. Subtract: $\frac{2}{3} - \frac{1}{5} =$
   A. $\frac{1}{2}$  B. $\frac{7}{15}$  C. $\frac{13}{15}$  D. 7

14. Subtract: $3\frac{2}{5} - 1\frac{4}{5} =$
   A. $1\frac{3}{5}$  B. $2\frac{2}{5}$  C. $2\frac{3}{5}$  D. $1\frac{2}{5}$

15. Subtract: $3\frac{1}{4} - 1\frac{2}{3} =$
   A. $2$  B. $2\frac{5}{12}$  C. $1\frac{7}{12}$  D. $2\frac{7}{12}$

16. Multiply: $\frac{1}{10} \times 7\frac{1}{7} =$
   A. $\frac{3}{14}$  B. $\frac{7}{10}$  C. $\frac{43}{70}$  D. $\frac{5}{7}$

17. Multiply: $3\frac{3}{4} \times 4 =$
   A. $15$  B. $15\frac{1}{16}$  C. $10$  D. $14$

18. Multiply: $2\frac{5}{8} \times 1\frac{1}{4} =$
   A. $2\frac{13}{16}$  B. $2\frac{1}{10}$  C. $3\frac{19}{32}$  D. $3\frac{9}{32}$

19. Divide: $2\frac{1}{4} \div \frac{3}{5} =$
   A. $1\frac{7}{20}$  B. $2\frac{11}{12}$  C. $1\frac{1}{20}$  D. $3\frac{3}{4}$
20. Divide: \( \frac{5}{8} \div 2 \frac{1}{3} = \)
   A. \( \frac{15}{56} \)  
   B. \( 1 \frac{11}{24} \)  
   C. \( 1 \frac{3}{12} \)  
   D. \( \frac{5}{16} \)

21. Divide: \( 2 \frac{3}{4} \div 9 \frac{1}{2} = \)
   A. \( \frac{11}{38} \)  
   B. \( \frac{3}{8} \)  
   C. \( 26 \frac{1}{8} \)  
   D. \( 13 \frac{1}{2} \)

22. The standard numeral for "fifty-three and seven thousandths" is:
   A. 53.7  
   B. .537  
   C. 53.007  
   D. 53.07

23. .375 rounded to the nearest hundredth is:
   A. .38  
   B. .40  
   C. .37  
   D. .30

24. List these decimals from smallest to largest: 7.23, 7.32, 7.3
   A. 7.32, 7.3, 7.23  
   B. 7.32, 7.23, 7.3  
   C. 7.23, 7.32, 7.3  
   D. 7.23, 7.3, 7.32

25. Add: 2.567
   \[ + .971 \]
   A. 3.538  
   B. 2.438  
   C. 2.538  
   D. 3.438

26. Subtract: 8.700
   \[ - 2.356 \]
   A. 6.454  
   B. 6.444  
   C. 6.344  
   D. 6.354

27. Multiply: 3.4
   \[ \times 2.3 \]
   A. 78.2  
   B. 7.82  
   C. 77.2  
   D. 7.72

28. Divide: \( .34 \div 7276 \)
   A. .0214  
   B. 21.4  
   C. .214  
   D. 2.14

29. \( \frac{7}{100} \) renamed as a decimal is:
   A. .07  
   B. .7  
   C. .007  
   D. 7
30. \(0.25\) renamed as a fraction in simplest form is:
   A. \(\frac{2}{5}\)  B. \(\frac{1}{4}\)  C. \(\frac{1}{10}\)  D. \(\frac{1}{25}\)

31. \(\frac{2}{5}\) renamed as a percent is:
   A. 40%  B. 25%  C. 20%  D. 10%

32. 0.2 renamed as a percent is:
   A. 2%  B. 0.2%  C. 20%  D. 200%

33. 10% renamed as a fraction in simplest form is:
   A. \(\frac{1}{9}\)  B. \(\frac{2}{8}\)  C. \(\frac{2}{5}\)  D. \(\frac{1}{10}\)

34. 50% renamed as a decimal is:
   A. 50  B. 5  C. .5  D. .05

35. 25% of what number is 6?
   A. 12  B. 18  C. 24  D. 30

36. 15 is what percent of 75?
   A. 40%  B. 60%  C. 15%  D. 20%

37. The standard numeral for \(4^2\) is:
   A. 16  B. 8  C. 44  D. 4.2

38. Compare: \(-5\) _______ +2
   A. =  B. >  C. <  D. Do not select this answer

39. Add: \(-3 + +9 =\)
   A. +12  B. +6  C. -12  D. -6

40. Add: \(-6 + -3 =\)
   A. -3  B. +9  C. +3  D. -9
41. Subtract: $7 - 8 = $
   A. $7$  B. $-1$  C. $+1$  D. $-15$

42. Subtract: $15 - 28 =$
   A. $+43$  B. $-13$  C. $+13$  D. $-43$

43. Multiply: $-9 \times 5 =$
   A. $-45$  B. $+14$  C. $-45$  D. $+45$

44. Divide: $-36 \div 9 =$
   A. $-4$  B. $-4$  C. $-\frac{1}{4}$  D. $+4$

45. Convert: $1\frac{1}{2}$ hours = _______ minutes
   A. 45  B. 60  C. 90  D. 105

46. Add: 5 hours 20 minutes + 2 hours 15 minutes
   A. 7 hrs 35 min
   B. 8 hrs 5 min
   C. 3 hrs 5 min
   D. 6 hrs 95 min

47. John collects $4 per month from each of the 115 customers on his paper route. Each month he collects a total of _______.
   A. $440$  B. $119$  C. $460$  D. $111$

48. Classify the following angle:
   A. Acute  B. Obtuse  C. Right  D. Straight

49. Find the perimeter of the following figure.
   A. 10 feet  B. 20 feet  C. 25 feet  D. 50 feet
50. Find the area of this triangle, using the formula given.

\[ A = \frac{1}{2} bh \]

A. 80 sq. in.  B. 9 sq. in.  C. 40 sq. in.  D. 18 sq. in.
CONCLUSIONS AND RECOMMENDATIONS

I. Junior and Senior High School

1. Allow for more individual attention, cut class size
to 25, with a teacher load of no more than 125 per day
in a 6-period day.

2. Enlist the assistance of the business community to
emphasize the importance of a high school education in
general and mathematics in particular.

3. Schedule at least one conference with the parents of
each student, preferably near the beginning of the
school year, to discuss responsibilities and
expectations.

4. Encourage the scheduling of pre-algebra for incoming
9th graders whose average in the eighth grade
mathematics course is 82% or less.

5. Assign and grade homework regularly.

6. Use numerical averages, rather than letter grades, on
report cards. A grade of 26% is far more revealing
than just an "F".

7. Institute schedules for final exams and turn in grades
after these exams are graded.

8. Require that either the last 9 weeks or the final exam
be passed in order to receive a passing grade in the
course. This would indicate at least minimum
competency in the topics covered during the 4th quarter, a prerequisite for courses sequential in nature.

9. In all schools where more than one person teaches a particular mathematics course, require regular departmental meetings during which topics to be taught, along with tentative time frames for covering these topics, as well as methods of instruction are discussed. Departmental tests, covering specified content, could be developed also.

10. Provide an unencumbered planning period for each teacher each day.

11. Continue in-service content and methodology seminars on a system-wide basis.

II. Elementary School

1. Every effort should be made to impress on a child, particularly one who is entering school for the first time, and his/her parents, the importance of a solid education. Parents should be required to bring the child to school, before the session begins, for a conference with the teacher. At this time, parents, child, and teacher could establish the duties of each, pertaining to the expectations of the parents and the
teacher for the student.

2. Manipulatives should be used in the teaching of basic mathematical concepts. Since young children spend more time watching TV and less time playing games in which counting is emphasized, there is a need to handle and count objects. The blocks, rods and disks common to manipulative methodology could fulfill this need.

3. Homework should be assigned regularly and checked for accuracy, neatness and completeness.

4. Appropriate behavior skills, such as sitting quietly in one's desk, should be practiced until the child is able to perform such skills at an acceptable level.

5. Study and listening skills should be mastered.

6. Elementary teachers should have a daily planning period, unencumbered by any other duty.

7. Classes should contain a maximum of 25 students.

8. An effort should be made to involve the community in the schooling process. For example, parents and community leaders could describe their jobs to a class, emphasizing the ways in which mathematics is used in work atmospheres.

9. A child who does not perform specified mathematical skills with at least 70% accuracy should not be passed to the next grade until he/she can perform at
that level. It is unrealistic to allow a child to fail mathematics for eight years, and expect him/her to pass algebra.

10. Regular in-service seminars in mathematics should be required for all teachers of elementary mathematics.

11. Wherever possible, mathematics specialists should teach the elementary school mathematics classes, following the leadership of the sixth-grade center. Even though prescribed time allotments are followed for mathematics instruction in the elementary classroom, many elementary teachers feel uncomfortable teaching the subject. As a result, teachers and students do not have the confidence they need when faced with mathematical problem-solving situations.
APPENDIX B
Dear Colleague,

You may recall that during the 1984-85 school session, Mr. Nichols gave me permission to use a sample of Algebra I students for my dissertation data. With your assistance, 1,543 students were polled and tested on various skills and attitudes. During this last year I have compiled the data and have run several statistical analyses. By using only the most influential attitude items (the ones with the highest loadings in a factor analysis), I was able to correctly classify 75% of these students as passing or failing the Algebra I course. Inclusion of the results from the SRA math skills subtests increased the accuracy of classification to 85%.

I need your assistance again. This time I am asking that you take a few minutes to read the list of these attitude items I previously mentioned and check your interpretation of each group. Please then check your answer(s) to the statements which follow and return all three pages to me at ASH. Your assistance in this matter, as it has been throughout this entire project, is deeply appreciated.

Sincerely,

Marie S. LaCour
Loading Factor 1

.723 My parents and I feel good when I understand how to work a math problem.
.698 It is important to study for a math test.
.695 Since my teacher knows more about math than I do, I should listen to his/her explanations.
.652 My parents always expect me to do my best in my schoolwork.
.591 My father expects me to be good at math.
.588 I know more than my math teacher does.
.586 I do not need to pay attention in math class; I know all the math I need already.
.448 It is better for me to do my homework as soon as I get home from school.

Factor 2

.722 Math is necessary in the kind of work I will be doing.
.694 I do not need to worry about learning a lot of math; I will not use it when I get out of high school.
.648 Math is unnecessary in my life.
.634 I need to know more than just arithmetic if I am to succeed in my chosen profession.
.599 We do not study the kind of math I will use in my future job.

Factor 3

.812 I am a very good math student.
.760 I can work math as well as anyone in my class.
.622 Math is too hard.
.540 I never quite understand what I am expected to do in math.

Factor 4

.702 When I get interested in watching TV, I forget I have algebra homework to do.
.654 I could make better grades in math, but I do not feel like working that hard.
.621 I really do mean to study, but somehow I never have time.
.506 I regularly do my algebra homework.
.441 I do not watch TV while I am doing my algebra homework.
I. What interpretation would you assign to

Factor 1: ______Acceptance of Authority
____Relationship to Adults
____Parental/Teacher Expectations
____Importance of Mathematics
____Other (Please explain)

Factor 2: ______Value of Mathematics
____Usefulness of Mathematics
____Importance of Mathematics
____Job Expectations
____Other (Please explain)

Factor 3: ______Self-Concept as a Mathematics Student
____Difficulty of Mathematics
____Peer Expectations
____Other (Please explain)

Factor 4: ______Distractions
____Study Habits
____Willingness to Work
____Lifestyle
____Other (Please explain)
II. Questions

1. Are these results compatible with your classroom/administrative experiences?
   ______ Yes
   ______ No

2. To what extent has change been initiated at your school to alleviate the failure rate in Algebra I classes?
   ______ Extensively
   ______ Moderately
   ______ Not at all

3. In what areas have changes been made?
   ______ Instructional methods
   ______ Reduced class load
   ______ Teacher Re-assignment
   ______ New textbook adoption
   ______ Course placement of incoming freshmen (pre-Algebra or Algebra I)
   ______ Other (Please explain)

4. In your opinion, can information of the type researched in this study be of value to you in your teaching/administrative duties?
   ______ Yes, very valuable
   ______ Yes, somewhat valuable
   ______ No, not at all
5. Do you believe that further research should be conducted?
   - Yes, on a periodic basis
   - Yes, but infrequently
   - No, further information is unnecessary

6. Do you believe that studies conducted at the local level can expedite decision-making?
   - Yes
   - No

7. Would you support local research efforts?
   - Yes
   - No

8. Is this the first information you have received about this study?
   - Yes
   - No

9. If no, please indicate the source of previous information.
   - Informal conversations with the researcher
   - Formal presentation to a school board committee
   - Administrators' meeting
   - Central staff memo
   - Other (Please explain)
Please check one of the following:

____ Mathematics Teacher
____ Principal
____ Central Staff Administrator
____ Board Member

(If you are a classroom teacher, please omit the following questions.)

10. Would student attitudinal information be of assistance to you in

____ Making out the master schedule
____ Assigning teachers to specific courses
____ Purchasing textbooks
____ Limiting class size
____ Establishing/maintaining a parent organization
____ Enlisting community involvement in your school(s)
____ Other (Please explain)
____ None of the above

11. Have any decisions pertinent to any of the above categories been made as a result of this research?

____ Yes
____ No
____ I don't know.
Interview Protocol

I. What interpretation would you assign to

Factor 1: _____Acceptance of Authority
    _____Relationship to Adults
    _____Parental/Teacher Expectations
    _____Importance of Mathematics
    _____Other (Please explain)

Factor 2: _____Value of Mathematics
    _____Usefulness of Mathematics
    _____Importance of Mathematics
    _____Job Expectations
    _____Other (Please explain)

Factor 3: _____Self-Concept as a Mathematics Student
    _____Difficulty of Mathematics
    _____Peer Expectations
    _____Other (Please explain)

Factor 4: _____Distractions
    _____Study Habits
    _____Willingness to Work
    _____Lifestyle
    _____Other (Please explain)
II. Questions

1. Are these results compatible with your classroom/administrative experiences?
   ______ Yes
   ______ No

2. To what extent has change been initiated at your school to alleviate the failure rate in Algebra I classes?
   ______ Extensively
   ______ Moderately
   ______ Not at all

3. In what areas have changes been made?
   ______ Instructional methods
   ______ Reduced class load
   ______ Teacher Re-assignment
   ______ New textbook adoption
   ______ Course placement of incoming freshmen (pre-Algebra or Algebra I)
   ______ Other (Please explain)

4. In your opinion, can information of the type researched in this study be of value to you in your teaching/administrative duties?
   ______ Yes, very valuable
   ______ Yes, somewhat valuable
   ______ No, not at all
5. Do you believe that further research should be conducted?
   ______ Yes, on a periodic basis
   ______ Yes, but infrequently
   ______ No, further information is unnecessary

6. Do you believe that studies conducted at the local level can expedite decision-making?
   ______ Yes
   ______ No

7. Would you support local research efforts?
   ______ Yes
   ______ No

8. Is this the first information you have received about this study?
   ______ Yes
   ______ No

9. If no, please indicate the source of previous information.
   ______ Informal conversations with the researcher
   ______ Formal presentation to a school board committee
   ______ Administrators' meeting
   ______ Central staff memo
   ______ Other (Please explain)
Please check one of the following:

_____ Mathematics Teacher
_____ Principal
_____ Central Staff Administrator
_____ Board Member

(If you are a classroom teacher, please omit the following questions.)

10. Would student attitudinal information be of assistance to you in

_____ Making out the master schedule
_____ Assigning teachers to specific courses
_____ Purchasing textbooks
_____ Limiting class size
_____ Establishing/maintaining a parent organization
_____ Enlisting community involvement in your school(s)
_____ Other (Please explain)
_____ None of the above

11. Have any decisions pertinent to any of the above categories been made as a result of this research?

_____ Yes
_____ No
_____ I don't know.
Vita

Marie Cleo Stafford LaCour was born March 25, 1939, in Alexandria, Louisiana. She is the oldest of the three daughters born to Marie Cleo David and Byron Leroy Stafford, both of whom were lifelong residents and educators of Rapides Parish. She is the mother of two children, Marie Cleo (Ree-C) and Robert Claude, Jr, (Rob).

Marie attended public school in Rapides Parish and graduated from the Lecompte High School in 1956. She holds a Bachelor of Science degree in Education from Northwestern State University (1960), a Master of Education degree from the University of Southwestern Louisiana (1968), the Certificate of Education Specialist (1983) and a Doctor of Philosophy degree in Educational Research (1987) from Louisiana State University. Currently on leave from her duties as chairman of the mathematics department and teacher at Alexandria Senior High School, she is directing a state-funded grant to modify the attitudinal and academic behaviors of mathematically-at-risk sixth grade students in Rapides Parish.
DOCTORAL EXAMINATION AND DISSERTATION REPORT

Candidate: Marie Stafford Lacour

Major Field: Educational Research

Title of Dissertation: Educational Research and Educational Policy Making: A Case Study of Local Level Utilization

Approved:

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November 25, 1987